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PROCEEDINGS



TICC

6th TICC

INTERNATIONAL CONFERENCE

NEXT NORMAL...NEXT MOVE
TOWARDS SUSTAINABLE
DEVELOPMENT GOALS

5th MARCH, 2022

Book of Proceedings
The 6th TICC International Conference 2022
“Next Normal...Next Move towards Sustainable
Development Goals”

Thailand International College Consortium (TICC)

Prince of Songkla University International College
Faculty of International Studies, Prince Songkla University
Khon Kaen University International College
Naresuan University International College
Burapha University International College
International College for Sustainability Studies,
Srinakharinwirot University
Silpakorn University International College
International College of Digital Innovation,
Chiang Mai University

TABLE OF CONTENTS

WELCOME MESSAGE FROM THE THAILAND INTERNATIONAL COLLEGE CONSORTIUM (TICC)	I
TICC CONFERENCE MANAGEMENT COMMITTEE	V
SCIENTIFIC COMMITTEE	VI - VII
TICC MEMBERS & OUR GOALS	VIII
ACKNOWLEDGEMENTS	IX
CONFERENCE SCHEDULE	X
PRESENTATION SCHEDULE	I – XVII

TOURISM, HOSPITALITY AND MICE

- The Effect of Covid-19 Pandemic to the Employment Generation in the Tourism Sectors in the Philippines 1
- How will the Hospitality Industry Adapt with A.I. for the Post- COVID-19 Landscape? Investigating A.I. Technologies within Thailand’s Hotel Sector for the New Normal Conditions 22
- Hospitality Skills for the Next 10 Years: A Case Study at a Hospitality School in Thailand 38
- Hotel Mitigation and Strategic Response during COVID-19 from International Chain Hotels in Bangkok 58
- Benefits of Hospitality Services in Attracting the Guest to Your Hotel 67
- How Thai Hotels Response to COVID-19 during Locked Down. 77
- How New Normal Affect Hotel Industrial Training 86
- Hokkien Chinese Cultural Capital : Local Heritage and Creativity of Unique Identity through Café Business in Phuket Old Town 96

EDUCATION

- A Brief Analysis of Confucian Merchant Cogitation Embodied in Textbook ‘New Silk Business Chinese Writing’ and Significances for Cross-cultural Business Chinese Writing Curriculum Lectures. 112



▪ The Perceptions towards M-learning in Private University during the COVID-19 Pandemic in Thailand	120
▪ Move Analysis of Chemistry English Research Article Abstracts Published in an International Journal	135
▪ Supplies Administration of School Administrators under the Songkhla Primary Educational Service Area Office 3	146
▪ Roles of School Administrators in Promoting Students’ Disciplines in Schools of Songkhla Primary Educational Service Area 3	158
▪ The Relationship between Competency of Administrators and the Administration of Intensive Islamic Study Curriculum under Primary Education Service in Three Southern Border Provinces	172
▪ Curriculum and Communication: The Concerns about Staff, Students, Instructors, and Policies at University Level in Thailand	183

BUSINESS AND MANAGEMENT

▪ The Application of Balanced Scorecard Evaluation Model for Power Development Fund Management in Thailand	194
▪ Factors of E-procurement Adoption for the Business in Chonburi	206
▪ The Impact of Influencers on Consumers’ Purchase Intentions	216
▪ What Drives A Transition from Natural Rubber to Other Types of Farming in Thailand: A Proposed Conceptual Framework	230
▪ Factors Affecting Intention to Use Food Delivery Applications During Covid-19: A Case of Thailand	247
▪ Purchase Decision Model of Running Shoes Using Multiple Regression Analysis: A Comparative Study Between Beginners and Advanced Runners	257
▪ The Effect of Monetary Policy on Stock Returns under Different Firm Characteristics	269
▪ Assessing the Perception of Bank’s Consumers on Banking Innovation and Behavioral Intention in Developing Country: A Case of Competitive Environment in Laos Banking Industry	288
▪ Content Validity of Self- rating Scale of Self-directed Learning (SRSSDL) for Applying with Employees in The Workplace	305

SCIENCE, TECHNOLOGY AND BCG ECONOMY

▪ Development of Mycelium Sheet from Oyster Mushroom, Pleurotus SP.	320
▪ Forecasting Diesel Consumption in Thailand Using Decomposition with SARIMAX-ANN Hybrid Model	333

- The Isolation and Quantitative Determination of Protocatechuic Acid from *Sechium Edule* (Jacq) Swartz. 356

- Consumer Acceptance and Physical Property of Esan Hot Pot Sauce 364

HOLISTIC HEALTH AND WELLNESS MANAGEMENT

- Relationship between Environmental Factors Influencing the Detection of Total Coliforms Bacteria in Drinking Water in Sealed Containers, Southern Thailand by Multiple Logistic Regression. 373

INTERNATIONAL STUDIES

- An Analysis of Female Protagonist (Josephine) in the Novel of Little Women 383
- A Comparative Study of Dehumanization in the Novel and the Film of The Giver 397
- An Analysis of Feminist Perspectives Reflected in the Film of The Color Purple 411
- Determinant of Outward FDI: Case Study Singapore, Malaysia and Thailand 429

ART MEDIA AND COMMUNICATIONS

- Covid-19 A Temporary Pandemic or Permanent Disease A View from Different Perspectives- 446
- Jargons in Green-Washing Strategy: Effects on Consumers' Perception in Thailand 453

POSTER

- How to Initiate Thailand Emergency Medical Team Verified By WHO; Focus On Pharmacists Responsibilities. 464
- Development of Transethosomes Containing Coffee Berry By-Product Extract for Cosmeceutical Application 465
- Antioxidant, anti-collagenase, anti-elastase and cytotoxic activities of *Tremella fuciformis* extract for cosmeceutical applications 466
- A Comparative Analysis of Allergen Proteins in Latex between Hevea Brasiliensis Clones RRIT-251 and RRIM-600 467
- Teaching Media and Politics in Civic Education with Wag the Dog: A Cross-Disciplinary Approach 468

WELCOME MESSAGE FROM THE THAILAND INTERNATIONAL COLLEGE CONSORTIUM (TICC)

Welcome to the 6th International Conference titled “**Next Normal...Next Move towards Sustainable Development Goals.**” The TICC International Conference is a forum for scholars, researchers and students all over the world to share their research experiences and their research points of view in seven areas; 1) business and management, 2) science, technology and BCG economy, 3) art media and communications, 4) tourism, hospitality and MICE, 5) international studies, 6) education, and 7) holistic health and wellness management. As you know, it is a VIRTUAL conference, co-hosted by Prince of Songkla University, International College (Hat Yai Campus) and Faculty of International Studies, Prince of Songkla University (Phuket campus), Khon Kaen University International College, Naresuan University International College, Burapha University International College, Silpakorn University International College, International College for Sustainability Studies, Srinakharinwirot University, and International College of Digital Innovation, Chiang Mai University. On behalf of the coordinating committee, we are pleased to welcome all participants.

The conference has been held annually in several locations, such as Phuket, Pitsanulok, Chonburi and Khon Kaen. This VIRTUAL event is an opportunity to maintain the sequence. It is also an opportunity to bring together researchers and students from different disciplines to exchange their opinions, ideas, practices, and findings to support our efforts to reach sustainable development goals at an international level. We have a full programme and look forward to an exciting and stimulating event today. Let the games begin!

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TICC MEMBERS & OUR GOALS

The Thailand International College Consortium (TICC) International Conference is co-hosted by 8 International colleges consisting of Prince of Songkla University International College Hatyai Campus (PSUIC Hatyai Campus), Faculty of International Studies, Prince Songkla University (Phuket Campus), Khon Kaen University International College (KKUIC), Naresuan University International College, Burapha University International College., Silpakorn University International College, International College for Sustainability Studies (SWUIC) and International College of Digital Innovation, Chiang Mai University (CMUIC) These international colleges established the Thailand International College Consortium (TICC) in 2018 to enhance academic collaborations among the partner universities. TICC has the following goals.

1. To exchange Thai and international students at both undergraduate and graduate levels among partner universities
2. To exchange lecturers among partner universities
3. To conduct collaborative research projects.
4. TICC would like to welcome all international colleges in Thailand to become a member and enjoy several benefits that TICC could offer.



ACKNOWLEDGEMENTS

We would like to acknowledge the contribution made to the 6th TICC International Conference by several parties, including all conference participants, the reviewing committee members who contributed their time, energy, and knowledge, the international conference funding from Songkla University International College, Faculty of International Studies, Prince of Songkla University and, importantly, friendship among the TICC. This international conference could not have successfully held without all the valuable supports.



CONFERENCE SCHEDULE





The 6th Thailand International College Consortium International Conference
on the Topic "Next Normal...Next Move towards Sustainable Development Goals"
On 5th March, 2022
through a Zoom Meeting

08.30 a.m. - 09.00 a.m.	Registration
09.00 a.m. - 09.05 a.m.	Opening ceremony
09.05 a.m. - 09.10 a.m.	The Report of the 6th TICC International Conference by Dr. Sumana Laparajkit, Dean of Prince of Songkla University International College
09.10 a.m. - 09.15 a.m.	Opening Speech by Assistant Professor Dr. Niwat Keawpradub, President of Prince of Songkla University
09.20 a.m. - 10.00 a.m.	Keynote Lecture on the topic “Next Normal...Next Move towards Sustainable Development Goals” by Abhisit Vejjajiva, former Prime Minister of Thailand
10.00 a.m. - 10.10 a.m.	Group photo
10.10 a.m. - 10.40 a.m.	Keynote Lecture on the topic “Next Normal...Next Move towards Sustainable Development Goals” by Professor Dr. Amornrat Phongdara, Dean of Faculty of Medical Technology of Prince of Songkla University
10.40 a.m. - 10.45 a.m.	Best Paper Award Announcement
10.45 a.m. - 10.55 a.m.	The handover ceremony to the next host of the Thailand International College Consortium International Conference
10.55 a.m. - 11.00 a.m.	Closing ceremony
11.15 a.m. - 04.00 p.m.	Present and critique academic articles



Room: Tourism, Hospitality and MICE

Moderator: Asst. Dr. Nantawan Muangyai, Asst. Prof. Dr. Rungnapha Khamung,
Dr. Potjanee Kamolrat, Dr. Nethchanok Riddhagni

Submission ID	Submission Type	Title	Time
80	Full Papet	Hotel Mitigation and Strategic Responses during COVID-19	11.15 - 11.30
85	Full Papet	How new normal hotel industrial training affect hotel management Studen	11.30 - 11.45
89	Full Papet	Hokkien Chinese Cultural Capital : Local Heritage and Creativity of Unique Identity through Café Business in Phuket Old Town	11.45 - 12.00
10	Full Papet	The effect of covid-19 pandemic to the employment generation in the tourism sectors in the philippines	13.00 - 13.15
13	Abstract	After the Covid-19 Pandemic Will there ever be a new normal for the small businesses at Bangsaen Beach?	13.15 - 13.30
16	Abstract	Entrepreneurship in the Hospitality and Tourism Industry in Thailand: A Model of Personal Characteristics	13.30 - 13.45
65	Full Papet	How will the hospitality industry adapt with A.I. for the post-COVID-19 landscape? Investigating A.I. technologies within Thailand's hotel sector for the new normal conditions	13.45 - 14.00
69	Full Papet	Hospitality Skills for the next 10 years: A case study at a hospitality school in Thailand	14.15 - 14.30
83	Full Papet	Benefits of hospitality services in attracting the guest to your hotel	14.30 - 14.45
84	Full Papet	How Thai Hotel Response to Covid-19 During the Quarantine	14.45 - 15.00



Room: Education [EDU]

Moderator: Dr. Supanida Chantarin, Dr. Gornkrit Meemongkol,
Asst. Prof. Dr. Saranya Pathanasin, Dr.Sudrudee Bumrung

Submission ID	Submission Type	Title	Time
24	Abstract	“Forensic Accounting”-Its role, significance and future for Thailand	11.15 - 11.30
34	Full Papet	A Brief Analysis of Confucian Merchant Cognition Embodied in Textbook’ New Silk Business Chinese Writing’ and Significances for Cross-cultural Business Chinese Writing Curriculums Lectures	11.30 - 11.45
35	Full Papet	Hokkien Chinese Cultural Capital : Local Heritage and Creativity of Unique Identity through Café Business in Phuket Old Town	11.45 -12.00
42	Full Papet	Move Analysis of Chemistry English Research Article Abstracts Published in an International Journal	13.00 - 13.15
45	Poster	Teaching Media and Politics in Civic Education with Wag the Dog: A Cross-Disciplinary Approach	13.15 - 13.25
50	Abstract	VIDEO Project with English Subtitles: Sharing and Showcasing Best Practice from Project-based Learning	13.25 - 13.40
58	Full Papet	Supplies Administration of School Administrators under the Songkhla Primary Educational Service Area Office 3	13.40 - 13.55
59	Full Papet	Roles of School Administrators in Promoting Students’ Disciplines in Schools of Songkhla Primary Educational Service Area 3	13.55 - 14.10
62	Full Papet	The Relationship between Competency of Administrators and the Administration of Intensive Islamic Study Curriculum under Primary Education Service in Three Southern Border Provinces	14.10 - 14.25

Room: Education [EDU]		Moderator: Dr. Supanida Chantarin, Dr. Gornkrit Meemongkol, Asst. Prof. Dr. Saranya Pathanasin, Dr.Sudrudee Bumrung	
Submission ID	Submission Type	Title	Time
88	Full Papet	Curriculum and Communication: The Concerns about Staff, Students, Instructors, and Policies at University Level in Thailand	14.25 - 14.40
90	Abstract	Test Bank Software Development for Srinakharinwirot University Standardized English Test (SWU – SET)	14.40 - 14.55
92	Abstract	Thai Engineers' Perception on Vocabulary Prescribed in an English for Engineering Commercial Textbook	14.55 - 15.10


Room: Business and Management [BUM]

Moderator: Dr. Nongnuch Boonklum, Dr. Kongkidakarn Sakulsinlapakorn,
Asst. Prof. Kevin Jones

Submission ID	Submission Type	Title	Time
6	Full Papet	The Application of Balanced Scorecard evaluation model for Power Development Fund Management in Thailand	11.15 - 11.30
19	Full Papet	Factors of e-procurement adoption for the business in Chonburi	11.30 - 11.45
20	Abstract	What CSR activities does the local community prefer? A study of residents near Amata City using conjoint and cluster analyses	11.45 - 12.00
30	Abstract	A Study of Food Delivery Services: Comparison of Restaurant Food Delivery and Online Food Delivery Services during the Pandemic	13.00 - 13.15
32	Full Papet	The impact of influencers on consumers' purchase intentions	13.15 - 13.30
53	Full Papet	What drives a transition from natural rubber to other types of farming in Thailand: A proposed Framework	13.30 - 13.45
57	Full Papet	Factors affecting intention to use food delivery applications during covid-19: A case of Thailand	13.45 - 14.00
71	Full Papet	Purchase Decision Model of Running Shoes Using MRA: A Comparative Study between Beginners and Advanced Runners	14.00 - 14.15
73	Full Papet	Benefits of hospitality services in attracting the guest to your hotel	14.15 - 14.30
75	Full Papet	Assessing the Perception of Bank's Consumers on Banking Innovation and Behavioral Intention in Developing Country: A Case of Competitive Environment in Laos Banking Industry	14.30 - 14.45
81	Full Papet	How Thai Hotel Response to Covid-19 During the Quarantine	14.45 - 15.00



Room: Science, Technology and BCG Economy [STB]

Moderator: Dr.Chakkrapong Kuensaen, Dr.Wuttiwat Jitjak,
Dr. Jesper T.N. Knijnenburg, Dr. Chutima Ploychankul

Submission ID	Submission Type	Title	Time
7	Poster	How to initiate Thailand Emergency Medical Team verified by WHO; Focus on pharmacists responsibilities.	11.15 - 11.25
17	Full Papet	Mycelium sheet from oyster mushroom, Pleurotus SP.	11.25 - 11.40
26	Poster	Development of transethosomes containing coffee berry by-product extract for cosmeceutical application	11.40 - 11.50
28	Poster	Antioxidant, anti-collagenase, anti-elastase and cytotoxic activities of Tremella fuciformis extract for cosmeceutical applications	11.50 - 12.00
37	Poster	A comparative analysis of allergen proteins in latex between Hevea brasiliensis clones RRIT-251 and RRIM-600	13.00 - 13.10
70	Full Papet	Forecasting Diesel Consumption in Thailand Using Decomposition with SARIMAX-ANN Hybrid Model	13.10 - 13.25
72	Full Papet	The isolation and quantitative determination of Protocatechuic acid from Sechium edule (Jacq) Swartz.	13.25 - 13.40
74	Full Papet	Consumer acceptance and physical property of Esan hot pot sauce	13.40 - 13.55

Room: Holistic Health and Wellness Management [HWM]			Moderator: Asst. Prof. Dr. Benjamas Suksatit
Submission ID	Submission Type	Title	Time
67	Full Papet	A study relationship between environmental factors influencing the detection of total coliforms bacteria in drinking water in sealed containers, Southern Thailand by Multiple logistic regression.	11.15 - 11.30
Room: International Studies [INS]			Moderator: Dr. Nicha Tovankasame
Submission ID	Submission Type	Title	Time
47	Full Papet	An Analysis of Female Protagonist (Josephine) in the Novel of Little Women	11.15 - 11.30
48	Full Papet	A Comparative Study of Dehumanization in the Novel and the Film of The Giver	11.30 - 11.45
49	Full Papet	An Analysis of Feminist Perspectives Reflected in the Film of The Color Purple	11.45 - 12.00
76	Full Papet	Determinant of Outward FDI: Case Study Singapore, Malaysia and Thailand	13.00 - 13.15

Room: Art Media and Communications [AMC]

Moderator: : Asst.Prof.Dr. Nuwan Thapthiang,
Dr. Pailin Thawornwijit

Submission ID	Submission Type	Title	Time
18	Abstrat	The Installation Art as an Extension of the Social Space: the Seasail Art Project in Phuket old town	11.15 - 11.30
36	Full Papet	Covid-19 a temporary pandemic or permanent disease -a view from different perspectives	11.30 - 11.45
38	Full Papet	Jargons in Green-Washing Strategy: Effects on Consumers' Perception in Thailand	11.45 - 12.00

TOURISM, HOSPITALITY AND MICE

The Effect of Covid-19 Pandemic to the Employment Generation in the Tourism Sectors in the Philippines

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Abstract

Through all the decades in the history of mankind, tourism is one of the prime movers to economies and a contributor particularly on the creation of employment although its role is complex and it is composed of several sectors whose success is inter-dependent. The purpose of this study was to investigate as represented by tourists' consumption of products and services known as internal tourism expenditure specifically in the following categories; 1) accommodation services for visitors 2) miscellaneous 3) country-specific tourism services including shopping 4) transport services 5) food, beverage and restaurant services 6) travel agencies and other reservation services and 7) entertainment and recreation services covering the period 2016 to 2020, as the basis for examining the jobs created in the tourism sectors in relation to its effect to the Covid-19 pandemic. Moreover, secondary data used in a retrospective study approach, which compared the performance of different sectors of the tourism industry. The job created in the specified period ranked as follows: 1) passenger transport, 2) accommodation and food and beverage, 3) miscellaneous 4) retail trade on tourism characteristics goods 5) recreation; entertainment and cultural services and lastly, 6) travel agents, tour operators and tourism guides. Based on the results within the five-year period, both internal tourism expenditure and employment generation in tourism industries has been increasing on the first to third years with its peak on the fourth year and a huge dropped in the 5th year which was the immediate effect of the pandemic. It further shows that tourism expenditures increases, employment in the tourism sector also increases and vice versa. Likewise, the employment generated in the tourism industries will also depend on the strategies and as far as the quality of service that these sectors could provide to the tourists during their visits by the concerned sector to preserve sustainability and to consider the external factors as uncontrollable forces that affects the industry.

Keywords: Tourism, internal tourism expenditure, tourism employment generation, tourism employment growth rate, Covid-19 pandemic

and provide jobs, income and experience for many people, which contribute to their social inclusion and personal development. On the other hand, the concept of the multiplier is used in the travel industry to encompass the direct secondary effects of visitor expenditures on an economy (Gee, Makens & Choy , 1989).

The tourism business is composed of industry players of different sizes who provided a variety of services aimed at satisfying tourist demands and making of every tourist’s stay memorable from the time of their arrival to their departure. Many industry players are small and medium enterprises (SMEs) who invest their resources, aiming not only to earn a profit but also to make their existence relevant to society. Their presence creates employment, contributes to national development through the payment of taxes, and improves the local facilities by building infrastructure projects implemented by the government sector. Moreover, factors such as, friendly tourist policies, peace order and security, quality products and services will always encourage tourists to return often to a destination.

According to Katz and Green (2001), small enterprises employ 50 or less while medium enterprises have from 51 to 500 employees, with both types of enterprise being independent and owner-managed. In the modern era, many SMEs are innovators who think of new ideas and efficiently deliver products and services. As innovators, they are more open to introducing and adapting to change, as well as being sensitive to the needs of the community. In the tourism sector, they provide quality products and services to tourists through a variety of types of business, including hotels, restaurants, various forms of transportation, souvenir and other types of shops, and other establishments which make a tourist’s stay memorable, by providing a high level of customer satisfaction, with the aim of achieving repeat business. Successful entrepreneurs think long-term and adopt a sustainable approach to the particular area in which they operate, and are able to offer good service to the community and the society in general. Further, as Getz, et. al. (2004), noted, small owner-operated businesses provide most of the services which attract visitors’ spending.

Anyone who owns a business is an entrepreneur, including the owner of small businesses, and it is important for both existing entrepreneurs who have been operating within the tourism industry, as well as new entrants to keep abreast of developments in the tourism business. As noted above, the various components of the tourism industry are inter-dependent and new ideas can lead to new business opportunities (Katz & Green, 2001). Tourism entrepreneurs should be aware of important indicators, such as the number of tourist arrivals and, most importantly, tourists’ reasons for and behavior in spending money during their stay, before making any major business decisions.

Inbound tourists are people not permanently residing in a specific country destination. They may travel as individual travelers or in groups, for leisure or for business purposes. As Davidson (1994) noted, business tourism in which people travel for reasons related to their work represents one of the oldest forms of tourism, with man having travelled for this purpose of trade since very early times. On the other hand, during a tourist’s visits, he/she will spend money for basic needs, availing her/himself of products and services, while taking time to appreciate the beauty of and attractions at the destination as a tourism product. According to the World Tourism Organization, the measurement of numbers of inbound visitors can provide

information about expenditure that permits the estimation of the economic impact of tourism at both national and local levels.

On the other hand, domestic travelers are people who live permanently in a country and use the products and services offered at a locality within that country. For instance, domestic travelers may be people spending time with their family at the weekend or dining at a restaurant, or may be representatives of business organizations conducting business meetings in tourism facilities, such as hotels and restaurants. All these activities entail tourism expenditure by visitors which represents the amount paid for the acquisition or the consumption of goods and services, including those imported into the country and sold to visitors for personal use during tourism trips, or purchased to be given away as gifts, and includes expenditure by visitors themselves, as well as expenses paid or reimbursed by others (UNWTO, 2010).

Covid-19 Impact to the Tourism Sector

The United Nations World Tourism Organization (UNWTO) reports that almost all countries have implemented travel restrictions of one sort or another, such as travel bans, visa controls and quarantines (UNWTO 2020). As a result, international tourism was almost totally suspended in April and May of 2020. Inbound tourist arrivals declined 74 per cent between January and December 2020, about 1 billion trips. However, if the pre-COVID months of January and February 2020 are excluded, the fall in arrivals amounts to 84 per cent” (UNCTAD, 2021).

Unfortunately, the year 2019 was not a good year for Tourism due to the pandemic. According to UNWTO (2020), **“the COVID-19 pandemic has caused a 22% fall in international tourist arrivals during the first quarter of 2020, the latest data from the World Tourism Organization (UNWTO) shows (UNWTO, 2020). Likewise, the United Nations specialized agency, the crisis could lead to an annual decline of between 60% and 80% when compared with 2019 figures places millions of livelihoods at risk and threatens to roll back progress made in advancing the Sustainable Development Goals (SDGs)”**. In addition, according World Travel and Tourism Council (2021) in 2019, the Travel & Tourism sector contributed 10.4% to global GDP; a share which decreased to 5.5% in 2020 due to ongoing restrictions to mobility. Moreover, “WTTC president and chief executive officer Gloria Guevara said: “as travel restrictions around the world remained in place over the summer months, our estimates report an increase from 121 million to 143 million jobs lost. In the space of just four months, our study has shown a further 22 million jobs under threat worldwide. This is devastating news, and we need international coordinated action now.” (M.S Arnaldo, 2020).

Further, tourism receipts worldwide are not expected to recover to 2019 levels until 2023. In the first half of this year, tourist arrivals fell globally by more than 65 percent, with a near halt since April—compared with 8 percent during the global financial crisis and 17 percent amid the SARS epidemic of 2003, according to ongoing IMF research on tourism in a post-pandemic world (A. Behsudi, 2020). In line with this, according to World Travel and Tourism Council (2021), the Travel & Tourism sector suffered a loss of almost US\$4.5 trillion to reach US\$4.7 trillion in 2020, with the contribution to GDP dropping by a staggering 49.1% compared to 2019; relative to a 3.7% GDP decline of the global economy in 2020.

Moreover, COVID-19 is affecting different aspects of public and private life, from economic and environmental fluctuations to changes that affect individuals in terms of income, education, employment and changes affecting public services such as civil aviation and postal services (UNWTO, 2020). In addition, the estimate is based on losses caused by the pandemic’s direct impact on tourism and the ripple effect on related sectors, and is worse than previously expected estimated that the standstill in international tourism would cost the global economy between \$1.2 trillion and \$3.3 trillion. Likewise, the steep drop in tourist arrivals worldwide in 2020 resulted in a \$2.4 trillion economic hit (UN News, 2021). Further, Covid-19 reared its head and soon we were engulfed in a global pandemic that has shuttered borders, cancelled holidays and business trips, greatly reduced flight numbers and wreaked havoc on tourism and travel focused businesses of every conceivable kind. In the first 10 months of 2020 alone, it cost the tourism industry \$935 billion in revenue worldwide – or if we stick with our long-form representation, \$935,000,000,000 (D. Madden, 2021).

In ASEAN Region, Thailand’s economy is expected to be impacted severely by the COVID-19 pandemic, shrinking by at least 5 percent in 2020 and taking more than two years to return to pre-COVID-19 GDP output levels (World Bank, 2020). Further, with Covid-19 closing borders for more than a year, the damage from losing international tourism has revealed a major weakness in Thailand’s overall tourism strategy. With up to 18% of the country’s GDP brought in by tourism, the disproportionate dependence on foreign travellers and lack of attention to domestic tourism has ravaged the industry and the national economy (N. Fronde, 2021). In addition, Singapore’s tourism sector experienced its “toughest year on record” in 2020 due to unprecedented global travel restrictions and border closures amid the COVID-19 pandemic visitor arrivals plummeted 85.7 per cent to 2.7 million, down from 19.1 million the year before, according to official data. Nearly all of these arrivals were in the first two months of 2020 (CNA Singapore, 2021). In Vietnam, the COVID-19 pandemic has disrupted year-on-year growth of inbound tourism while causing profound consequences for the tourism industry and related sectors. As Vietnam remains closed to international tourists, it is unlikely for inbound tourism to return to pre-pandemic levels this year (M.N Nguyen, 2021). Likewise, in Cambodia COVID-19 posts economic threats to different aspects of Cambodia’s development, with tourism, manufacturing for export and construction seen to be the most affected sectors. In combination, these sectors contributed more than 70% of Cambodia’s economic growth and around 39.5% of total employment in 2019 (Open Development Cambodia, 2020).

In the same scenario, the Asian Development Bank (ADB) estimates that the Covid-19 (coronavirus) outbreak could cause a decline in tourism revenue for Brunei Darussalam by as much as -0.086% of gross domestic product (GDP) in the best case scenario (US\$11.7mil), -0.113% in the moderate case (US\$15.3mil) and -0.192 per cent in the worst case (US\$26.1mil) (The Star, 2020). Likewise, the “sudden stop” in tourism arrivals and receipts caused by the onset of COVID-19 is expected to have a devastating impact on tourism enterprises in the Lao PDR. The impact is larger for enterprises that mostly served international guests (ADB Briefs, 2020). In addition, the COVID-19 pandemic and its containment measures have affected livelihoods in Lao PDR. While efforts to contain the pandemic were largely successful, over 2020 and the first quarter of 2021 the negative economic impact of Covid-19 has been felt (The World Bank, 2021).

On the positive note, recognizing the importance of domestic tourism, the United Nations specialized agency has released the third of its Tourism and COVID-19 Briefing Notes, -

Understanding Domestic Tourism and Seizing its Opportunities.- UNWTO data shows that in 2018, **around 9 billion domestic tourism trips were made** worldwide – six times the number of international tourist arrivals (1.4 billion in 2018) (WNTTO, 2020). In addition, with the proper strategy and incentives, domestic tourism can lead the rebound in the early phase of recovery and technically, domestic tourism has the potential to fully replace foreign visitors in more than half of the economies across Asia and the Pacific. This is based on the assumption that all tourists that traveled internationally in 2018 would opt to travel within their home country in 2020 (Development Asia, 2020). In line with this, given the international travel restrictions and fear of infection, domestic tourism offers a better chance for a rebound in the early phase of recovery. Many governments are looking for ways to stimulate domestic tourism as a way to support the battling tourism industry (ADB BRIEFS, 2020).

Employment Generation in the Tourism Sectors

Tourism plays a great role in the generation of employment opportunities among the people particularly of tourist importance. Thus, the tourism industry has tremendous capacity to create both direct and indirect employment. Starting from various tour operators, hotels, tourist offices, tourist guides and transport operators it provides direct employment to various categories of people (Owlgen, n.d.). Further, by its very nature **Travel & Tourism is labor intensive**, it provides on average one employee per room and indirectly employed too like guides, drivers, gardeners and laundry staff and that number rises to four and around half of all employees in the hotel, catering and hospitality sector (WTTC, 2018). Likewise, Tourism is creating jobs for millions at a time when the failure to provide hope for a better future to people of all regions is one of our biggest global challenges. The sector’s wide reach also stimulates entrepreneurship and growth of micro, small and medium-sized enterprises (MSMEs). MSMEs are the sector’s main innovators and sources of economic diversification, as well as being major job creators across sectors (T.Refai, 2017) .

Specifically, what jobs created in the tourism sector as a contribution to the economy? According to Swarbrooke & Homer, (2001) “in the tourism business, hotels are a major source of income and support a large number of jobs in this sector which account for a large proportion of overall employment in tourism.” Nevertheless, “a recent trend in tourism introduced by the ASEAN Tourism Standards (n.d.) is the home stay, an alternative form of furnished accommodation generally located in a house, which provides guests with the opportunity to experience the lifestyle of local communities and the families within them, while also offering them access to other tourist attractions.”

Further, (Gee, et.al, 1989) “tour operators referred to as ground operators normally provide services at the destination only and do not package or market transportation to or from destination, their services normally cover hotel transfers, overnight accommodations, sightseeing, and sometimes special arrangements, which are usually collectively referred to as land arrangements.” Likewise, road transport is a major source of revenue for taxis and car hire companies. Public transport, while an integral sector of the tourism industry must also provide services, but these are not solely dependent upon tourism demand (Holloway, 2002). In addition, direct spending on travel supports 7.5 million American jobs or 7 percent of total private sector employment. Indirect and induced impacts support an additional 6.9 million jobs, for a total of 14.4 million American jobs. Only five of the 20 major industries employ more people than tourism (P. Jennings, 2014).

Moreover, according to Chon & Maier (2010),” patrons enjoy variety of cuisines, including food cooked and served in styles from around the world such as Chinese, Indian, Malaysian, Thai, French, Italian, Cajun, Japanese, American, and Mexican, as well as variety of ethnic fusion cuisines”. In addition, “thousands of people in the tourism business are employed in travel agencies or other forms of specialist intermediaries which are a source of relatively well-paid employment in the industry” (Swarbrooke & Horner, 2002). In line with this, **Tourism is a major source of employment** because of its labour-intensive nature and the significant multiplier effect on employment in related sectors. It is estimated that **one** job in the core tourism sector creates about **one-and-a-half** additional or indirect jobs in the tourism-related economy. Overall tourism accounts for **one in ten jobs** worldwide (UNWTO, 2019).

However, there were some job opportunities created which was not part of the category but gives important functions to the entire tourism. According to UNWTO (2010) miscellaneous as they call it as “others, refers to non-tourism-related consumption products comprises goods and services that cannot be associated with any of the explicitly mentioned purposes of the preceding categories, such as newspapers and magazines, current health care products and occasional health services” which are consumed by tourists. Further, travel and tourism industry is one such sector, which is evolving at a rapid rate creating more job opportunities for the youth. Research suggests that every one out of 10 jobs in the world is backed up by travel and tourism (A. Agarwal, 2019).

On the other hand, tourism is a major contributor to employment creation particularly for women, youth, migrant workers, rural communities and indigenous peoples and has numerous linkages with other sectors. Consequently, tourism can lead to the reduction of poverty and to the promotion of socio-economic development and decent work (ILO, 2016).

Employment Generation before and during Pandemic

Tourism is one of the sectors most affected by the Covid-19 pandemic, impacting economies, livelihoods, public services and opportunities on all continents. All parts of its vast value-chain have been affected. As many as **100 million direct tourism jobs are at risk**, in addition to sectors associated with tourism such as labor-intensive accommodation and food services industries that provide employment for 144 million workers worldwide” (WNT0, n.d).

According to the International Labor Organization (ILO), global unemployment reached 197.1 million in 2015 and by 2017 will surpass 200 million, as one of the sectors with the highest such potential is travel and tourism, which continues to grow and stay resilient despite global challenges. Tourism provides 10% of the world’s GDP, 7% of global trade and as many as one in every 11 jobs globally. In each of the six years following the global economic crisis of 2010, the number of international tourist arrivals around the world grew at 4% or above.” (T. Rifai, weforum.org).

Further, “tourism and hospitality industries have created many job opportunities for millions of people in the world in different areas like accommodation, food and beverage (restaurants, dining rooms, cafes, fast food outlets, pubs, nightclubs, bed and breakfasts, motels, hotels, resorts, lounges, catering operations; airlines, airports, aircrafts, ships, boats, cruises, land transportations like trail, bus, travel agencies, tour operation companies), natural and cultural attractions such as national parks, caves, monuments, museums and galleries, theatres, concerts, festivals, carnivals, conferences, trade shows, and exhibitions)”. (Aynalem et al.,)

Moreover, **“Travel and tourism provides jobs for people with little formal training and by its very nature, the tourism industry is often labor intensive, needing large numbers of people to service rooms, prepare food and maintain hotel infrastructure”**(WTTC, 2017).

In addition, “tourism can also be viewed from the supply side and it will then be understood as the set of productive activities that cater mainly for visitors as such, tourism is an important source of job creation and countries are interested in its development for this reason” (WNTTO, 2014). On the other hand, in “United Kingdom the travel and tourism workforce comprises employees and self-employed persons from many industries across and a wide variety of jobs are on offer within travel and tourism: ranging from hotel, restaurant and bar work, to travel agency and tour operator roles, road, rail and aviation sector positions, artistic and cultural occupations, and a diverse range of others from IT and technology, to financial services” (Cbr, 2014). Meanwhile in European Union, “there were nearly 8 million people work in the food and beverage industry, while 2 million are employed in transport including the accommodation sector (not including real estate) accounts for 2.7 million jobs such as; travel agencies and tour operators account for just over half a million” (Eurostat, 2018).

In other developments, the Bureau of Economic Analysis (2017) said that “employment in the travel and tourism industries decelerated, increasing 1.6 percent in the second quarter of 2017 after increasing 2.4 percent (revised) in the previous quarter. The traveler accommodations were the leading contributor to the deceleration, adding approximately 500 employees in the second quarter of 2017 after adding 6,300 employees in the first quarter. Food and beverage services also contributed to the deceleration, adding approximately 10,400 employees in the second quarter after adding 13,900 employees in the first quarter of 2017” (BEA ,2017). And also, in 2019 “contribution of travel and tourism to employment (% of GDP) for Singapore was 8.7 %, though Singapore contribution of travel and tourism to employment (% of GDP) fluctuated substantially in recent years, it tended to increase through 2000 - 2019 period ending at 8.7 % in 2019”(knoema.com, 2019). More so, in Indonesia in 2019, direct contribution of travel and tourism to employment (% of GDP) for Indonesia was 3.7 %. Before direct contribution of travel and tourism to employment (% of GDP) of Indonesia started to increase to reach a level of 3.7 % in 2019, it went through a trough reaching a low of 2.8 % in 2013” (knoema.com, 2019).

Further, the contribution of travel and tourism to employment for Thailand was 6,131.1 thousand persons though contribution of travel and tourism to employment fluctuated substantially in recent years, it tended to increase through 2000 - 2019 period ending at 6,131.1 thousand persons” (knoema.com, 2019). Moreover, “the number of visitors to Thailand has grown rapidly from 14.1m in 2009 to 38.3m in 2018 (Chart 1). As a result, tourism has become ever more important as a driver of Thailand’s GDP growth, accounting for 12.3% of GDP in 2018 compared to only 5.3% in 2009. More so, the industry is an important source of employment, with total contribution of travel and tourism to employment was 15.5% of total employment in 2017 (5,834,000 jobs)– this figure is forecast to rise to 22.3% of total employment in 2028” (Bangkok Bank, 2019). With the latest update, “Thailand has lost about 1.45 million tourism jobs during the coronavirus pandemic, including 400,000 in the first quarter, a private tourism group said on Monday, as the country gets ready to reopen to visitors to try to rescue the struggling sector” (Bangkok Post, 2021). In the Philippines (psa.gov.ph, 2019) “employment in tourism characteristic industries was estimated at 5.4 million in 2018, higher by 1.8 percent compared to 5.3 million in the previous year. Share of employment in

tourism industries to total employment in the country was recorded at 13.0 percent in 2018.” Likewise, in the first quarter of 2020, the period when the travel restrictions and lockdowns in most countries started, international tourist arrivals declined by 22% resulting in an estimated loss of US\$80bn in global tourism receipts (Pwc Philipines, 2020).

Along with this, “Travel & Tourism is one of the leading job creators across the world, with more than 319 million jobs supported by the sector. This represents 10.0% of all employment, or one in every ten jobs worldwide. The sector has accounted for one in five of all net new jobs created across the world over the past five years and is a dynamic engine of employment opportunities. Jobs in Travel & Tourism particularly support women, youth and other, often marginalized, groups of society” (WTTC, 2019). In other developments, “as a service activity, tourism is highly labor intensive, accounting for 17% of direct employment in the Caribbean and 4% in Latin America, while in some countries (Antigua and Barbuda, Saint Lucia, Saint Kitts and Nevis and The Bahamas,) this share exceeded 20% in 2019. Taking into consideration indirect employment in this sector, the share of the “tourism economy” is more than double the direct employment share, particularly in the Caribbean. The tourism economy accounted for 35% of employment in the Caribbean and 10% in Latin America” (UN Publications, 2020).

Moreover, “following travel bans, border closures and quarantine measures, many workers cannot move to their places of work or carry out their job which has effects on incomes, particularly for informal and casually employed workers. As per data, the impact on the Indian hospitality industry could render a majority of the people in hospitality in India, jobless. As a result of this pandemic, the Indian tourism industry is looking at pan India bankruptcies, closure of businesses and mass unemployment (S. Dogra, n.d.) In addition, key sectors have been affected, particularly travel and tourism, and retail and other services sectors; business operations hence supply chains disrupted; employment and livelihood put at risk; while consumer confidence has declined (ASEAN Policy Brief, 2020) .

Further, “the Philippines may only see a significant rise in foreign tourist arrivals starting late 2021 or early 2022 as uncertainty over the pandemic continues, Fitch Ratings said in October, noting that the country’s low dependence on inbound tourism should limit overall economic impact.” (J. Ibanez, 2021). Despite of the challenges Tourism Secretary Bernadette Romulo-Puyat said, this confirms the industry’s vital role in the country’s recovery from the adverse effects of the coronavirus disease 2019 (Covid-19) pandemic. She further expressed optimism that the industry, virtually crippled by the disruption of international and domestic travel, would recover and emerge stronger “with the strong support of our stakeholders and partners.” (PNA, 2020). In a related story, “ILO estimates show that most of the Filipino tourism workers are in “food and beverage service sharing activities” with 69.1%. They are followed by tourism workers found in “sports and recreational activities” (13%) and “accommodation for visitors” (11.3%). This includes among others staff of airlines, hotels, travel agencies and transport companies within the region. In Southeast Asia, Thailand has the highest share of tourism employment reaching 9.0%, followed by Vietnam (6.9%) and Cambodia (6.7%), respectively. Nepal and Sri Lanka has the highest shares of jobs in tourism for South Asia, reaching 8.1% and 6.1%, respectively” (J. Opiniano & M. Luistro, 2020).

Moreover, the World Travel & Tourism Council’s annual Economic Impact Report reveals the dramatic impact COVID-19 had on the Philippine’s Travel & Tourism sector last year, wiping out \$37 billion from nation’s economy (Hospitality Net, 2021). On the other hand, the

contribution of the Philippine travel sector to the global economy is expected to rise sharply in 2021, by 48.5 percent year-on-year, if mobility and international travel resume while WTTC data showed tourism’s contribution to the country’s gross domestic product (GDP) dropped 41.4 percent due to the COVID-19 pandemic (T.Santos, 2021). .

4. Research Methodology:

This study utilized the secondary data released by the Philippine National Statistics as the one of the sources of reliable sources reviewed the five-year data including the internal tourism expenditure and the employment generated in the tourism sectors within the specified five-year period. Other related information stipulated in the review of related literature to support the content of this study.

5. Results:

According to the Philippine Department of Tourism (DOT), the foreign tourist arrivals and tourism receipts plunged by 83% in 2020, while the number of foreign tourists in the country was at 1.32 million, the same figure the DOT report in May 2020 this is an 83.97% plunge from the 8.26 million in 2019 (A. Rey, 2021). As such, “the total amount of receipts generated from inbound tourism, or the expenditure of foreign visitors, consequently plunged by 83.12% — from an estimated ₱482.16 billion in 2019 to ₱81.4 billion in 2020” (CNN Philippine, 2021)

Thus, the presentation in the succeeding pages explains the connection between the internal tourism expenditure and the employment generated within the five-year period in drawing the conclusion.

Table 1
 Total Internal Tourism Expenditure
 2016 to 2020 Growth Rate (in percent)

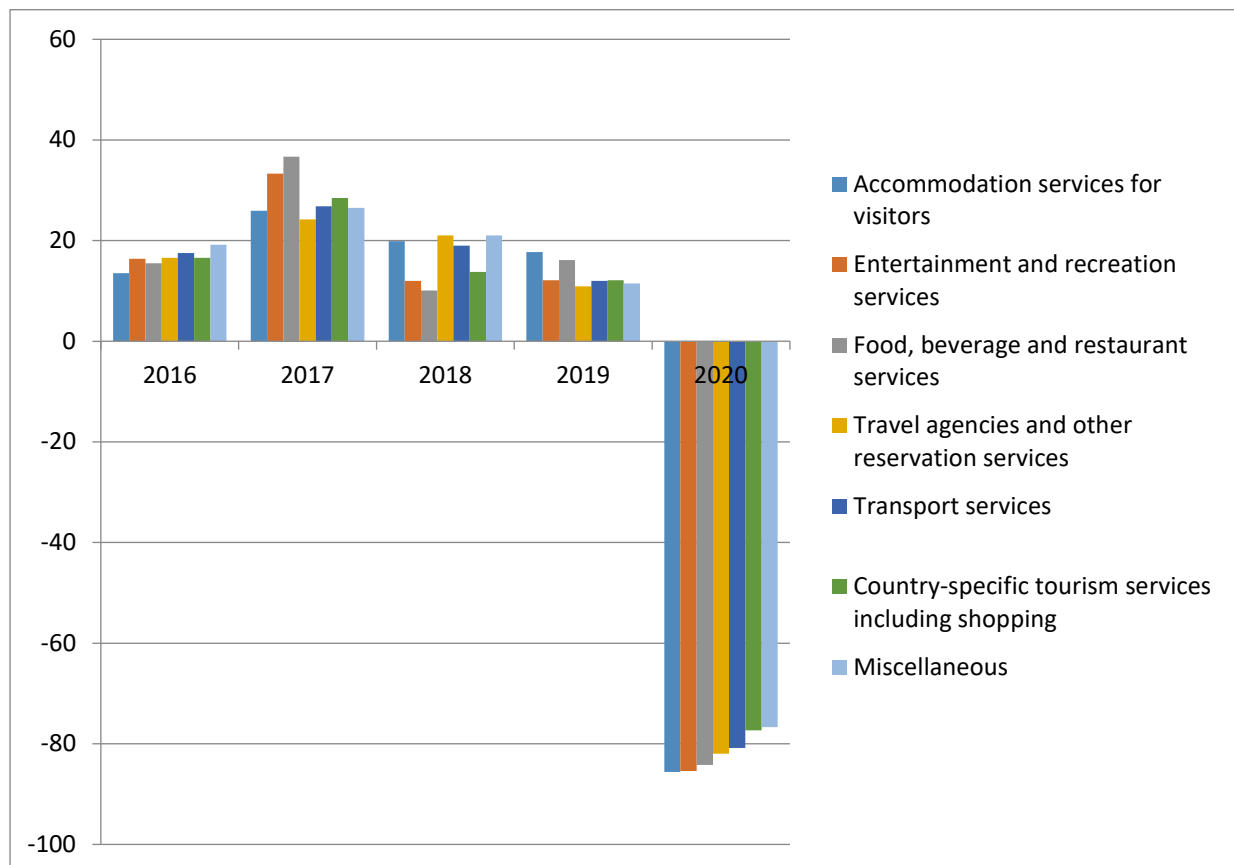
A. Consumption by products and services	2015-16	2016-17	2017-18	2018-19	2019-20	Rank
Accommodation services for visitors	13.5	25.9	19.9	17.4	-85.7	1
Entertainment and recreation services	16.4	33.3	12.0	12.1	-85.4	2
Food, beverage and restaurant services	15.5	36.7	10.1	16.1	-84.2	3
Travel agencies and other reservation services	16.6	24.2	21.0	10.9	-82.0	4
Transport services	17.5	26.8	19.0	12.0	-80.8	5
Country-specific tourism services including shopping	16.6	28.5	13.8	12.1	-77.3	6
Miscellaneous	19.2	26.5	21.0	11.5	-76.7	7
Total internal tourism expenditure	16.2	28.0	17.3	13.7	-81.6	-

Source: 2020 Philippine Tourism Satellite Accounts (PTSA) Report

As shown in Table 1, the internal tourism expenditure show a significant growth rate in 2016 to 2017 based on the following categories; food, beverage and restaurant service provided 36.7%. Similarly, 33.3% in entertainment and recreation, 28.5% in country-specific tourism services including shopping, miscellaneous provided 26.5% in the same manner as accommodation services for visitors accounted for 25.9% and travel agencies and other reservation services with 24.2% growth rate.

Unfortunately, the years 2019 to 2020 shows a downfall trend with a negative growth rate which greatly affect the Accommodation services for visitors with -85.7% as the highest, followed by Entertainment and recreation services with -85.4%, Food and beverage and restaurant services with -82.2% as the 3rd in rank, followed by Travel agencies and other reservations services with -82% as the 4th followed by Transport services with -80.8%, Country-specific tourism services including shopping gets -77.3% as the 6th in the ranked lastly, Miscellaneous on the 7th rank which has -76.7%.

Figure 1
Internal Tourism Expenditure Chart
2016 to 2020



Related to table 1, figure 1 shows the bigger picture of the internal tourism sectors from years 2016 to 2020. It explains that the years 2016 -2019 the Philippine tourism was doing well. However, it can be recalled that the Covid-19 was discovered towards the end of the year 2019

resulted to the closure of borders following the strict protocols thus limits the mobility of the foreign tourists resulted to negative results in the year 2020.

Table 2
Total Employment in Tourism Industries in the country
2016 to 2020 - Growth Rate (in percent)

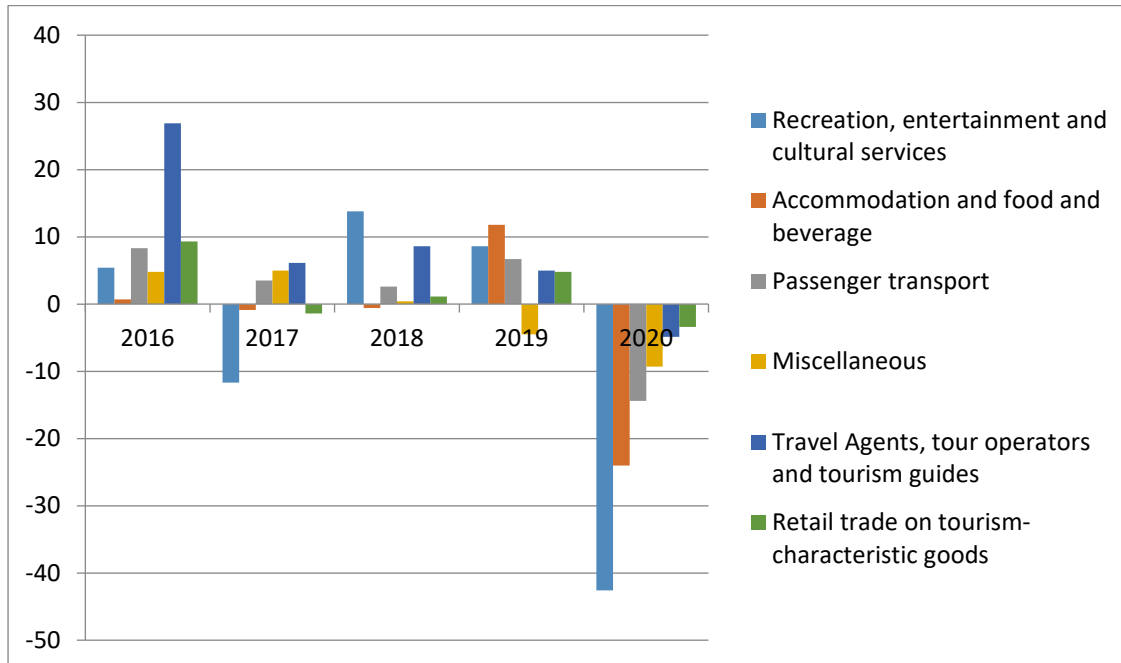
Tourism Characteristic	2015-16	2016-17	2017-18	2018-19	2019-20	Rank
Recreation, entertainment and cultural services	5.4	-11.7	13.8	8.6	-42.6	1
Accommodation and food and beverage	0.7	-0.9	-0.6	11.8	-24.0	2
Passenger transport	8.3	3.5	2.6	6.7	-14.4	3
Miscellaneous	4.8	5.0	0.4	-4.5	-9.3	4
Travel Agents, tour operators and tourism guides	26.9	6.1	8.6	5.0	-4.9	5
Retail trade on tourism-characteristic goods	9.3	-1.4	1.1	4.8	-3.4	6
Total Employment in Tourism	5.1	0.8	1.8	6.6	-18.1	-

Source: 2020 Philippine Tourism Satellite Accounts (PTSA) Report

As shown in Table 2, total employment in tourism industries in the country growth rate shows the different tourism characteristic as follows; the year 2015 to 2016 retail trade on tourism-characteristic goods shows 9.3% growth rate as the highest. Similarly, travel agents, tour operators and tourism guides growth rate in 2015-2016 accounted as the highest with 26.9%, in the same manner as passenger transport in 2015-2016 growth rate was 8.3%. In the year 2016-2017 miscellaneous growth rate was 5%, in the same manner as recreation, entertainment and cultural services did well in 2017-2018 with a growth rate of 13.8%. Likewise, in the year 2018-2019 accommodation and food and beverage made its highest growth rate of 11.8%.

However, the year between 2019 to 2020 indicated that there was a tremendous decline on the demand of the employment that shows that the year was not performing thus no guests in the country as it affected to the employment of the service providers. Based on the rank the hardest hit as follows; 1) Recreation, entertainment and cultural services -42.6%, 2) Accommodation and food and beverage with -24.0%, 3) Passenger transport -14.4% 4) Miscellaneous -9.3%, 5) Travel Agents, tour operators and tourism guides -4.9% and lastly 6) Retail trade on tourism-characteristic goods with -3.4%

Figure 2
Employment in Tourism Industries in the country Chart
2016 to 2020



Related to table 2, figure 2 shows the bigger picture of the employment in the Philippine tourism from years 2016 to 2020. It explains that the years 2016 -2019 the Philippine tourism was experiencing the usual challenges. However, it can be recalled that the Covid-19 was discovered towards the end of the year 2019 resulted to the closure of borders following the strict protocols thus limits the mobility of the foreign tourists that gave a huge negative effect in the year 2020.

6. Conclusions:

The findings of the study in the first research objective is summed the tourists' consumption by products and services such as follows: accommodation services, entertainment and recreation services food, beverage and restaurant services, travel agencies and other reservation services, transport services, country-specific tourism services, particularly shopping, and a miscellaneous also known as the internal tourism expenditure within the five-year period. Thus, it was the basis of investigating the internal tourism expenditure in the tourism sectors in the Philippines in comparison to the years before and during the country hit by the Covid-19 as the pandemic. Based on the results, the first four years the country's tourism internal expenditure was performing well. Inevitably, the country's tourism internal tourism expenditure was greatly affected with the pandemic on the year 2020 that shaken the world. Thus, it made a significant decrease in the internal expenditure growth rate in the following sectors according to rank as follow; 1) accommodation services for visitors 2) entertainment and recreation services and 3) food, beverage and restaurant services 4) travel agencies and other reservation services 5) transport services 6) country-specific tourism services including shopping and lastly 7) miscellaneous.

On the other hand, the findings of the study in the second research objective is summarized the total employment generated from tourism industries according to tourism characteristics to mention; recreation, entertainment and cultural services, accommodation and food and beverage, passenger transport, miscellaneous, travel agents, tour operators and tourism guides, retail trade on tourism-characteristic goods within the five-year period. Moreover, it was also the basis of investigating the employment growth rate in the tourism sectors in the Philippines in comparison to the years before and during the country hit by the Covid-19 as the pandemic. Based on the results, the first four years the country’s tourism employment was doing well. However, in the year 2020 the period the following sectors was the hardest hit in effect the growth rate have decreased tremendously according to rank as follows; 1) Recreation, entertainment and cultural services, 2) Accommodation and food and beverage, 3) Passenger transport, 4) Miscellaneous, 5) Travel Agents, tour operators and tourism guides and lastly, 6) Retail trade on tourism-characteristic goods.

In general, both internal tourism expenditure and employment growth rates had deeply affected by the Covid-19 pandemic that paralyzed the Philippine tourism industries. Nevertheless, the output of this study can be of used to any undertakings for all sectors particularly in the Philippine tourism as part of records in the history.

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8. References:

- Abhishek Agarwal (2019). Entrepreneur Asia Pacific. *Growing Travel and Tourism Industry is* Creating Millions of Jobs across Asia Pacific. Retrieved from <https://www.entrepreneur.com/article/327275>
- Adam Behsudi (2020). International Monetary Fund. *Tourism-dependent economies are among those harmed the most by the pandemic*. Retrieved from <https://www.imf.org/external/pubs/ft/fandd/2020/12/impact-of-the-pandemic-on-tourism-behsudi.htm>
- ADB Briefs (2020). *The Impact of COVID-19 on Tourism Enterprises in the Lao People’s Democratic Republic: An Initial Assessment*. Retrieved from <https://www.adb.org/sites/default/files/publication/613466/adb-brief-141-impact-covid-19-tourism-lao-pdr.pdf>
- ADB Briefs (2020). *Reviving Tourism amid the COVID-19 Pandemic*. Retrieved from <https://www.adb.org/sites/default/files/publication/633726/reviving-tourism-amid-covid-19-pandemic.pdf>
- Aika Rey (2021). CNN Philippines. *Philippines’ tourist arrivals, receipts plunge by 83% in 2020*. Retrieved from <https://www.rappler.com/business/tourist-arrivals-receipts-philippines-2020>

- ASEAN Tourism Standard. Retrieved from
<https://aseantourism.travel/media/kcfinder/docs/asta-doc/asean-tourism-standards-book.pdf>
- ASEAN Policy Brief (2020). *Economic Impact of COVID-19 Outbreak on ASEAN*. Retrieved from https://asean.org/storage/2020/04/ASEAN-Policy-Brief-April-2020_FINAL.pdf
- Bangkok Post (2021). Thailand loses 1.45m tourism jobs from pandemic. Retrieved from <https://www.bangkokpost.com/business/2091575/thailand-loses-1-45m-tourism-jobs-from-pandemic>
- Bangkok Bank (2019). *Tourism: Still a reliable driver of growth?* Retrieved from <https://www.bangkokbank.com/en/International-Banking/-/media/dc98bd4dd875455299b0c207bf16f2ac.ashx>
- Benavides, D. 2001. *The Sustainability of International Tourism in Developing Countries*. Paper presented at Seminar on Tourism Policy and Economic Growth, OECD, Berlin, 6-7 March.
- Bureau of Economic Analysis (2017). *Travel and Tourism Spending Stepped Up in the Second Quarter Travel and Tourism Satellite Account: Second Quarter 2017*. Retrieved from <https://www.bea.gov/system/files/2018-01/tour217.pdf>
- Cbr (2014). *Understanding the travel and tourism labour market A report for ABTA*. Retrieved from https://www.abta.com/sites/default/files/media/document/uploads/Cebr_-_ABTA_employment_study.pdf
- Chon, K. & Maier, T. (2010). *Welcome to Hospitality An Introduction*. 3rd ed. DELMAR CENGAGE Learning. International Edition, Clifton Park, NY.
- CNN, Philippines (2021). Foreign tourist arrivals drop by 83.7% in 2020 — DOT. Retrieved from <https://cnnphilippines.com/news/2021/1/12/ph-foreign-tourist-arrivals-drop-2020.html>
- CNA Singapore (2021). Visitor arrivals to Singapore plummet more than 80% in 2020, expected to stay weak amid COVID-19: STB. Retrieved from <https://www.channelnewsasia.com/news/singapore/stb-tourism-travel-visitor-arrivals-receipts-fall-covid-19-14088190>
- Davidson, R. (1994). *Business Travel*. Addison Wesley Longman.
- Development Asia (2020). *Strategies to Restart the Tourism Sector during the Covid-19 Pandemic*. Retrieved from <https://development.asia/policy-brief/strategies-restart-tourism-sector-during-covid-19-pandemic>
- Duncan Madden (2021). Forbes. The Covid-19 Pandemic Has Cost The Global Tourism Industry \$935 Billion. Retrieved from <https://www.forbes.com/sites/duncanmadden/2021/01/14/the-covid-19-pandemic-has-cost-the-global-tourism-industry-935-billion/?sh=2d8f45db7d40>
- Eurostat (2018). *Tourism industries – employment*. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Tourism_industries_-_employment&oldid=267583#The_tourism_industries_employ_over_13_million_people_in_the_EU

- Gee, C., Makens, J. & Choy, D (1989). *The Travel Industry*, 2nd Ed. Van Nostrand Reinhold. United States of America
- Getz, D., Jack, C., Alison, M. (2004), *The Family Business in Tourism and Hospitality*. CABI Publishing. Oxfordshire, UK.
- Holloway, J. (2002). *The Business of Tourism*. Pearson Education Limited. Tottenham Court Road, London.
- Hospitality Net (2021). *WTTC Research Reveals Travel and Tourism Sector’s Contribution To the Philippine’s GDP Dropped By \$37 Billion in 2020*. Retrieved from <https://www.hospitalitynet.org/news/4104734.html>
- International Labour Organization (2016). Sustainable tourism: A driving force of job creation, *economic growth and development*. Retrieved from https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_480824/lang--en/index.htm
- International Labour Organization (2020). *COVID-19 and employment in the tourism sector: Impact and response in Asia and the Pacific*. Retrieved from https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/briefingnote/wcms_742664.pdf
- Jenina P. Ibañez (2021). Business World. *Tourism revenues plunge as foreign visitors stay away*. Retrieved from <https://www.bworldonline.com/tourism-revenues-plunge-as-foreign-visitors-stay-away/>
- Jeremaiah Opiniano & Marlon Luistro (2020). PhilStar Global. *Nearly 2M Filipino tourist workers affected by COVID-pandemic — ILO report*. Retrieved from <https://www.philstar.com/headlines/2020/04/28/2010389/nearly-2m-filipino-tourist-workers-affected-covid-pandemic-ilo-report>
- Joyce Ann L. Rocamora (2020). Philippine News Agency. *PH records 73% drop in visitor arrivals in first 7 months of 2020*. Retrieved from <https://www.pna.gov.ph/articles/1111917>
- Ma. Stella Arnaldo (2020). Business Mirror. *2020 tourism jobs loss now seen at 174 million*. Retrieved from <https://businessmirror.com.ph/2020/11/02/2020-tourism-jobs-loss-now-seen-at-174-million/>
- Minh-Ngok Nguyen (2021). Statista. *Tourism industry in Vietnam - statistics & facts*. Retrieved from <https://www.statista.com/topics/7742/tourism-industry-in-vietnam/>
- Neill Fronde (2021). Thaiger. *Thailand focuses on international, but needs domestic tourism*. Retrieved from <https://thethaiger.com/hot-news/tourism/thailand-focuses-on-international-but-needs-domestic-tourism>
- Open Development Cambodia (2020). *Socio-economic impact of COVID-19 on Cambodia*. Retrieved from <https://opendevelopmentcambodia.net/profiles/socio-economic-impact-of-covid-19-on-cambodia/>
- Owlgen (n.d.). What type of Direct and Indirect employment is generated by tourism? Retrieved

from [https://www.owlgen.in/what-type-of-direct-and-indirect-employment-is-generated-by-](https://www.owlgen.in/what-type-of-direct-and-indirect-employment-is-generated-by-tourism/)

[tourism/](https://www.owlgen.in/what-type-of-direct-and-indirect-employment-is-generated-by-tourism/)

Paul Jennings (2014). American Society for Public Administration. *Tourism: A Pathway to Job*

Creation and Workforce Development. Retrieved from [https://patimes.org/tourism-](https://patimes.org/tourism-pathway-)

[job-creation-workforce-](https://patimes.org/tourism-pathway-job-creation-workforce-)

[development/?__cf_chl_jschl_tk__=pmd_784477e82eb59f999369a2e2b4b5e21b76a32ff1-1627720409-0-gqNtZGzNAk2jcnBszQiO](https://patimes.org/tourism-pathway-job-creation-workforce-development/?__cf_chl_jschl_tk__=pmd_784477e82eb59f999369a2e2b4b5e21b76a32ff1-1627720409-0-gqNtZGzNAk2jcnBszQiO)

Philippine News Agency (2020). *Tourism industry hikes share in GDP to 13%*. Retrieved from

<https://www.pna.gov.ph/articles/1106568>

Philippine Statistics Authority. (2014). *Philippine Statistical Yearbook (PSY)*, Retrieved from <https://psa.gov.ph/products-and-services/publications/philippine-statistical-yearbook/2014>

Philippine Statistics Authority. (2015). *Philippine Statistical Yearbook (PSY)*, Retrieved from <https://psa.gov.ph/products-and-services/publications/philippine-statistical-yearbook/2015>

Philippine Statistics Authority. (2016). *Philippine Statistical Yearbook (PSY)*, <https://psa.gov.ph/products-and-services/publications/philippine-statistical-yearbook/2016>

Philippine Statistics Authority. (2017). *Philippine Statistical Yearbook (PSY)*, Retrieved from <https://psa.gov.ph/products-and-services/publications/philippine-statistical-yearbook/2017>

Philippine Statistics Authority. (2018). *Philippine Statistical Yearbook (PSY)*, <https://psa.gov.ph/products-and-services/publications/philippine-statistical-yearbook/2018>

Philippine Statistics Authority (2019). Contribution of Tourism to the Philippine Economy is 12.7 percent in 2018. Retrieved from <https://psa.gov.ph/content/contribution-tourism-philippine-economy-127-percent-2018>

Philippine Statistics Authority (2021). Philippine Tourism Satellite Accounts (PTSA) Report. Retrieved from https://psa.gov.ph/sites/default/files/2021-06/PTSA%202020%20Report%20ao14Jun_signed_0.pdf

Pwc Philippines (2020). *Impact of Covid-19 on the Philippine Tourism industry*. Retrieved from

<https://www.pwc.com/ph/en/publications/tourism-pwc-philippines/tourism-covid-19.html>

Republic of the Philippines, Commission on Higher Education (2017). *Memorandum Order No.*

62, Series of 2017. Retrieved from <https://ched.gov.ph/wp-content/uploads/2018/03/CMO-62-BS-Hospitality-Tourism-Management.pdf>

Sintayehu Aynalem*, Kassegn Birhanu and Sewent Tesefay (2016). *Employment Opportunities*.

Journal of Tourism & Hospitality and Challenges in Tourism and Hospitality Sectors, 2016,

5:6 DOI: 10.4172/2167-0269.1000257. Retrieved from <https://www.longdom.org/open-access/employment-opportunities-and-challenges-in-tourism-and-hospitalitysectors-2167-0269-1000256.pdf>

- Sukrit Dogra (n.d.). EHL Insights. COVID-19: *Impact on the hospitality workforce*. Retrieved from <https://hospitalityinsights.ehl.edu/covid-19-impact-hospitality-workforce>
- Swarbrooke, J. & Horner, S. (2002). *Business Travel and Tourism*. Butter-Heinemann, 200 Wheeler Road Burlington MA.
- Talib Rifai (2017). World Economic Forum. *Tourism and Job Creation – Advancing the 2030 Development Agenda*. Retrieved from <https://reports.weforum.org/travel-and-tourism-competitiveness-report-2017/tourism-and-job-creation-advancing-the-2030-development-agenda/>
- Talib Rifai (n.d). The World Economic Forum. *WNTO Jobs, Jobs, Jobs*. Retrieved from tourism-competitiv <https://reports.weforum.org/travel-and-ness-report-2017/tourism-and-job-creation-advancing-the-2030->
- Tina Santos (2021). Inquirer.Net. *PH tourism’s share in GDP drops 48%* .Retrieved from <https://business.inquirer.net/324012/ph-tourisms-share-in-gdp-drops-48>
- The Star (2020). Covid-19 affects Brunei’s tourism revenue, says ADB. Retrieved from <https://www.thestar.com.my/news/regional/2020/03/09/covid-19-affects-bruneis-tourism-revenue-says-adb>
- The World Bank (2021). Monitoring the Impact of COVID-19 in Lao PDR. Retrieved from <https://www.worldbank.org/en/country/lao/brief/monitoring-the-impact-of-covid-19-in-lao-pdr>
- Travel and Tourism Total Contribution to Employment (2019). *Indonesia - Direct Contribution of travel and tourism to employment as a share of GDP*. Retrieved from <https://knoema.com/atlas/Indonesia/topics/Tourism/Travel-and-Tourism-Direct-Contribution-to-Employment/Direct-contribution-of-travel-and-tourism-to-employment-percent-of-GDP>
- Travel and Tourism Total Contribution to Employment (2019). *Singapore - Contribution of travel and tourism to employment as a share of GDP*. Retrieved from <https://knoema.com/atlas/Singapore/topics/Tourism/Travel-and-Tourism-Total-Contribution-to-Employment/Contribution-of-travel-and-tourism-to-employment-percent-of-GDP>
- Travel and Tourism Total Contribution to Employment (2019). *Thailand - Contribution of travel and tourism to employment*. Retrieved from <https://knoema.com/atlas/Thailand/topics/Tourism/Travel-and-Tourism-Total-Contribution-to-Employment/Contribution-of-travel-and-tourism-to-employment>
- United Nations Conference on Trade and Development (2021). *Covid-19 and Tourism an Update Assessing the Economic Consequences*. Retrieved from https://unctad.org/system/files/official-document/ditcinf2021d3_en_0.pdf
- United Nations News (2021). COVID-19 impact on tourism could deal \$4 trillion blow to global economy: UN report. Retrieved from <https://news.un.org/en/story/2021/06/1095052>
- United Nations World Tourism Organization (2020). *Conceptual Guidance on Tourism Statistics in*

- the Covid-19 Context. Retrieved from <https://www.unwto.org/covid-19-and-tourism-statistics>
- United Nations World Tourism Organization (2010). *International Recommendations for Tourism Statistics 2008*. New York 2010. Retrieved from https://unstats.un.org/unsd/publication/seriesm/seriesm_83rev1e.pdf
- United Nations Publication (2020). The impact of the COVID-19 pandemic on the tourism sector in Latin America and the Caribbean, and options for a sustainable and resilient recovery. Retrieved from https://repositorio.cepal.org/bitstream/handle/11362/46502/3/S2000751_en.pdf
- World Bank (2020). Major Impact from Covid-19 to Thailand’s Economy, Vulnerable Households, Firms: Report. Retrieved from <https://www.worldbank.org/en/news/press-release/2020/06/30/major-impact-from-covid-19-to-thailands-economy-vulnerable-households-firms-report>
- WNTO (n.d.). Tourism and Covid-19-Unprecedented Economic Impacts. Retrieved from <https://www.unwto.org/tourism-and-covid-19-unprecedented-economic-impacts>
- United Nations World Tourism Organization (2010). *International Recommendations for Tourism Statistics 2008*. New York 2010. Retrieved from https://unstats.un.org/unsd/publication/seriesm/seriesm_83rev1e.pdf
- UNWTO (2020). Highlights Potential of Domestic Tourism to help drive economic recovery in destinations worldwide. Retrieved from <https://www.unwto.org/news/unwto-highlights-potential-of-domestic-tourism-to-help-drive-economic-recovery-in-destinations-worldwide>
- UNWTO(2020). International Tourist Numbers could fall 60-80% in 2020. Retrieved from <https://www.unwto.org/news/covid-19-international-tourist-numbers-could-fall-60-80-in-2020>
- UNWTO (2019). *Tourism and Jobs: a better future for all*. Retrieved from <https://www.unwto.org/world-tourism-day-2019>
- World Travel and Tourism Council (2018). **Tourism provides jobs where they’re needed most**. Retrieved from <https://worldtraveltourismcouncil.medium.com/tourism-provides-jobs-where-theyre-needed-most-200f11ac2029>
- World Travel & Tourism Council (2021). *Economic Impacts Reports*. Retrieved from <https://wttc.org/Research/Economic-Impact>
- World Travel & Tourism Council (2017). Travel and Tourism creates livelihoods and opportunities for everyone in society (2017). Retrieved from <https://worldtraveltourismcouncil.medium.com/travel-tourism-creates-livelihoods-and-opportunities-for-everyone-in-society-2acf5f4acec6>
- World Travel & Tourism Countil (2019). Travel & Tourism Global Economic Impact & Trends 2019. Retrieved from <https://ambassade-ethiopie.fr/onewebmedia/Tourism-WTTC-Global-Economic-Impact-Trends-2019.pdf>
- World Travel & Tourism Council (2021). *Economic Impact Reports*. Retrieved from <https://wttc.org/Research/Economic-Impact>
- World Tourism Organization (UNWTO) and International Labour Organization (ILO) (2014).

Measuring Employment in the Tourism Industries – Guide with Best Practices. Retrieved from <https://www.e-unwto.org/doi/pdf/10.18111/9789284416158>.

How will the Hospitality Industry Adapt with A.I. for the Post-COVID-19 Landscape? Investigating A.I. Technologies within Thailand’s Hotel Sector for the New Normal Conditions

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Abstract

This article will focus the Thailand hotel sector and how Artificial Intelligence or A.I. is being used now and will be implemented in the near future. Until recently, A.I.’s potential in the hospitality industry has been under-utilized. COVID-19 has decimated the industry across all sectors, altered guests’ expatiations, and created new safety concerns. The hospitality industry has been forced to consolidate, automate, predict, and adapt to an uncertain future landscape. The hotel industry eagerly anticipates an onset of customers once the situation fully winds down and the local market sees a return to pre-COVID-19 tourist numbers. This paper will investigate the types of A.I. technology currently in use throughout local Bangkok hotels and areas where it could be expanded. Additionally, an attempt will be made to document the local market’s knowledge and perceived need for A.I. in the near future, and their confidence in A.I. technologies to provide adequate security within the hotel as well as protecting the privacy of their guest’s personal data. Finally, quantitative and qualitative data will be collected through questionnaires provided to local Bangkok hoteliers. As part of the investigation, data will also be collected and reported to identify and compare the local hotels sectors overall level of A.I. technology in relation to current industry levels and trends, its preparedness and ability to adapt with new strategies, and the ways customers will likely be exposed to new A.I. technology experiences when staying at Bangkok hotels in the coming new-normal conditions.

Keywords: Artificial Intelligence, machine learning, robotics, personalization, smart hotels.

1. Introduction

The hospitality industry generates billions of dollars around the world, and is one of the most vital industries on the planet. In terms of human resources, this industry employs people in a variety of professions indirectly and directly, including the hotel business, hotel industry, air travel industry, among other industries. Because many services in this industry are enjoyed during leisure time, the hospitality industry is primarily reliant on their customer’s disposable income and the occurrence of leisure time (Beaver, 2002). This industry is a significant cash generator in a variety of economies, particularly those that rely heavily on tourism as a source of government revenue. The hotel business, on the other hand, is a highly sensitive industry that relies on the economic and political stability of diverse locations and economies to prosper.

A.I. technologies are touching and transforming practically all aspects of our lives and economies. Among the ways in which A.I. is currently affecting our lives on a daily basis include: *Online shopping and advertising* where A.I. is widely used in commerce for optimizing products, planning inventory, and logistics. *Social media online behavior* monitoring by A.I. applications can mine the wording of social media information and detect [fake news and disinformation](#) from online sources. *Web search engines* learn from the vast input of data provided by their users to provide relevant search results and assist personalized recommendations based on a previous searches or purchases. *Digital personal assistants* in smartphones use A.I. to provide relevant, personalized services. Virtual assistants answer questions and provide recommendations. *Machine translations* are done by A.I. technologies using language translation software based on written or spoken text to improve translations and automated subtitling. *Smart homes and cities* incorporate learning behaviors to save energy, developers of smart cities regulate traffic to improve connectivity and reduce traffic jams. *Cars* use A.I.-powered safety functions such as automated sensors that detect possible dangerous situations and accidents. *Navigation* is largely A.I.-powered, improving the safety, speed and efficiency of traffic. *Cybersecurity* systems use A.I. to help identify cyber threats and cyberattacks through continuous data input minoring. *Food and farming*, A.I. [supports a sustainable](#) healthier [food system](#) on farms by monitor the movement, temperature and feed consumption of their animals as well as reducing the use of fertilizers, pesticides, irrigation and environmental impact. *Public administration and services* use A.I. data and pattern recognition systems to provide early warnings of natural disasters. *Airports* use thermal imaging A.I. systems for security and monitoring health. *The medicine profession* uses A.I. to help recognize health and infection issues and provide data tracking to monitor the spread of the diseases like COVID-19.

From a guest's point of view, their basic relationship with A.I. within a hotel has been limited. A.I.'s visibility has been used more as a promotional tool such as the novelty of an automated robot to deliver luggage or for assisting room service operations. Until recently, the majority of A.I. usage has been more for back-office automation: revenue management systems (RMS), locating demand patterns, SWOT analysis, forecasting prices, categorization, planning human resource requirements, storing customer data for marketing and to create a more customized guest experience. A.I. soon will be a regular component of a guest's experience, used in more visible ways. The trend is swinging toward a more relaxed and personalized experience. Customers have more freedom at their fingertips to make their own choices and have higher expectations than ever before. Hotels are feeling the pressure and are betting on A.I. to lead the way. Smart rooms and the smart hotel are among the hotel sector's new concepts to meet those needs, and exceed them with more personalized experiences delivered through artificial technology. This concept basically takes advantage of internet-connected devices, capable of communicating or interacting with one another and then to respond intelligently to a user's request from a single control point. To take full advantage of the coming implementation of new A.I. technologies, the industry needs to maintain and build new levels of trust with its customers, both in personal safety concerns and privacy issues with customer data. A delicate balance of implementing an artificial machine intelligence to blend with, and not overwhelm, for an overall improved guest experience, is the industry challenge.

Defining A.I. Technology

Artificial Intelligence or A.I. is a field of computer sciences that emphasizes the development of intelligence machines. It is the ability of a computer program or a machine to think, learn

and work like humans. This can be seen for example in systems such as speech recognition, problem-solving, learning and planning. There are four basic categories or types of artificial intelligence-based systems:

Type I: Reactive Machines, possessing no memory and only responds to stimuli. This area of A.I. is mainly used for automation, for example- replacing task based physical human jobs.

Type II: Limited Memory Machines, considered a narrow A.I. technology which uses memory to learn and improve its responses through algorithms. Examples can be seen in driverless cars, chatbots, digital assistants, google translate, spam filters, social media ranking, Siri, automated traffic lights, facial recognition systems, and smart homes, cities and infrastructures.

Type III: Theory of Mind, considered a general A.I. technology which understands the needs of other intelligent entities. This type of A.I. can mimic and interact with humans socially and directly affect human behavior. Many on-line help services utilize different forms of this system to walk you through a problem. Type III has the potential to comprehend feelings, motives, intentions, and expatiations. That will be seen in the next generation of artificial intelligent machines.

Type IV: Self-Aware, considered a super-intelligent A.I. having human like intelligence and self-awareness. This type of A.I. for instance, would enable intelligent machines to create more intelligent machines. (Geisel, 2018). A possible down side to self-aware machines, we would not know what they are thinking or how they think about us! For example, the Terminator series depicts a future where A.I. does not see humans as part of their future.

Defining A.I. Technology within the Hotel Industry

Machine Learning Systems, for back office and as communication systems where guests can interact, or as data storage systems for guests' recognition or security. *Robotic Devices*, that are capable of motion and can communicate and deliver services. They may contain certain characteristics of emotion, dialogue, personality, human-oriented perception, social learning, or environmental modeling.

2. Objectives

The purpose of this paper is to present a comprehensive review of current and proposed applications of A.I. Technologies within the hotel industry, specifically the Bangkok, Thailand hotel sector.

3. Literature Review

The first step in the research was defining what A.I. technology is and citing examples of how it is commonly incorporated into our everyday lives. The next step required study on how A.I. has been and is being used in the hospitality industry, and specifically within the hotel sector, areas where there is a perceived need, and directions where it is likely to be utilized in the near future. Also, the substantial growth of the global middle-class population, particularly as it was taking shape in developing nations, was the most significant demographic or social megatrend for many years. It was expected that this would be the primary driver of hospitality and tourism's future expansion. The COVID-19 epidemic, however, has thrown this assumption into disarray resulting in a sharp increase of unemployment and lost incomes. This is raising

questions about the most beneficial ways of introducing and implementing new artificial intelligence concepts into the industry. The authors need to look at the industry's future growth drivers from the ground up. Prior to the pandemic, it was thought that a broad-based approach would lead to increased growth. However, a more targeted strategy, adapted to the demands and behaviours of various age groups, appears to be more appropriate currently.

Gen Y and Gen Z, these individuals are comfortable with current technology and use it to make travel easier and more convenient. They also enjoy technological advancements in hospitality and tourism. Tourists from Generations Y and Z can travel alone, in pairs, or in small groups. They may also be concerned about contracting COVID-19. However, if artificial intelligence does not help to lower travel and accommodation costs, this could be offset by their often-limited budgets and brief hotel stays of these travellers.

Gen X, when it comes to vacations, these travellers are looking for exciting new experiences. They could be traveling with their families or on business. Even when the COVID-19 epidemic is over, the economic effects of the crisis will continue to influence this demographic, and they will be wary of leisure expenditures. Because Gen X travellers are more likely to have children to consider, and many may also be responsible for caring for elderly parents, they will be more cautious about traveling than Gen Z or Gen Y visitors. In comparison to Gen Y and Z, they are less reliant on technology. Overall, Gen X travellers are likely to spend less on travel and tourism, preferring arrange travel during vacations and to closer areas to their home bases.

The Baby Boomers, before the crisis, baby-boomers were seen to be a high-potential, high-spending demographic since they have more purchasing power and can travel for longer periods of time. However, in the aftermath of the pandemic, this cohort is considerably more cautious to travel for pleasure because data shows that the elderly are a high-risk category; they account for a big percentage of COVID-19 fatalities and severe symptom cases. Baby boomers aren't dependent on or enthusiastic of technology. On this basis, hoteliers must devise innovative ways to appeal to this demographic by instilling faith in their facilities' health and safety standards.

Chatbots, Digital Assistants, and Virtual Reality

One of the most common uses of A.I.'s type II machine learning is through a “machine conversation system”. *Chatbots* allow any human users to interact with machines in a more natural mode of conversation” (Shawar, 2005). This language processing form of A.I. is already used for bookings, check-ins, and recommendations for guests. A concern and challenge for the industry is protecting its user's privacy. For this system to be useful, a data base of their personal information is required (Ahn, 2019). This A.I. system has also been developed and increasingly utilized in the form of *Digital Assistants*. This front-facing customer service systems provide on-line and direct messaging services. Additionally, they can be embedded in websites, and messengers, used as customized applications for cell phones, and even carried by users like a wristwatch. *Virtual Reality* is being used as a tool to recreate and promote travel 360-degree video experiences (Citak, 2021).

Robotic technologies

Durning the COVID-19 pandemic and the social distancing restrictions, the need for a broader range of type II A.I. applications became more apparent in hospitality. *Robotic technologies* (especially relating to guest interaction) have attracted more attention from the industry. There have to date only been a few instances of adopting robots for hotel sector use to great success. Among them is Hilton's Connie, which employs IBM's Watson A.I. software to provide a more personalized guest experience. Yotel Hotels are utilizing service robots for rudimentary room service requests and offer guest's digital keys (Social Tables, 2019). Marriott and

InterContinental have embraced the voice activated “smart room” concept using artificial intelligence powered by China’s Alibaba (Noel. 2019). Among the most advanced of these “smart hotels” in service is the Alibaba Hotel in Hangzhou, China. This boutique hotel features robotic butlers delivering supplies to guests, and facial recognition systems for accessing elevators and rooms, in addition to service robots for room and laundry service. (Brion. 2019, Par.1).

In Japan, the Henn-na Hotel utilized the world’s first fully robotic staffed hotel, employing 243 robots from front office, storage room to check-in and check-out services with voice and facial recognition (Henn-na Hotel 2019). However, the robotic staff was reduced to half within the first year and plans for additional hotels was canceled due to overly optimistic reliance on these devices. Current technology did not support the way these robots were being used. This was a case of tech optimism over tech realism. “Where a bot is most useful is not in place of a social context, but when you want precise information in as short a time as possible or to save you waiting for something” (Schuller, Björn. 2021). Where the Henn-na experiment proved successful was in room service, cleaning and luggage transportation with entry-level robotic tasks. The lesson they learned was that more crucial customer service needs still require a more human-centered service touch. Looking ahead, we may see low-cost hotels running largely on service automation, robotics and A.I. with a skeleton crew. For a more visible human workforce, customers may be looking to the more expensive hotels for the “new currency of luxury hospitality in the future”, an exclusive human touch (Schuller, Björn. 2021).

A.I. technologies vs human talent

Among the benefits of people working with A.I. technologies are that they work in more productive ways, develop a wider range of technological, emotional and social skill sets and produce better business outcomes (de Leede. 2016). That being said, the services sector could experience a huge job loss with the emergence of A.I., particularly in the large size enterprises. The impact could be as much as 15-20 per cent when A.I. achieves critical mass (Banerjee, Amitava (2021). In the next three years and from there on, the annual A.I. growth rate could reach higher levels. The gap between large and small players in the hotel sector will grow as the former will become more efficient by embracing artificial intelligence. Big companies are going to become bigger because of the bots, small companies will not be able to afford it and even if they can afford, viability of using or implementing these systems will be low. Consequently, A.I. may cause the replacement of certain sectors of human talent, challenging the industry to redesign and restructure as a result (Ivanov and Webster. 2017). Understanding the direct impact these changes could have on employee engagement and productivity levels, as well as the overall customer experience is receiving much research. (Bowen and Whalen. 2017).

Guest Environments

Many hotels are seeing the value of utilizing smart devices to keep guests and staff healthy and safe, thanks to high foot traffic and visitor turnover, as well as heightened sanitary standards mandated by COVID-19. For example, these technologies can monitor the temperatures of all guests entering the hotel and separates anyone whose temperature exceeds 100 degrees for additional screening. A.I. technologies are increasingly being used to maintain safety. In the case of a security breach, door locks and emergency lighting can be activated, and employees can utilize mobile devices to transmit alerts if they require assistance or are facing an emergency. More and more properties are replacing plastic key cards with mobile apps that allow visitors to lock or open their doors using their phones, enabling convenience while also removing the possibility of the theft of a guest's key card. Finally, some hotels are experimenting with asset monitoring systems to keep track of guests' bags and valuables in

order to prevent them from being misplaced or stolen. Facial recognition technology can be employed to quickly allow staff recognition of guests. The latter ensures that only authorized workers have access to guest rooms or other restricted areas of the building, as well as detecting suspicious activity, identifying known criminals, and even detecting moods and emotions. Two Marriott hotels in China have teamed up with Alibaba to test facial recognition technology, which generates key cards after scanning a guest's face and matching it to a reservation. ([Patterson](#), Elle. 2021).

Many hospitality firms are recognizing the value of installing automated technology systems to reduce energy expenses allowing hotels to progress and become more innovative. Starwood Hotels & Resorts, for example, has started automatically altering indoor lighting in public spaces based on the amount of natural light entering the space. More hotels are installing occupancy sensors in guest rooms, which activate energy-saving procedures like lowering shades, adjusting the temperature, or turning off lights and devices if a room is recorded as unoccupied. Predictive maintenance can help properties reduce system failures, and smart monitoring devices can be used to detect problems like water leaks or poor air quality. ([Patterson](#), Elle. 2021).

Food delivery

When a consumer opens a meal delivery app, he or she is presented with a menu of food selections and restaurant choices. Previously, the list of alternatives was static, and customers had to scroll through the whole app to select the proper option. Until the COVID-19 situation developed, in most markets, food delivery systems provided a basic function. Due to social distancing, the market rapidly evolved into a new growth industry. Things have changed, to be sure. As soon as a consumer opens the app, it displays a menu of foods that match his or her preferences. Customers no longer have to hunt for a list of meals that they are looking for. The app has become more sophisticated as a result of A.I., which analyzes the customer's likes and dislikes and generates a list of recommended menu choices. To put it another way, A.I. has increased the user experience and productivity of these businesses. It's all about providing enough choices of food that's fresh and hot when it comes to meal delivery. Companies are increasingly utilizing A.I. algorithms to assist them do so in the most effective way possible. Previously, algorithms would assign a local delivery worker to a customer. The algorithm didn't even consider the status of his or her last order, let alone his or her track record throughout a lifetime. As a result, bad service and unwelcome waits became the norm. A.I., on the other hand, considers all of these criteria and, rather than displaying local delivery people, recommends the most qualified. These algorithms take into account the hotel's environment, the phases of food preparation, the delivery person's track record, the status of his or her prior delivery, and so on. So that neither the customer nor the delivery person has to wait at any point throughout the meal delivery. (Infolks, [2021](#))

According to a survey conducted by a business consulting organization, the internet meal delivery sector is expected to rise by more than 16 percent. By 2023, it is predicted to be worth \$17.02 billion. According to the research, a large percentage of respondents prefer to order food online because of the promotional offers and rebates they receive. Another advantage of buying meals online is the convenience it provides, as well as the wide range of cuisines available on a single platform. According to the findings, a growth in the number of logistics providers has enabled food delivery companies to optimize their fleet and minimize delivery times. Online food delivery platforms are increasingly focusing on acquisitions, and as a result, they are cooperating with logistics businesses to deliver their managed delivery operations in a specific sector. (Sinha, [Rishabh](#) . 2021)

Guest Experience

Hotels and resorts have long attempted to respond to the never-ending stream of visitor demands in a timely and suitable manner. After all, the extent to which they are able to consistently give a good level of customer service is critical to their reputations. Their talents in this area act as important performance indicators for determining their level of achievement. According to hotel industry, artificial intelligence enhances guest service fulfilment time while reducing problem resolution time by an average of one-third. As artificial intelligence is employed to tackle increasingly complicated guest experience management duties and take on a variety of new responsibilities that directly impact customer satisfaction rates, that proportion is anticipated to rise.

By seamlessly integrating technology-enabled amenities into the entire guest experience, artificial intelligence may further enhance the in-room guest experience, where expectations are also on the increase. Artificial intelligence can set up a guest room with a degree of accuracy that would defy human attempts using individual visitor preference data collected from past hotel visits.

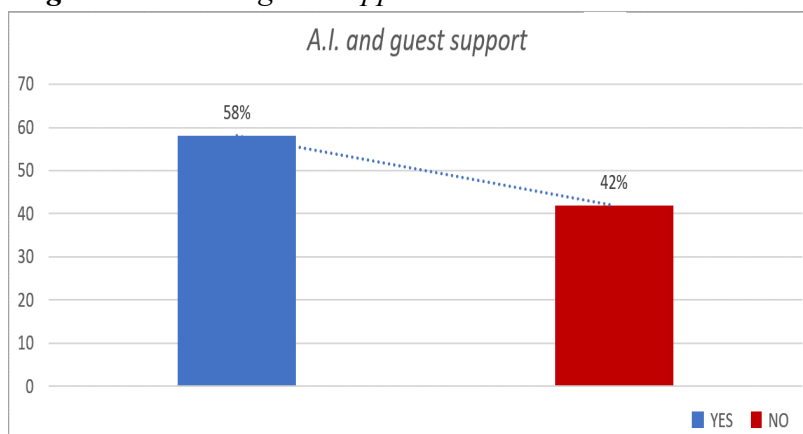
4. Methodology

The purpose of this paper is to present a comprehensive review of current and proposed applications of A.I. Technology within the hotel industry. Discovering how the industry is preparing for a post-COVID-19 landscape. This was done by analysing relevant academic literature papers identified via Scopus, Web of Science, Research Gate, and Google Scholar. As part of the research, secondary data was collected from industry journals, articles, and news reports. Additionally, research was conducted to establish the level of A.I. in the local Bangkok hotel sector.

Critical analyses of data were collected through the form of a questionnaire. Seven questions were presented to the relevant management/staff of 50 local Bangkok hotels, establishing within their hotel, the types of A.I. currently in place, proposed usage of A.I., the perceived need, jobs that have been or will be affected by the use of new A.I. technologies, and their confidence regarding security issues with the implementation of advanced A.I. technologies.

5. Results

Figure 1. A.I. and guest support?

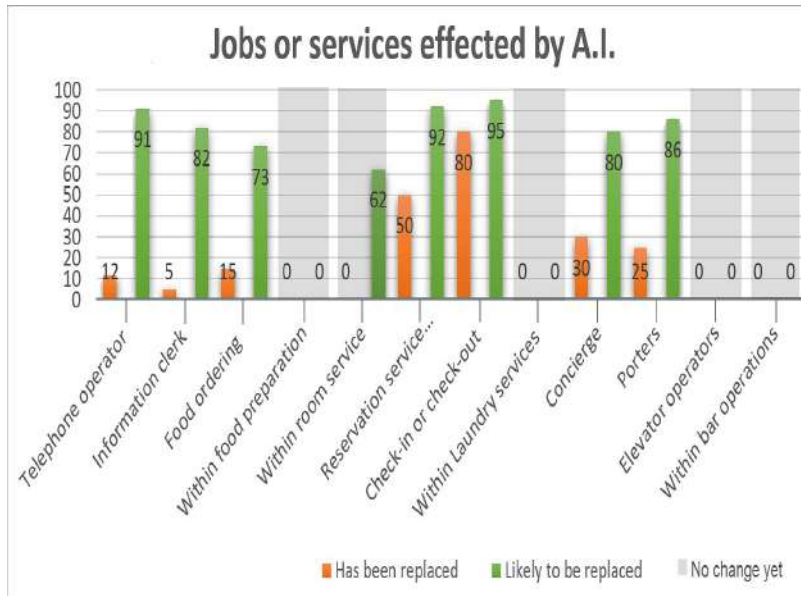


Do the current hotel facilities fully support your desired expectation for a guests' experience?

According to **figure 1**, 58% of participants agree that their current hotel facilities fully support the desired expectation for a guests' experience; however, 42% of participants disagreed,

perceiving a need for additional supports with A.I. technologies.

Figure 2. A.I. currently utilized.



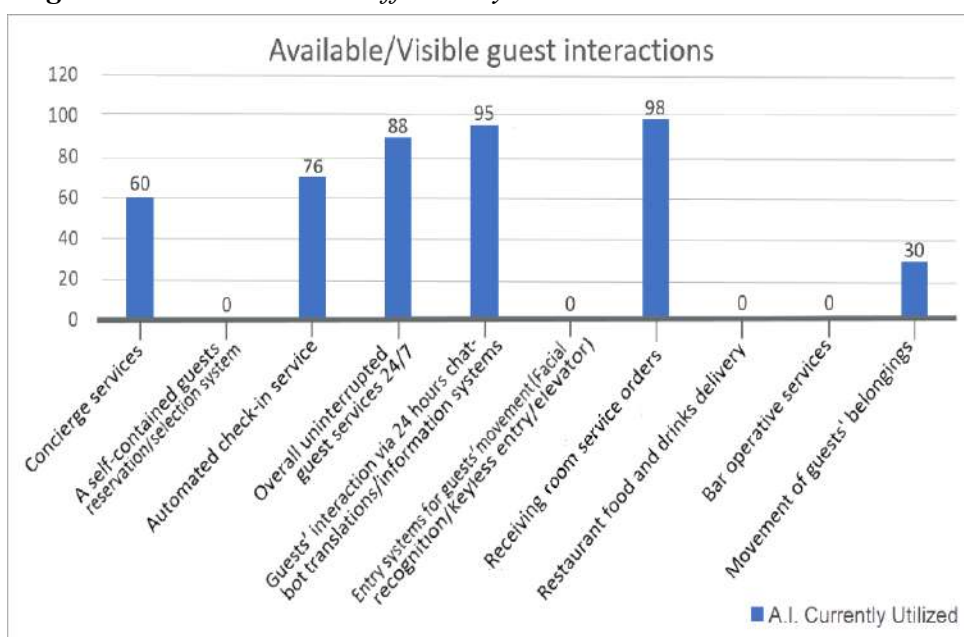
At your hotel, which types of A.I. are currently being utilized in front office, kitchen, housekeeping, maintenance/repair, collection of data, its storage, and of guests' interaction?

The initial part of the questionnaire illustrates general information of respondents. According to **figure 2**, of the 50 relevant management/staff members who participated in this questionnaire in the

Bangkok, Thailand area, 98% indicated that their room service orders utilized a form of A.I. technology; 95% of guests' interactions were via 24 hours chat-bot translations/information systems; 88% of local hotels questioned provided uninterrupted guest services 24/7; 76% of these hotels provided their guest with a type of an automated check-in service; 60% had guests' interaction with A.I. concierges' services; and 30% of participant respondents indicated that their hotel properties use a form of robotic porter services.

However, as for self-contained guest's reservation/selection systems; entry systems for guests' movement (Facial recognition/keyless entry/elevator); restaurant food and drinks delivery; bar operative services; ZERO respondents had these services available to guests.

Figure 3. Jobs or services effected by A.I.



What jobs or services have been or are likely to be replaced at your hotel by artificial intelligence in the near future?

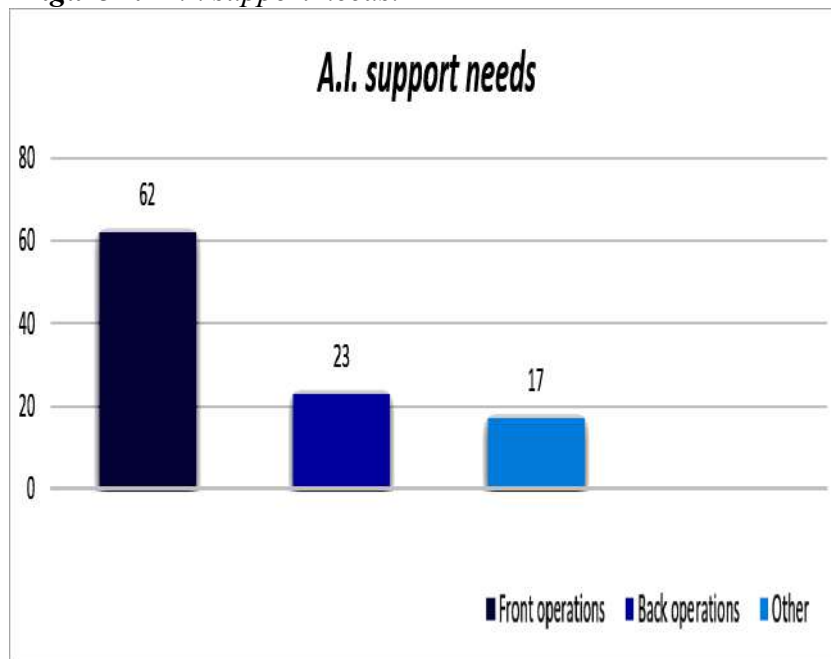
According to respondents as seen in **figure 3**, they indicate that 95% of check-in and check-

out service positions are likely to be affected by A.I. technologies in the near future. As for areas in the hotel that have not been directly affected by A.I. services as of yet, including food preparation; room service; laundry services; elevator operators and bar operations; it is expected that room service operations will be the most affected by A.I. Innovations with 62% responding a likelihood of replacement by A.I.; no other area in this group is expected to be impacted by A.I. in the near future.

Among the largest ranges of expected changes regarding A.I. in job replacement is in the telephone operator, from 12% currently and expected to be up 91%; the information clerk position, currently at 5% and expected to be up to 82%; and in food ordering at 15% currently and expected to be up to 73% in the near future.

Showing the smallest ranges of expected changes regarding A.I. in job replacement is in the check-in or check-out areas, respondents indicating there has been an 80% change in job replacement unitizing A.I. technology, which is only expected to experience a 15% increase in the near future to 95% respectively.

Figure 4. A.I. support needs.

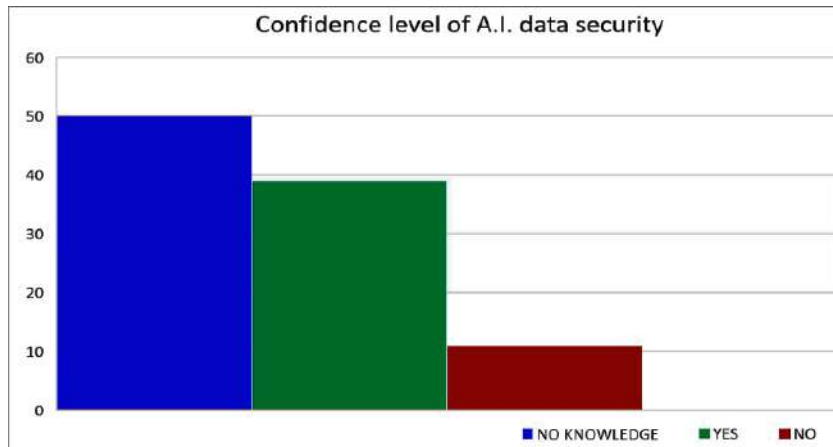


What areas need more support with A.I.?

According to **figure 4**, 62% of participants indicated a need in their hotel to provide additional A.I. support in the area of front of house operation; 23% of participants indicated that they need A.I. support services more in back of house operation; and 17% of participants indicated that there is a need in other

departments of their hotels.

Figure 5. Confidence level of A.I. data security.

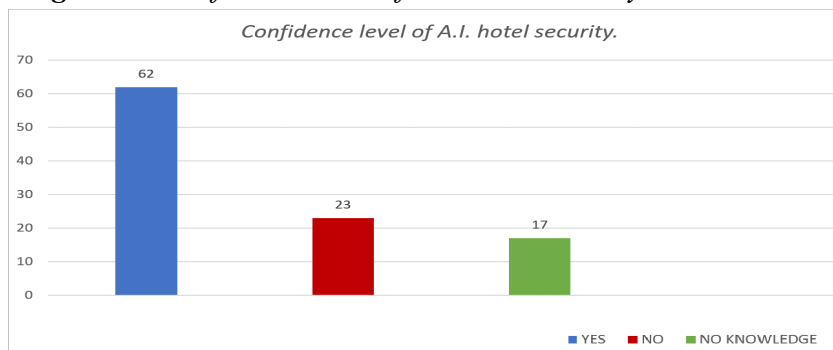


Are you confident with A.I. systems regarding guests' security of their personal data information?

Regarding the guests' security of personal data information, as shown in **figure 5**, 50% of hotel respondents indicated that they possessed no knowledge regarding this

question; a confidence level of 39% in A.I. for data security was indicated; and 11% disagreed with this position.

Figure 6. Confidence level of A.I. hotel security.



Are you confident that advanced A.I. systems can provide an acceptable level of hotel security?

When poled about hotel security, **figure 6** shows that 62% of respondents indicated their

confidence in their hotel's A.I. security management systems; while 23% of the respondents indicated their dis-satisfaction in A.I. technologies to handle the hotel's security; and 17% showed no knowledge on this subject at all.

Figure 7. On-line food delivery services.

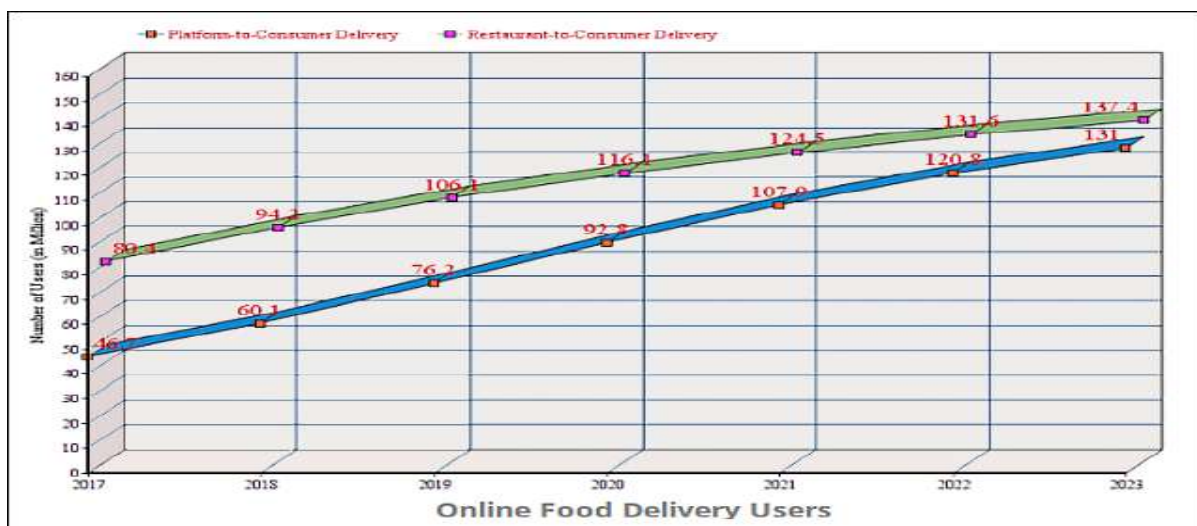


Figure 8. On-line delivery revenue

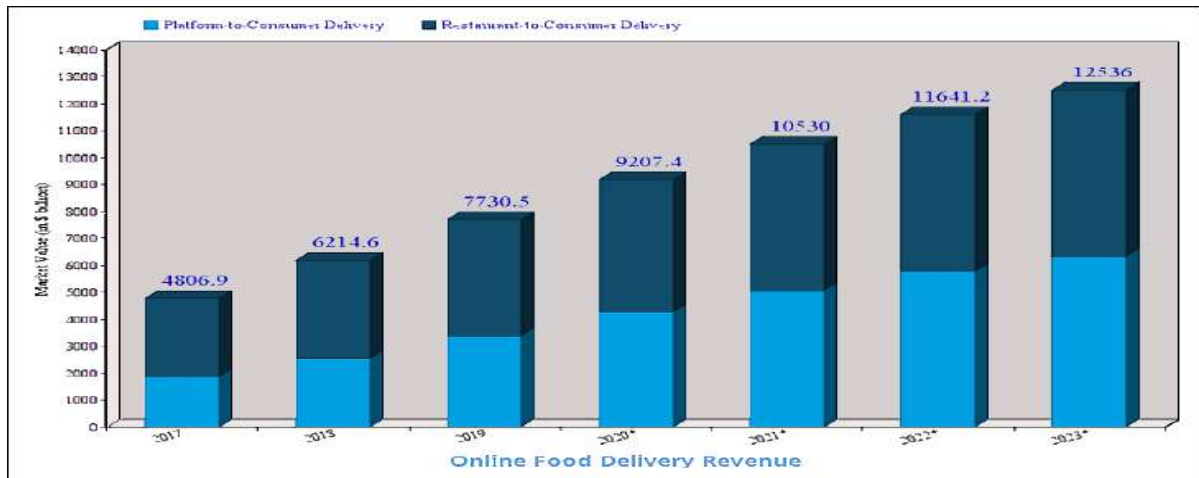
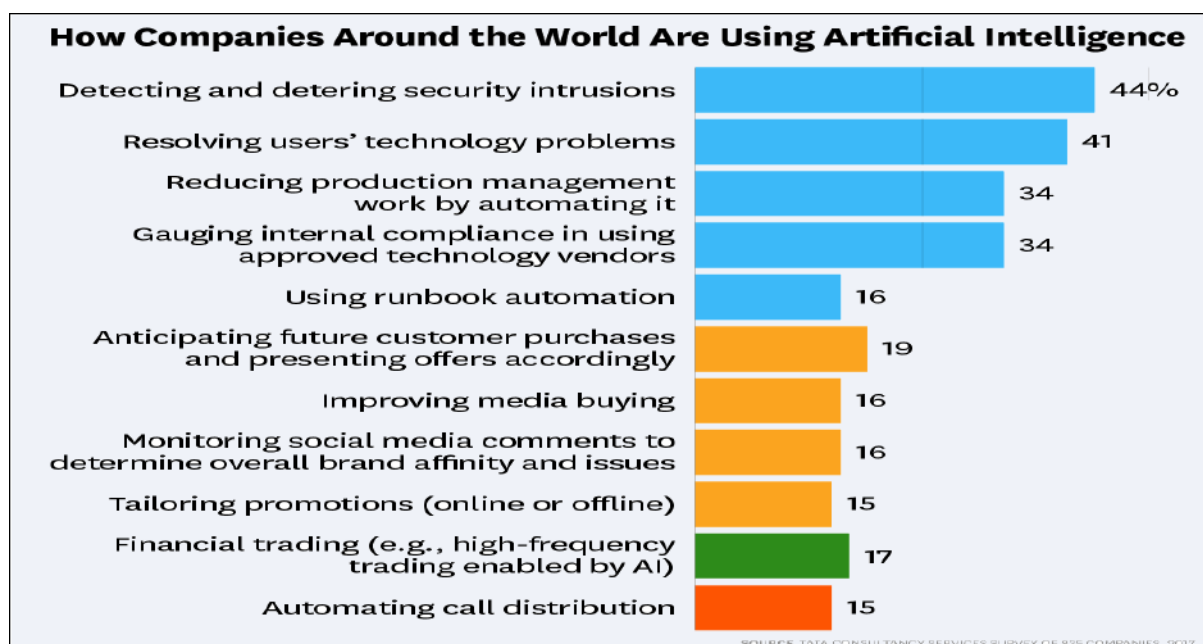


Figure 9. Likelihood to choose a hotel with facial recognition.



Figure 10. How companies use A.I. technology



6. Discussion

Whether in communication, education, consumption, or hotels, technology is becoming more prevalent in daily life. Hoteliers have reaped the benefits by extending technology applications in tourism operations, such as making online reservations and payments. Technology may help support marketing activities in a variety of ways, from generating interest in and demand for hotel services to making hotel stays more convenient and comfortable, organizing and gathering customer feedback, and encouraging repeat visits. With social alienation and diminished physical interaction becoming the new normal, hotels and other travel industry firms should expect to employ technology more to generate trust in their services and stay competitive.

Chatbots have been a popular choice in recent years as a way to enhance a hotel's external connection with customers, but they are also increasingly being used internally, particularly to improve and expedite operations. In this vein, recent research has revealed that chatbots can be used for a variety of tasks. As a result, chatbots have been used in a variety of businesses, and by the end of 2022, chatbots are predicted to replace more than 85 percent of consumer contacts. Chatbots provide the benefits of services such as bookings/reservations, recommendations, among other services, particularly within tourism and hospitality business. In terms of the most numerous chatbot-enabled applications in use, Chinese industries are among the heaviest users. Several attempts at conceptual research on chatbot services in the tourism and hospitality industry have been made in the past. To name a few, combined organizational theories to investigate firm-level adoption of chatbot services in the tourism sector; introduced the current applications of A.I. technologies, including chatbots, in the tourism and hospitality industry; explained that the benefits of using chatbot services outweigh the challenges for hotels; and Ivanov elaborated on the influences of automation technologies. However, neither the quality nor the quantity of dimensions have been found in this research. According to the research, 62 percent of participants said their hotel needs more A.I. help in front of house operations, 23 percent said they need more A.I. support in back of house operations, and 17 percent said there is a need in other departments of their hotels.

Executives in the hospitality industry should carefully examine how much automation they need and where it should be used in their service processes. Although there was some flexibility in the application of this technology, there was a clear distinction between supportive and substitutive automation. Some companies chose to automate as much of their service processes as feasible, while others chose to automate only a portion of their service production or delivery. The extent to which service robots were utilized to automate service operations seems to be determined by the business model intended. Operators seeking to give a cheaper alternative to their competitors' service offerings, save money by decreasing the requirement for human labour. While having more control over the service process was advantageous, it also resulted in highly standardized, simplified service encounters and scripted customer experiences. According to the respondents, A.I. technologies are projected to effect 95 percent of check-in and check-out service professions in the near future. As for areas of the hotel that have not yet been directly affected by A.I. services, such as food preparation, room service, laundry services, elevator operators, and bar operations, room service operations are expected to be the most affected by A.I. Innovations, with 62 percent responding that A.I. will likely replace them in the near future; no other area in this group is expected to be impacted by A.I. in the near future. As for areas of the hotel that have not yet been directly affected by A.I. services, such as food preparation, room service, laundry services, elevator operators, and bar

operations, room service operations are expected to be the most affected by artificial intelligence. Innovations, with 62 percent responding that A.I. will likely replace them in the near future; no other area in this group is expected to be impacted by A.I. in the near future. The telephone operator position, which is currently at 12 percent and is expected to rise to 91 percent; the information clerk position, which is currently at 5 percent and is expected to rise to 82 percent; and the food ordering position, which is currently at 15 percent and is expected to rise to 73 percent, are among the positions with the largest ranges of expected changes regarding A.I. in job replacement. Customers buying takeaway drinks or business travellers seeking convenience benefited most from this type of service. Service robots were primarily utilized to support staff by relieving their burden and resolving common pressure points by operators trying to appeal to a broader market (e.g., flagging a waiter to order more or to pay the bill). In the end, this strategy was beneficial to all parties involved. The high-tech/high-touch dichotomy exemplifies the contradictions of introducing technology. On the one hand, service robots may supplement or replace employees by serving clients in several languages or consistently preparing food. Service robots, on the other hand, do not yet cope well with uncertain or dynamic settings. The systems fail as soon as customers deviate from the planned customer path. In other words, the more touchpoints that are automated, the more opportunities for things to go wrong. As a result, operators must build recovery procedures tailored to service robots. Customers may purchase their favourite comfort food and have it delivered to their front door while binge-watching the latest show from the comfort of their own couches. Isn't it fantastic? That's because it is, and the ease of use appeals to a wide range of customers, not just millennials. Parents who don't have time to cook can order food online and feed their entire family without turning on the oven. The most appealing feature of internet food delivery services is their ease. It takes a long time to order food from an internet restaurant delivery service. Customers looking for fast food should generally go to the restaurant personally rather than rely on delivery services. Traffic, weather, how busy a restaurant is, and the complexity of a customer's order are all factors that contribute to longer wait times for online meal delivery. Is it reasonable to expect a customer to wait an extra half hour (or perhaps an hour) for their food to be delivered? If customers can't wait, they should pick up their food themselves. Every day, more restaurants join the online meal delivery community, giving clients a larger range of foods to pick from when placing an order. Customers can now explore different restaurants rather than being limited to those close to their homes or those that cater just to locals. Connecting restaurants with new clients is one of the most beneficial aspects of the industry, and it also allows customers to try something new. More options are available when ordering online. Customers may now purchase a cornucopia of delectable culinary selections, including healthy options, from their favourite local businesses. Instead of chicken wings, how about grilled chicken with steamed vegetables? It's conceivable. Instead of a burger and fries, how about a salad? Make it happen. Customers can stick to healthy eating programs even when they don't want to cook or eat out because of online food delivery services. Customers are usually charged fees in addition to the cost of the food when ordering through an online delivery service. A booking fee, fees for crowded areas, and even a gratuity for the delivery driver are examples of these expenses. Is it worth a few bucks more to get a burrito delivered?

Since the beginning of the pandemic, the problems for foodservice companies posed by online food delivery and takeaway meals have only grown. Aggregators are profiting from the upheaval, with A.I. technology playing a significant role. According to data, A.I. is critical for these businesses because it helps them to make the most of the massive data repositories gathered during the purchase process. While orders eventually go to foodservice providers,

according to the study Artificial Intelligence in Foodservice, food aggregators acquire the majority of customer data, including meal preferences, personal information, and payment information. This offers them a major competitive advantage, contributing to a rising power imbalance between foodservice providers and aggregators (especially the smaller ones). This segment of the market may soon increase its offerings for foodservice companies, including technologies such as conversational platforms. This would allow SMEs that are unable to acquire A.I. skills to benefit from the benefits of new technologies and become part of a bigger infrastructure while maintaining their local and original identity. The pandemic has hastened a shift in economic models, with aggregators emerging as clear winners.

The problem that these kinds of findings provide for the hotel industry isn't just technological. A.I. applications are available to serve hotels of various sizes. As the authors have stated, the problem is teaching hotel workers on how to use these technologies. Currently, traditional methods to hospitality education separate technology, such as the one we're discussing here, from individuals receiving instruction in the many hospitality disciplines. This compartmentalization, however, can only endure so long. Artificial intelligence is rapidly being used in both services and manufacturing. Human intellect, work life, and A.I. are becoming more integrated across many fields, including health, resulting in the use of 'augmented intelligence' to solve difficulties. The problem that these kinds of findings provide for the hotel industry isn't just technological. A.I. applications are available to serve hotels of various sizes. The significance of trust building and communication to overcome the obstacles connected with human workers and AI contact is a crucial managerial takeaway from the current article. AI-enabled technologies, such as robots, nevertheless require programming to comprehend their team environment and connect efficiently with human coworkers. As a result, human workers and managers continue to bear the brunt of communication and trust-building in such groups. As a result, managers should clearly state the aims and expected outputs of such teams, as well as a concise explanation of the performance evaluation criteria. It is envisaged that such efforts will lead to the building of team trust. Furthermore, the facilitating environment dynamics mentioned earlier should be clearly visible in the organization's hotel strategies, where teams made up of human and AI workers are becoming a visible part of the modern organizational landscape. In a hybrid working environment of human and AI workers, managers need a clear understanding of what specific abilities are needed in both types in order for the teams to achieve their goals, therefore skills identification and development tactics in such organizations will need to be improved. The paper has substantial policy implications in addition to managerial ramifications. In response to the topic of hotel guests' trust in the protection of personal data information, 50 percent of hotel respondents said they had no idea; 39 percent expressed confidence in artificial intelligence for data security; and 11 percent disagreed. When asked about trust in hotel security, 62 percent of respondents said they have confidence in their hotel's A.I. security management systems, while 23 percent said they are dissatisfied with A.I. technologies to handle the hotel's security, and 17 percent said they have no knowledge of the subject.

7. Conclusion

Implementing A.I. technologies in the form of chatbots or automated robotic devices do offer genuine benefits to the industry and have the potential to supplement or even replace traditional information, communication services including sales channels (such as newsletters, websites, sales desks, and hotlines) and various human services now and in the future. The level of usage

in each environment must be strictly considered. Step-by-step, as each new area of A.I. is added to a hotel, it must be analyzed from every direction, balancing the hotels needs and the customers’ end benefits and losses. A.I. technologies are still developing and at this point, they can supplement the functions in a hotel but cannot completely replace human interaction. An over reliance on A.I. in some areas could have an unexpected effect of damaging customer relations or negativity effecting the guests’ experience, customer trust, and creating collateral damage to the industry. Much more research and experimentation are needed to develop long-term working models.

The hotel business was behind the times when it came to implementing AI. That is no longer the case, as this research study demonstrates, particularly in terms of the visitor experience. Today, the industry is racing to not just replicate A.I.-enabled home and workplace experiences in guest rooms, but to outperform them with a suite of novel capabilities aimed at further elevating the total visitor experience across the property, and beyond. Restaurants who want to keep serving dine-in and delivery clients will have to adjust their prices to match the added costs of delivery. Customers who prefer consistency in pricing may raise total menu prices to compensate these costs, with dine-in and pick-up customers effectively subsidizing delivery. Restaurants might also establish separate, more expensive delivery menus.

The article will value the people working or related to hospitality and tourism industry in understanding the pro and cons of artificial intelligence and future of hotels with technology. This article also identifies promising research directions for the future. To begin, future studies might collect data and study employees' attitudes to developing technologies like as AI, both skilled and semi-skilled, and measure productivity increases as a result of such technology. Second, the role of key decision-makers and boards in the development and use of developing technology might be critical. As a result, future research should focus on the kind of leadership styles that are most conducive to implementing emerging technology in the workplace. Third, future research can use human workers' emotions and adjustment dynamics in teams working with AI-powered robots to experimentally evaluate the touch problems of developing technologies such as AI in the HRM environment.

8. References

- Anh, Min Sung, et al. (2019). *Lessons Learned from the Development and Deployment of a Hotel Concierge Robot to Be Operated in a Real-World Environment*. 2019 16th International Conference of Ubiquitous Robots.
- B.A. Shawar, E Atwell. (2005). *Using corpora in machine-learning chatbot systems*. International Journal of Corpus Linguistics, pp 489-516.
- Banerjee, Amitava. (01 January, 2021) *Impact of Artificial Intelligence on Service Sector*, linkedin, https://www.linkedin.com/pulse/impact-artificial-intelligence-service-sector-amitava-banerjee/?trk=public_profile_article_view
- Bowen, J. and Whalen, E. (2017), “*Trends that are changing travel and tourism*”, Worldwide Hospitality and Tourism Themes, Vol. 9 No. 6, pp. 592-602.
- Brion, B. (2019). *Chinese e-commerce giant Alibaba has a hotel run almost entirely by robots that serve food and fetch toiletries – take a look inside*. (21, October). Business Insider Nederland’s.
- Citak, Joanna. (2021), *25th International Conference on Knowledge-Based and Intelligent Information & Engineering Systems*. A note on the applications of artificial intelligence in the hospitality industry. Science Direct.

- Clark, Emma. (2021). *Applications of A.I. Technology in the Hospitality Industry*. Apextech 2021.
- de Leede, J. (ED.) (2016), “*New ways of working practices*”, Advanced Series in Management, Emerald Group Publishing Bingley.
- Geisel, Ann. (2018). *The Current and Future Impact of Artificial Intelligence on Business*. International Journal of Science & Technology Research. Vol 7, Issue 5, May 2018.
- Haddad, Sam. (2020). *Inside the hotel run by robots*. accessed April 19, 2020 <https://www.raconteur.net/technology/automation/robot-hotel-ai/>
- Infols, [March 3, 2021](#), <https://medium.com/tech-break/impact-of-ai-in-online-food-delivery-system-5c65a28aede>
- Ivanov, S. and Webster, C. (2017), “*Adoption of robots, artificial intelligence automation by travel, tourism and hospitality companies: a cost-benefit analysis*”, International Scientific Conference Contemporary tourism – traditions and innovations, Sofia University, 19-21 October.
- Johannsen, Florian and Schaller, Dorina. (2021). https://www.researchgate.net/figure/Sample-conversation-with-a-hotel-booking-chatbot_fig1_336531265, March 2021.
- Lunkam, Puttachard. (22 January, 2019). [Tourism & Hotel industry in the post-COVID world](#), Krungsri Research, <https://www.krungsri.com/en/research/research-intelligence/ri-future-of-tourism-21>
- Markovic, Susana. (2020). *The Impacts of Robots and Artificial Intelence on Service Quality in the Hotel Industry*. Association of Economists and Managers of the Balkans.
- Noel, S. 2019. *A.I. in Hospitality in China: Are Robots Taking Over the Hotel Industry?* – Daxue Consulting.
- [Patterson](#), Elle. (2021), <https://www.iotforall.com/how-hotels-are-becoming-smarter-to-adapt-to-changing-times>) August 25, 2021
- Ramaswamy, [Satya](#). (14 April 2017) *How Companies Are Already Using AI*, Harvard Business Review, <https://hbr.org/2017/04/how-companies-are-already-using-ai>
- Ruel, Huub and Njoku, Esther. *AI redefining the hospitality industry*. Journal of Tourism Futures, Vol. 7, No. 1, 2021.
- Schuller, Björn professor of A.I. at Imperial College London, specializing in affective computing relating to the science of A.I. and emotion.
- Short, Taylor (05 February, 2015) *Guest Preferences for Technology Use in Hotels*, Market Research Associate, <https://www.softwareadvice.com/hotel-management/industryview/technology-use-report-2015/>
- [Sinha, Rishabh](#). (2021) <https://www.esds.co.in/blog/how-ai-is-taking-over-the-indian-online-food-delivery-industry/>
- Social Tables. (2019) *6 Hotel Brands Leading the way with Using Robot Technology*. [Thematic Research](#). Posted 16 Apr, 2021, <https://www.globaldata.com/food-delivery-companies-using-data-ai-competitive-advantage-break-food-production-market-says-globaldata/>
- Walch, [Kathleen](#). (02 July 2019) *AI's Increasing Role in Customer Service*. Forbes, <https://www.forbes.com/sites/cognitiveworld/2019/07/02/ais-increasing-role-in-customer-service/?sh=68e756f673fc>

Hospitality Skills for the Next 10 Years: A Case Study at a Hospitality School in Thailand

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Abstract

In response to covid-19 and the new hospitality landscape, hospitality educational institutions need to rethink hospitality education in developing a new generation of hospitality talent. The purpose of this case study at Silpakorn University International College and Vatel Hotel & Tourism Business School in Thailand, is to identify future skills required by the hospitality industry for successful careers in the ever-evolving business of hospitality management and developing effective curricula to meet those needs. The study discusses some of the skills students can obtain not only through academic studies and professional practice in real-life environments, but also the significance of gaining international experiences during their studies.

The methodology incorporated a qualitative survey questionnaire with students on a BBA double degree programme in Hotel Management, whilst more subjective in-depth interviews were conducted with two Human Resource Managers in Thailand's hospitality industry. The research also discovered that many students aim to open their own hospitality business upon graduation, and therefore seek entrepreneurial skills as part of their studies as well. Finally, H.R Managers highlighted some of the key soft and hard skills that employers seek including having effective language and communication skills, being digitally savvy, thinking critically and creatively, and demonstrating cultural intelligence.

Keywords: Hospitality education, hospitality trends, hard and soft skills, international internship, experiential learning

1. Introduction

Since the turn of the 21st century, education has concentrated on developing the kinds of new skills required for an ever-changing and inter-connected world. As part of this discussion, there has been much debate about the importance of hard and soft skills for employees in the hospitality industry. Ward (2020, para.2) differentiates hard and soft skills by explaining,

‘hard skills are those you can learn and be taught...and are more easily proven with certifications and diplomas. Soft skills are a mix of social, emotional, and communications skills that are not as easily measured and are often acquired through experience’

Hospitality education has therefore long acknowledged that students need to gain hard or technical skills and leaving most hospitality educational institutes to focus on these skills (Jaykumar, 2018). However, the discussion over the importance of people skills or soft skills to improve services and customer experiences, has gained much greater traction in recent years

(Burns, 1997 and Lashley, 2009) and led to its inclusion in hospitality curricula (Jaykumar, 2018). Some of the main methods for developing soft skills outside of the traditional academic classroom environment include experiential learning (or learning-by-doing) through practical training in real life hospitality environments and internships. This not only helps students to be trained and evaluated by industry professionals, but also for students to be able to self-reflect about their own performance and areas of improvement.

Vatel Hotel & Tourism Business School (n.d.) is an example of a hospitality educational institution that focuses on experiential learning as part of its curriculum. A global network of 55 schools which was founded in Paris, France in 1981, all schools convey the same vision and teaching philosophy to 9,000 students, based on the right balance of theoretical courses and professional training. The Bachelor programme rotates studies weekly between business management courses and hands-on professional practice. 50% of the programme is in professional training and students can practice in real life professional environments on campus. Students gain internship experience during their studies both at 5-star hotels in Thailand and internationally in France for 5 months providing students with a greater understanding of cross-cultural management issues. In addition, there is an exchange programme with other Vatel schools for one year to help develop cultural awareness and personal growth.

Students therefore not only learn professional skills and business management theory, but also additional desirable ones that are transferable across many positions and highly sought by employers, including having effective communication and language skills, being digitally savvy, thinking creatively and critically, demonstrating cultural sensitivity for international markets, and managing diversity (Oxford economics, 2012).

Employment positions in hospitality management that were popular 10 years ago, including Food and Beverage, Rooms Division, Kitchen, Marketing, Human Resources, Finance, Special Events, Revenue Management, may still be the case today, however there are new opportunities opening-up in positions such as digital marketing, business analysis, green skills, health and wellness and food stylist (Mayo, 2022).

The purpose of this research is therefore to determine the current trends in the hospitality industry and the skills required for bachelor degree students and employability. Hospitality educational institutions will then be able to ensure that these skills are being taught and developed throughout the students' studies.

2. Research Objectives

It is imperative that educational institutes need to update their curricula to meet these needs of industry and identify future trends to equip students with the right business and professional skills to be ready for new opportunities and successful careers. Sisson and Adams (2013) point to the fact that soft skills need to be prioritised as they account for 86% of competencies in the hospitality industry. Therefore, a small case study approach at Silpakorn University International College (SUIC) and Vatel Hotel & Tourism Business School in Bangkok, Thailand aims to uncover the skills required in response to the covid-19 pandemic and the new hospitality landscape to close the current skills gap and provide recommendations for

hospitality institutions to redesign their curricula to develop a new generation of hospitality talent.

- 1) What skills are hospitality organisations seeking from graduates?
- 2) What skills are students looking to develop for their future career success?
- 3) How can hospitality educational institutions respond to meet these needs and update their curricula?

3. Literature Review

3.1 Skills for the 21st century

Throughout the early 21st century, various initiatives such as ‘Partnership for 21st century skills’ in the USA created frameworks to prepare students for a world that was becoming increasingly complex and connected through aspects of globalization. These frameworks in education started to focus on developing key skills deemed necessary for survival and adjusting to the demands created by this ever-changing new environment.

Trilling & Fadel (2009) created a model based on the ‘Partnership for 21st century Skills’ (Batelle for kids, n.d.) that placed skills into three different categories: learning and innovations skills; digital literacy skills; and life and career skills. Learning and Innovation skills demonstrate creativity, innovation; critical thinking, problem solving, communication and collaboration, whilst digital literacy skills focus on media and ICT literacy. Finally, the career and life skills deal with skills in leadership, productivity, responsibility, flexibility, adaptability, initiative, self-direction, social and cross-cultural skills.

These models coincided with additional industry reports that demonstrated the importance of soft skills in the work environment. Economist Intelligence Unit Limited (2010) survey highlighted the need for organisations to focus not only on communication skills, but also to consider the international environment by understanding employees’ cultural values and creating a shared organizational culture. Whilst technical skills are deemed important, it is often the ability to work internationally across different cultures, build relationships, as well as problem solve, that often determines whether a manager is successful and demonstrates appropriate leadership skills.

Oxford Economics (2012) in their publication ‘Global Talent 2021’, also supported these indicators by discussing workforce needs and skills required based on a global survey of 352 Human Resources professionals. The report highlighted the future implications for senior business executives and shifts in the supply of talent. Oxford Economics therefore predicted that skills in high demand would fall into 4 main categories: Agile thinking skills, Interpersonal and communication skills, digital skills, and global operating skills.

Seetha (2014) discussed the need for individual soft skills to take more importance, whilst a plethora of researchers have identified common themes of soft skills for the modern work environment. For example, Robles (2012) identified the top 10 soft skills in the business work environment including other skills such as integrity, courtesy, responsibility, teamwork, positivity, professionalism, flexibility and work ethic; whilst Crawford & Weber (2016) added into their five factor soft skills model the areas of coaching, problem-solving and creativity.

3.2 Thailand’s national educational policy

In a local context, The Office of National Education Commission (1999) addressed the traditional methods of learning to a more student-centred approach in their National Education Act of 1999. This approach focused on innovation and technology, whilst providing students with more analytical and critical thinking skills. As Thailand’s economy grew throughout the early 2000s, the Thai government in 2006 introduced the National Qualification Framework which focused on five domains of learning; Ethical and Moral Development, Knowledge, Cognitive skills, Interpersonal skills, and Responsibility; Analytical, Information Technology and Communications skills.

This was revised in 2015 for a 15-year National Education Plan to help turn Thailand into a ‘value added economy’ with technology, creativity and innovation playing a major role in developing national education policies. The plan focuses on education developing critical thinking and problem solving; creativity and innovation; collaboration, teamwork and leadership; communications, information and literacy (Office of the Education Council, 2017).

The skills identified from the national educational policy will therefore be considered during this research to see if they are still up-to date in accordance with the latest trends and specifically for the hospitality industry.

3.3 Soft skills for the hospitality industry

Soft Skills for management trainees in the hospitality industry were discussed by researchers as far back as the 1980s. Tas (1988) compiled a list of 36 competencies after interviewing 75 hotel managers in the USA and in relation to soft skills largely focused on good working relationships. Soft skills for hospitality employees were therefore largely emphasized by characteristics that demonstrated a positive attitude, punctuality, responsibility, and strong work ethic (Alonso & O’Neil, 2011). Through their research they found that 99% of employers thought that soft skills such as social and interpersonal skills were ‘very important’.

Sisson and Adams (2013) research found that 86% of competencies required for managers in accommodation, food and beverage, and meetings and events were “soft skills” rather than “hard” technical skills. They discussed that quite often hard skills are the kinds of skills that are task oriented and can be learned by students in the classroom. On the other hand, soft skills require contact with customers, and these can only really be properly experienced through professional training in real life operational environments or on hotel internships. Sisson and Adams still recognised the need for technical skills and highlighted the fact that it is often these skills that get the students a job upon graduation in the first place, however they perhaps summarized the need for developing various soft skills such as managing employees with critical and strategic thinking, by arguing

“the need for technical industry expertise is decreasing while the need for non-industry-specific knowledge is increasing”. Sisson and Adams (2013, p. 137)

More recently, in their research of business programmes Dean & East (2019) found that soft skills in intercultural communications and cultural intelligence are essential in a modern business environment. Students need to interact globally with diverse groups of people and therefore understanding different team members from various ethnical backgrounds and

genders is crucial. Prasad (2020) and numerous other online industry sources intelligence (Hosco, n.d.; Giannotti, n.d.; esoftskills.com, n.d.; Phillpott, 2021) all cite similarly agreed upon soft skills for hospitality employees including: service mindedness, positive ‘can do’ attitude, teamwork, flexibility, problem solving, communication skills, languages, cultural awareness, influencing and leadership, and emotional intelligence. However, teaching such soft skills is not always as easy to accomplish through hospitality education. According to McKay (2017, para. 1.)

‘Hospitality requires a unique mix of skills. Not only are staff expected to know physical hard skills, but they are also expected to perfect soft skills, which are a lot more difficult to teach in a traditional classroom’

3.4 Hospitality skills gap

Which soft skills are required have long been discussed by researchers and the hospitality industry, others have also investigated which of these soft skills are currently lacking (Hartman & McCambridge, 2011; Bassiouni & Hackley, 2014). Research shows that effective communications are areas which repeatedly gets mentioned especially with students who are Millennials and Generation Z as they have been born into periods with different communications and used to interacting with each other through technology.

The impact of skills gaps on the hospitality industry is profound, with a UK skills survey (Winterbottom et al, 2019) found that skills gap density is highest amongst hotel and restaurant employees. Sales and customer skills at 71% was by far the higher proportion, but also followed by skill gaps in the lack of management and leadership skills (62%). Whilst SHRM’s report (2019) on skills gaps in USA found that ‘over 50% of respondents feel that skills shortages have worsened or greatly worsened in their organizations in the last two years.’ The report also discovered that the top 3 missing soft skills are problem solving (including critical thinking, innovation, and creativity) ability to deal with ambiguity and communication skills.

Jefferis and Hutchinson (2020) from their study of New York Hotel managers, found that there is a gap between the soft skills that students possess and what they are required to have. The skill sets students possessed did not match with the expectations of hotel managers and therefore were deemed not ready for employment in the hospitality industry. The study concluded that whilst a hotel internship can help develop essential soft skills, they often do not provide the levels of skills that hotel managers require, whilst students are often unaware of the levels of skills they need to have as well.

3.5 Experiential learning & hospitality education

This therefore leads to the discussion of equipping students with the right soft skills for employment readiness in the hospitality industry. A vast majority of hospitality education curricula now combines traditional elements of lecture-based classroom theory along with hands on learning through actual experience. As a service product, students not only need to gain academic theoretical knowledge but also technical skills in practical training and develop soft skills in operational environments that the classroom would not be able to provide. The notion of experiential learning was first developed by Kolb (p38, 1984) who described it as a

“Process whereby knowledge is created through the transformation of experience”

The necessity to include experiential learning in hospitality education has long been advocated to develop both technical and soft skills. Foucar- Szocki and Bolsing (1999) advised that professional experience could be developed with the hospitality industry by providing students with internships. The internships and experiential learning would provide the following aims: Conceptual Knowledge; Management Skills; Communication Skills; Career Development Skills; Application of Work Environment Skills and Program Needs Assessment Skills for the institution and sponsoring organization. The experience would also most importantly provide an opportunity for the student to self-reflect on their training, as well as being provided essential feedback on their performance by supervisors.

Green and Erdem (2016, p43) stressed that the learning process should help prepare students for employment, whilst also applying skills in critical thinking and emotional intelligence

‘Experiential learning helps bridge the existing gap between hospitality education and the competencies employees expect from graduates of hospitality programs.’

Losekoot et al (2018) discussed the value of internships for students by studying a year’s worth of workplace diaries, which revealed that as well as hard skills, students developed skills in professionalism, teamwork, communications, and personal development. They also suggested that internships provide a good opportunity for hospitality organisations to promote their companies to prospective future employees, although further studies are required to improve the overall effectiveness of internships. Studies on experiential learning conclude that it is vitally important for students to gain real life industry experience as part of their studies either in professional training such as through application restaurants or hotels and internship placements.

An example of hospitality education incorporating this into their study curriculum can be seen at Vatel Hotel and Tourism Business School (Vatel, n.d.), which stresses the significance of learning by doing in real life environments on campus application restaurants which are open to the public. The rotation between academic management theory classes and professional training in developing technical skills and soft skills such as communications, personality development, emotional intelligence, critical and creative thinking are therefore then demonstrated through work and performance.

Vatel (n.d.) also provides at least two hospitality internships throughout a student’s studies, including a 5- month international internships. Quin et al. (2020) study of students on a 6-month internship at up-scale hotels found that technical skills are more effectively learned, but soft skills are still improved upon despite various challenges and gave students the opportunity to self-develop.

3.6 Hospitality trends and future skills

Prior to the covid-19 pandemic, according to the United Nation World Tourism Organisation (2020) the global tourism industry witnessed record levels of travel with 1.5 billion international tourist arrivals. In 2019 there was an estimated 330 million jobs in tourism (WTTC, n.d.), mainly supporting women, young people, communities and minority groups. However, these large increases in tourism trips were being driven by low-cost airlines and affordable package holidays that was leading to issues of over-tourism and environmental degradation. Therefore, much of the travel trends prior to covid-19 was focusing on issues of

sustainability and the alignment of policies with the United Nations 17 Sustainable development goals in 2015. Whilst the covid-19 pandemic has undoubtedly put a temporary hold on much of the international travel market, the sustainability trend will be an ongoing movement for the future and allows hospitality organisations to rethink and restart their operations with a more responsible and socially aware service.

A survey from travel providers such as Booking.com (2019) Sustainable Travel report also uncovered that more and more travellers are seeking organisations that apply sustainability to their services and are more determined to make sustainable travel choices. Whilst Deloitte (2021) found that with certain generations such as Millennials and Generation Z, there is

‘more of a desire to deepen their ties with those businesses that benefit the environment and to stop using services that are seen as harming the planet’ (Deloitte 2021, p29).

Deloitte also discuss the impact and significance of technology on these generations with their ability and power to use social media and other technological platforms, which has given rise to the Digital Natives ability to connect on a global scale, share opinions and influence people in new ways.

Whilst the hospitality industry has been one of the hardest hit by Covid-19 with various travel restrictions placed on a global scale, it has acted as a wake-up call in to the future needs of travellers and to think about the kind of desirable tourism services. Covid-19 has created new innovative products, businesses have had to adapt and be flexible in this new tourism landscape. Travelers are seeking personalized, unique experiences with more authenticity with the additional importance of health, wellness, cleanliness, safety, and security. All of this will be combined with effective communications to reassure and inform guests through technological smart hospitality services (Landman, n.d.).

In fact, since the pandemic started the health and wellness industry has been one of the few growth areas and will continue to be the fastest growing segment in the coming years (Callaghan, 2021). Hotel groups such as Hyatt have bought up reputable health and wellness businesses and incorporated them into their hotel brand portfolios. Miraval for example was acquired by Hyatt as part of their already growing collection of spas (Hyatt, n.d.).

These recent hospitality trends in sustainability, health and wellness, and digitalisation demonstrate the need for education to incorporate these topics into curricula. As well as hard skills, the literature discusses the growing importance of developing effective softs skills, particularly in a complex and challenging international environments, whilst also understanding the influence of Millennials and Generation Z.

3.7 Future of soft skills

Felder et al in their report for OECD (2018, p4) predict that the skills needed by 2030 will have to deal with a rapidly changing world across areas of environmental concerns, economic and technological challenges, and widening social issues. The report proposes a learning framework that considers these factors and states that

‘Education needs to aim to do more than prepare young people for the world of work; it needs to equip students with the skills they need to become active, responsible and engaged citizens.’ (2018, p5)

The OECD framework (2018, p6) highlights skills over the next 10 years to be developed further that can be applied in ambiguous situations and therefore this requires a broad set of skills from critical thinking, creative thinking, learning to learn and self-regulation; social and emotional skills such as empathy, self-efficacy and collaboration and practical and physical skills including new information and communication technology devices.

World Economic Forum (2020) in ‘The Future of Jobs Report 2020’ also predicts the top 10 skills by 2025 will be: Analytical thinking and innovation; active learning and learning strategies; complex problem-solving; critical thinking and analysis; creativity, originality and initiative; leadership and social influence; technology use, monitoring and control; technology, design and programming; resilience, stress tolerance and flexibility; Reasoning, problem-solving and ideation.

Covid-19 has also perhaps demonstrated the need for flexible skills that are qualities and skills relevant across different industries. This most recently has been strongly recognized by Deloitte’s survey of Millennials and Generation Z in 2021, as they listed the most important characteristics for an employee in a successful business as being: ‘Flexibility/adaptability (40%); Creativity (29%); Empathy (26%); Technologically savvy (25%); Expertise/proficiency for role (24%); Critical thinking (23%); Curiosity (20%); Inclusiveness (15%); Courage to challenge the status quo (15%); Values that align with an organization (14%)’ (Deloitte, 2021, p10).

In response to the covid-19 pandemic, new skills have also taken on more of a significant role. More recently, LinkedIn’s (2021) Workplace Learning Report 2021 surveyed more than 1200 Learning and Development professionals as well as 900 learners to uncover the current top skills; Resilience and Adaptability, Technology skills/ Digital fluency, Communication across remote or distributed teams, Emotional Intelligence, Cross-functional collaboration, leading through change, change management, dealing with stress, time management and creativity.

Therefore Browne (2021) discusses the need for new skills for a new world that will be driven by health and safety measures, innovative services that meet the needs of customers, adaptability and digital technologies. Browne also believes that hospitality students need to develop leaderships skills, awareness of Artificial Intelligence (AI), be social media savvy and aware of sanitation issues.

Connectivity with students also needs to happen both inside and outside of the classroom as ways to improve the skills of Generation Z students and ready to meet the demands of the 21st century. Additionally, educational institutions need to realize that the average attention span of a university student lasts for only 10 minutes, and therefore messaging needs to be short and incorporate different methods of learning to keep the student’s attention (Richardson, 2010). Educators therefore should teach soft skills across all courses in order to better prepare students for employment (Anthony and Garner, 2016). This case study and research methodology will help hospitality educational institutions understand the needs of industry, students and ultimately redesign their curricula for the next few years.

4. Research Methodology

A case study approach was selected to provide detailed information and help understand how one single unit has adapted to the demands of the hospitality industry and students' needs. Yin (2003, p11) describes case studies 'as an empirical inquiry, often using multiple methods of data collection as each has their own 'complementary strengths and weaknesses'.

It is difficult to make sweeping generalisations from this study and apply them to other hospitality educational organisations (Hartley, 2005). However, the findings will hopefully help other institutions understand the research implications and draw their own conclusions.

4.1 Data Collection

A 'mixed method' approach for a small-scale case study is useful for an interpretivist perspective, by gathering more relevant detailed primary survey data from students and secondary data through interviews and documentary evidence by Silpakorn University and Vatel on recent curriculum development. As the study wanted to understand which skills students needed to develop throughout their studies, a questionnaire was conducted with first year students studying at Silpakorn University International College and Vatel in Thailand on a BBA Hotel Management programme. In total 32 students responded in January 2022, out of a sample size of all 35 first year students.

Conceptual frameworks from the literature on soft skills helped structure the questionnaire and interviews. The questionnaire with both closed and open-ended questions needed to be comprehensible for students and allow them to provide their own thoughts and opinions as well. The short questionnaire consisted of 6 short questions that could be completed in an average time of ten minutes to encourage respondents and ensure a higher response rate. The questionnaire was provided online through google forms to allow ease of access and flexibility for completing.

As part of an updated curriculum process, secondary data was obtained from semi-structured interviews between Silpakorn University International College and a Senior Director of Human Resources of a large international hotel group (Participant A, personal communication, 2020) and a Human Resources Manager from a small international luxury hospitality group (Participant B, personal communication, 2020). The interviews with industry professionals from two large hospitality organisations aimed to discover the current up-to date skills required by the hospitality industry and their recommendations for updating hospitality curricula.

In order to question the findings, it was also important to review recent documentary analysis to provide background information and act as a supplementary tool to the interviews and questionnaires. Vatel's academic partner in Thailand is Silpakorn University, and therefore policy statements on preparing graduates and academic standards would help understand the skills required in relation to the data collected.

5. Results

Initial findings from existing documentary evidence demonstrated the overall educational standards and student outcomes at Silpakorn University (n.d.) through its mission. An education at Silpakorn University aims to provide graduates with the right knowledge and skills

to build their own careers, whilst at the same time ensuring an appropriate quality of life and skills to build their own careers with professional ethical behaviour and perseverance. Other societal and lifelong learning skills are also mentioned to the benefit of both the community and family environments, including protecting Thai culture.

With a vision of being a ‘leading creative’ university (Silpakorn University, n.d.), Silpakorn focuses on innovation and creativity in the 21st century, with the ability of applying and integrating various scientific approaches to develop or solve problems. Graduates should be able to demonstrate entrepreneurial characteristics, creating value and opportunities, whilst being in touch with societal issues and the greater world at large as a self-responsible global citizen.

This is reinforced further by Silpakorn University Division of Student Affairs (n.d.), points to nine desirable graduate skills as a feature of the overall university across all subject disciplines:

1. Academic and professional knowledge
2. Creative and critical thinking
3. Responsible for duty
4. Discipline
5. Have public spirit
6. Dignity
7. Recognize the value of art and Thai values
8. Good human relations and able to work with others (teamwork)
9. Ethical courage.

Silpakorn University’s educational standards covers a wide generic area of different programmes, whereas Vatel Group’s ‘Spirit of Vatel’ (Vatel, n.d.) focuses specifically on life-long learning skills for hospitality students. These include skills that prepare the next generation to build their own future in the international tourism and hospitality industry, increasing hospitality skills in dynamic learning conditions and conveying know-how, giving students the tools to reach their professional goals and proper conduct, and teaching classes which respond to expectations in the hospitality industry.

5.1 Hospitality industry interviews

The Human Resource Managers reflected on the need for soft skills in the hospitality industry and mentioned the following skills for hospitality education to focus on: innovation, creativity, problem solving, communication and interpersonal skills, willingness to cooperate, information and technological skills, social media, current affairs, leadership, emotional intelligence, life and career skills, resilience, adaptive/flexible, wellbeing / good health, social skills / networking, cultural intelligence, collaboration / teamwork.

In addition, some of the comments made by the H.R Managers included:

‘We need not only skilled employees with knowledge of hotel operational systems, but who can fit in any kind of hotel and respond well in various situations with a service mind.’

‘In modern environments we need students to have knowledge of cost control, cost analysis, accounting and revenue management.’

‘We look for team players both as the potential to be a leader but also to follow others with initiation, demonstrate effective communication skills and have at least one other foreign language (preferably two).’

‘Hospitality graduates need to be IT literate, know about digital marketing and be concerned with the laws and ethical behaviour of hotel management.’

‘Be aware of products and services for new trends in the hospitality industry from sustainability to wellness and medical tourism.’

‘To improve cultural awareness, it is extremely useful for students to gain experience internationally and have at least a 6-month internship abroad.’

5.2 Students’ questionnaire

Of the students’ responses 56.3% were female and 43.8% were male. The majority were 16-19 in age (68.8%), 20–23-year-olds accounting for 21.9% and the remaining 9.4% older than 24 years of age. Students were asked to rank the following areas that they deemed to be the most important for their studies and future success. In order of importance were:

- 1) International internship
- 2) Professional Practice
- 3) International Double degree
- 4) International study environment
- 5) Exchange program
- 6) Domestic Internship
- 7) Academic theoretical courses

In terms of soft skills, students were asked to list the 10 most important soft skills from a list of the 20 most referred to from the literature review. The 10 most chosen answers in order were:

Joint 1st – Teamwork and open mindedness

Joint 3rd – Communication skills and adaptability

Joint 5th – Cultural awareness & problem solving

7th – Language skills

Joint 8th – Positive attitude, creativity, empathy

The final question was an open-ended question, where students were asked to identify and list the soft skills that they would like to improve the most during their studies. Communication and language skills were by far the most common answer, followed by problem solving, creativity, time management, digital skills, and teamwork.

6. Discussion

6.1 Students’ needs

6. The development of critical thinking skills and applying these in the work environment. This can include analytical and problem-solving skills.
7. To demonstrate creativity in the work environment and innovative ideas.
8. To show a positive attitude, a collaborative team spirit, good social and interpersonal skills.
9. To be disciplined, law abiding and follow rules and regulations.
10. Always show ethical behaviour and be concerned for sustainable practices.

The industry H.R Managers recommended that there should be more academic courses that meet the needs of current trends in the hotel & tourism industry, whilst challenging students to be more critical with their thinking as well as showing creativity in a business environment. Proposed new subject areas that could be included mainly ranged from information technology such as AI, social media, digital communications, and e-marketing to trends in sustainability which are now of great concern for the hospitality industry.

They also suggested that hospitality curricula could provide flexible study options with a study plan that offers a wide variety of courses as free electives. This would then allow students in their final year to choose courses that better matched their own personal interests and areas to improve upon for graduate employment positions. With regards to communications, languages and cultural awareness, HR Managers felt that international internships should be for a minimum of 6-months for students to fully benefit from this international experience and personal growth.

6.3 A common set of skills

Based on the response from the student survey and HR Managers a clear set of similar needs emerged for developing students’ skills in preparation for employment in the hospitality industry. There was an obvious correlation between the responses which can be best summarized as the following list of general skills required:

Hard skills:

- Technical training and knowledge for hospitality operations
- Hospitality business administration including Marketing, Human Resources, Economics, Law and Finance
- Mathematics and statistics
- Management theories for the hospitality industry, including cultural management and entrepreneurship
- Knowledge of tourism and travel
- Speak more than one foreign language
- Proficiency in computer software and Hotel Property Management Systems
- Technology – computing, automation, Artificial Intelligence, Big Data
- Digital marketing and social media community management
- Sustainability concepts and tools for hospitality businesses

students also need to have the hard skills for demonstrating leadership qualities in international environments from managing diversity, proficient in more than one language and possess effective cultural intelligence.

Whilst hospitality educational institutions can provide a core set of courses to deal with the hard skills, undoubtedly soft skills need to be developed in environments that allow students to experience real life operations by having direct contact with customers. Learning by doing plays a vital role in the development of soft skills and allows students to reflect about their own self growth at the end of an internship. Whilst there might be limitations in providing practical training on campus in real life operational environments, it will be likely that hospitality educational institutions can partner with industry for student placements. This will enable students to develop soft skills in areas such as improving communications, interpersonal skills, teamwork, open mindedness, flexibility, and work ethic.

The ongoing Covid-19 pandemic has raised questions about the hospitality industry’s ability to adapt and create new opportunities in the face of limited international travel along with empty hotels. Those that have been able to, have operated outside of their normal areas of service, whilst additionally focusing on domestic markets. According to the UNWTO (2022), the tourism industry faced its worst year on record in 2020, as there was a 73% decrease in international travel compared to the previous year. The International Labour Agency (ILO, 2021) estimated that five Asian countries (Brunei, Mongolia, Philippines, Thailand, and Vietnam) saw 1.5 million job losses in 2020, which was one third of all total job losses in these countries. This has been a wake-up call to the industry and hospitality employees have realised that the ongoing uncertainty and job security means that many employees have had to look elsewhere for employment in other industries.

As the hospitality industry looks to rebound in 2022, organisations face another battle in attracting previous employees back to the industry and this time with the ability to retain them in the future. It is hoped that with new innovative products and services, a focus on the health and wellbeing of customers along with technological advances, the transferable skills gained from working in hospitality are kept and utilized within the industry itself, rather than transported elsewhere and the loss of talent. This however is an area that requires much further research and discussion for the next generation of hospitality graduates.

8. References

- Alonso, A. D., & O’Neill, M. A. (2011). What defines the “ideal” hospitality employee? A college town case. *International Journal of Hospitality & Tourism Administration*, 12(1), 73–93. <https://doi.org/10.1080/15256480.2011.540986>
- Anthony, S., & Garner, B. (2016). Teaching soft skills to business students: An analysis of multiple pedagogical methods. *Business and Professional Communication Quarterly*, 79, 360–370. <https://doi.org/10.1177/2329490616642247>
- Bassey, M. (2007). Case Studies, in Briggs, A. and Coleman, M., (eds.) *Research Methods in Educational Leadership and Management* (2nd Edition pp142-155), SAGE Publications Ltd,

Bassiouni, D., & Hackley, C. (2014). “Generation Z” children’s adaptation to digital consumer culture: A critical literature review. *Journal of Customer Behaviour*, 13, 113–133. doi:10.1362/147539214X14024779483591

Batelle for kids. (n.d.). Framework for 21st century learning. Batelle for Kids. retrieved December 20, 2021, from <http://www.battelleforkids.org/networks/p21/frameworks-resources>

Booking.com. (2019, April 17). *Booking.com reveals key findings from its 2019 sustainable travel report*. Booking.com. <https://globalnews.booking.com/bookingcom-reveals-key-findings-from-its-2019-sustainable-travel-report>

Browne, K. (2021, April 9). *Upskilling in 2021 for a post-COVID-19 hospitality career*, Ehotelier.com. <https://insights.ehotelier.com/insights/2021/04/09/upskilling-in-2021-for-a-post-covid-19-hospitality-career/>

Burns, P. (1997). Hard skills, soft skills: Undervaluing hospitality's 'service with a smile. *Progress in Tourism and Hospitality Research* 3(3): 239–248. John Wiley & Sons. [https://doi.org/10.1002/\(sici\)1099-1603\(199709\)3:33.0.co;2-2](https://doi.org/10.1002/(sici)1099-1603(199709)3:33.0.co;2-2)

Bush, T. (2007). Authenticity in research – reliability, validity and triangulation in Briggs, A. and Coleman, M. *Research Methods in Educational Leadership and Management* (2nd Edition, pp 91-105) SAGE Publications Ltd

Callaghan, S., Lösch, M., Pione, A. and Teichner, W. (2021, April 8). Feeling good: The future of the \$1.5 trillion wellness market, McKinsey & Company. <https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/feeling-good-the-future-of-the-1-5-trillion-wellness-market>

Crawford, A & Weber, M. (2016). Developing Soft Skills for Future Hospitality Leaders: A Case Study, *Journal of Hospitality & Tourism Cases*, 5, 49-57. <https://dx.doi.org/10.4135/9781529712636>

Dean, S.A., & East, J.I. (2019). Soft Skills needed for the 21st -century workforce. *International Journal of Applied Management and Technology* 2019, Volume 18, Issue 1, 17–32 <https://doi.org/10.5590/IJAMT.2019.18.1.02>

Deloitte. (2021). *The Deloitte Global 2021 Millennial and Gen Z Survey*. Deloitte Touche Tohmatsu Limited. <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/2021-deloitte-global-millennial-survey-report.pdf>

Economist Intelligence Unit Limited (2010). *Global firms in 2020 The next decade of change for organisations and workers*. Society for Human Resource Management (SHRM). <https://www.shrm.org/hr-today/trends-and-forecasting/research-and-surveys/documents/10-economist%20research%20-%20global%20firms%20in%202020.pdf>

Esoftskills. (n.d.). *Essential soft skills for hospitality managers*, Esoftskills. retrieved November 23, 2021, from <https://esoftskills.com/soft-skills-for-hospitality-managers/>

Felder, F., Grayling, A., Steinberg, L. & Bentley, T. (2018). The future of education and skills; Education 2030. OECD. <https://www.oecd.org/education/2030-project/contact/>

Foucar-Szocki, R. & Bolsing, C. (1999). ‘Linking hospitality management programmes to industry’. In: C. Barrow, & R. Bosselman (Eds.). *Hospitality management education*, Haworth Hospitality Press, New York, pp. 37-65.

Giannotti, F. (n.d.). Hospitality Skills: Foundation for high emotional intelligence (EQ). EHL. retrieved December 18, 2021, from <https://hospitalityinsights.ehl.edu/hospitality-skills-emotional-intelligence>

Green, A and Erdem, M. (2016). Bridging the Gap Between Academic and Industry in Hospitality: Using Real life Case Studies, in *Developments in Business Simulation and Experiential Learning*, Volume 43, 2016 pp. 43-46

Hartley, J. (2004). Case Study Research in Cassell, C. and Symon, G. (Eds) *Essential guide to qualitative methods in organizational research*, SAGE publications pp. 323-333.

Hartman, J., & McCambridge, J. (2011). Optimizing Millennials’ communication styles. *Business and Professional Communication Quarterly*, 74, pp. 22–44. doi:10.1177/1080569910395564

Hosco. (n.d.). *Hospitality soft skills, more important than ever*. Hosco. retrieved December 18, 2021, from <https://advice.hosco.com/en/hospitality-soft-skills-more-important-than-ever-before/>

Hyatt. (n.d.). *Our wellbeing brands, portfolio and promise*. Hyatt. Retrieved January 8, 2022, from <https://about.hyatt.com/en/wellbeing.html>

International Labor Organization. (2021, November 18). *ILO research highlights massive COVID-19 impact on tourism employment in Asia and the Pacific* (press release). https://www.ilo.org/asia/media-centre/news/WCMS_827494/lang--en/index.html

Jaykumar, P. (2018). Hospitality Management Institutes-the Skills Training Industry Perspective. *Journal of Services Research*, 18(2). pp 139-151.

Jefferis, J and Hutchinson, H. (2020). A new perspective on the soft skills hospitality management students need to be successful in the hospitality industry: Meeting the gold standard and the Soft Skills Index. *Travel and Tourism Research Association: Advancing Tourism Research Globally*. 32. https://scholarworks.umass.edu/ttra/2020/research_papers/32

Kolb, D. (1984). *Experiential Learning: experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.

Landman, P. (n.d.). *Top hospitality & hotel trends in 2021 and beyond*. Xotels.com. Retrieved December 20, 2021, from <https://www.xotels.com/en/hotel-management/hotel-trends>

Lashley, C. (2009). The right answers to the wrong questions? Observations on skill development and training in the United Kingdom’s hospitality sector. *Tourism and Hospitality Research*. 9(4), 340–352. <http://www.jstor.org/stable/23745487>

LinkedIn. (2021). *LinkedIn Learning 5th Annual Workplace Learning Report*. LinkedIn. https://learning.linkedin.com/content/dam/me/business/en-us/amp/learning-solutions/images/wlr21/pdf/LinkedIn-Learning_Workplace-Learning-Report-2021-EN-1.pdf

Losekoot, E., Lasten, E., Lawson, A. & Chen, B. (2018). The development of soft skills during internships: The hospitality student’s voice, *Research in Hospitality Management*, 8:2, 155-159, DOI: 10.1080/22243534.2018.1553386

Mayo, G (2022, February 2). *Career trends and in-demand jobs in the hotel industry for 2022*, ehotelier. <https://insights.ehotelier.com/insights/2022/02/02/career-trends-and-in-demand-jobs-in-the-hotel-industry-for-2022>

McKay, M (2017, May 18). *Why soft skills training is vital in the hospitality industry*. Typsy. <https://blog.typsy.com/the-importance-of-training-in-the-hospitality-industry>

Office of the National Education Commission, Thailand. (1999). *National Education Act*. Office of the National Education Commission. <https://asean.org/wp-content/uploads/2016/08/Thailand184.pdf>

Office of the National Education Commission, Thailand. (2017). *National Qualifications Framework for higher education in Thailand*. Office of the Education Council, Ministry of Education, Thailand. <http://backoffice.onec.go.th/uploads/Book/1552-file.pdf>

Oxford Economics. (2012). *Global talent 2021*. Oxford Economics. <https://www.oxfordeconomics.com/Media/Default/Thought%20Leadership/global-talent-2021.pdf>

Phillpott, S (2021). November 6), *10 essential skills for a career in tourism and hospitality*. Career Addict. <https://www.careeraddict.com/top-10-skills-needed-for-a-job-in-hospitality>

Prasad, R. (2020). Role of soft skills in enhancing the employability in tourism and hospitality sector in India, *International Journal of Scientific & Engineering Research*. Volume 11, Issue 1, January-2020 188 ISSN 2229-5518, 188-194. <https://www.ijser.org/researchpaper/Role-of-Soft-Skills-in-Enhancing-the-Employability-in-Tourism-and-Hospitality-Sector-in-India.pdf>

Prensky, M (2012). *From Digital Natives to Digital Wisdom: Hopeful Essays for 21st Century Education*. Corwin. https://marcprensky.com/writing/Prensky-Intro_to_From_DN_to_DW.pdf

Qin, Q., Hsu, C., & Wu, Y. (2021). Becoming managers – A narrative analysis of skill acquisition during hotel internships, *Journal of China Tourism Research*. DOI:10.1080/19388160.2021.1920534

Richardson, H. (2010, January 12). *Students only have ‘10-minute attention span*. BBC. http://news.bbc.co.uk/2/hi/uk_news/education/8449307.stm.

Robles, M. (2012). Executive perceptions of the top 10 soft skills needed in today’s marketplace. *Business and Professional Communication Quarterly*, 75, 453–465. doi:10.1177/1080569912460400

Seetha, N. (2014). Are soft skills important in the workplace? A preliminary investigation in Malaysia. *International Journal of Academic Research in Business and Social Science*, 4, 44–56. doi:10.6007/IJARBS/-i4/75

Silpakorn University (n.d.). *Mission & Vision*. Silpakorn University. Retrieved December 10, 2021, from <https://www.su.ac.th/en/mission-vision.php>.

Silpakorn University Division of Student Affairs (n.d.). Silpakorn University. Retrieved December 10, 2021, from https://dsa.su.ac.th/ksu/?page_id=53

Sisson, L. G., & Adams, A. R. (2013). Essential hospitality management competencies: The importance of soft skills. *Journal of Hospitality & Tourism Education*, 25(3), 131–145. <https://doi.org/10.1080/10963758.2013.826975>

Society for Human Resource Management (2019). *The global skills shortage*. Society for Human Resource Management. <https://www.shrm.org/hr-today/trends-and-forecasting/research-and-surveys/pages/skills-gap-2019.aspx>

Tas, R. F. (1988). Teaching future managers. *Cornell Hotel and Restaurant Administration Quarterly*, 29(2), 41–43. <https://doi.org/10.1177/001088048802900215>

Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. Jossey-Bass/Wiley.

United Nations World Tourism Organisation. (2020, January). *International tourism growth continues to outpace the economy*. UNWTO. <https://www.unwto.org/international-tourism-growth-continues-to-outpace-the-economy>

United Nations World Tourism Organisation. (2022, January). *Tourism grows 4% in 2021 but remains far below pre-pandemic levels*. UNWTO. <https://www.unwto.org/news/tourism-grows-4-in-2021-but-remains-far-below-pre-pandemic-levels>

Vatel Hotel and Tourism Business School (n.d.). *Bachelor in Hotel Management*. Vatel Hotel & Tourism Business School. Retrieved December 9, 2021, from <https://vatel.co.th/en/hospitality-degrees/bachelor-international>

Vatel Hotel & Tourism Business School. (n.d.). *The Spirit of Vatel*. Vatel Hotel & Tourism Business School. Retrieved December 9, 2021, from <https://vatel.co.th/en/international-network/international-hospitality-school>

Ward, D. (2020, December 14). *Hard Skills Vs. Soft Skills: You Need Both In Hospitality*. <https://www.hcareers.com/article/career-advice/hard-skills-vs-soft-skills-you-need-both-in-hospitality>

Winterbottom, M; Kik, G; Selner, S & Whittaker, S (2019). *Employer Skills Survey 2019*. UK Government. <https://www.gov.uk/government/publications/employer-skills-survey-2019-uk-excluding-scotland-findings>



World Economic Forum (2020). *The Future of Jobs Report 2020*. World Economic Forum. <https://www.weforum.org/reports/the-future-of-jobs-report-2020/in-full/infographics-e4e69e4de7>

World Travel & Tourism Council. (n.d.). *One in 330 million*. World Travel & Tourism Council. Retrieved December 22, 2021, from <https://travelhub.wttc.org/one-in-330-million>

Yin, R. (2003). *Applications of Case Study Research*, 2nd edition, Applied Social Research Methods Series, Volume 34, Sage Publications inc

Hotel Mitigation and Strategic Response during COVID-19 from International Chain Hotels in Bangkok

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Abstract

According to the COVID-19 situation, it has been spreading and increasing steadily over the past few years. Many hospitality industries have faced many changes. People cannot travel both domestic and international routes. Consequently, many hotels need to find the solution to adapt themselves to survive throughout the pandemic. This research aimed to examine how hotel industries had coped with the COVID-19 crisis (August 2021 – November 2021) by using mitigation and strategic response (4R tactics: reduction, readiness, response, and recovery). These strategies could mitigate the risk or effects from the initial until the pandemic of the crisis and emphasize the stages of the crisis management process.

The objective of this research was to identify and review the marketing strategies that can cope with COVID-19 situation (August 2021 – November 2021) of hotel industries. The result showed that hoteliers decided to focus on three stages, which were the Reduction, Response and Recovery with 34%, 33% and 27%, respectively. From the interview, job rotation, demand reorientation, data integration, and hygiene & sanitation protocols were the 4R strategies from the international chain hotels. The gathered data in this study would provide the information to be the guideline for the hospitality industries to relate to how they identified or mitigated factors contributing to the current and post COVID-19 pandemic.

Keywords: COVID-19 crisis, Hospitality industry, *Strategic responses*

1. Introduction

According to COVID-19, it has been spreading and increasing steadily over the past few years. Many hospitality industries have to face with many changes. For example, several lockdowns led to a management and financial problem for almost a year. People could not travel both domestic and international routes. It became a norm that they were in the worst situation, people should stay home to prevent COVID-19. However, some hotels turned their property into alternative state quarantine to remain cash flow.

This research aimed to examine how 4-5 stars international chain hotels in Bangkok had coped with the COVID-19 crisis by using strategies from 4R tactics that consisted of reduction,

readiness, response, and recovery. Qualitative procedures were applied into this research to gain the in-depth information on 4-5 stars international chain hotels in Bangkok during the period of August 2021 – November 2021. The reason why this research mainly focused on 4-5 stars international chain hotels, they were mostly the biggest giants in the hospitality industry in Thailand and used to make enormous revenue for the country, but when the pandemic occurred rapidly, all hotels must face many changes in their business.

2. Research Objective

To identify the marketing strategies that can cope with COVID-19 of international chain hotel in Bangkok during the period of August 2021 – November 2021.

3. Literature Review

Due to the ongoing pandemic, lots of negative influences had affected the global tourism industry and domestic tourism industry in both tourism demand and supply sides. Furthermore, it caused a huge impact towards the hospitality industry as the sales volume rapidly dropped. Fung et al. (2020, pp. 1062-1070) modified the crisis management frameworks to handle with contagious disease as SARS (Severe Acute Respiratory Syndrome) and Influenza A (H1N1) in 2003 and 2009, respectively. There were four stages: reduction, readiness, response, and recovery named as 4R tactics. This framework could mitigate the risk or effect during the pandemic of the crisis.

3.1 Reduction stage

The reduction stage is the stage before the crisis occurs which helps minimize the loss for the organizations and mostly focuses on prevention and planning. Hoteliers conduct environmental analysis for unprecedented upcoming crises and are recommended to form a crisis management team with a contingency plan. There are two main subjects play an important role involving with this stage as human resources and technology (Ritchie et al, 2019, p. 102812; Garrido-Moreno et al., 2021).

- Technology

Technology is used for increasing the contactless society such as chatbots, self-service kiosks, digital payment systems, mobile applications, and in-room technologies. These technologies help minimize the face-to-face conversation between hotel staff and guests by letting the technologies facilitate the guests on the arrival stage, occupancy stage, and departure stage. In addition, the hotels bring the idea of proactiveness by planning the best action to confront the crisis in advance, such as checking body temperature for customers, reminding guests about epidemic prevention, implementing the standard of cleaning the public areas and hotel rooms, preparing protective materials or equipment sufficiently (Lai & Wong, 2020, pp. 3135-3156).

- Human Resources

Referring to Fung et al. (2020, pp. 1062-1070), the crisis management team creates the plan and collaborates with health and safety department to provide sufficient information about the current situation for their guests and employees precisely. Human resources plan to reduce the number of office hours and working days, freeze or reduce pay rates, unpaid vacation, develop a contingency plan to ensure the employees' safety and security. Most of strategies focus on reducing non-essential operational costs and monitoring

cash flows. Therefore, closure of some facilities, flexibility of staff allocation, and postponement of new investments are considered (Garrido-Moreno et al., 2021).

3.2 Readiness stage

In this stage, the organization aims to the protection of staff and guests by applying cancellation management with a great flexibility. The closure of international borders leads to few numbers of foreign visitors. Then, promotional packages that specifically attract residents are a wisely option. Besides, restoring customer confidence is vital. Extending loyalty programs, free cancellation services, re-scheduling services, and increasing benefits for the members are the most effective strategies for maintaining the number of guests.

3.3 Response stage

All contingency plans, tactics, and strategies are implemented by applying the effective internal and external online communication channels during the crisis (Yacoub & ElHajjar, 2021, pp. 929-948). Moreover, the hotels apply more efficient methods to reduce operating costs, engage online customers, and adjust the sales prices based on the current situation. Another subject is marketing leads to an opportunity by allocating a small proportion of attention and little funding to the business (Garrido-Moreno et al., 2021).

3.4 Recovery stage

After the pandemic, the hotels aim to recover and rebuild their brand image. Receiving government support fund is one of the important practices. Collaboration with other organizations in the same sector such as airlines, tour operators, and travel agencies is another strategy which help the organization to share the information across the businesses.

4. Research Methodology

4.1 Sampling Method

This research was conducted by applying a purposive sampling with qualitative method. The in-depth interview provided more details from the perspective of executive managers who plays an important role in the international chain hotels during the crisis.

4.2 Data Collection

The strategic responses of the hotel were investigated (Table 1). The criteria to select the hotels were shown as follows:

- 4 - 5 stars international chain hotel
- Operated in this time of COVID-19 situation during August 2021 – November 2021
- Located in the business areas of Bangkok, which are Sukhumvit, Silom, Sathorn, Ratchaprasong, Siam, and the area next to Chao Phraya River

Table 1. Classification of interview questions by 4R tactics

No.	Questions	4R tactics
1.	Does your hotel have a crisis management team? Who is on the crisis management team?	Reduction
2.	When COVID-19 first hit Thailand, did your hotel create a short-term and long-term contingency plan to cope with the coming situations?	
3.	During the COVID-19, does the hotel have to close down any other outlets or facilities? Why?	Readiness
4.	How did the hotel do with the employee during COVID-19 to maintain them?	Reduction & Readiness
5.	Does the hotel allow any departments to work online? Which ones?	Response
6.	Does the hotel still communicate with customers while having COVID-19 pandemic? If yes, why? (B2B and B2C)	
7.	How does the hotel deal with revenue loss from booking cancellations during COVID-19 period?	Recovery
8.	Have any departments applied software and technology programs up until now during the post pandemic stage? Which department and How?	
9.	What strategies does your hotel use to solve the financial burden during COVID-19? Please elaborate. (Maintenance, Employee, F&B, Hygiene, Cut Off, Government Support)	Readiness - Recovery
10.	How does the hotel handle booking cancellations from the start of COVID-19 period (Fist hit in 2020)?	
11.	Which tactics are conducted for retaining customers?	
12.	What plan do your hotel apply to attract more new customers, maintain service quality with new normal and technology to ensure customer’s safety during COVID-19?	Response - Recovery

5. Results

According to the interview from the four different executive managers, there were 33 strategic responses which can be classified into 4R tactics from the interview questions in Table 1. These strategies were stated in other articles as could be seen from Table 2. Hoteliers decided to focus on three fields, which are the Reduction, Response and Recovery with 34%, 33% and 27%, respectively. The Readiness stage is 6% coverage out of 33 different strategies in total (Table 2).

Table 2. Combination of recorded response, 4R tactics, and related articles

Repetitive times	Actual actions taken	4R tactics	References
Four times	● Reduce labor cost ● Unpaid vacation ● Job rotation ● Demand reorientation (local market analysis) ● New products or services (food delivery) ● Service and facilities shut down ● Internal and external communication (B2B/B2C) ● Contingency plan ● Online marketing (direct mail) ● Sanitation protocol (social distancing, staff hygiene) ● Information access (government) ● Infrared sensor and alcohol dispenser	Reduction Reduction Reduction Response Response Readiness Response Reduction Response Readiness / Response Response Recovery Response / Recovery	Hidalgo et al., 2022 Hidalgo et al., 2022 Hidalgo et al., 2022 Hidalgo et al., 2022; Varelas & Apostolopoulos, 2020 Hidalgo et al., 2022; Varelas & Apostolopoulos, 2020 Hidalgo et al., 2022 Hidalgo et al., 2022; Varelas & Apostolopoulos, 2020 Hidalgo et al., 2022; Varelas & Apostolopoulos, 2020; Sarwari et al., 2021 Hidalgo et al., 2022; Varelas & Apostolopoulos, 2020 Hidalgo et al., 2022; Kim & Liu, 2022 Hidalgo et al., 2022; Varelas & Apostolopoulos, 2020

	(new technology) - SHA/SGS certification - Contactless payment and online check in - Crisis management team - Data integration (PMS) - Staff training - Customer relation building	Recovery Reduction Recovery Reduction Response	Hidalgo et al., 2022; Sarwari et al., 2021 Sarwari et al., 2021 Sarwari et al., 2021 Hidalgo et al., 2022; Varelas & Apostolopoulos, 2020 Hidalgo et al., 2022; Varelas & Apostolopoulos, 2020 Hidalgo et al., 2022; Sarwari et al., 2021 Kim & Liu, 2022; Varelas & Apostolopoulos, 2020
Three times	- Wage reduction - Self promotion - Governmental support (Travel together) - Price reduction - Flexible strategic approach	Reduction Recovery Recovery Response Reduction	Hidalgo et al., 2022 Hidalgo et al., 2022; Varelas & Apostolopoulos, 2020 Hidalgo et al., 2022 Hidalgo et al., 2022; Sarwari et al., 2021 Varelas & Apostolopoulos, 2020
Two times	Future vision and prospects	Recovery	Varelas & Apostolopoulos, 2020
One time	- Layoffs - Working hour reduction - Quality improvement	Reduction Reduction Response /	Hidalgo et al., 2022; Sarwari et al., 2021 Hidalgo et al., 2022 Hidalgo et al., 2022;

Within the response stage, the demand of reorientation is mostly applied. There must be a sudden change in the market, causing huge financial loss. Therefore, a lot of businesses choose to bail out from the market for protecting the firm. Business owners conduct the alternative markets to improve their businesses with temporary compensation. This will not require a lot of resources and it could possibly prolong the business operation during a crisis.

Lastly in the recovery stage. Data integration will be a big part, since in the 21st century, all different data was collected. This could be used as a material or a guideline in the future when a similar situation happens again, businesses could have a faster response towards it.

Table 3. Suggest Strategies according to 4R Tactics

4R Tactics	Suggested Strategies
Reduction	Job rotation
Readiness	Hygiene and sanitation protocols
Response	Demand reorientation
Recovery	Data integration

As previously mentioned, there are countless strategies that could be taken. To sum up, there is no perfect solution to each crisis and conditions. This research is dedicated to informing the actual conduct of different hospitality firms in response with COVID-19 during August 2021 – November 2021 in Bangkok, and to investigate the reasons why they could sustain themselves. Therefore, this research could help other firms or businesses when facing a similar situation in the future, there will be the crisis response strategies for every firms.

7. References

- Fung, C., Tsui, B., & Hon, A. H. Y. (2020). Crisis management: a case study of disease outbreak in the Metropark Hotel group. *Asia Pacific Journal of Tourism Research*, 25(10), 1062-1070. <https://doi.org/10.1080/10941665.2020.1784245>
- Garrido-Moreno, A., García-Morales, V. J., & Martín-Rojas, R. (2021). Going beyond the curve: Strategic measures to recover hotel activity in times of COVID-19 [Article]. *International Journal of Hospitality Management*, 96, Article 102928. <https://doi.org/10.1016/j.ijhm.2021.102928>
- Hidalgo, A., Martín-Barroso, D., Nuñez-Serrano, J. A., Turrión, J., & Velázquez, F. J. (2022). Does hotel management matter to overcoming the COVID-19 crisis? The Spanish case. *Tourism Management*, 88, 104395. <https://doi.org/https://doi.org/10.1016/j.tourman.2021.104395>
- Kim, Y. R., & Liu, A. (2022). Social distancing, trust and post-COVID-19 recovery [Article]. *Tourism Management*, 88, Article 104416. <https://doi.org/10.1016/j.tourman.2021.104416>
- Lai, I. K. W., & Wong, J. W. C. (2020). Comparing crisis management practices in the hotel industry between initial and pandemic stages of COVID-19 [Article]. *International Journal of Contemporary Hospitality Management*, 32(10), 3135-3156. <https://doi.org/10.1108/IJCHM-04-2020-0325>

- Ritchie, B. W., & Jiang, Y. (2019). A review of research on tourism risk, crisis and disaster management: Launching the annals of tourism research curated collection on tourism risk, crisis and disaster management. *Annals of Tourism Research*, 79, 102812. <https://doi.org/https://doi.org/10.1016/j.annals.2019.102812>
- Sarwari, S., Huq, S., & Minar, T. A. (2021). COVID-19: The Way Luxury Hotels Deal With the Pandemic. *International Journal of Tourism and Hospitality Management in the Digital Age (IJTHMDA)*, 5(2), 1-13. <http://doi.org/10.4018/IJTHMDA.20210701.oa5>
- Varelas, S., & Apostolopoulos, N. (2020). The Implementation of Strategic Management in Greek Hospitality Businesses in Times of Crisis [Article]. *Sustainability*, 12(17), 14, Article 7211. <https://doi.org/10.3390/su12177211>
- Yacoub, L., & ElHajjar, S. (2021). How do hotels in developing countries manage the impact of COVID-19? The case of Lebanese hotels [Article]. *International Journal of Contemporary Hospitality Management*, 33(3), 929-948. <https://doi.org/10.1108/IJCHM-08-2020-0814>

Benefits of Hospitality Services in Attracting the Guest to Your Hotel

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Abstract

Hospitality services are considered to be the main factor in hotels. In this research, the observation used the Service Quality Model: SERVQUAL to investigate evidence that service quality of employees was affected by an increasing number of customers. The hotel uses the SERVQUAL model as a strategy to create a solid brand image and make a profit in the long term. The focus is to meet customers' needs in part of physical, emotion, intellect, and mind. This study researches and compares standard service quality that matches customers' expectations. The observations were conducted with 10 interviewees from different departments which relate to the questionnaires, including front office, kitchen, F&B, and housekeeping. This research searched about how 'SERVQUAL' benefits the hospitality industry and how it attracts guests to the hotel. However, the concept of the questionnaires is not only focused on staffs' service, but also focused on staffs' grooming, hotel's design, and all of the equipment in the hotel which comprehensive 5 dimensions of service quality (SERVQUAL). This research aims to attract guests to the hotel and expand the hotel's loyalty guests by using the SERVQUAL model.

This analysis showed advantages and results from service quality which have an influence on customer satisfaction. Additionally, it showed reasons that customers keep coming back to the hotel. It concludes that hospitality service provides huge advantages by using SERVQUAL models to provide customer service quality.

Keywords: SERVQUAL, Service Quality, Hospitality Industry

1. Introduction

Hospitality is a service group that tends to extend in tourism. The word “guest” is an essential word for the hotel industry. It is related to the word “service”. The customers are at the heart

to make business move ahead. The key to delivering excellent customer service relates to building relationships with customers. Employees not only know customers' names and provide service to them, but they also need to know more details about their customers. For example, employees know what customers like and do not like to eat for breakfast. Employees observe customers without asking them again and again. The aim of hospitality services is to build customer loyalty. In addition, it makes a great impression on customers constantly. Recently, significant things in hospitality are a great customer impression, customers delight, positive reviews, good reviews, etc. These are good memories that customers receive from service. Moreover, they suggest these things to their companions such as friends, family or colleagues. This seems like an advertisement without payment (Barsky and Labagh, 1992).

The paper regarding the possible advantages in hospitality service can create guest satisfaction influencing the increase in the number of customers. The hospitality service used to attract guests is “the SERVQUAL Models”. It consists of 5 main subjects: reliability, responsiveness, assurance, empathy, tangibility and 22 dimensions that are adapted to 22 questions about which are great factors to delight guests and make them come back to use service. These questions are brought to interview the 10 sophisticated staff working in the different departments after that their opinions are compared with similarity and difference of the SERVQUAL Models so as to summarize whether the models can work in the hospitality industries or not. The objective of this paper is to research topics about “The benefits of hospitality service in attracting the guest to your hotel”. By using the similarity of the SERVQUAL Model and the interviewing from the staff in the hotels. First, to research the similarity and differentiation of the model and staff ideas. Second, to research what services are attracting guests to hotels. Last, to research the SERVQUAL models is working in the hospitality industry. This paper is scope on the hotel services which are related to the SERVQUAL models service to attract guests to the hotel. The paper is focused on interviewing the 10 staff who are working in hospitality industries in the different departments.

2. Literature review

Hospitality is the industry which provides between tangible and intangible products at the same time. One of the most important things for the hospitality industry is service. For this research the authors were focus on the service in hospitality industry which can benefit the hotel and attract the customers, and it led the researchers to 2 different valuable researches which are ‘*Service Quality Management in Hotel Industry: A Conceptual Framework for Food and Beverage Departments*’ and ‘*Determining the Impact of Service Quality on Customers Satisfaction and Loyalty: A Study of Automobile Repair Services Factor in Ebonyi State*’

For ‘*Service Quality Management in Hotel Industry: A Conceptual Framework for Food and Beverage Departments*’ shows that service is hard to compare and scale because it is an intangible thing which cannot be seen but customers can feel it. The 5 dimensions of SERVQUAL which are tangibility is the part which make the product or service usable for

- Employees who have the knowledge to answer customer questions.

4. Empathy

- Giving customers individual attention.
- Employees who deal with customers in caring fashion.
- Having the customers’ best interest at heart.
- Employees who understand the needs of their customers.
- Convenient business hours.

5. Tangibles

- Modern equipment.
- Visually appealing facilities.
- Employees who have a neat, professional appearance.
- Visually appealing materials associated with service.

In the hospitality industry, the thing that can evaluate the service is customer satisfaction. If a hotel's staff can create a first impression and meet customers' satisfaction at the first time it will create a good image for the hotel, if hotel's staff fail to meet customers satisfaction at the first time it will create the hotel's image in a negative way. According to the benefit from the hotel's service, if the hotel can make customers feel impressed and convenient while staying at the hotel it will create word of mouth from the customers which is more powerful than any other advertising, and it will expand customers base and create loyal customers as well.

3. Research methodology

After the research question is chosen, this study searches for research relating to hospitality service. This used 2 research analyses in hospitality service. The research was chosen to describe the advantages of hospitality service by increasing the number of customers in the hotel. Firstly, “Service Quality Management in Hotel Industry: A Conceptual Framework for Food and Beverage Departments” written by AbuKhalifeh and Som, 2012. It is informed by the SERVQUAL Model divided into 5 dimensions: Reliability, Responsiveness, Assurance, Empathy, and Tangibles. This is related to service in hotels. Secondly, the second research exhaustively describes 5 dimensions. It is separated into 22 subjects.

First research clarifies overall that it shows service quality. The second research is “Determining the impact of service quality on customer satisfaction and loyalty: A study of the automobile repair services sector in Ebonyi state” written by Izogo, 2013. This increase understanding in practical methods used in main factors. The process uses questionnaires based on 22 items.

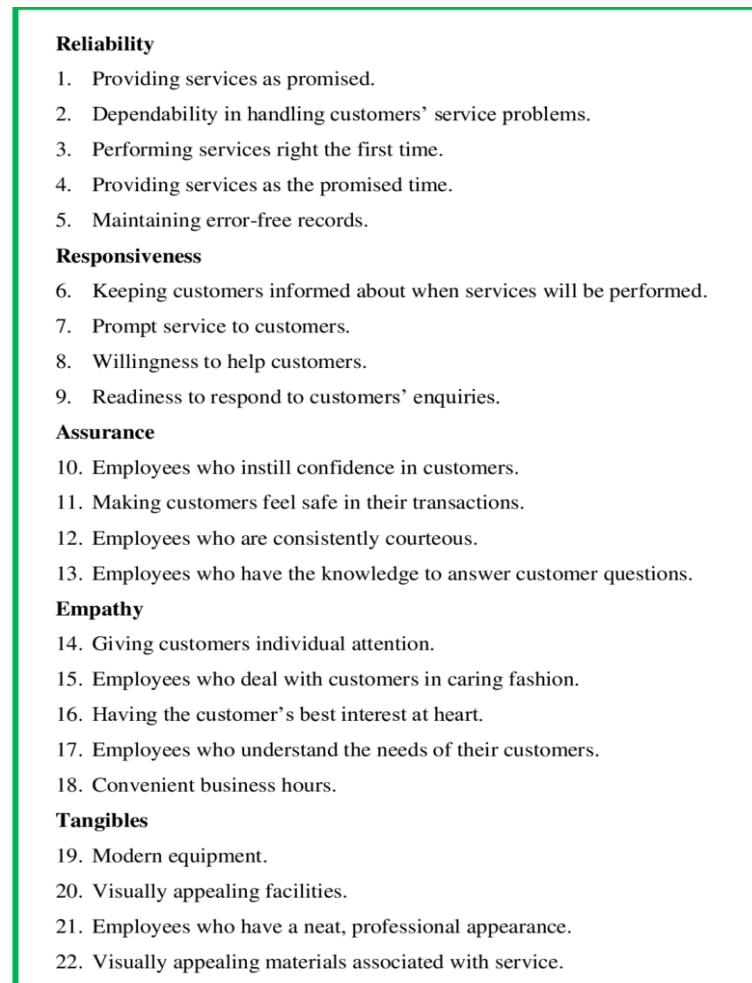


Figure 2: The SERVQUAL 22-Scale Items

Source: Parasuraman et al., 1994, p.207

In the interview part, it includes 22 items that are divided into 5 main subjects and 22 questions based on a model constructed by Parasuraman et al., 1994, p.207 and AbuKhalifeh and Som, 2012.

There are 10 experienced hotel workers and each person has a different task for example kitchen, housekeeping, and reception. The reason why workers in various departments were interviewed is that they have diverse aspects and different experiences. Therefore, this provides the result with the most accurate and credible. To begin with, it is raising questionnaires about each of the factors and how it affects guest satisfaction depending on service quality, it is evaluated by interviewing after the prevalence of each department service. After that it is categorized into a group of answers in the result part focusing on observation from interviewees in order to analyze in discussion sectors. However, the trouble that happened during analysis is that some interviewees misunderstand the purpose of questions. Accordingly, their answers are not relatively clear and likely to be analyzed again so as to find the exact main idea and compare the result with the model to explain how service quality influences the number of customers. After finishing all analyzing parts, the last process is the conclusion.

4. Findings/results

According to the SERVQUAL Model, the questionnaire used to support the five dimensions of the model can divide into 22 questions considering service quality. These five dimensions are classified into tangibility, reliability, responsiveness, assurances, and empathy. By doing interviews with ten interviewees from different departments. The result is based on the experiences of the ten-key information.

The first dimension which is reliability. The questions include the understanding of customer demand, capability of employees to solve customers’ problems, providing right service at first time, providing service punctually, and working in accuracy. Most of the interviewees stated that the most important thing is to create reliability. They emphasize the understanding that the staff need to create customer satisfaction. It makes customers feel that employees pay attention to them. Candidates said it can create good feelings and create an impression on customers. This makes customers want to come back to use service at the hotel again. They said by providing good customer service. This makes the number of customers steadily increasing by word of mouth. They said the first impression can create a good impression. In case, they deliver good service for the first time. They said customers receive great experiences. This builds customer confidence.

By focusing on responsiveness, which is the second dimension. The focus consists of informing customers, providing general service agreement, sincerity of employees, readiness to answer customer questions. Interviewees stated that information about service time is important. It is general information that employees inform customers. They said this helps the customers to plan ahead. For example, the customers can plan what they will do in one day such as eating period, travel itinerary, meetings, etc. They said in case employees inform customers at the right time. This is important because it helps the customers receive the right information. This helps to create a first impression. Interviewees said service agreement creates confidence in customers. They recognize policies and follow regulations of the hotel. It creates a good image for hotel brands.

They commented that sincerity creates guest satisfaction and trustworthiness. This attracts more customers because the customers feel satisfied from service. They give good feedback and spread word of mouth. Most of the interviewees give the answer in the same way that all of the staff need to understand what customer needs or want because this will make customer see that all of staff ready to take care customer also make customer feel comfortable and satisfied if not this will make customer complains the hotel services. Next is about staff solving guest problems. The candidates said this is very important and can also make customers feel satisfied. In case of business customer sometime they need adaptor for charging the laptops and they forget they asking with hotel if staff can find for them this will be good because customer will not complaints but if cannot solve this problems customer will think that just a little problem why staff cannot help customer for solving problem.

Next is about first impressions. The client talk about this in an important way because the first time is very important. If the first-time staff provide worse service to customers this can affect the hotel by the way the customer will choose to stay with your hotel only this time. Also doing the things that promise to customers the interviewees said whatever staff can provide service for customers as staff promise to customers this will be good. This can make customers think that staff is willing to provide service on what staff promise to customers. Last is about making mistakes while providing services. This is also important. The customers will complain to the hotel about the mistake. Sometimes the staff thought that this was just a little mistake but in the guest way this is a huge problem to the customer because of what the customer expected.

For the third dimension, which is assurance. The question focuses on trustworthiness. The interviewees said to create trust in customers. This builds customer confidence when they come to use service at the hotel such as check-in, check-out, transportation, etc. The interviewees said employees always ask and inform customers. It helps to minimize mistakes in service. They said the customers can make sure that they receive precise information. Interviewees said the employees provide service exceeding customers' expectations. This makes the customers impressed and come back to use the service again. Interviewees said safety makes the customers feel comfortable in part of service, supervision, equipment, and so on. Because the employees take responsibility for the assets of customers. They said good manners make the customers feel impressed. The reason is they feel that the employees give respect to the customers, which creates a positive image of the hotel and accurate information accommodates customers.

According to the fourth dimension, which is “Empathy”, for the questions the author focuses on the way to service each customer base on their need and want. They have to service their customers upon hotel standards, however they have to focus on customers’ purpose as well because the hotel has many types of customers for example honeymoon, leisure, or business. According to food, one of the interviewees said that she has to provide clear information about the ingredients in case that some of the customers might be allergic to some kind of food so hotel staff must avoid this mistake by providing complete information as well. If staff can understand customers and service them in the proper way it can impress customers and make them feel impressed with the hotel and service, it can create loyal customers. Along with the equipment that the hotel can impress customers with the up to date technology to service them because it can make customers feel more comfortable, including use social media for contact with customers, because it can make customers feel that they can contact with the hotel easily, however for using the up to date technology have to base of the type of hotel.

Lastly are “Tangibles”, the questions focus on the design of both exterior and interior design, furniture, equipment, and staff uniform. According to the design of the hotel the interviewees said that it can attract customers, but the design has to be based on the type of the hotel and customers’ taste as well. According to technology and equipment, interviewees said all of the equipment has to be in the right place, especially technology equipment and electric equipment

have to do the dairy check to make sure that it is still working and not breaking to make customers confident and create impression at the same time. Along with staff uniform and grooming can affect the hotel image and customers’ impression as well because if staffs have proper grooming, it can make customers feel that staff are professional and create trustworthy. For the time for service interviewees said that the hotel has to stand by for 24 hours to support customers, but some outlets, for example gym or swimming pool have to set the proper time for customers safety and avoid unexpected situations.

5. Discussions and conclusions

The results show that 10 applicants pay attention to service quality. They focus on several factors such as service performance, service expectation, service quality dimensions, etc. In this interview, customer satisfaction relates to different factors. This depends on each customer according to their needs, experience, word of mouth, and so on. This indicates that the hospitality industry uses service quality dimension delivering service to customers to achieve what customers expect. The researchers apply whole dimensions to make customer perceived value from service quality in order to reach customer satisfaction. They believe customer satisfaction is core values in the hospitality industry. In contrast, interviewees already have more than four months. They faced several situations in the hotel while they were working. These results claim that candidates realize the importance of service. To create a positive brand image and impression to every customer. Thus, the outcome is customers advertise the hotel by word of mouth which attracts more customers.

This research demonstrated significant service quality and guest satisfaction. In which it helps to increase the number of the customers in the hotel. In addition, there are five dimensions in the SERVQUAL model. This shows attributes that can be a response to the needs and expectations of customers. This study shows that the SERVQUAL management framework is essential in hospitality service. In order to create guest satisfaction and brand loyalty. Thus, the hotel can use the service quality to enhance customers in each department such as housekeeping, food and beverage, kitchen, and so on. Excellent quality customer service provides appreciation to customers. This implies that the customers spread their good feelings and experiences to others during their stay at the hotel.

The SERVQUAL models are used basically in the service sections in hospitality industries or hotels. This research paper is focused on how to provide service to attract guests to choose your hotel as their destination. This research is having the results based on interviewing with the questions focused on 22 items and also two similarity topics research papers to define whether these dimensions are affected to the hotel in good ways or not. As of the results of questioning with 10 candidates. Most of the outcome is the same idea is to make guests feel satisfied is the best way to service guests. Therefore, this also needs to take a development depending on the trends of guests at that time.

6. Limitations and direction for future research

The first limitation of this study is that interviewees were from different hotels, departments and provinces. This resulted in different standards and notions due to the class of each hotel. For instance, some employees who worked for the 4 stars have different standards of service from those working for the 5 stars hotel.

Secondly, the number of interviewees is inadequate. There are only 10 interviewees. Hence, the result of study might be not completely accurate and effective enough to ensure that the hypothesis SERVQUAL of study is truly correct.

Thirdly, the difference in behavior and attitude of each person. Every person has a different way of thinking and taking actions during service. This can be affected by the answer due to interviewing 10 interviewees.

Fourthly, it needs to improve several factors such as the number and nationalities of applicants. The method is interviewing by phone interview. This research paper has the answer by interviewing only 10 people with Thai nationalities. Therefore, in the future this can be improved by interviewing more people with different nationalities. The reason is interviewees have more chances to obtain different aspects, methods, and results from interviewing. In addition, the observations are only limitations of questionnaires and time limits. Some of the interviewees were not answering all the questions which have been asked. This can affect the results of this research paper. Moreover, in the future the interviewers can add more methods or interviewing more deeply to interviewees. Namely, the authors improve the questionnaire to be simplification questions.

7. Direction for future research

The results of this research paper suggest that the concept of SERVQUAL Models or 22 items usefully to the hospitality industries. Therefore, there are attempts to gain more opportunities and suggestions for future research. First, opportunities for hotels to improve their service style and training more to develop their staff. Second, for new hotel branch to plan and the way to design the hotel style and the style of services to attract the target customers also to match on what guests need or want. Third, basically used as the topics for students or anyone who would like to work or study in the hospitality industry. In addition, there is the limitation for the research papers such as the time for doing the research. Moreover, this research paper can be useful for the future such as being used for teaching or training students or staff in hospitality industries and can help to do better research papers on similar topics. Finally, this research paper is showing the SERVQUAL model is useful for hospitality industries. By the way, this model is basically used but also needs to update and improve to connect to the present or the future trending in the hospitality industry.

8. Reference

- AbuKhalifeh, A. N., and Som, A. P. M. (2012). Service quality management in hotel industry: a conceptual framework for food and beverage departments. *International Journal of Business and Management*, 7(14), 135-141.
- Ananth, A., Ramesh, R., and Prabakaran, B. (2011). Service Quality Gap Analysis in Private Sector Banks–A Customers Perspective. *Indian Journal of Commerce and Management Studies*, 2(1), 245-253.
- Babajide, O. (2011). Breakfast service quality in Restaurant Gui Hilton Helsinki Airport hotel (Doctoral dissertation, Bachelor’s Thesis, HAAGA-HELIA University of applied sciences. Retrieved from <https://publications.theseus.fi/bitstream/handle/10024>).
- Barsky, J. D., and Labagh, R. (1992). A strategy for customer satisfaction. *Cornell Hotel and Restaurant Administration Quarterly*, 33(5), 32-40.
- Caruana, A. (2002). Service loyalty: The effects of service quality and the mediating role of customer satisfaction. *European journal of marketing*.
- Cheung, C., and Law, R. (1998). Hospitality service quality and the role of performance appraisal. *Managing Service Quality: An International Journal*.
- Izogo, E. E. (2013). Determining the impact of service quality on customer satisfaction and loyalty: a study of automobile repair services sector in Ebonyi State. Ebonyi State University, Abakaliki, Nigeria.
- Kotler, P., and Keller, K. L. (2006). *Framework for Marketing Management & Custom case*. 3rd Edition. New Jersey: Prentice Hall.
- Ladhari, R. (2009). A review of twenty years of SERVQUAL research. *International journal of quality and service sciences*.
- Parasuraman, A., Zeithaml, V. A., and Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, 49, 41-50.
- Parasuraman, A., Zeithaml, V.A., Berry, L.L. (1994), Alternative Scales for Measuring Service Quality: A Comparative Assessment Based on Psychometric and Diagnostic Criteria, *Journal of Retailing*, vol. 70, no. 3, 1994, pp. 201-30. Commented [WU37]: What referencing style is used
- Zeithaml, V.A and Bitner M.J. (2003). *Services Marketing: Integrating customer focus across the firm*. 3rd Edition. New York: Mcgraw-Hill.

How Thai Hotels Response to COVID-19 during Locked Down.

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Abstract

This research project has been conducted due to the 2020 pandemic outbreak COVID-19. The paper showed how deadly and harmful this virus can be to human beings and how threatening to Thailand's economy, specific to the hospitality industry fraction. Researchers conducted interviews with various job positions in the hospitality industry to gain opinions and personal insight from each part of the industry.

The method researcher used for this research paper was direct phone interviews. The chosen process is best to gather information because it is the fastest, most efficient, and straightforward to acquire primary data. There were many challenges from doing this method due to the global pandemic of COVID-19. One of the major challenges was actually finding a person that works in the hotel industry. Most of the hotels in Thailand were closed and some still open with less than half of the staff working. Due to the low numbers of people, it took more time to secure an interview. The reason to conduct this research is to see how differently COVID-19 affects people in different job statuses and what is their input to deal with this global pandemic problem.

The questions had been created for the interview which separated the interviewee into four groups, operation employee, back of house employee, management level and general manager or owner of the hotel. This paper aims to find subdivisions for the hotel industry as the new normal because of the COVID-19 outbreak and to provide various strategies and ideas during this outbreak.

Keywords: —COVID-19, Economy, Hospitality Industry, Thailand. Keywords—COVID-19, Economy, Hospitality Industry, Thailand

1. Introduction

COVID-19 has become a global pandemic problem over a million cases reported and hundreds of thousand deceased worldwide. COVID-19 can be passed from carrier to receiver by a droplet either from their nostrils or mouth. The virus can stay on the surface for up to twenty-four hours depending on the surface. COVID-19 symptoms also present differently depending on the complication diseases and ages of the carriers or receivers. If the infected are elders with

respiratory diseases, COVID-19 can prove more fatal. The treacherous truth of COVID-19 causes many major cities over the globe to be on lockdown.

Schools, department stores, entertainment businesses, hotels, restaurants, and all the activities which contain more than one person are all banned. Then curfew has been activated to reduce social contact. However, these strategies help flatten the curve. But it affects the economies tremendously. Small and medium enterprises with no small investment funds are bankrupt, while some are struggling. Most of the service-related employees are now unemployed with no salary to pay for groceries, electricity, or rent.

In Thailand, the hospitality industry provides thirteen to fourteen percent of the country's economy (Thailand Business News 2020). In Southeast Asia, Thailand is the largest destination for Chinese tourists. Thirty percent of all foreign tourists were Chinese (Thailand Business News 2020). During the pandemic outbreak, it is within Thailand's high season for tourism and hotels (Culture Trip 2018). Before the first case has been reported most of the luxury hotels are at eighty to ninety percent occupancy, but right after the number of infected cases increased, the occupancy rate drops to sixty percent and keeps decreasing till all the reservations are cancelled (Thailand Business News 2020). Although the number of cases reported in Thailand according to the Ministry of Public Health is lower than in Japan or South Korea, the government is taking serious measures to contain this outbreak as much as possible.

This new COVID-19 virus directly affects the hospitality industry, with all the international airports being on lockdown and hotels are under a state of emergency to close during this time. This global pandemic event will severely change the way hotels operate, and more importantly, it will change the behavior of tourists. They will be more cautious with social distancing in mind. They will prefer more private space than crowded areas. Some types of accommodation can answer these new criteria. Such as Airbnb or boutique hotels, while larger hotels may have to adapt to this new normal. All the changes which happened during the lockdown and after this COVID-19 pandemic will shape a new normal to the hospitality industry, the question is “How will hotels respond” and what are the options and opinions from the hotelier be.

2. Literature Review

The hotel industry and tourism have a tremendous negative effect during the crisis. As a consequence of being locked down in many countries, including businesses in service areas are compulsively temporarily closed. 10,000 Employees are inevitably unemployed, several hotels set new regulations either decreasing monthly salary or force spending of the day off. Big Hotel chains such as AWC (Asset World Corp), SHR (S Hotels and Resorts), and B2 (B2 Hotels) are temporarily closed. Dusit Thani announced closing seven hotels in its chains.

Meanwhile, reducing the monthly wages of employees in managers and higher positions. As well as, Centara group. According to The Bangkok Insight (2020), Hotel occupancy rates from April to May is already zero percent. Moreover, one hotel in the Lumpini area announced an unemployed total of 300 employees at once, also another hotel in the Sukhumvit area is given two possible alternatives to employees rather resign and receive compensation or stay employed but receive 25 percent of their regular wages, within 24 hours.

Locked down preventive measures cause temporary closed more than 30 hotels in Bangkok alone, this affect spread wide to top tourism destinations in Thailand including Chiang Mai and Phuket. Hotels in Chiang Mai are temporarily close more than 50 hotels, including Chiang Mai Orchid Hotel, Eastin Tan Hotel, Veranda Chiang Mai, Novotel, Four seasons, U Chiang Mai,



which close between 1 April to 31 May in first announcing. These are also happening in Phuket. As Phuket is high popularity of tourist destinations in Thailand and the Main areas for Covid-19 observation preventive measures (The Bangkok Insight, 2020).

Phuket began to be locked down city starting from 30 March to 30 April at first announced, and extend to 15 May later (Thansettakij, 2020). As a result, Hotels in Phuket roughly 2,000 hotels approximately 100,000 rooms have occupancy rates of nearly 0% - 5 %. This led to temporary closed in many hotels, some hotels even reported bankruptcy during COVID-19 pandemic period. Also, besides Bangkok, not only Chiang Mai and Phuket have faced problems. Other areas of high tourist destinations including Hua-hin and Pattaya are temporarily closed or began to measure "Leave Without Pay" for those hotels where they are not reported temporarily closed.

According to The Bangkok Insight, 2020, The Evason Hua Hin in Pranburi, perated by Pranburi Beach Resort Limited company, Announced permanently closed on 30 March 2020. However, Forbes Thailand, 2020 reported that during the pandemic period. Hotel owners all over the country are helping medical Staff by turning 0% occupancy hotels into resting places for showering and staying for nurse and medical staff. Medium-scale and high scale hotels near hospitals are united to help medical staff during the pandemic period. The following lists are examples of the hotels where they turned themselves into a resting place for providing convenience to medical staff.

The Quarter Residence in Praya Thai district Rabbitat Hostel, Bless Residence Sukhumvit Soi 33, YELLOW ROOMS Hotel Victory Monument. Big scale hotels besides in Bangkok are Istan tan Hotels in Chiang Mai, Natai Beach Resort & Spa, OYO 419 Maleewan Jomtien and Na Banglampoo Hotel, Punjadara Hotel in Nakhon Ratchasima, Sripattana Hotel in Nakhon Ratchasima, The Bonanza Resort Khao Yai in Nakhon Ratchasima, Asawann Hotel in Nong Khai, Grand Bella hotel in Pattaya and more. Hotels that are interested to be part of this project can be registered via the Health Service support Department. There are 280 hotels registered during the pandemic period (Forbes Thailand, 2020).

In this paper, associated to the largest hotel chain like 'Marriott' show us how big corporate companies deal with problems. Due to the global pandemic outbreak COVID-19 has caused Marriott to shut down many of its properties, with nearly 1.4 million rooms worldwide, furlough employee's numbers tend to rise (Bangkok Post, 2020). The actions Marriott takes are trying to balance everything associated with the company. Furlough employees may not receive a further salary but they still receive a full medical benefit from the hotel, and Marriott plans to re-hired furlough employees as many as possible. According to Bangkok Post, Marriott spokeswoman also said that "The vast majority of the brand's properties isn't Marriott" which means that the furloughing employee's strategy only applies to the properties Marriott owns. The employee reduction starts from housekeeping up to the general manager but for corporate-level Marriott making significant cuts in senior executive salary instead (Marriott, 2020).

Marriott is taking numerous plans to deal with the fluidity of the situation to help improve the finances of the company in 2020. The company also plans to help owners and franchisees by deferring most of the brand standard by delaying renovations by one year and suspending brand standard audits. Marriott also dramatically reduced costs from every angle from salary, shortening workweeks, cancelling non-essential travel spending and even eliminating some of

the investment plans, this action is expected to help save hundreds of million US dollars (Marriott Business Update, 2020).

Marriott mitigation plan is a corporate side of view, the company tries to reduce expenses in various ways but in those actions, it affects employees directly, it's great to keep the health benefits but without salary how can furlough employees pay for other expenses. These are just examples of actions from the world's largest hotel company, which brings up the questions, how about other hotel companies responding the same way or they offer different solutions.

3. Methodology

Data used for this research paper are primary data and secondary data. Academic websites, research papers that are similar in topic, and other reliable and related content applied for secondary data. The data was used to gain more understanding and pinpoint the focus of this topic research and help shape the questions for the interviews. This method helps authors ask the right questions and guide this research in the right direction. The interview is the procedure used to approach and gather primary data. The chosen process is best to acquire efficient and straightforward information.

A face-to-face interview would be more efficient to conduct an interview, but due to lockdown and social distancing, a phone interview is more appropriate. Each question is easy to understand and is in the same order to see different answers, there were fifteen questions in total. To gain a diverse opinion and answer each participant was chosen from different establishments across the Thailand hospitality industry. The participants were divided into four groups, ten people in total. Those four groups are; the first group, four employees from the operational department, the second group, three employees from the back of the house departments, the third group, two employees from the management level, and the fourth group, general manager or owner of the hotel. There were many challenges from doing this method due to the global pandemic of COVID-19.

One of the challenges was finding and contacting a person that works in the hotel industry. Currently, hotels in Thailand are not operating, some are, with less than half of the staff working. Due to the low numbers of people, it took more time to secure an interview. Another obstacle, most of the interviewees are not used to being interviewed and do not understand the procedure, which takes more time to prepare them with detail and information. The situation was handled by asking the interviewee ahead of time if they were willing to follow through with the interview by sending a direct message or email address. Furthermore, interviewees have the choice not to reveal themselves and conduct an interview anonymously. The hotels that were in the interview are Sofitel Bangkok, Rosewood hotel Bangkok, Chann Bangkok-Noi, E11 Hotel (same owner), Four Season Hotel Bangkok, Bangkok Marriott Hotel the Surawong, and Sukhumvit Park Bangkok - Marriott Executive Apartments.

The list of questions is as follow:

- Which hotel are you currently working and what is your position?
- What is the first action the hotel takes?
- Are there any changes to the schedule?
- How does it affect your income?
- Does your hotel close during the quarantine?

- If yes or no what is your opinion?
- What are the security measures taken by the hotel?
- Do you feel secure in your job during this situation?
- What are your major concerns during this pandemic?
- What are your activities during your quarantine?
- Is the quality of work from home effective?
- Do you take any other jobs, activities, or charity events during this quarantine?
- Are there any charity program activities from your hotel? How does your hotel achieve that activity?
- Do you think the hotel industry is going to be the same after this pandemic?
- What is your recommendation for this pandemic?

4. Finding and results

After spending time dissecting each discussion dialogue, the results are very diverse. As interviewees were in designated groups, the representative of each group will be chosen to discuss in this section. The first person said that his hotel had acknowledged COVID-19 since December 2020, before the government officially announced it to the public. In the beginning, his hotel conducted body temperature measurements of hotel guests and employees and performed social distancing. In the meantime, knowledge and direction are insufficient from the Thai government, which is why these are the only procedures hotels take. The schedule was excessively changed, as the New Normal or Working from Home are applied, he has to standby seven days a week instead of weekdays.

During the quarantine with no guests, the service charge decreases to zero. He and other employees only receive a salary with no deduction. Uncertainty is the common emotion most hoteliers face because some hotels had laid off employees during the quarantine. They fear they will face the same unlucky end. On the bright side, his hotel is doing charity events to help feed medical staff with hotel resources. The hotel also encourages people who have access to Facebook to join them. He said after the lockdown, the hotel industry would resolve into the new direction. Artificial Intelligence might replace document-related positions, but he feels confident that operation-related still needs a human touch.

The second person is currently working for a soon open hotel. The action his hotel pursues is to stop the operation and close immediately, which means all employees are under quarantine right away. The income is different from the first-person establishment because his hotel is under development. There are no service charges, and salaries are lessened. He agreed to the response his hotel took. He said that even though the government is not officially putting the hospitality industry under The State of Emergency yet, the situation does not seem better, so this action is the most efficient.

Furthermore, before his hotel is under lockdown they measure all of their employee's body temperature before sending them to quarantine themselves. With this method, the hotel can confirm that no one got infected. During the quarantine, he is encouraged to be active. He has to do many conference calls and planning with his team. Therefore, after the quarantine, they can be more efficient. Unfortunately, his field of work is operational. He finds this New

Normal working from home difficult. Lastly, he mentions that in every bad situation there is a lesson to learn, he said that “At least during this pandemic and after, people will be more responsible for themselves and others”

The third person hotel is not closed during the quarantine. The hotel type is an executive apartment. guests stay for a long period and at least have one-year contract. Currently, she works in front of the house, which means working from home does not apply. The schedule is excessively changed. Usually, there are three to four people on one shift but now it has changed to one or two people. They have to use their annual public holiday to replace the increased day off. The hotel loses walk-in guests. Long-term guests cannot access all facilities, which affect service charge and revenue. First, the hotel only reduces employee service charges and salary, but in the end, the hotel ends up furloughing employees.

As the hotel is still operational, safety measures for employees and guests are strict. No outsider is allowed to dine at the restaurant in the hotel. All employees and guests are under observation for any symptom of sickness, body temperature measurement, and all the surfaces are clean with cleaning alcohol at least three times a day. This hotel wants to reach out and help the public by donating medical equipment needed to hospitals. Up to the present moment, the third person chooses to do some small online business to substitute the missing salary. She also suggests that the hospitality industry will never be back to normal if the vaccine is not here. She recommends everyone to be responsible, punctual, and conscious then we will get through this global pandemic together.

The fourth-person opinion of this crisis is a bit different. The first action taken is to educate employees about the COVID-19 situation, then change the roster and duties to fit the situation. Closing the hotel is the right decision, because it helps prevent infection and is best for employees' health. The concern appears to be an adaptation of his team as the situation happens quickly, there is not enough time to prepare. The new normal of working from home will be as effective with some adjustment. He is confident that the hospitality industry will survive this pandemic. An understanding and adaptation will help the industry through these changes.

Finally, the response is very diverse due to many factors. The participants are different in age, gender, personality, and experience in the industry. Even though some points of view may differ, the matter aspect is a line. According to all the information gathered. The hospitality industry is not prepared enough for this kind of event. The emergency fund is not enough to take care of employees' benefits they deserve. Employees' income is decreased even at the management level. The number of furloughed employees keeps increasing, everything seems distressing.

However, every group of participants agreed that the hospitality industry is adaptable. Many hotels acted swiftly and efficiently without any guideline from the Thai government at the time. It helps prevent a cluster. After gaining more information and understanding of Covid-19. Hotels come up with many contingency strategies. This proves that the hospitality industry can handle the pandemic situation quite well. The problem here seems to be a financial factor. If the hotel considers more in the emergency reserve, it will not reach the point of furloughing. In the end, there is room to reconsider and improve to be more efficient and responsible. With everything that happens, hope this devastating event will help hotel owners be more aware of these problems.

5. Conclusion

In conclusion, The COVID-19 pandemic is defined as the global health pandemic of our time. These spread to many countries expeditiously and extensively with over six million cases reported and hundreds of thousand deceased global. The COVID-19 pandemic makes many countries shut down immediately to protect their people from this disease. In which each country would come up with defensive measures Nevertheless, many countries are trying to slow the spread of the virus by testing the disease and treating patients as soon as possible, also carrying out contact tracing.

In mid-January, Thailand was affected by the COVID-19 virus outbreak which now is under control but the economy is entering a recession as businesses lose their income and households lose their supply chain disruption, especially in tourism and exports. However, In the beginning, the number of people related to this disease is at a relatively low rate. On the other hand, In the weeks later the number has accelerated increasingly. This pandemic has had an impact on many businesses in Thailand especially the hospitality industry because the number of travellers in Thailand has been decreasing hugely and it is mostly from the Chinese tourists as well as many reservations were cancelled at the same time.

Therefore, the main purpose of this research is to know how Thai hotels handle and respond to COVID-19 not only in terms of maintaining their business from the perspective of the owner but also sustaining and supporting every staff equally. Nonetheless, the method that was used in this research paper is direct phone interviews. This method is the best way to gather information if compared with other methods. While this method is better than others, there are still some challenges that can occur, for example, the global pandemic of COVID-19 that the number of people who are still working in hotels has decreased therefore it takes longer for the interview.

In contrast, most of Thais are shy to do an interview, therefore, it is necessary to ask for their allowance and inform them earlier. In this research paper, the questions would be 15 questions in total in which they would also be separated into 4 main groups to see the opinion in different positions from owners to employees. Nevertheless, the answer reveals that owners and operators in Thailand have implemented various strategies to limit the ongoing business outbreak. While many hotels are temporarily closed in Bangkok, in other places are exploring new revenue generation strategies. To protect their employees and guests' health including safety, some local hospitality players have announced temporary closures of their hotels.

The results after interviewing the candidates are disparate due to the different groups and different positions therefore the representative of each group will be chosen to discuss in the results section. However, nowadays it is necessary for other hotels that are still open to be updated and maintain their standard as well as having additional safety measures. In the view of the owner of the hotel. Regarding the major concern in the view of owners, most of them are afraid that this pandemic would take longer which would make them have no income. From the perspective of staff, they said that they still feel safe working in hotels because hotels provide everything and do their best to protect staff and guests.

Nevertheless, for the major concerns during this pandemic, there are two major concerns which are health and income because many hotels had laid off staff due to the bankruptcy. The main

activities that most staff do during this quarantine mostly would be cooking and selling things online to get the second source of income. In the upcoming future, the staff mentioned that they think that Thailand is getting better now, therefore, they hope that they will be able to work as normal soon.

To sum up, every response is from various perspectives within different positions but in the end, it shows that the COVID-19 pandemic plays an important role in people's lives as well as the economy of the country especially the hotel and hospitality industry. Many hotels are shut down due to bankruptcy while many staff are laid off at the same time. This research is to observe how hotels in Thailand get affected by this pandemic and how well they handle it in which most of the results show that they can handle it well. Lastly, No one would want this pandemic to happen but when it happens, it shows how helpful people have for each other. However, the only thing that everyone wants is to have a normal life and to have a better life after this crisis as well as being secure by the government and stimulating the growth of the economy in a better way.

6. Direction for future research

As an attempt to maintain the existence of the hotel industry, several directions are suggested for future research in this study. The first issue to be focused is to engage future studies about how hotels should plan after a pandemic. This includes the strategies being held by the hotels to attract the customers, and how they shall promote their hotels persuasively in order to give the sense of comfort to stay at the hotel without worrying about Covid-19 transmission. Thus, hotel revenues will be improved after declining rapidly during the lockdown as the customers' trust increases.

In this regard, customers can be interviewed about their opinions on what facilities and services should be maintained after the pandemic. Al Saleem and Al-Juoori, 2013, suggested that the success of hotel industries is in line with how customers' expectations and necessities are fulfilled. Therefore, it is very pivotal to collect their opinions in order to develop the hotel quality after the pandemic ends.

Lastly, conducting future research about emergency fund allocation for hotel industries in Thailand is likely crucial. This study is intended so that hotel businesses are aware of the importance of managing the fund allocation in emergency situations other than Covid-19. Through conducting this research, it is expected that hotel owners will not experience too much loss in the future. This loss is mainly due to the lack of occupancy rate during the lockdown without any funds to cover the issues. As the occupancy rate is less than the hotel's capacity, it tends to lead to the depletion of hotel revenue (Taha, 2000). Therefore, by engaging future research on this matter, the problems that may arise during such a crisis as the dismissal of workers, salary reduction, and hotel operating costs can be better mitigated in the future.

8. Reference

- [1] Al Saleem, A. S., & Al-Juoori, N. F. (2013). Factors Affecting Hotels Occupancy Rate. *Interdisciplinary Journal of Contemporary Research in Business*, 142-159.
- [2] Craig Karmin (2020). Bangkok Post: Marriott Begins Furloughing Tens of Thousands of Employees.

- [3] Connie Kim, Jackie Burka McConagha, Betsy Dahm (2020). Marriott International: Provides Business Update Amidst The Rapidly Evolving Coronavirus Situation.
- [4] Forbes Thailand. (2020, April - May). travel. <https://forbesthailand.com/news/travel/>
- [5] Taha, Tariq. (2000). Hotel Management. Alexandria: New Approach of Dar Al Ma'arefa.
- [6] Jeff Pinchuck. (2020). Thailand Business News: How COVID-19 Will Change Thailand Tourism Sector.
- [7] Sarah Williams. (2018). Culture Trip: When's The Best Time To Visit Thailand.
- [8] Thansettakij.(2020, 21 June). ภูเก็ต สั่งปิด “ลือกดาวน์” พื้นที่เสี่ยง.
<https://www.thansettakij.com/content/432158>
- [9] Thebangkokinsight. (2020, 8 April). โรงแรม กับผลกระทบมหาศาลจากโควิด - 19.
<https://www.thebangkokinsight.com/328801/>

How New Normal Affect Hotel Industrial Training

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Abstract

An internship is one type of job experience where students are allowed to obtain skills and knowledge from real workplaces and operations. To begin with, an internship in hospitality in terms of service provider allowed students to interact with guests and be able to get full knowledge until Covid-19 had occurred. The style of service sequence and health concerns is likely to be the main priority for hotels to consider before recruiting trainees.

These research project intentions to conduct and analyze the negative effects caused by the new normal condition. This factor presents as an issue among the students of hotel management in the hospitality industry fraction. The method for this research paper will collect the data by direct phone interviews and face to face interviews. The chosen method is best to approach these issues. An interviewee has been divided into three groups for the most efficient outcome. Those three groups are a person who is related to the problems, which are two from the Human resources department, three from other departments of the hospitality industry that used to interact with trainee students, and five students of a hotel management facility.

This paper is determined to collect primary and secondary data on the issue. In which the data collected can be used to take the matter to a more positive outcome. Furthermore, to help those who may be related to understand the new normal condition in the hospitality industry and enhance their thought and skill, which will help them continue pursuing a career in the industry.

Keywords: Industrial training, New normal, Hospitality Industry, Hotel Management Students

1. Introduction

The hospitality industry is service oriented. Most of the base knowledge can be learned through study materials, lectures, research, case studies, or even self-studies. But it is barely enough to execute correctly. To make a student of hotel management understand more about their career and build a strong foundation, they need interactions with real customers. A popular method used by many hospitality industry establishments is industrial training or on the job training or internship. Industrial training will provide an actual working environment for a student, and they can gain practical knowledge, soft skill, and hard skill during the training. This process

will help a student to develop their confidence and motivate them to pursue a career path they have chosen.

On the other hand, as industrial training is the first exposure to a real working environment for a student, this experience will be one of the most influential to a student's impression of the industry. If the host did not fully prepare or is unwilling to provide a student with proper training this can develop a negative attitude toward training and the industry itself. These matters were already posted as a problem to be aware of before this "New Normal" condition happened. Due to COVID-19, many countries are on lockdown, some businesses such as the hospitality industry were closed. Many undergraduates and newly graduated missed the opportunities to conduct their industrial training either in their own country or abroad due to safety. According to Mr. Thana Boonlert, a writer from Bangkok Post, the statistic of job prospects melts in graduate students (appendix C). The number of jobless in 2020 after Covid-19 is twice higher than last year. According to the Journal of public economics (Esteban M.Aucejo, Jacob French, Basit Zafar, and Maria Paola Ugalde Araya), 13 percent of the students delayed their graduation due to Covid-19, mostly from dropping an internship. COVID-19 itself proves that many hotels are not fully prepared to comprehend the situations, hotels layoff a lot of their employees due to the tenacious amount of time under lockdown.

As of now, the pandemic situation proves to be better in some of the countries. Hotels are up and running again but lack customers and employees. As industrial training in hotels uses a real environment to create an experience for a trainee, the lack of employment and customers of the hotel does not help the training to be better but more worrying. If the first exposure experience of hotel management students is compromised, how will the hospitality industry establishments provide similar experiences? That brings up many questions. Industrial training in hotels demoralizes students' impression more than motivates them. What will be a better option for them to keep developing and pursue their career path? The purpose of this paper is to gain a better understanding of this situation for hospitality students, so they will know what to expect for their first interaction with the industry.

2. Literature Review

Covid-19 is a contagious disease that has no boundaries and set off to be one of the most severe events in world history. The outbreak affects everyone's well-being and leaves them and their close ones with mental health problems and trauma (Cucinotta and Vanelli, 2020). Covid-19 impacts everyone in society, but not everyone affects the same way. The working class is now more vulnerable than ever, with the uncertainty, fear, stress, and anxiety caused by Covid-19 can lead to job insecurity (Pfefferbaum, 2008). Many academics believe that fear of an economic crisis caused by Covid-19 can affect employees' mental health. (French et al., 2020). Many factors keep the fear of Covid-19 up high and increasing, financial insecurities, governmental health care policies, job insecurity, and just plain uncertainty. Learning by doing reinforces classroom understanding by contextualizing knowledge' (Clark et al., 1998).

A proper understanding and skilled employees in the hospitality establishment requires training in the real scenario. Many studies showed that internship or industrial training is an important component in the hospitality industry. On the other hand, theory in the classroom is as essential as training (Ciofalo, 1988). Industry professionals believe that hospitality students who have

A set of ten questions was created to use for interviews. All the topics are in the same order to see the different answers between the groups. Each inquiry is direct and easy to understand so the interviewee can answer them correctly and right on point. The other method used was secondary information research, by reading through academic websites, blogs, articles, and mainly going through other research papers with a similar topic. The secondary data was used to shape the ideals of questions for interviews and the literature review. The list of questions is as follow:

Questions:

1. Have you ever experienced industrial training in the hospitality industry before Covid-19? Where and when?
2. Did new normal conditions cause you any industrial training opportunities?
3. Have you trained in the hospitality industry during or after Covid-19? If yes, what difference do you feel? If not, why?
4. Do you think that this new normal condition affects hotel industrial training?
5. If you are going to apply for an internship now, what are you concerned about?
6. As your current faculty do you still pursue a job in the hospitality industry if yes/no why?
7. How do you feel about the hospitality industry training before Covid-19 and how do you feel about it now?
8. In this new normal condition do you think industrial training in hotels provides you with real job experience?
9. Do you think industrial training is beneficial and essential?
10. What other method do you recommend to replace or improve industrial training experiences in the hospitality industry?

3. Finding and discussion

The result of this data analysis has been separated into three topic sections to understand every angle of the research. The first section will cover all about the overall picture of the effect Covid-19 has caused in the hospitality and tourism industries. Due to the course of Covid-19, we aim to analyze the connections between students and the experience they would get before and after Covid-19 has occurred. The direction of changes between these two will break down and eventually lead to the conclusion of this research result.

The impact on the hospitality and tourism industries

According to Hassan Djeebet (2020), Manager of food and beverage, technical program, Les Roches Marbella. On a business level, the impacts of the crisis have reached every industry in the world, with travel and tourism taking a massive hit. According to OAG Aviation Worldwide, the travel restrictions on international flights have caused the global airline industry losses to mount up to \$880 billion.

Conferring to International Tourists arriving in Thailand, Tourists received at Suvarnabhumi and Don Muang Airport (appendix A). As shown in the data table, from 2015 to 2019 in February, the numbers of tourists arriving in Thailand are not less than 450,000. Then travel restriction and curfew were undertaken due to Covid-19, February 2020, the number of tourists decreased to no more than 120,000. the number of International tourists in Thailand from 2011

to 2020. As you can see, in 2020, Thailand has no tourists because of Covid-19 like many other countries that encounter the same crisis. This effect comes with consequences, the connection between these jobs in the same line of industries. When there are no consumers, service providers such as hotels will lack customers due to less demand as shown in (appendix B).

In hotel industries, more than 50 percent of the revenue declined in 2020. 80 percent of the hotel rooms are empty and 70 percent of the employees have been laid off or reduced wages. From this top view can see the impact of Covid-19 on the hospitality industry. However, this research focuses on the role of employees in the operation and how operation after this massive hit will change student experience in the hospitality industries.

The experience of training and internship before and after Covid-19

Affording to the result, most of the students choose to postpone their internship and focus on paperwork due to the resources of the hotel. Most of the hotels reduce the over budgets such as trainees and employees to maintain the cost of the hotel which affects students who are currently taking interns in the hotel.

The quality of the internship is dropping but on the other hand responsibility of the students begins to increase. The interaction with real situations is changing because there are fewer guests to interact with such as the front office and housekeeping. Furthermore, the function of the operation has changed. The rotation between departments is placed, students have to work in different departments they did not apply for and overwork unnecessarily because the employees or trainers are not able to provide knowledge and experience to trainees. This field of research reflects on the quality of the internship by seeing what students obtain and their opinion of the decision they have made which means the purpose and style of the internship have major changes from before Covid-19.

In term of HR, hotels are also concerned about students’ health while they are taking internships in the hotel. After all, Covid-19 occurs. All of the authors still have the same idea of how the internship is crucial and necessary for this line of work. An internship is a job experience where students obtain skills and knowledge from real workplaces and operations. To begin with, an internship in hospitality in terms of service provider allowed students to interact with guests and gain knowledge until Covid-19 had occurred.

The style of service sequence and health concerns is likely to be the main priority for hotels to consider before recruiting trainees, but the number of trainees is still decreasing due to the experience of the internship has changed for Covid-19. Even though hygiene and sequence of new normal training are added in every hotel training, during the crisis might not be enough to build efficiency as old normal behavior but in a meantime, the new normal might become usual and everything will be back to where it used to be.

Students opinions and perspectives towards training and hospitality before and after Covid-19

According to the results, most of the students who graduate this year have difficulty finding jobs in the same line of work. The perspective has changed after the crisis, some are looking for other careers of work because this career might not be stable as before. The effect is not

just experienced in training or internship as in the previous topic section but it continues towards their next move after graduation. The result shows more than 40 percent have planned to intern this year but due to covid-19, the process needed to be postponed or cancelled. Furthermore, the rest of the interviewees or candidates choose to work in the same line of work because they've trained and obtained knowledge from the course and they do not want to restart a new career again. This shows the impact of Covid-19 on students' opinions, the instability creates risk and takes away their chances to start a job. However, some still believe to fulfill the place where people were laid off during the crisis after everything is back to normal.

4. Conclusion

In conclusion, the big picture of the problem is the hospitality and tourism industry itself. As the industry required customers to provide service, generate revenue, and provide real job experience for students. Due to travel restrictions, the decreasing numbers of tourists cost hotels a lot. Hotels are service providers; a tangible product that cannot be separated are services, customers, and providers. To create a real job experience for any of the students or trainees need all three factors to be available.

Services in the hotel can be separated into two big departments, rooms, and restaurants. The food and beverage department and the kitchen feel less changed because now hotels focus on restaurant sales more than room sales due to lack of tourists, which make these two departments quite busy. On the other hand, in departments like the front office or housekeeping, their tasks are lessened than they used to be. As interviewing human resources, they both agreed that the experience received from the internship will change due to the new normal and there is not much the hotel can do to make it like it used to.

One of the solutions many hotels come up with for trainees in departments that have fewer tasks to accomplish is to rotate them to other departments throughout the hotel. This solution is not a cure-all, it's good for some students who don't know their career path yet this will be their opportunity to try different things. But for students who already know what they wanted to do may end up in a department where they do not prefer.

The perspective of the hospitality and tourism industry careers is very unstable in these new normal periods. Many undergraduates have delayed their graduation due to Covid-19, mostly from dropping an internship, and many newly graduated have difficulty finding jobs. This problem may seem harmless but it will increase unemployment numbers from hotel management fractions and there is not much that can be done till the vaccines are available. Despite all the negative opinions toward industrial training, there is one positive opinion which all interviewees agreed is that industrial training provides skills and knowledge where no classroom can do and, it is still beneficial and essential for this line of work.

5. Limitation

This study has presented how a new normal hotel industrial training affects management hotel students. The comparison between before and after helps this research to point out the effects and the solution plan for students who are currently having problems in the hospitality industry. The instructions of the question systems lead to limitations of this study. The delimitation helps us focus on the key research information but the failure of the method and lack of service agents

in distribution to gather unauthorized information has been a struggle in this study. Consequently, this will further research paths and may help future cases on this topic. We recreate a set of questions that can use and pick information in more areas of resources and reinforce even more opportunities to access unauthorized information in the research area. In the future, students were able to discover during research and reorganize the outcome.

The investigation into this topic is quite open. A lot of information is involved in the interviewee's experience. The set of questions has to be the same to provide accurate results. Due to the diversity of interviewees, age, gender, experience, and career status, some questions might not suit the interviewees. If some interviewees cannot provide a few answers, it might not be efficient for the research result.

Furthermore, the research needed information from experienced interviewees such as the human resource department of the hotel to obtain how training takes place for trainees, but some information was limited and implied. The goal is to highlight the answer to the topic, but some interviewees' experience was not enough with the set of questions because their answers with the opinion and predictions of what they think it was going to be like, not like when they were there in some questions.

However, questions were enough to lead this study to the goal. Lastly, it was convenient for the interviewees and easier to conclude. This study is relying on primary resources and the beginning of the research was the time all students were likely in the middle of nowhere. Some do not have solutions to the problems, because the choice they made depends on the college or organization such as the hotel or agency. During this Covid-19, everything is not stable, the result could be inaccurate. The interviewer avoids close contact which leads to difficulty in communication. A higher position is more difficult to get an interview for. Other students might argue and find this limitation not a compelling perspective on this topic, for example, some students might have contact with someone inside the company which makes it easier to get information and opinions.

The presentation in terms of technical perspective in big data analysis and information systems may find more room for improvement in the topic. However, the main goal of presenting was to add our understanding from data to the resources. The questions with yes and no are limiting the answer into small group answer choices, the open question is likely added in this research.

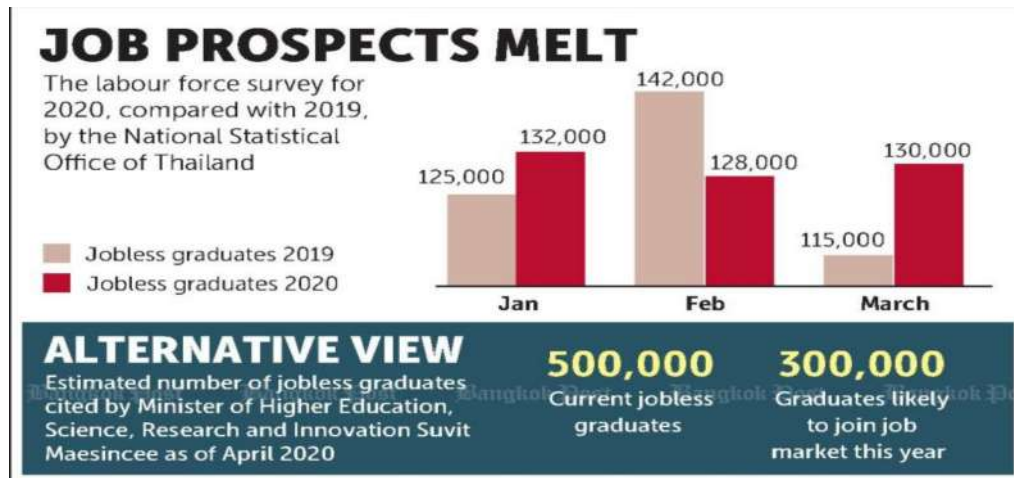
6. Direction of future research

As this “New Normal” is in post-pandemic timelapse, we could not know how long it will last. The results towards the new normal might have changed to just normal depending on the experience of the students and resources. The training might develop to cover the economic turndown and create a path for this career to one of the most stable careers again. The subset method polar questions with limited result answers, in the future, might come up with open questions to support and collect more opinions from interviewees. Furthermore, this study may not conduct many interviews, instead, the method of research can be added to support such as questionnaires and surveys. The goal is to find the best solution for this research topic. Also able to gather customer points of view at the same time.

7. Reference

- [1] Amit Datta and Babita Jha (2015). Research Gate: Industrial Training and its consequences on career perception; a study in context of the Hotel Management students’ at Jaipur.
- [2] Andy Aditya (2020). Start up in Thailand: Hospitality Industry in Thailand.
- [3] Ashaq Hussain Najar, Manik Arora and Priya Singh (2009). Academia: Hotel Industrial Training and Hotel Management Students; A Critical Analysis of Hotel & Hospitality Institutes.
- [4] Cares Act (2020). American Hotel & Lodging Association (AHLA): Covid-19 devastating hotel industry, Low to zero hotel revenue driving unprecedented job loss and Comparison to other Financial Crises [CrossRef] Oxford Economics and Hotel Effectiveness.
- [5] Ciofalo, A. (1988), Evaluating internships effectively. *Journalism Educator*, 43(1), 66–70.
- Clark, G. and Whitelegg, J. (1998), Maximising the benefits from work-based learning: The effectiveness of environmental audits. *Journal of Geography in Higher Education*, 22, 325-334. doi:10.1080/03098269885732.
- [6] Cucinotta, D.; Vanelli, M. WHO Declares COVID-19 a Pandemic. *Acta BioMed*. 2020, 91, 157–160. [PubMed] 46.
- Norris, F.H.; Stevens, S.P.; Pfefferbaum, B.; Wyche, K.F.; Pfefferbaum, R.L. Community Resilience as a Metaphor, Theory, Set of Capacities, and Strategy for Disaster Readiness. *Am. J. Community Psychol.* 2008, 41, 127–150. [CrossRef] [PubMed] 47.
- [7] Dexter R. Buted, Sevilia S. Felicen and Abigail L. Manzano (2014). *International Journal of Academic Research in Business and Social Sciences: A Correlation Study between Student Performance in Food and Beverage Services Course and Internship in F&B Department of Hospitality Business*.
- [8] Esteban M. Aucejo, Jacob French, Maria Paola Ugaldá Araya, and Basit Zafar (2020). *Sciencedirect: The Impact of COVID-19 on Student Experiences and Expectations; Evidence from a Survey*.
- [9] French, M.T.; Mortensen, K.; Timming, A.R. Psychological Distress and Coronavirus Fears during the Initial Phase of the COVID-19 Pandemic in the United States. *J. Ment. Health Policy Econ.* 2020, 23, 93–100.
- [10] Jill Poulston (2008). *ResearchGate: Hospitality Workplace Problems and Poor Training: A Close Relationship*.
- [11] Kiran Mayi Immaneni and Vedala Naga Sailaja (2017). *International Journal of Mechanical Engineering and Technology (IJMET): Industrial Exposure Training in Hotels and Its Impact on Undergraduate Students; Challenges and Remedies*.
- [13] Petrillose, M.J., and Montgomery, R. (1998), An exploratory study of internship practices in hospitality education and industry’s perception of the importance of internships in hospitality curriculum. *Journal of Hospitality & Tourism Education*, 9(4), 46-51.
- [14] Sunder Srinivasan and Rajeshree Pol (2014). *International Journal of Informative & Futuristic Research (IJIFR): Study on Importance of Industrial Training as a part of Hotel Management Education Curriculum, as perceived by industry and students*.
- [15] Thana Boonlert (2020). *Bangkok Post: Covid-19 Crisis Casts Shadow Over Graduate Futures*.
- [16] Vinay Rane (2020). *Shiksha: Impact of Corona Virus on Industrial Training of Hospitality Students*.

Appendix



Source: Labour force survey of 2020, compared with 2019 by International statistical office of Thailand (C)

Hokkien Chinese Cultural Capital : Local Heritage and Creativity of Unique Identity through Café Business in Phuket Old Town

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Abstract

This research aims to study, first the identity of Hokkien's culture in Phuket which is presented through café in Phuket Old Town, the second to study strategies of developing value added of cultural capital base on Hokkien's culture which is presented through café in Phuket Old Town and the third to study strategies of developing café related to cultural tourism. Conceptual Framework for analyzing data includes Creative Tourism, Development of cultural capital, Structural and Functionalism, Cultural Hybrid and Local Identity.

By purposive sampling, key informants will be the 5 business owners, 10 customers and 10 tourists in Phuket Old Town. Researcher analyst data by using content analysis and descriptive analysis method

Hokkien Chinese's culture in the Downtown related to Café for value added base on cultural capital, which is represented through art, architecture, activities and life style, moreover illustrates ways of life of Hokkien Chinese which ethnic identity is became implication of café business and attract strategy tourist also local people as well.

Finally, if concern about types of tourism, Café business represents as the parts or relates to cultural tourism, Ethnic tourism, food tourism, History tourism and recreational tourism. Thus café is the place where tourists will have experience in the dimension of ethnicity “Hokkien Chinese” through food, history, culture, art and recreation.

Keywords: Hokkien Chinese, Café, Cultural Capital value added, Phuket, Cultural Tourism

1. Introduction

Since Sukhothai Era, for China was the period of Yuan Dynasty, many Chinese groups such as Cantonese, Hokkien, Hainanese and Yunnan Chinese traveled to Thailand for trading and settled permanently. Especially, Chinese from Guangzhou of Guangdong County and Fuzhou of Hokkien County traveled to Thailand for trading since before Han dynasty (Winai

Phunampol, 1989:47). In Ayutthaya Era more Chinese immigrated to settled permanently such as Chinese business men, Artistes, actors, pig herders and doctors etc. (Skinner, 1957:15). Moreover, many Chinese were appointed by Thai government to be nobleman. In Southern Thailand there are various ethnic groups, in this matter Phuket island, where nowadays the main economic depends on tourism business, the most of Chinese who settle here is Hokkien Chinese. In the view of cultures and history, Phuket represents the relationship especially between Thailand and China, Hokkien Chinese immigrated here and did many businesses. Actually, in the past Chinese in Phuket influenced to tin mine business.

At the present, Hokkien Chinese culture is as one part of local identity and promoted for tourism business. Then architecture, foods, ceremonies and festivals, which represent Hokkien Chinese culture, are presented and created in the dimension of cultural capital value added. In this matter, inconsistently to plans of Phuket government sector and private sector for creating strategies in the dimension of cultural capital for tourism business. So, the issue about preservation of Hokkien Chinese cultures as local heritage and creating cultural capital value added for Café business. Due to by preliminary observing, many row houses are renovated to be Café, this phenomenon indicates one of the popular businesses and changing of new life style that take place in Phuket old town zone. Moreover, inevitably to investigate the strategies to attract guests of café.

2. Objectives

1. To study the identity of Hokkien's culture in Phuket which is presented through café
2. To study strategies of developing value added of cultural capital base on Hokkien's culture
3. To study strategies of developing café related to cultural tourism

3. Research Methodology

This research base on qualitative research methodology thus ethnographic research will be suitable for studying and researcher will apply emic view to understand the phenomenon.

3.1. Scope

3.1.1. Setting

This research topic, specific data collection in old Phuket town zone on Talang Road, Krabi Road and Dibuk road where there are distinguish building style, Sino-Portuguese Architecture. This area is representative to offer experience of overseas Hokkien Chinese culture in many dimensions such as arts, foods, occupations etc.

3.1.2 Sample

By purposive sampling, key informants will be 5 Café business owners and 10 tourists

3.2. Instruments of Data Collection

The data collection for this research are in-dept interview, observation and participant observation.

3.3. Analyzing data

The researcher will analyst data by using content analysis and descriptive analysis method from the data which researcher collect from the target group by interview. Every data will be collected have to pass three steps before analyzing data, there are decode the data from the

interview by using Thai language, translate all decoded data from Thai language into English and the last step is using translated data to make analysis and answer the research question.

4. Literatures Review

Researcher explored and found documents of research project, articles and books which relate with research topic because literatures review would be guideline for the researcher to have basic knowledge of phenomenon and concepts for analyzing the data such as the research about creative tourism, develop of cultural capital, hybrid culture and local identity.

4.1. Café and restaurant

Chalisa Chaisean (2020) “Business Plan for Northern Fusion Food” the conclusion of this research is the most people nowadays will decide to buy food from delivery company more than cook the foods with families. It is because nowadays most people like to have a clean and delicious meals and emphasize new interesting foods which adapt with demand in the present. So, many food business owners give attention on northern fusion food.

Natthapong Phirunthong (2014) discussed the result of the study of the topic “Brand Image Specialist for Cafes and Restaurants” that from the study giving a service in business café and restaurant, owners or clerks should focus on demand of the customers. In addition, this study also make owner aware about the inside and outside atmosphere of the store or SWOT analysis, design of service, corporate identity design, food packaging design, point of sale material, food styling, food photography and online marketing.

Narapreeya Chantakul (2019) “Business Plan for NARA Café” the result of this research, there are two strategies for making business become famous. There are focus strategy and differentiation strategy. Focus strategy is the plan which was used in the first period of the beginning of the café because this plan helped the owner to focus on target group by emphasize to personal favourite which can improve to wider target groups in the future. Differentiation strategy was used as the key plan to make café have their own identity and more attractive than others by using quantity of products and services.

Apichaya Pracharachniyom (2020) “Business plan for Chonnabot Khaoyai café and resort”. The result of the study was explained that this café and resort has tourists and groups of friends as target groups. The owner makes the guests feel like, they live in fresh environment and have a good take care. In addition, the owner also used social media to make advertisements such as Facebook, blogger or Instagram because in this era most people use technology for searching everything specially traveling.

In the conclusion café and restaurant business should have a good plan which focus on service and quality of the products because every customer will focus on the quality and service for making a decision to be a customer of the café and restaurant. In addition, nowadays every business owner should focus on one more thing is the different and healthy food, so fusion food can become more important in food company because people can taste a new food which combine between traditional food and modern food in the same dish. On the other hand, if any café and restaurant do not have fusion food, they must have a plan for business especially finding the identity of business such as identity dressing, friendly service or online

advertisement for making people know the business easily and create business's identity that different from others.

4.2. Cultural Heritage

Katematu Duangmanee (2021) The cultural heritage of typical Chinese ethnic food in Trang province can conclude that identity of Chinese food is the knowledge which teaching inside the family. Knowledge that many people could gained from their parents be used for people's ways of life and identity in each area. Intellect of food are the step of cooking and ingredient. So, the conclusion of this research was used Chinese traditional herb to be local heritage.

Chainarong Srirak (2020) Result of the study “Survey of local wisdom heritage and evaluation of participatory tourism potential of Non Tun communit, Nong Bua Lamphu”, Non Tun community have many groups of immigrants, so they effect to this community by make this community have many cultural heritages in this area. From cultural heritages, it made local people have strong belief and have a circle of learning (environment – spirit – human). This circle is used for create local heritage.

Sukrita Pumkaew et al (2020). The researcher studied about “The Demand on Preservation of Folk-Plays Cultural Heritage in Thannamthip Sub-District Community, Betong District, Yala Province”. In Thannamthip has two cultural heritages, there are Chinese chess and traditional kite. So, the researcher joined the community and learn the history of Thannamthip. This area is a multi-cultural area by the reason of immigration especially Chinese. So, the Chinese chess and traditional kite become local heritage and the leader of community use both of them to be key attraction point to make tourists interest to visit.

In summary, cultural heritage is the most important thing for every society because every cultural heritage can develop every part of community such as economy which make all member have jobs or gain more income, community can change the area become education field because there are many professional about cultural heritage inside community, so they can teach about their own cultural heritage for people who interest to study. In addition, cultural heritage also can make community stronger because whenever the leader of the community conserve the cultural heritage the community will have more time to be together and remember how the community can survive because cultural heritage not only economic products, but they can be ways of life, knowledge, traditional foods or festival.

5. Conceptual Framework

5.1. Creative Tourism

1. Creative tourism is the tour which tourist can have the same feeling with the atmosphere and local people. Most of this tour will be museum. In addition, creative tourism must have three main parts, there are: first, attractive points such as historical place or arts. Second, members of the community, this point is very important because the members of community will be the key of development of the community. The last one is contributor, contributor also can be separated into four kinds, there are government, individual, local organization and education (Titapa Bumrungsilp et al, 2018).

2. Creative tourism can be separated into two types of creative tourism, there are: using creativity as a tourist activity and using creativity as backdrop of tourism. Using creativity as a tourist activity is the popular tourism strategy because the tourist can be the member of the

community, but nowadays using creativity as backdrop of tourism become popular more than before because it does not only make tourist be a part of the community, but this tourism strategy also can make the place be more attractive.

3. Creative tourism is tourism which allow tourist develop themselves by learning from real experience in local community. In addition, creative tourism also can help every tourist understand the idea and local identity deeper than other kind of tourism (Bangkokbiznews 2016).

The concept, creative tourism will be guideline for discussion and explanation why this research is important and how creative tourism idea can develop Phuket’s identity through café in Phuket Old Town. In addition, researcher can explain what kind of creative tourism in this research will be. This is very important to know the type of creative tourism in Phuket because every type of creative tourism will have their own way to development. So, if anyone want to develop the tourism place by using creative tourism area, they should understand what type of creative tourism deserve to use in that area. Furthermore, in Phuket Old Town creative tourism is the main part of tourism plan. As you can see, every area in Phuket especially Phuket Old Town, the authority will give more attraction about cultural capital and they will use creative tourism plan for develop Phuket’s areas.

5.2. Cultural Capital

1. Develop of cultural capital is the action that people use the cultural capital in that area and develop or create them to be new thing and have more value. On the other hand, whenever people want to find a way to develop cultural capital, people have to understand every structure and idea of that group of people (Utis Tahom and Sunan Senarat, 2019).

2. There are four keys of development of cultural capital. First is the happiness. The happiness is not mean only the happy of people, but it is included proud, sufficiency and preservation of cultural heritage. Next is refinement, in this key is the people who have a great skill about crafting or choosing the material. Third is knowledge. Knowledge is the action that people must learn from the ancestors and understand the reason of action. The last one is local ways of life. Local way of life is the most important thing because it makes developer understand reason why they have to choose that material, why they have to save their culture or what are the main reasons which make local cultural capital can be popular (Nitiphol Tharoop et al, 2021).

3. There are many cultural capitals in Thailand were accepted by UNESCO. So, many local people can use cultural capital to increase their products because cultural capital is a key of the value chain in Thai creative industry by using story or content of culture. In addition, cultural capital also helps local people to create new products but use less capital (Department of Cultural Promotion:2019).

Researcher will use develop of cultural capital idea to explain the way to develop Phuket cultural capital through café business in Phuket Old Town because whenever developer want to develop any area, researcher should know what is the main cultural capital in that area. In addition, cultural capital also be the key thing to develop local economy because cultural capital can make the society have more identity. In addition, cultural capital can make the society become more attractive and more value for local people and tourist, so every member in society especially Phuket Old Town should understand and know the value of cultural capital because Phuket Old Town’s cultural capital is one of the most beautiful and important roles in Thailand’s economy system.

5.3. Structural and Functionalism

1. Rober K. Merton (1910 - 2003) separated the role in social as manifest, latent and dysfunctional. Some role of some structures would give benefit to people in society. On the other hand, some group of people could gain small benefit or gain nothing and some society would get disadvantage of the structure.

2. Emile Durkheim (1858 - 1917) had an idea that structure in each society is a part which support in that society. So, this idea was connected with Alfred Reginald, Radcliffe Brown (1881 - 1951) and Bronislaw Malinowski (1884 – 1942). They had an idea that social function is a part which support in each society because every society had their own process which make every member in society be the one example value, belief and culture

Structural and Functionalism is the idea which separate the role in social in many parts, and each part will have their own way to support the society. Functionalism will be used in the research to explain why local identity can be the main attraction point for tourism business and café business in Phuket Old Town. Functionalism also can explain the result and possibility of development Phuket’s local business by using cultural capital. Furthermore, this idea also can help researcher to understand the organization and important role which help development of Phuket Old Town through tourism and café business because this idea was explained that every part of society has their own important role and each role will support the development of society.

5.4. Cultural Hybridity

1. Cultural Hybridity is the connection between different cultures and that connection can create a new culture by accept each culture. In addition, hybrid culture is a type of cultural communication by the reason of personal or group of people’s acceptances the culture.

2. There are three levels of Cultural Hybridity, the first, the lowest hybrid culture is the communication which contrast with the attitude and ideology. The second, Medium level of hybrid culture is the action which connect what people say. The third, the highest of hybrid culture is everything connect with attitude and ideology. (Sunthorn Nawakawin: 1994).

3. Cultural Hybridity is the culture which mixing between local culture and other culture for example mixing between local culture and technological innovation in the steps of processing the products or reform the original culture to be new culture which have root of the origin.

Cultural Hybridity is the relationship between different cultures and can be separated into three levels of hybrid cultures, there are lowest, medium and highest. In addition, hybrid culture will help researcher to understand more about identity of hybrid culture and how to make hybrid culture can become more attractive by make every culture in hybrid culture can develop together. So, in this research will use hybrid culture to analyze local culture in Phuket Old Town because Phuket Old Town is the area where using hybrid culture and hybrid culture is the most important part of development in this area because this area can become famous, attractive and be the area where people proud the cultural capital because of hybrid culture.

5.5. Local Identity

1. Local identity is the main part of development in society in landscape. A good local identity is a major attraction for tourist and give benefit for local people. Furthermore, local identity also can support the members’ jobs and economic transformation of the local site (Council of Europe: 2000).

2. Local identity is an important part of urban development. It makes an image of a place more attractive by using their ways of life. So, a place where have a good local identity will affect to local people and local business (Israa Barkat et al. 2019).

3. The result of the study explained that hand woven cotton which is local identity in Loei is developed for make the community become stronger and every member in the community can study about self-reliant. In addition, this development also help unemployed member can have job. The most important thing for this development is this community can become the place where can be classroom for people who interest to study about hand woven cotton in Loei (C.Dononbao and J.Peerasan: 2019).

Local identity is the idea that develop the area by using local capital such as ways of life, atmosphere and building. Furthermore, local identity also helps every community in the development process because this idea will make all member understand the importance of the local identity and find the ways to develop it. So, the writer will use local identity to explain the economic development in Phuket Old Town by using local identity. In addition, local identity can explain why every development in society have to focus on local identity.

6. Background of Phuket Downtown and Hokkien Chinese Cultural Experience

Phuket is a famous tourist destination in southern Thailand. At the present this province is promoted many types of tourism, such as recreational tourism, ecological tourism, ethnic tourism, historical tourism and cultural tourism, for the benefit of economic development. At Phuket downtown, the main Chinese group is Hokkien Chinese, they emigrated from Fujian to Phuket since Ayuttaya Era (1350-1757), and thus Hokkien Chinese cultural identity is promoted for tourism. My aim is to understand the significance of Phuket downtown relates to the culture of Hokkien Chinese and tourism. Due to various ethnic groups settle together in Phuket, such as Indian, Thai, Chinese Muslim and western people etc., therefore multi-cultural identity features are as consequence. Hokkien Chinese cultural identity is clearly prominent in downtown. Furthermore, nowadays this cultural identity is a part of promoting cultural tourism to attract tourists. Tourism development has become the main project for Thailand's development, since during the fourth (1977-1981) and fifth (1982-1986) National Economic and Social Development Plans. After that, the main plan was developed for the development of specific area as Phuket in 1979, *consequent* of tourism *promotion*, travel industry growth is expanding rapidly. The Downtown, where there are many things to show the cultural identity of the Hokkien Chinese in various dimensions including buildings, architecture, art, religion, traditions, history, food and other cultural activities, because this area consists of subarea showing function of presentation cultural aspects of Hokkien Chinese as above.

During the years 1901 - 1913, which was in the reign of King Rama V, it was the period of Phuket downtown was developing, with the construction such as roads, the division of downtown's area into commercial subarea function, the government buildings such as hospitals and other public utilities. The budget of downtown development gained from the mining business. Phuket downtown was built during the reign of Sim Bi Na Ranong (Phraya Ratsada Nu Pradit Mahison Phakdi). The buildings are found similar style, called Sino-Portuguese, in Malaysia, Singapore, trading port, Malacca, Penang including Taiping. The significant Sino-Portuguese architecture is mixing between Chinese and Portuguese art, but when considered in detail, actually this architecture style shows explicitly also composed of other styles of European art from many eras of art history, especially art deco, including Indian art.

Downtown buildings with mixed architectures of the above styles can be divided into different categories according to the main function as follows. However, some buildings may have mixing of Functions.

1. Residence
2. Economic Center
3. Presentation of History
4. Religion such as in Downtown there are also Chinese shrines. "Shrine of the Sangha" built in the year. 2432 is a tribal clan clan, Tan, which is Hokkien Chinese.

However, many buildings have multi-function example being residential and commercial housings are found to be occupational function. Furthermore the owner of Many old and large mansions were Hokkien Chinese, owners of mining business such as Mr. Tek-Kok Sae-Ngo's house while Mr. Sitt Thantawanitj's house was mansion of Lord (Phra) Phi-Thak-Chin-Pracha, who was prototyp of Tantawanitj clan and he was the first Chinese-Hokkien mining owner in Phuket, nowadays this mansion has become a famous Thai food restaurant. For Mr. Pracha Tadanavanich's house was built in 1919 to use as Lord (Phra) Phi-Thak-Chin-Pracha's bridal house but this house was not used. At the present this house, is used as a residence while antique things are still maintained in good condition and open to the public and tourists to visit the house as a museum. About the old building of Phuket Thai Hua School at the present has changed function to be a museum. In Downtown, there is also Chinese Hainan's Shrine located in the Sino Portuguese building. In addition, buildings with Sino Portuguese architecture are also present in the Thai temples of Downtown. Such as the cubicle and the library at Mong-Khon-Ni-Mit temple. However, the pattern on the gable is stucco of Thai art style. This evidence illustrates mixing of various art and architecture style. In the other words buildings in downtown show the phenomena of cultural hybridity.

Urban planning Design in the past became the identity of Phuket downtown at the present, therefore local governments such as the municipality organization of Phuket etc. have realized the value of the old buildings, thus many projects have organized to develop and preserve Phuket downtown cover area 210 square meters. However because most of the buildings are private buildings, local government has focused on how projects work together with communities and other organizations. Strategies which the municipality organization of Phuket has implemented such as forms database of architecture and planning of development and conservation of the old buildings, consequently local people and tourists will have the opportunity to gain knowledge and learn about art, architecture, history and culture of Hokkien Chinese in Phuket. The municipality organization also uses Strategies arrange exhibitions and festivals about the themes of Hokkien Chinese culture which have become annual activities since 1998. The purpose of all strategies is to raise and stimulate awareness about the importance of preserving the identity of old culture which is explicit in Phuket downtown.

As a consequent of social and cultural change, the way of life of Hokkien Chinese has changed in terms of the tourism context include economic change and interaction of people in new social structures, norms and values. Hokkien Chinese's everyday life still shows prominently in the downtown through cuisine, traditional Hokkien Chinese costume shop, hair salon, shoe repair shop, gold shop, tailor shop, traditional blacksmith shop, bike shop etc. While at the present old buildings have been renovated to retain original identity however some old buildings have been refurbished as modern cafes with combination of antique and modern style to attract tourists and new generation people. Furthermore, many buildings have been modified to be

Guest houses. For old hotels, Hokkien Chinese owners have improved facilities to serve tourists, however still maintain old style of interior. At Thawon hotel, there is photograph exhibition of Phuket city in the past, as well as exhibits antiques such as furniture, telephone, movie projector, Chinese hat, kitchenware which in the past was used for cooking for mine labors. Thus, photographs and antiques express Hokkien Chinese's way of life in the past as cultural representation without description by letter like ethnography, in another way attempt to present by means of visual anthropology. As innovation, modern paintings appear at some buildings to attract new generation of local people and tourists to visit.

Phuket local governments attempt to preserve and transmit Hokkien Chinese culture to new generation by organize events as follows:

1. Old Phuket Festival
2. Walking Street, this event takes place every Sunday evening, at Talang Road, where both sides of this road consist of old-style building. Organizer provides cultural activities such as dancing and music performances etc. Moreover, many products and local foods are sold there.
3. The exhibition of Hokkien Chinese wedding is also organized at downtown and the highlight is Hokkien Chinese wedding performance.
4. Vegetarian Festival is an annual event which is organized in September or October; participants will eat only vegetarian food and refrain from killing animals, with purposes for making good merit and purity of mind and body. In addition, the parade of Chinese gods will go around downtown. This festival is Hokkien Chinese identity presentation and one part of tourism promotion to attract tourists.

7. Oversea Hokkien Chinese Cultural and Café

Oversea Chinese culture do not have much influence in most part of Thai café, but there are still have some province in Thailand where oversea Chinese culture have high influence to the local style café, there are Songkla and Phuket Oversea Chinese culture for their daily life such as belief, festival and business. We will see many of oversea Chinese style of business in Songkla and Phuket such as café, restaurant and grocery especially Hokkien Chinese culture has been represented for creating unique style, such as the history, architect, art and food etc., have been applied for café style creativity. As we can see, most provinces where oversea Chinese culture have high influence and be a crucial role for local business especially in café are the provinces where have Thai Chinese as the main ethnic group. So, if we talk about café in Phuket and oversea Chinese culture. Oversea Chinese culture is the key point of the café because local people are Thai Chinese that means the target group of cafés in Phuket will be various groups however, we can divide into two main group such as Tourists and Local People. Thai Chinese group and the atmosphere of the café will not be contrast with the local atmosphere. In addition, oversea Chinese culture and café can have a strong relationship with each other because ways of life of oversea Chinese is the community that like to be in group when they have free time or afternoon. So, the easiest place where they can be in group with others is local café. So, we cannot separate café from oversea Chinese culture because café have important role for oversea Chinese's ways of life for a long time and it will be positive if we use oversea Chinese culture with the café such as style of coffee, building and snacks because these three things are the symbol of oversea Chinese culture.

In short, oversea Hokkien Chinese culture and café are the pair which stay together for a long time and café have many symbols for oversea Hokkien Chinese culture such as ways of life and community because Hokkien Chinese like to make appointment their friends in the afternoon at café for their free time. In addition, Hokkien Chinese also have high influence with the café in areas where have large group of Hokkien Chinese community especially in Phuket, if we focus on business.

In the dimension of location, the Phuket old town or downtown this area the government has the policy to preserve as Hokkien Chinese old cultural presentation to promote and attract tourists, thus the appearance of ways of life at this area is as the stage of performance that support café business where Hokkien Chinese culture is as the part of café presentation.

8. Strategies of Attraction

Most of café in the present is a new style café because this type of café is very popular nowadays. So, new style of café is the café which combine multiple styles between modern style and local identity, vintage or the habitus of the owners, but many cafés will decide to use modern style with other identity style such as Thai and Chinese or Thai and Japanese because this type of new style café is easier to be popular more than other type of combination by the reason of life style nowadays. So, we can see many of this style nowadays because this kind of style can attract the tourist more than non-fusion style. In addition, combination of modern style with other identity style can make café be unique and guests will feel different from others by the reason of the atmosphere, smell or services of the café. Another reason is about life style of people, people nowadays especially teenagers like travel to foreign country, so when they are in Thailand and see the café which can give feeling same as they are live in that country, that café will be popular and gain advantages over other café.

On the other hand, if we will discuss or consider about the strategy of the business's owner, we will know that business owner will use new style of café by the reason of attraction, be different and be popular. On the other hand, the most important reason for the owner is to conserve the local identity and increase the value of local identity because they can make identities for their café such as building, foods or beverages. Furthermore, the strategies for new style of café nowadays are not only building, foods and beverages, but there are services and atmosphere too. Strategies about services and atmosphere are the key selling point in the present because people like to get new experience of service and relaxation from the café example costumes, atmosphere or entertaining.

In conclusion, the new style of café in Phuket old town has many types of new styles such as mixing between modern style and local identities. It is good plan for owners who want to have their own café business, but they should understand first new style café is not only the building, but it is about the atmosphere, services and local food. So, when they understand new style of café, they should have good strategies and the easiest strategies for new style is combine between modern style with local identities. Furthermore, new style of café which mixing local identity, café presents identity of Hokkien culture will be more attractive, conserve local identity and that café can be a key point to increase the value of local identity.

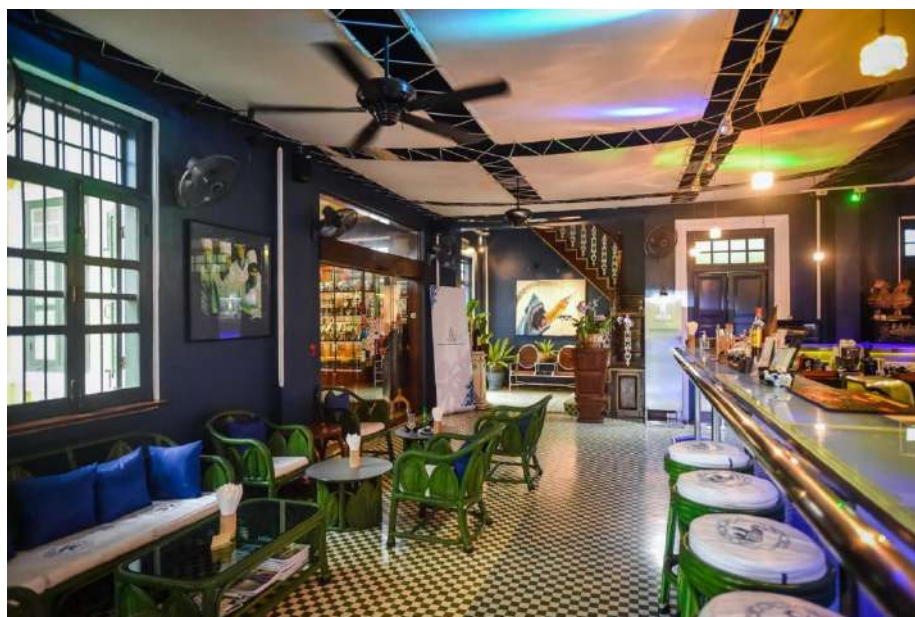
9. Influence of Habitus to café creativity

There are many influences of café creativity such as location, foods, beverages and decoration, but in this paragraph the writer will focus on guest, life style and habitus because these three influences are the main influence which can connect to development of café and relationship between café and local identity. So, the writer can see the important of influence of guest, life style and habitus. Therefore, the writer will explain and show the reason why these four influences are important with café business and make a conclusion about relationship between café and culture.

The first one is guest is the target group of the café, so the owners have to know which type of guest the owners should focus and study about them such as their lifestyle and habitus. When the owners have enough information about the guests, the owners should change or adapt their satisfaction for decoration or menu of foods and beverages in the café. If the owners do not give attention about their guest, the café cannot improve or grow up because the business will not have customers or just have small groups of customers.

After that, owners should know about target group's life style. Study target group lifestyle is a good plan for owners because they will know the future way of the café and owners can get new idea for development the café. Owners adapt target groups lifestyle with local cultural identity then café can be more attractive and be distinguished. Habitus is one of the most important factors and owners should observe their guests and asking for advice. When owners get some advice and result of the observation, they should think and create new ideas from that because the café will have some identities that make customers satisfy such as new beverages, foods or corner for taking photos. Moreover, café business is the type of business which using habitus as a point of selling.

As a result, café businesses have been influenced by local identity, life style and habitus of guests. Owners of the café should give attention on these influences to develop the café to grow up and plan for the future because whenever owners know and understand the guests, life style and habitus, the owners will have new ideas for creating the café to mix with local identity. In addition, key for development the café business and create some unique such as beverages, building and atmosphere. the café will be attraction point in Phuket old town area and support the economy system in local by using the local identity as the main



performance activity, which presents the world as a museum to confirm and reinforce the perception of tourists.

Within the borders of the Phuket, there are many ethnic groups, Such as Thai, Indian, Chinese, etc. settle together. Each group reveals their own cultural identity through symbols, such as rituals, art, belief, food, costume and language, including the history of each group. However, as many ethnic groups have resided closely together for a long time, the phenomena of “Cultural Hybridity” appear and also show the significant in ways of life in the community of downtown. Consequently mixing, borrowing and adaptation among various cultures have taken place in this area. The welding of Thai and the Hokkien Chinese culture in many dimensions signifies that at the present their can live together peacefully in Thai society, and cooperate in the activities that are mutually useful. The original ethnic identity is maintained and supported by the members of each ethnic group although there is clearly borrowing and mixing of some customs between each group.

For another thing, the informal and formal groups of Hokkien Chinese support and participate in the activities about festival and other events which involve Hokkien Chinese cultural presentation. This builds up solidarity among them. Moreover, these mechanisms reaffirm the identity of Hokkien Chinese through cultural activities in downtown and stimulate ethnic consciousness among Hokkien Chinese people in Phuket.

In addition, cafés in Phuket are distinguished and have been promoted for tourism, many cafes apple Phuket’s cultural capital of Hokkien Chinese such as local coffee, architecture and local dessert. For guests of café who are tourist will get experience as cultural tourism of Hokkien culture in Phuket through café in Phuket.

11. References

- Chuthamas Dononbao and Jirawat Peerasan. (2020). Innovation of development in the hand-woven cotton of the local identity in Loei province. *Journal of Fine and Applied Arts (Khon Kaen University)*, 12(2), 22–42.
- Apichaya Pracharachniyom. (2020). *Business Plan for Chonnabot Khaoyai Café & Resort* (Independent Studies Master of Business Administration Program of Small and Medium-Sized Enterprises). Bangkok: Bangkok University.
- Bangkokbiznews. (2016). *Creative Tourism*. <https://www.bangkokbiznews.com/pr-news/biz2u/215030>.
- Barth, Fredrick (1969). *Introduction, Ethnic Groups and Boundaries: The Social Organization of Culture Difference*. London: Allen & Unwin.
- Chainarong Srirak. (2020). Survey of local wisdom heritage and evaluation of participatory tourism potential of Non Tun communit, Nong Bua Lamphu. *Journal of International and Thai Tourism*, 16 (2), 22-44.
- Chalisa Chaisean. (2020). *Business Plan for Northern Fusion Food*. (Independent Studies Master Degree Program of Management Entrepreneurship). Bangkok: Bangkok University.
- Cohen, Anthony P. (1994). *Self Consciousness: An Alternative Anthropology of Identity*. London: Routledge.
- Cohen, Abner (1974). *Two Dimensional Man*. Berkeley: University of California Press.
- Cohen, Erik (2001). *The Chinese Vegetarian Festival in Puket: Religion, Ethnicity and*

- Tourism on a Southern Thai Island*. Bangkok: White Lotus.
- Concil of Europe. (2000). *European Landscape Convention*.
<http://conventions.coe.int/Treaty/en/Treaties/Html/176.htm>
- Coughlin, Richard J. (1960). *Double Identity: The Chinese in Modern Thailand*. Hong Kong: Hong Kong University Press.
- Department of Cultural Promotion. (2019). *culture, worth to value*.
http://www.culture.go.th/culture_th/ewt_news.php?nid=3972&filename=index
- Durkheim, Emile (1965). *The Elementary Forms of the Religious Life*. New York: The Free Press.
- Geertz, Clifford (1966). Religion as a cultural System. In Banton, Michael ed. *Anthropological Approaches to the study of Religion*. London: Tavistock Publications.
- Goffman, Erving (1959). *The Presentation of Self in Everyday Life*. New York: Basic Books.
- Hurbert M. Blalock, Jr. (1982). *Race and Ethnic Relation*. London: Prentice-Hall Englewood Cliffs.
- Israa Barkat, Hany Ayad and Ingi Elcherif. (2019). Detecting the physical aspects of local identity using a hybrid qualitative and quantitative approach: The case of Souk Al-Khawajat district. *Alexandria Engineering Journal*, 58(4), 1339-1352.
- Katematu Duangmanee. (2021). The Cultural Heritage of Typical Chinese Ethnic Food in Trang Province. *Journal of Humanities and Social Sciences (Thonburi University)*, 15(2), 150-162.
- Landon, Kenneth P. (1964). *The Chinese in Thailand*. Oxford: Oxford University Press.
- Narapreeya Chantakul. (2019). *Business Plan for NARA Café*. (Independent Studies Master of Business Administration Program of Small and Medium-Sized Enterprises). Bangkok: Bangkok University.
- Natthapong Phirunthong. (2014). *Brand Image Specialist for Cafes and Restaurants*. (Independent Studies Master of Business Administration Program of Contents Management and Value Creation). Bangkok: Bangkok University.
- Nitiphol Tharoop et al. (2021). World Heritage City and Creating a Unique Identity with a Cultural Capital in the Spa Business. *Panyapiwat Journal*, 13(1), 92-103.
- Sakunrattanamatee, Praprüt. (1989). The remarks in the history about the relation between Thai and Chinese since ancient until the end of 19th century”. In Pongsripean, Vinai ed., *Art and Culture of Thai-Chinese studies*. Bangkok: Silpakorn University.
- Skinner, G.W. (1957). *Chinese Society in Thailand: Analytical History*. Ithaco: Cornell University Press.
- Suksarmran, Somboon (1986). *Religion belief and Ritual of Chinese community*. Bangkok: Chulalongkorn University.
- Sukrita Pumkaew. (2020). The Demand on Preservation of Folk-Plays Cultural Heritage in Thannamthip Sub-District Community, Betong District, Yala Province, In 12th National Conference on Administrative and Management (pp.466-467). Songkla: Prince of Songkla University.
- Soonthorn Nawawin. (1994). *Cultural mix between Thai Buddhists and Thai Muslims Na Tham Subdistrict, Mueang Yala District, Yala Province*. (Thesis Master of Arts degree program of Thai Studies Major). Bangkok: Srinakharinwirot University.
- Titapa B. et al. (2018). A Model of Creative Tourism for Cultural Preservation of the Ethnic Group in Srisaket Province. *Journal of Social Academic (School of Social Sciences Chiang Rai Rajabhat University)*, 11(1), 30-42.



- Utis T. and Sunan S. (2019). Course of Adding Economic Value to Rolled Wafer Cultural Product of Baan Yang Community Enterprise Group, Baan Yang sub-district, Muang District, Buriram Province. *Journal of Research and Development (Buriram Rajabhat University)*, 14(1), 7-25.
- Virinder S. Kalra. (2005). *Diaspora & Hybridity*. London: SAGE Publications Ltd.
- Winai Phunampol, (1989) Origins and characteristics of Chinese people entering Thailand From the beginning to the end of the Ayutthaya period. In *Thai Chinese Arts and Culture Studies*. Bangkok: Silpakorn University.

EDUCATION

A Brief Analysis of Confucian Merchant Cogitation Embodied in Textbook ‘New Silk Business Chinese Writing’ and Significances for Cross-cultural Business Chinese Writing Curriculum Lectures.

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Abstract

This academic paper aims to analyze the textbook of ‘New Silk Business Chinese Writing’ published by Beijing University Press from Chinese Confucian cultural perspective. The author briefly explains the cogitation of Confucian Merchants derived from traditional Confucian concepts and indicates the impacts of it to Business communication in this modern world. This study also highlights contents in business writing textbook that reflect or represent ‘humanity’, ‘etiquette’ and ‘wisdom’ of Confucian Merchant concepts from aspects of ‘format’, ‘choices of vocabularies’ and ‘description or expression traits’ and discusses the connection between culture differences and linguist Writing in commercial fields. At the last part of this article, the writer provides teaching suggestions for business writing courses enrolled with students from diverse culture backgrounds.

Keywords: Business Chinese Writing, Confucian Merchant Cogitation, Cross-Culture Study

1. Introduction

1. The relationships between Culture and language

‘No language can exist unless it is steeped in the context of culture: and no culture can exist which does not have, at its corner, the structure of natural language’ (Lotman, 1978). The relation between language and culture is complex and dependent. Evaluations of cultures facilitate the birth and development of languages. Languages as a carrier and a communication tool simplify and promote the inheritance and innovation of cultures. A language is considered a code or a symbol to reflect the core and spirits of one or several cultures. (Kramsch, 1990) The diversity of historical backgrounds and cultural characteristics from nations or regions make languages worldwide different and various. Culture differences and cultural mindset affect communication profoundly in nearly all aspects from oral communication to official writings.

2. Confucian Businessmen Cognition and Business Chinese Communication

For more than two thousand years, Confucianism and its signature composition “the Analects” have influenced Chinese society, even neighboring countries and regions, and almost Chinese people worldwide in terms of education, politics, morals and virtues. (Li, 2013) The

impacts and popularity of Confucianism is primarily manifested in ideology and academics through language expression. Many of the sentences or sayings in ‘The Analects’ have become Chinese famous idioms which are still used often nowadays. For instance, “三人行必有我师焉” (there is always someone to learn from) and “见义勇为” (be brave for justice) and so on. Many concepts of Confucian impact the development of mainstream ethic values and social code of conduct in China guiding the daily behavior and communication manner of most Chinese people. (Wu, 2011)

The spirit of Confucian merchants originated from the core of Confucianism—the five elements, namely humanity(仁), justice(义), etiquette(礼), wisdom(智) and trust(信). Businessmen who believe in Confucian have not only the creative spirits for chasing profit and margins, but also obey the Confucius morality and consciousness. Tracing back to four hundred years ago, at Ming and Qing Dynasty, two of Chinese well-known Businessmen Community from Shanxi and Anhui, which is abbreviated into Jin (晋) (Jiao, 2017) and Hui (徽) (Hu, 2014), take Confucianism as business vision and management philosophy to lead and regulate their business behavior and communications. Confucianism could be perceived in their business daily operation, partnership maintenance strategy making, and human resource management. To demonstrate specifically,

- ‘Trust’ (信) Confucian businessmen prioritize integrity in trades or exchanges, that is, provide genuine products instead of defrauding customers and abide contracts and promises to establish and promote brand image or to gain reputations following by profits and prosperities.

- ‘Justice’ (义) Company respect Confucianism take ‘Justice’ or ‘Righteousness’ as the most important virtues when planning their business believing that profits should come from moral and judicial trades. (Yang, 2014) They will be looked down to if the money was obtained by betraying their friends, partners, family ‘Justice’ is a standard for measuring business activities and a creed for dealing with the relationship between personal or corporate interests and the interests of others.

- ‘Humanity’ (仁) It is also a noble moral sentiment and cultivation. It is the core and essential feature of Confucianism. A Confucian businessman often has a benevolent heart, saving people from difficulties, not trapping people in adversity or in dangers. In the process of merchants; they often put national or social interests at first, proactively fulfilling social responsibilities and obligations to repay the society. (Faliang, 2014)

Meanwhile, ‘humanity’ also impacts on human management decision making. (Bing Wang, 2014) It encourages management level take care of their employees’ physical and mental conditions rather than exploiting labors. A great Confucian merchant is willing to support employee’s personal growth and development.

- ‘Etiquette’ (礼) It is the behavioral morality in Confucianism and an external manifestation of the overall quality of Confucian businessmen since ancient Song Dynasty. Merchants communicate with and coordinate various social or business relations by strictly abiding not only commercial laws or regulations of the country but also business ethics in the process of trades. (Hu, 2014) For instance, qualified Confucian leaders need to notice and obey social protocols, taboos, table manners and formal languages.’ Etiquette’ helps to build a friendly internal and external business environment when they are pursuing for profits.

- ‘Wisdom’ (智) From business operation and social aspects, Confucian businessmen constantly learn from previous lessons and experience in order to achieve successful management and higher professional levels. (Yuan, 2018) They also value the importance of

education, aim to continuously improve technical and comprehensive qualities of themselves and their employees and increase the enterprise sustainability and build up a company portfolio with well-educated and intellectual characters.

Confucianism is a treasure of Chinese culture. Throughout the ages, it has profoundly influenced Chinese language, culture, politics, economy, customs, and even the way of thinking of Chinese people. There are many different ways of thinking between Chinese and Europeans and Americans (Jing, 2010) because we live in two different cultural backgrounds. The influence of Confucianism on the Chinese has never been interrupted since ancient times, and will continue in the future. It can be said that in the process of teaching Chinese as a foreign language, if the Confucian ideology and culture were being neglected, there will be many language phenomena impossible to explain and understand. International students would face both linguistic and cultural obstacles during learning Chinese. Introducing or infiltrating Confucianism lectures helps student deepening the comprehension of Chinese language and tackling problems related to Confucianism efficiently.

2. Methodology

1. Analysis Method

This academic paper use qualitative analysis method to look into the business writing textbook from cultural perspective. The author firstly sorted and summarizes the Chinese textbook ‘New Silk Road Business Chinese Writing Course’ in terms of format and content.

Then both parts are examined and interpreted via comparisons with the aforementioned five Confucian beliefs ,humanity(仁), justice(义), etiquette(礼), wisdom(智) and trust(信).The analysis process is not only focus on the linguistic application level, but also Chinese Cultural heritage and connotation that textbook editors attempted to convey. The cultural features behind the sentences and edition layout which are highly overlapped with spirits of Confucianism are also extracted and listed as proves of Confucian business cognition embodied in the book.

2. Population and details of the business textbook

‘New Silk Road Business Chinese Writing Course’ is a widely used textbook published by Peking University Press in 2009, written by Lin Huan and Li Xiaoqi. (Lin Huan, 2009) Although originally edited as reference for BCT (Business Chinese Test), this book is practically and functionally useful for students learning basic Chinese writing contents and skill in work place or trading industry. It clarifies the format and writing of each mostly used commercial document, from short announcements to marketing reports, and shows typical references and examples with defects. In addition, the common business related expressions listed in each lesson help readers to grasp the usage of professional words and gradually learn to use complex sentence patterns.

According to the characteristics of the application of business Chinese, the relevant business communication styles and formats are summarized and sorted out to present to readers in a simple and clear way. This textbook aims to help and train learners to become familiar with and then master the key points and methods of business Chinese writing.

This paper aims to find out inspiration for further teaching and help foreign students take advantage of the textbook and understand Chinese Writing in official business occasions in a better level.

3. Result

The Confucian Concepts in business field are embodied in the Textbook as shown in examples below.

1. Wisdom (智): Specialized writing vocabularies and formats

Commerce and business events are formal and serious occasions from Chinese Businessman's points of view. To show their profession and dedication, they intend to apply very formal linguist expressions and patterns when writing an email or letter to their suppliers or superiors in company. (Zhou, 2016) They believe that what they wrote represents their or enterprise's image and affects other's anticipation or judgments on business value even risks.

During commercial letters exchanges, a well-organized writing with accurate and advanced elements or terminologies make people more confidence on their business partners' capabilities and attitude towards transactions. Formal writing vocabularies and formats are highlighted in the book 'New Silk Road Business Chinese Writing Course'. Especially in defected example with lower scores, authors emphasize the lack and improper use of advanced writing languages and format of articles. The following chart compared the two different expression ways in oral and writing situations of words with same meaning.

Table of partial oral and formal vocabularies comparison in the textbook

Oral	Formal	Meaning in English
是	为/系	Be
不小心	不慎	Careless
还	仍	Still
没	未	Not
不能	无法	Cannot/Unable
给	予以	To give
在	于	At
有	具备	Have
因为	鉴于	Because
知道	获悉	Know
交 (钱)	缴纳	Pay
一定	务必	Must
把	将	Preposition to connect objects
丢	遗失	Lost
里面	内	Inside
自己	本人	Self
捡	拾	Pick up

很对不起	深表歉意	Deeply apologize to.....
马上	立即	Immediately
真的	属实	Real

(Source: made by the author)

From the demonstration of Merchant's Letter of claimer below, we could study the official format in business writings. The title is the first words to write in middle of the page to advice the theme of the letter. Above the name of recipient and sender are their job positions or titles. Colon could not be omitted after the receiver's name. There two spaces in the beginning of each lines and Arabic number with a dot is applied to make sub-elements clearly. An enclosure is also requested to be address at the end of the letter right below official expressions.

索 赔 函^①

顺风旅游公司国内部主任
张强先生：

今年四月中旬，贵部要求与我公司联手推出两条蜜月旅行线路。我公司表示同意，并与贵方签订了合作协议。但是近日，有两对新婚夫妇来我公司投诉。据他们反映，你们的“厦门鼓浪屿浪漫休闲双飞四日游”，无论是线路还是食宿，均未达到合同承诺的标准。贵公司的做法在参团游客中造成了很坏的影响，并间接损害了我婚庆公司的声誉。

据此，我公司要求贵方：1. 退还我公司客户参团费每人 1000 元（名单附后）；2. 赔偿我公司经济损失 5 万元。

请贵部尽快办理为盼。

附件：1. 游客名单；2. 顾客投诉记录。

今生缘婚庆公司客服部经理
刘 美
5 月 14 日

Figure : An Example of Letter of Claimer
(Source: New Silk Road Business Chinese Writing Course page.87)

2. Etiquette(礼): Courtesy phrases and polite remarks

Business communication in writing among different countries enlarges the difficulties on affiliates' interaction. It is harder to exhibit good manners and etiquette when there is no face to face talks, no acknowledge of facial expressions, tones and intonation of voice and body gestures. (Yuan, 2018)Therefore, courtesy phrases and polite remarks are necessary and vital to show respects to potential or regular customers. There are several phrases repeatedly adopted in this textbook to raise readers' attention on learning and use of the Chinese polite expression in business fields. For instance,“ 顺颂, 商祺” (Best wish on your business) appears approximately five times at the end of important business communication letters, such as price inquiry(page60), business negotiation(page77), reference letter(page96), etc., Other Courtesy words like “请麻烦” (sorry to bring the trouble to you), “谢绝” (thank you but no) , “歉难

(sorry but no) ”, “静候佳音” (waiting for the good news with patience) could not be neglected either.

3.Humanity(仁): Logic of writing and layout of articles

From letters of business greeting (page72and74), reference (page96) and furlough application (page98) in textbook, we could learn the difference of composing logic and layout between Chinese and foreign writers. Guided by the concept of “Humanity “in Confucianism, Chinese business writing is more people-oriented and subjective. (Cheng Minghua, 2012) In those letters, greetings and gratitude, descriptions of feelings are much explicated. It is rarely being straightforward or purposely ingratiate with stakeholders’ interests at the very beginning. The authors pay attention to enhancing interpersonal relationship and friendship through adverbs, adjectives and narrative lines, not just describing tedious statistics and objective matter of facts. (Yi, Yang, 2012) They expects letter receiver to feel the gentleness, respects and caring by reading their writing rather than the coldness and selfish of property plunder and business competitions.

Taking the letters of business greeting in page 74 as an example, it was written to establish a new partnership with a potential supplier. Not talking too much about cost and profit margin, a quarter of the letter is complimenting on their products. Adjectives like “式样新颖” (stylish) , “美观大方” (pretty and great), “时尚” (fashionable) are used to show how the agent is fond of the products and to plead the supplier vividly.

Another example is a personnel recommendation letter in page 96. When intruding an interior to visit a partner for profession training, besides listing working experience ,a general manager uses one of fourth paragraph to describe that employee’s good characters and personalities through words like “踏实肯干” (studious and steadfast) ,“有艺术才能” (talented and skillful in arts) From the context of this references, we could learn that this manager is very supportive and caring about the career progress and personal growth of her subordinates which is another evidence of “humanity”.

4.Trust(信) and Justice(义): Learning material, exercise and content selected

“Trust and Justice” are mainly reflected by the learning and exercise contents sorted out in the textbook of ‘New Silk Road Business Chinese Writing Course’. The study and practice of a notice of loss of found (招领启事) in page 52 indicates that the stuff found occasionally should not be hide or hold as personal asset selfishly. It is the response of the well know saying in the Analects “见利思义” (think justice first when saw the profit) At the same page, a statement of product quality(质量声明) to customer from a food factory reveals the seriousness of honesty and accountability for company thriving in competitive markets. While, an apology statement (道歉声明) and a settlement letter of claimer(理赔函) in page 54 and 88 separately suggest that being “Trust and Justice” also means taking responsibilities on mistakes or losses made in transactions.

4. Discussion & Conclusion

With the results from analyzing the Confucian cognition in this business writing textbook, the author concluded the following inspirations and suggestions for Chinese Business Chinese Lectures.

From the psychology and emotion aspect, at the prologue part, lecturers could prepare students to be open-minded culturally. (Min & Mingzhu, 2020) An introduction of Confucianism is required to help student to understand in details about Chinese people-oriented cultures. The lecture could guide students make comparisons between Chinese Confucianism oriented culture and local culture in that specific foreign country or any other cultures they interested in. By this mean, learners could acquire knowledge about the diversity and difference of worldwide cultures.

Meanwhile, teachers could adapt news or stories of Chinese corporate philanthropies to exemplified explanations of Confusion Merchant concepts. If skipping this step, it would be very difficult for students to truly understand the essence of Chinese communication in business occasions. They would easily get bored and resist on studying challenging vocabularies and patterns or advanced writing formats. Even if they could finish their homework by stimulating examples on textbook, without fully recognizing the culture behind the phrase and lines, their writing would be lack of flexibility, uniqueness and practicability in the real business practices.

However, each ancient culture has its merits and demerits, Confucianism as well. Thus, the teacher should help entry level students to differentiate useful Chinese Confusion culture elements from those have been outdated and stale for nowadays study. (Yan, 2009) For example, it should be avoided to add more obscure expression barely applied lately or lagged cultural concepts, such as, feudalism in Chinese business writing curriculum designs.

In terms of linguist knowledge, students could be guided to master formal Chinese expression and terminologies in commerce or international trade related industries. Summary and accumulation of adjectives and descriptive expression are the other vital section for students composing business letters in a humane and benevolent manner. In the teaching process, lecturers are suggested to train students to discover and explore their feelings and emotions as both business letters' writer and recipient, taking advantage of empathy to remind themselves of using courtesy phrases and showing respect and politeness via the writing.

Culture is an essential element which could not be neglected in language teaching and study, specifically in professional writing section. Chinese businessmen are impacted by historic Confucianism in styles of business operation, management and partnership establishment. It would be more effective in formal communications if their foreign business affiliates understand the Confucian culture in China. Business Chinese writing course is set up to prepare foreign students being professional and skillful when exchanging commercial letters with Chinese partners in real business world. In order to tutor learners grasping the core of Business writing, it is necessary to analyze the textbook used in classes from Confucian businessman's prospective. Confucian merchant's ideology, the concepts of 'Humanity', 'Justice', 'Wisdom', 'Etiquette' and 'Trust' in business field is embodied in textbook of 'New Silk Road Business Chinese Writing Course' in form of expression, formats, layouts and contents. Exploring and

introducing these five features in curriculum enable students to learn not only the method and style of writing Business letters in Chinese, but also the cultural roots about why they should compose the writing in that way.

5. References

- 1.Lotman, Y.M.,Uspensky, B.,Mihaychuk, G. (1978). “On the Semiotic Mechanism of Culture”. *New Literary History*, 9, 211.
- 2.Claire Kramsch,(1990).“Reviewed Work: CULTURAL STUDIES IN FOREIGN LANGUAGE EDUCATION by Michael Byram”, *Studies in Second Language Acquisition*. 12,103-105.
- 3.Fangping,Li.(2013).“Research on the Influence of Confucianism on Chinese Culture”. *Forwards Postion*. 10, 55-56.
- 4.Xingchen,Wu(2011).“The influence of Confucianism on China and the world”.(Online). <http://www.longquanzs.org/cywh/r/11803.html>, February 3, 2021.
- 5.Yizhi,Jiao.(2017).“Positive Influences of Confucianism on Shanxi Merchants from the Arts of Couplet”. *Journal of Liaoning Economic Vocational and Technical Institute*. 3, 44-46.
- 6.Fang,Hu.(2014).“Confucianism and the Management of Huizhou Merchants”. *Journal of Chaohu College*. 16, 20-21.
- 7.Bing,Yang.(2014).“The Management of Huizhou Merchants and Its Contemporary Significance from the Perspective of Confucian Humanism”. *Journal of Yancheng Normal University (Humanities and Social Sciences Edition)*. 34, 38-41.
- 8.Faliang,Li.(2014).“Analysis of the Value Connotation and Characteristics of the Confucian Merchants Culture in Central regions of China”. *Overview of Chinese Core Journals*.143-145.
- 9.Wenhong,Yuan.(2019).“Inherit Confucian culture and promote the spirit of Confucian businessmen”.(Online).<http://www.chinarushang.net/rushangfangtan/2019-06-10/1221.html>, February 10, 2021.
- 10.Jing,Wu.(2010).“Effects of Differences between Chinese and Western Thinking Modes on College Students ' English Writing and Counter measures”. *Haidian University Journal*. 04,83-87.
- 11.Lin,Huan.,Li,Xiaoqi. (2009). *New Silk Road Business Chinese Writing Course* .Beijing: Peking University Press.
- 12.Dongting,Zhou.(2016).“Why is there a special format for writing letters”.(Online). <https://www.zhihu.com/question/53287719/answer/134314572> ,March 3,2021
- 13.Minghua, Cheng.,Yun, Zhang.(2012)“Effects of Differences between Chinese and Western Culture on College English Writing”. *Journal of Beijing City University*. 02,95-99.
- 14.Yi,Yang.(2012).“The Influence of Cultural Differences on English Writing and the Countermeasures”. *Journal of Foreign language teaching and research*. 58,62-64.
15. Min, Jiang.,Mingzhu, Hu.(2020).“Analyzing the influence of the differences between Orient and Western cultures in the writing of business English”. *Journal of English Square*. 112,47-49.
- 16.Yan,Huang.(2009).“A Review of the Research on Cross-cultural Communication in Teaching Chinese as a Foreign Language”. *Journal of Oversea Chinese Language Teaching*. 04,71-75.

The Perceptions towards M-learning in Private University during the COVID-19 Pandemic in Thailand

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Abstract

The COVID-19 pandemic affected people's lives in many ways, including the education field. This study aims to explore and analyse the perceptions towards m-learning in the private university during the COVID-19 pandemic in Thailand. There are 15 samples from The Far Eastern University, Chiang Mai, Thailand. All samples have been selected by using purposive sampling. The samples were separated into three groups, namely, students, parents, and teachers. Each group has five samples. The perception questionnaire, semi-structured interview, and news were used as main instruments to analyse perceptions towards m-learning during the COVID-19 pandemic. The perceptions questionnaire data has been evaluated by using the mean score. Then, thematic analysis was used to analyse the samples' perceptions from semi-structured interviews and news. As a result of this study, positive perceptions and negative perceptions towards m-learning were revealed. Positive perceptions consist of health, improvements, gadgets or tools, teaching and learning methods, teaching and learning materials, and budget. In contrast, negative perceptions deal with health, improvements, gadgets or tools, teaching and learning methods, teaching and learning materials, budget, and social interactions.

Keywords: Perceptions; m-learning; private university; COVID-19 pandemic

1. Introduction

The COVID-19 has impacted people's lives around the world. About 214 countries confirmed that their people infected COVID-19. To decrease the number of infections, the lockdown was used as a primary solution in many countries (Atalan, 2020). Therefore, it cannot be denied that technology tools were used as a primary tool for connecting and working in COVID-19 situations, especially in the education field.

After the COVID-19 pandemic, many schools have to close until the COVID-19 situations get better (UNICEF, 2021). Hence, portable gadgets were used as a tool for learning and teaching through online platforms.

Thailand is the one country that has hard times of the COVID-19 pandemic. Then, Thai teachers also decided to use portable gadgets for learning and teaching online. Teachers and

students connected by using portable devices, namely smartphones or tablets, through many online and virtual conference platforms.

Therefore, m-learning becomes the essential strategy to solve the problems of teaching and learning in COVID-19 situations in Thailand. Teachers stimulated and motivated students to study and improve their skills by using their portable gadgets such as smartphones and tablets. Furthermore, teachers tend to create instruments for teaching their students through online platforms.

2. Research Objectives

2.1 To explore private university students' perceptions and teachers' perceptions towards learning by m-learning during the COVID-19 pandemic.

2.2 To analyse perceptions of private university parents' perceptions towards learning by m-learning during the COVID-19 pandemic.

3. Literature Review

3.1 M-learning

The mobile phone is the most effective device for communication (Miangah & Nezarat, 2012). According to Klopfer, Squire, and Jenkins (2002), there are five unique; 1)portability, mobile phone is small and light, so it's convenient to move anywhere, 2)social interactivity, the mobile phone can be support students to have social interaction and exchange their information, 3)context-sensitivity, this device can support students to get the specific context in current time and location, 4)connectivity, it's the favourable device to connect other devices, and 5)individuality, it's facile to create activities for individual students (Miangah & Nezarat, 2012).

In addition, Sarrab, Elgamel, and Aldabbas informed that m-learning allows students to have distance learning, fulfill their learning needs, improve students' interaction and decrease the problems about culture and communication. Moreover, it can develop student-centered learning (Sarrab et al., 2012). However, m-learning still negatively affects students, such as learning achievements and cognitive load (Chu, 2013).

3.2 Related study

There are many pieces of research claiming that teaching or learning by using m-learning tends to have both positive and negative perceptions.

For the positive perceptions, Hanif, Asrowi, and Sunardi (2018), who collected the data from 61 students in Indonesia, revealed that students have positive perceptions about learning by using a mobile phone. Students informed that m-learning is an attractive strategy that supports them to learn and improve their skills (Hanif et al., 2018).

Same as other researchers, Hashim, Choo, and Song (2009) presented that based on the results from 185 first-year students in Malaysia, students had positive perceptions towards learning by using m-learning. Students claimed that m-learning allows them to learn anytime and anywhere. In addition, students can use a mobile phone as a social device to connect with other

people. Furthermore, they also believed that m-learning supports their learning. Even students have positive perceptions about m-learning, they still reflect negative perceptions. Most students accepted that they felt uncomfortable using mobile phones for learning because of the price that they had to handle. Learning through m-learning, students have to pay for network services and buy a suitable mobile phone (Hashim et al., 2009).

4. Research Methodology

This study aims to analyse private university students, private university students' parents, and private university teachers' perceptions towards learning by using m-learning during the COVID-19 pandemic.

The participants were selected by using a purposive sampling method. There are three groups of participants in this study: students, parents, and teachers. For students and teachers, the criteria were used to choose the participants are; 1) the participant need to study or work in a private university in Thailand, 2) the participant has to face problems because of COVID-19 pandemic, 3) the participant needs to use a portable gadget such as smartphone, tablet, laptop, etc. for learning or working in COVID-19 situations, 4) the participant can speak the Thai language, and 5) the participant is willing to share their opinions about m-learning. Moreover, the parents were choosing based on the following criteria; 1) the participant need to have at least one child study in a private university in Thailand, 2) the participant has to face problems because of the COVID-19 pandemic, 3) the participant needs to have at least one child use a portable gadget such as smartphone, tablet, laptop, etc. for learning during COVID-19 pandemic, 4) the participant can speak the Thai language, and 5) the participant is willing to share their opinions about m-learning

There are 15 samples from the Far Eastern University, a private university, Chiang Mai, Thailand, chosen in this study. Each group of representatives has five people. Furthermore, the perceptions questionnaire and semi-structured interviews were used as instruments to collect the data. However, the perceptions questionnaire was used to collect the data from teachers and students, not including parents. In addition, the perceptions' questionnaire aims to explore the perceptions about teaching and learning by using m-learning. Both instruments, the perceptions questionnaire and semi-structured interviews were used the Thai language as a primary language to collect the data to ensure that the researcher and participants understood in the same way. Moreover, the news was used as another data to analyse students' perceptions, teachers' perceptions, and parents' perceptions to support the questionnaire and semi-structured interview results.

5. Results

Based on the data collected from the questionnaire, semi-structured interview, and news, the students' and teachers' perceptions were revealed. Then, the parents' perceptions were analysed by using semi-structured interviews and news.

5.1 The students' perceptions

Students' perceptions towards learning by m-learning were analysed by using the perceptions' questionnaire, semi-structured interview, and news.

5.1.1 The perceptions' questionnaire about students' perceptions

The perceptions' questionnaire focused on two sections, namely, teaching and learning methods and teaching and learning material (m-learning).

a. Teaching and Learning methods

For teaching and learning methods, both positive and negative perceptions were revealed.

- Positive

Based on the perceptions' questionnaire results, students strongly agreed that learning by using m-learning is the best way of studying during the COVID-19 pandemic ($\bar{x}=4.6$). Furthermore, they slightly feel uncomfortable ($\bar{x}=2.2$) and faintly complicated to learn online ($\bar{x}=2.4$).

- Negative

Although students strongly believed that learning through online platforms by using m-learning is suitable for learning during the COVID-19 pandemic ($\bar{x}=4.8$). In addition, they were moderately pleased to study online ($\bar{x}=3.4$). Students somewhat agreed that they wanted to study by using hybrid learning ($\bar{x}=3.2$). They rather feel that learning online is hard for them ($\bar{x}=3.2$). Furthermore, students think that learning through online platforms is less interesting and less enjoyable ($\bar{x}=2.8$). Therefore, they genuinely think that the COVID-19 pandemic should be solved as soon as possible, then they can study at the university as usual ($\bar{x} = 4.8$).

b. Teaching and Learning materials (m-learning)

Teaching and learning materials via m-learning that informed in this study were portable gadgets such as smartphones, tablets, iPad, laptops, and MacBooks.

- Positive

Corresponding to the results from teaching and learning methods, students strongly believed that they were ready to study by using m-learning ($\bar{x}=4.2$). In addition, they also moderately agreed that learning through an online platform by m-learning was the best way on the Covid-19 pandemic ($\bar{x}=3.8$). Moreover, students revealed that they feel comfortable using portable gadgets for learning ($\bar{x}=3.8$), and they believed they have advanced skills to use portable devices to learn through online platforms ($\bar{x}=3.4$). In addition, students revealed that they could understand all lessons taught through the online platform by m-learning($\bar{x}=3.2$).

- Negative

Even though students feel comfortable learning through an online platform by m-learning($\bar{x}=3.8$), but they were informed that they slightly like to use portable gadgets to learn ($\bar{x}=2.4$). Moreover, they faintly pleased to learn online ($\bar{x}=2.0$).

5.1.2 Semi-structured interview about students' perceptions

Based on the results from students' semi-structured interviews, students' perceptions. Both positive and negative perceptions were revealed. There were health, improvements, gadgets or tools, teaching and learning methods, teaching and learning materials, and budgets for positive perceptions. Then, negative perceptions were health, improvements, gadgets or tools, teaching and learning methods, teaching and learning materials, budgets, and social interactions.

a. Health

According to the semi-structured interview results, students revealed that learning through social platforms by m-learning helped them avoid the risk of infecting COVID-19. Still, it also affected their health in other ways.

- Positive

Students realised that online learning was the best way to study during the COVID-19 pandemic. They have to study through online platforms and virtual conference platforms such as ZOOM and Google meet. Moreover, students also understood and agreed to learn online by using smartphones or other portable gadgets because they didn't want to study at the university. Most of the students revealed that they were terrified to go to the university because they had no idea which people were infected and who had a high risk of infecting COVID-19. Therefore, students think learning online by m-learning without studying on-site is safe and better for their health.

- Negative

Learning through online platforms or virtual conference platforms by m-learning may be suitable and safe for physical health. In contrast, it can be affected students' psychological health. Students informed that they feel stressed to learn online because they can't understand and follow the lessons taught online. Some of the students said they always feel moody because of the problem of connecting to the internet while learning online by m-learning. In addition, students also informed that they feel anxiety when the teacher lets them take a test or a quiz because they have to complete their test before and submit it on time. However, their smartphones have lots of problems about the speed of the internet, speed of their smartphone (some of the students admitted that their smartphones are not good enough to study online and they didn't have other portable gadgets such as iPad and laptops to solve this problem and support them to learn online smoothly like other friends.)

b. Improvements

- Positive

Students informed that they have more skills to use their mobile phones to learn online. In addition, most of the students revealed that some applications or virtual conference online platforms which they didn't realise the benefits before, such as “Google Classroom,” after the university closed and they have to learn online, they have to practice and learn how to use “Google Classroom” to learn and submit their assignments. Then, students think that learning through online platforms or virtual conference platforms by m-learning motivates them to improve their technology skills.

- Negative

Even though students realised they have more improvements in technology skills, they still feel that they have less understanding in the class. Students claimed that they couldn't understand the lessons taught online. When they compared it with learning onsite, they believed they had more understanding and could complete all assignments that teachers informed. In contrast, they faced many problems following the lessons that the teacher taught.

c. Gadgets or tools

- Positive

Students informed that they feel pleased to use mobile phones or other portable gadgets to learn online. Some of them revealed that they don't need to go to the university or wake up early to attend the class. In addition, some students claimed that they do anything while learning, such as lying down on the bed while learning and wearing any dress they want.

- Negative

In contrast, students have negative opinions about using portable gadgets for learning online. From the semi-structured results, two groups of students have different negative opinions about using mobile phones or other portable devices for learning online or virtual conference platforms. The first group is students who have suitable and enough portable

gadgets for learning online; they informed that although they feel comfortable to learn online by m-learning, they also feel complicated to learn and think it is not as good as learning on-site because they have to use more than one portable gadgets. Furthermore, all students confirmed that they must use at least two portable devices such as smartphones and tablets or laptops to learn and follow all online class lessons. Students showed that they have to use one smartphone to connect with Google meet and other portable gadgets such as tablets to do the online class assignments. In addition, they sometimes use three portable gadgets, namely smartphones, tablets, and laptops, for learning. They informed that they used a computer or laptop to connect Google meet and used smartphones to do and submit the assignments. Then, they sometimes use a tablet to watch the clip videos on YouTube, which the teacher gave them as examples in the class. Same as the first group of students, the second group, who have only one portable device, also faced problems using portable devices for online learning. However, they didn't inform that using more than one portable device is complicated and too much for them. They revealed that they lack portable gadgets to study online. Most of them explained their family situation after the COVID-19 pandemic; they informed that they have only one smartphone to study online, so they can't attend the class and do the assignments simultaneously while learning online. They found their smartphone could not switch the applications, and sometimes their smartphone could not connect to the internet. Then, they have to take their smartphone and walk around their house to find an excellent spot to connect to the internet. Therefore, they sometimes miss what the teacher teaches or speaks and do not understand some lessons. In addition, some of them also informed that they have only one smartphone which can use for learning online, and they also have a sibling. Therefore, they have to share their smartphone with their brother or sister, so they cannot attend the class online because their brother or sister has to use it for learning.

d. Teaching and Learning methods

- Negative

Students informed that they don't seem pleased to do the assignments, especially group work assignments. They claimed that it's hard for them to communicate and work with others online. Then, they think the way that teachers let them work in groups and do the project (Project-based learning) is not a good idea.

e. Teaching and Learning materials

- Positive

Even though some of the students have problems with using their mobile phones to learn on the online platform and attend a virtual conference (Google meet), they confirmed that they like the materials that teachers use to teach in the class such as video clips and applications. Students informed that they enjoy learning with many materials that teachers created for them, such as video clips, PowerPoints, and documents. In addition, they think all of the materials that teachers use in the class support them to learn more and improve their skills. Furthermore, they have more chances to learn it any time that they want. Students exposed that before and after every online class, teachers will upload all materials on online platforms such as Google Classroom. Therefore, students felt it was convenient to download and study by themselves. In addition, some of the students informed that they don't have to worry when they miss the class because teachers will upload all video clips while they teach on online platforms, so students still have chances to study it again and again by themselves.

f. Budgets

- Positive

Most students who have suitable and enough portable gadgets are exposed that they have no problems with the budget. In addition, they think there is no difference between

studying online and studying on-site. They still use the same range of budgets. On the other hand, other students with suitable gadgets revealed that they have to use less money when studying online because they don't need to pay for transportation and accommodation. Some of the students claimed that they are not living in Chiang Mai, so they have more budgets than their friends who lived in Chiang Mai. Then, the ways to study by using online platforms or virtual conference platforms allowed them to study at home. Therefore, they can save more money. Furthermore, some of the students thought they could save a lot of money because they live with their parents, so they didn't need to lose their budgets for food too. (Students happily informed that they don't have to worry about paying for food or laundry because their parents pay for them when they study at home.)

- Negative

In contrast, students who don't have suitable or don't have enough portable gadgets have negative opinions about studying by using m-learning. They complained that they have lots of problems studying by using m-learning. Some of them said they need to have at least one portable device to study through online platforms or virtual conference platforms. However, they have only one smartphone. In addition, some students also informed that they not only have one smartphone for studying online, but they also have to have to share one smartphone with their siblings. Students have shown that they felt bad to have less money to buy new smartphones or other portable gadgets to study through online platforms or virtual conference platforms like other friends in the class. Not only students who don't have enough money to buy a new smartphone for learning, most students who don't have suitable portable gadgets, but their parents have abilities to buy a new one for them; they also have a negative opinion about learning through the online platform too. Most of them revealed that studying through online platforms forces them to buy new portable gadgets. Then, they have to spend lots of money learning online compared with learning onsite.

g. Social Interactions

- Negative

Students informed that they have less chance to face their friends. Although they can communicate with each other through social media such as Line and Facebook, they still feel different and separate from their friends. In addition, some of the first and second-year students informed that they didn't know each other before. However, they have to talk and work together through social media. Then, it's complex and complicated for them to make friends and work together. Moreover, they feel they don't have any friends, and they cannot absorb the environment or atmosphere of being a university student.

5.1.3. News about students' perceptions

Based on a UNICEF-led survey in Thailand (2020), children tend to have mental health problems because of COVID-19 (UNICEF, 2021). The main reason is that children were forced to learn online. From nearly the half of households surveyed, “ Fifty-one percent did not have access to devices for online learning; 26 percent did not have internet access for online learning; and 40 percent of parents and caregivers said they did not have time to oversee their children's online learning ” (UNICEF, 2021).

The surveys review that students' situation may not be suitable for learning online because of a lack of technical support, a poor learning environment, pressure to do household chores, or being forced to work (UNICEF, 2021).

The results above informed that students cannot enhance their skills because they didn't have the proper conditions for learning by using technology, especially a mobile phone.

5.2. The teachers’ perceptions

For teachers’ perceptions, questionnaires, semi-structured interviews, and news were used to collect the data.

5.2.1. The perceptions’ questionnaire about teachers’ perceptions

There are two groups of teachers’ perceptions which are teaching and learning methods and teaching and learning materials.

a. Teaching and Learning methods

- Positive

According to the results, teachers informed that they think students should study through online and virtual conference platforms ($\bar{x}=4.4$). Although, they are slightly agreed that they do not feel uncomfortable teaching through online and virtual conference platforms ($\bar{x}=1.8$). Furthermore, they are delightful teaching online ($\bar{x}=3.6$). In addition, teachers agreed that they preferred to teach students online during the COVID-19 pandemic ($\bar{x}=4.0$).

- Negative

Although teachers felt pleased to teach students through online or virtual conference platforms, they still agreed that students should not learn online all the time; students and teachers should have time to meet and learn some parts of the lesson onsite ($\bar{x}=3.8$). They still strongly agreed that the COVID-19 pandemic problems should be solved as soon as possible, then students will have chances to study onsite ($\bar{x}=4.6$). In addition, teachers moderately agreed that teaching through online and virtual conference platforms is complex and complicated to improve students’ skills ($\bar{x}=2.4$).

b. Teaching and Learning materials (m-learning)

- Positive

Teachers fairly agreed that using m-learning for teaching is the best solution during the COVID-19 pandemic ($\bar{x}=3.0$). Teachers agreed that they were ready to use portable devices to teach students ($\bar{x}=4.2$). Moreover, they can teach and improve students through online and virtual conference platforms by m-learning ($\bar{x}=4.0$). In addition, teachers agreed that they feel comfortable using portable devices for teaching students ($\bar{x}=3.6$). Then, they moderately agreed that they prefer to use portable devices to teach students through online and virtual conference platforms ($\bar{x}=2.6$). More than that, teachers fairly think they are able to teach all lessons by m-learning without any problems ($\bar{x}=3.0$).

5.2.2. The perceptions’ semi-structured interview about teachers’ perceptions

Based on teachers’ semi-structured interviews, positive and negative perceptions were revealed. Positive perceptions are health, improvements, gadgets and tools, teaching and learning methods, and teaching and learning materials. Then, teachers’ negative perceptions were improvements, gadgets and tools, teaching and learning methods, and teaching and learning materials.

a. Health

- Positive

For teachers, all agreed that in this Covid-19 situation, students should learn online because it is safe for both teachers and students. Students and teachers can avoid the risk of infecting and spreading COVID-19 to each other. Based on teachers’ opinions, they think learning by using m-learning is the best way during the COVID-19 pandemic. We don’t have any choice to choose other ways of learning. Then, both teachers and students need to do their best to learn through online platforms or virtual conference platforms.

Furthermore, some teachers also informed that students' health is essential. Teachers understand some of the students who have problems with studying by m-learning. However, students need to realise that when teachers let students learn onsite, it means students who come from various places have to study and meet each other at the university. Then, it is a real risk and danger for every students' health because they may risk infecting COVID-19 at any time.

b. Improvements

- Positive

Some teachers revealed that the COVID-19 pandemic might be the negative cause of making both teachers and students change their lives and their learning or teaching styles. However, it is also a chance to stimulate students to use technology for learning. Teachers said students have improvements in IT skills. In the same way, teachers also have to develop themselves to create new teaching instruments and use technology such as m-learning to support students to study and enhance their essential skills to live in the 21st century. Students have more chances to learn new 21st century skills such as IT skills, teachers also have more improvement. Most teachers believed that in this COVID-19 situation, teachers need to enhance their skills, such as teaching skills and IT skills, because learning through online platforms tends to be different from learning at the university. Therefore, they need to understand how to teach online platforms or virtual conference platforms to motivate students to learn and support students to be able to learn online. In addition, teachers also have to develop their instruments to make them suitable for teaching students online.

- Negative

Some teachers informed that students have fewer improvements compared with studying onsite. Most of the teachers reviewed that they evaluated students' improvements and students' skills from the assessments and the activities in the class. Incredibly, teachers who teach English and the Chinese language, they convinced that it's really hard for students to enhance their language skills through m-learning. Students tend to have problems understanding the lesson and have problems using English or the Chinese language for communication in real situations. Furthermore, Language teachers also pointed out that students sometimes cannot listen to what teachers speak clearly because of their old portable gadgets and their internet. Then, learning by m-learning is not suitable for the students who learn the language. However, some of the teachers who teach marketing and accounting revealed that there are no problems with students' improvement at all. Teachers can create new teaching instruments to improve students' abilities. In addition, they believed that students' improvements depend on students' attention and students' behaviour of learning. It's nothing related to learning online by m-learning or learning onsite.

c. Gadgets or tools

- Positive

Some of the teachers revealed that they have more chances to learn how to use portable gadgets or tools for teaching through online platforms or virtual conference platforms. In addition, the university supports some of the technology to help teachers can be able to students through online platforms.

- Negative

Based on teachers' opinions, they revealed that both teachers and students have to face problems with gadgets or tools for learning online. Teachers revealed that some of them don't have suitable portable devices to teach students through online platforms or virtual conference platforms. They have to buy suitable portable devices such as laptops and iPad by themselves. Although the university supports some gadgets such as computers and cameras to projectors for them, teachers still have problems using them for teaching. In addition, teachers

pointed out that not only do teachers have to face this problem, but their students also reflected that they have problems using m-learning such as smartphones for learning.

d. Teaching and learning methods

-Positive

Teachers revealed that teachers and students tried to learn in new ways. Then, it is normal for teachers to find suitable teaching methods to teach on online platforms. Moreover, based on teachers' opinions, they believed that their students also have to find new learning methods to make themselves have more understanding about the lessons by themselves. Some of the teachers informed that they think teaching methods are not important as students' attention in learning in the class. They revealed that although teachers teach students online or virtual conference platforms, if students pay attention and work hard, they still have more improvements and get good scores, same as learning onsite. Therefore, teachers reflected that in the COVID-19 pandemic, they have to improve their teaching methods.

On the other hand, students also have to improve their learning methods. In teachers' opinions, both teachers and students have to help each other succeed in the course's objective. Learning methods should be corresponding to teaching methods.

- Negative

Teachers may confirm that in the COVID-19 pandemic, both teachers and students are creating new ways of teaching and learning which suitable to each other. However, there are still some problems, such as teaching and learning through online and virtual conference platforms. Students have issues focusing on the lessons through online and virtual conference platforms. More time passed mean less concentration. Most students cannot accept and respond to any teaching method for a long time by m-learning. Same as teaching methods, students cannot find ways to learn and focus on the information or take more time to do the activity by themselves. Then, teachers felt that teaching and learning methods by using m-learning are not suitable for students. Some teachers claimed that the best teaching method they used to stimulate students to improve their skills is not working when teaching online. Therefore, teachers felt that although they can find the best teaching methods for learning by m-learning, it is still worthless if students are not willing to pay attention and corporation with teachers.

e. Teaching and learning materials

- Positive

Based on teachers' opinions, they believed that they could motivate students to get more knowledge and improve their skills through online platforms by m-learning. Most of them who taught business fields (accounting and marketing) informed that they had to construct the new teaching instruments that they had never done before to stimulate and motivate students learning through online and virtual conference platforms. For example, they have to record the clip videos and construct the presentation for teaching by m-learning. In addition, they revealed that after they used the new teaching materials, their students can adapt and get the points or improve their skills as same as learning onsite. Then, they think there is no difference between learning online and onsite. However, teachers need to prepare the materials before at least a week and post it on Google classroom because students need to read and prepare themselves before beginning the class.

- Negative

In contrast, most teachers who taught about language and traveling presented that their students have lots of problems studying online and virtual conference platforms. They confirmed that language skills need to practice face to face. There is no matter how good of teaching materials. If students don't have a chance to practise with the real situations and go to

find more experiences outside the class, their language skills are pretty hard to improve as learning onsite. Then, students may have chances to learn online, but they still have problems enhancing their language and traveling skills.

5.2.3. News about teachers’ perceptions

Not only do students have problems with technology for learning, but teachers also have the same problems. Based on a survey, each school has different abilities to give online resources to enhance students’ skills. More prominent schools tend to have superior instruments for teaching and supporting their students more than smaller schools because of better financial situations (Mala, 2021). Hence, teachers may have complicated situations for preparing instruments or activities to improve their students through online platforms.

In addition, many universities have decreased income, especially private universities. They have to face the lack of income from the international students or less income because their parents have an economic problem. Moreover, because of remote learning, some students decided to request a leave of absence until the COVID-19 situation improved (WorkpointTODAY, 2021). Besides the budget differences, teachers have to face different ways of teaching. Most teachers have to suddenly change their teaching styles, from traditional pedagogy to technology-based learning, which uses mobile phones (Mala, 2021). Then, the universities may have fewer possibilities to find new suitable instruments that support teachers teaching on online and virtual conference platforms.

5.3. Parents’ perceptions

Based on the parents’ perceptions, positive perceptions are health, improvements, and budgets. The negative perceptions are improvements and social interactions.

5.3.1. Semi-structured interview about parents’ perceptions

a. Health

- Positive

The parents accepted that they didn’t want their children to go to the university because of the COVID-19 pandemic. Then, learning through social platforms and virtual conferences is the best because their children can be safe and sound from the COVID-19 pandemic.

b. Improvements

- Positive

Based on parents’ opinions, they think their students can study and improve their abilities by using m-learning. Most parents presented that studying online is the best way to enhance their children's skills in this COVID-19 pandemic. In addition, some parents also informed that it is no difference between learning online and onsite. Their children still have improvements, enhance their skills, and gain new knowledge.

- Negative

Even though most parents were not concerned about children’s improvements related to their study, some parents are still worried about social and physical improvements. Some parents are concerned about studying by using m-learning because their children have to stay at home in front of the screen all the time. Then, it is hard for their children to go outside or play sports with their friends.

c. Budgets

- Positive

Most parents informed that they have no problems with learning online. They don't have any issues with money to buy the new or suitable portable gadgets for their child or children. Some parents revealed that they have some problems with money, but they are still willing to find suitable portable devices for studying by m-learning to their child or children because they understand that in this COVID-19 pandemic, it is impossible for their child to study at the university. Even though all parents understand the situation and have no problems about studying online, all of them still hope that the university will be able to open and let students study onsite as soon as possible.

d. Social interactions

- Negative

For social interactions, most parents are concerned about learning through online platforms. They felt their children had fewer chances to communicate with other people. In addition, some of the parents are informed that it's good when they can see and stay with their child or children. Moreover, they don't have any problem about studying through online platforms or virtual conference platforms. However, they still realise that their children have no friends when they are studying at home. Parents revealed that they are afraid that their child will have fewer social skills. Furthermore, some parents informed that they know their child or children and communication with their friends through social media, but in their opinion, communicating online is not the same as communicating face-to-face. There are many skills that their child will miss when learning through online platforms, such as face-to-face communication skills, social skills, and work collaboration skills.

5.3.2. News about parents' perceptions

To be successful in learning, teachers and students are not only affected because of teaching and learning by using technology such as mobile phones. However, parents can be another group who have stressful times about their children learning. Ms. Nattaya Boonpakdee, ThaiHealth's Director of Healthy Child, Youth, and Family Promotion Section, claimed that based on the impact during Thai students learning online follow-up, three reasons make parents stressed because of their children learning through an online platform; 1) parents let their children learn by themselves which is not suitable for children age, 2) parents and children have less time for communication because they used most of their time in online platform, and 3) parents are lack of modern skills to take care their children (Bangkokbiznews, 2021). Furthermore, parents have to face pressure situations, less income because of the COVID-19 situation, and other responsibilities. At the same time, they need to help their children learn online (Bangkokbiznews, 2021). Then, children tend to have a high risk of violent situations at home because of the stress between parents and children.

6. Discussion and Conclusion

To answer research question one, to explore private university students' perceptions and teachers' perceptions towards learning by m-learning during the COVID-19 pandemic, the perceptions' questionnaire, semi-structured interview, and news were used to examine students' perceptions and teachers' perceptions towards learning by using m-learning.

After the study, both positive and negative perceptions towards learning by m-learning during the COVID-19 pandemic were exposed.

Positive perceptions are about health, improvements, gadgets and tools, teaching and learning materials, and budgets based on students' perceptions. In construct, negative perceptions were health, improvements, gadgets and tools, teaching and learning methods, budgets, and social interactions.

Based on teachers' perceptions, positive and negative perceptions were revealed. Teachers reflected positive opinions about health, improvements, gadgets and tools, teaching and learning methods, and teaching and learning materials. On the other hand, teachers have shown negative opinions about improvements, gadgets and tools, teaching and learning methods, and teaching and learning materials.

Students' perceptions and teachers' perceptions may reflect in different ways and present in different topics. However, the main points are still the same. Students and teachers believed that learning by m-learning is the best way to solve the problems and is the only way to learn during the COVID-19 pandemic. Both of them reflected some positive about learning through online and virtual conference platforms via portable devices, but they still want to study onsite.

According to the results of all instruments, questionnaires, semi-structured interviews, and news, teaching and learning through online platforms via portable devices affect students negatively more than positively. Students have to face multiple learning problems and miss many opportunities to improve various necessary skills. Corresponding to other research, online learning effectively improves students' knowledge and skills (Rakhmanina et al., 2021; Bączek et al., 2020; Hanif et al., 2018). In addition, m-learning supports students' learning (Hashim et al., 2009). However, students have problems using m-learning online, such as accessing the internet (Erarslan, 2021). Some skills cannot improve through online learning, such as social skills (Bączek et al., 2020). Moreover, students have to find suitable gadgets or tools for learning (Hashim et al., 2009). In addition, online learning is not suitable for enhancing students' language skills compared with traditional learning (Albiansyah et al., 2021). Therefore, even though learning by m-learning in the COVID-19 pandemic is the best solution and can improve students' knowledge and skills, it still has weak points, such as students don't have the readiness to learn online and virtual conference platforms by m-learning. Moreover, online learning does not support students to develop students' social and language skills.

To answer research question two, to analyse perceptions of private university parents' perceptions towards learning by m-learning during the COVID-19 pandemic.

According to semi-structured interviews and news results, parents have positive perceptions about health, improvements, and budgets. Then, negative perceptions are improvements and social interaction. In line with other researchers, Although parents accepted that online learning decreases the risk of their child infecting the COVID-19 and it is the best way to learn during the COVID-19 pandemic, parents still want their child to learn onsite (Haller & Novita, 2021; Lase et al., 2020) because they lack time and enough abilities to support their child to study at home (Lase et al., 2020).

7. References

Albiansyah, A., Hidayat, D. N., & Aringga, R. D. (2021). EFL students' perceptions toward online English learning during the COVID-19 Outbreak. *ELLITE: Journal of English*

- Language, Literature, and Teaching*, 6(1), 1–8.
<https://doi.org/10.32528/ellite.v6i1.4460>
- Atalan, A. (2020). Is the lockdown important to prevent the COVID-19 pandemic? effects on psychology, environment and economy-perspective. *Annals of Medicine and Surgery*, 56, 38–42. <https://doi.org/10.1016/j.amsu.2020.06.010>
- Bączek, M., Zagańczyk-Bączek, M., Szpringer, M., Jaroszyński, A., & Woźakowska-Kapłon, B. (2020). Students' perception of online learning during the COVID-19 pandemic: A survey study of polish medical students. <https://doi.org/10.21203/rs.3.rs-41178/v1>
- Bangkokbiznews. (2021, August 29). ทำอย่างไร เมื่อถูก 'เรียนออนไลน์' แฉกลายเป็นเครียดทั้งบ้าน.
 bangkokbiznews. Retrieved October 15, 2021, from
<https://www.bangkokbiznews.com/news/957160>
- Chu, H. (2013). Potential negative effects of mobile learning on students' learning achievement and cognitive load-a format assessment perspective. *Educational Technology and Society*. 17. 332-344.
- Erarslan, A. (2021). English language teaching and learning during covid-19: A global perspective on the first year. *Journal of Educational Technology and Online Learning*. <https://doi.org/10.31681/jetol.907757>
- Haller, T., & Novita, S. (2021). Parents' perceptions of school support during COVID-19: What satisfies parents? *Frontiers in Education*, 6.
<https://doi.org/10.3389/educ.2021.700441>
- Hanif, M., Asrowi, A., & Sunardi, S. (2018). Students' access to and perception of using mobile technologies in the classroom: The potential and challenges of implementing mobile learning. *Journal of Education and Learning (EduLearn)*, 12(4), 644–650.
<https://doi.org/10.11591/edulearn.v12i4.8398>
- Hashim, H., Koo, C. and Song, H. 2009. Exploring learner's perception of mobile learning. *Paper presented at the International Conference on E-learning*.
 17-20 June 2009. Algarve, Portugal.
- Lase, D., Zaluchu, S. E., Daeli, D. O., & Ndraha, A. (2020). Parents' perceptions of distance learning during covid-19 pandemic in rural Indonesia.
<https://doi.org/10.35542/osf.io/hz7t8>
- Mala, D. (2021, January 4). *Covid Hinders Education again*. <https://www.bangkokpost.com>.
 Retrieved October 15, 2021, from
<https://www.bangkokpost.com/thailand/general/2045015/covid-hinders-education-again>
- Miangah, T. M., & Nezarat, A. (2012). Mobile assisted language learning.
 IJDPS: International Journal of Distributed and Parallel Systems, 3(1), 309-319.

- Rakhmanina, L., Martina, F., Halolo, F. B., Syafryadin, S., & Noermanzah, N. (2021). Students' perception on online English learning during covid-19 pandemic era. *Silampari Bisa: Jurnal Penelitian Pendidikan Bahasa Indonesia, Daerah, Dan Asing*, 3(2), 428–439. <https://doi.org/10.31540/silamparibisa.v3i2.1150>
- Sarrab, M., Elgamel, L., & Aldabbas, H. (2012). Mobile Learning (M-Learning) and Educational Environments. *International Journal of Distributed & Parallel Systems*. 3. 31-38.
- UNICEF. (2021, August 24). *First Day of school 'indefinitely postponed' for 140 million first-time students around the world*. UNICEF. Retrieved October 15, 2021, from <https://www.unicef.org/thailand/press-releases/first-day-school-indefinitely-postponed-140-million-first-time-students-around-world>
- WorkpointTODAY. (2021, January 2). *สำรวจผลกระทบหลัง covid-19 จุดเปลี่ยนครั้งสำคัญของการศึกษาโลก*. workpointTODAY. Retrieved October 15, 2021, from <https://workpointtoday.com/education-covid-19-4/>

Move Analysis of Chemistry English Research Article Abstracts Published in an International Journal

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Abstract

Move analysis is an analytical approach to the recognition of text and has been used to examine various types of genres. The aim of this paper is to analyze the move structures of Chemistry English research article abstracts published in an international journal. Forty English abstracts were collected by using a purposive random sampling method. Hyland's (2000) framework is adopted (Introduction-Purpose-Method-Result-Conclusion) to analyze the abstracts' moves of the current study's corpus. The findings reveal that most abstracts are written by using a four-move structure rather than using the five-move framework. This can be assumed that instead of conforming to the universal framework, the analyzed abstracts tend to employ a conflicting structure. Moreover, the abstracts in the corpus mostly begin with the Introduction move and end the section with the Result move. It is expected that this research would provide beneficial results for educators, students, and others involved in the analysis of discourse and other related fields. This study is hoped to pave the way for further studies in the same field of the move analysis, as well as to provide sufficient details for inexperienced research writers to write their research article abstracts, the very first section for the particular publication.

Keywords: Move Analysis; Research Article Abstracts; Chemistry RA abstracts

1. Introduction

English is the world's language, and it has also become an integral part of international societies, cultures, and economies. English is an important and a widely language used for humans to communicate with each other across the world and in academic communities. It cannot be argued that most of the academic papers released are written in English to associate with people in their fields. One of the requirements of both international and national journals is an English abstract that accompanies a research article. To write academic papers, more insights of what makes an appropriated style and functional in each discoursal environment are needed. This is because the conventions of particular disciplines affect academic writing (Kamler & Thomson, 2006). In order to cope with the difficulty of writing abstracts in the English language, move analysis is one of the most fashionable ways to help inexperienced writers to develop their academic writing skills effectively. According to Kanoksilapatham (2015), the ability to understand and / or write research articles in English is crucial for

academic and professional success in science and technology under the context of globalization and international research collaborations. Move analysis is one of the genre-based approaches used to define the structure of research articles (RAs) and it has now become an influential method. From the notion of Swales’2004, move means a discursual segment that performs a particular communicative function. Moreover, Yang and Allison (2003) define a move as a text frame that is used to classify chunks of text in terms of their specific communicative intentions. Focusing on communicative functions of texts in learning and teaching contexts can be an efficient way to turn the attention of teachers and students away from the surface structures of text to the socially situated use of texts with specific intentions (Hüttner et al., 2009). Therefore, the approach of move analysis can be seen as a valuable method for improving academic writing. Furthermore, Kanoksilapatham (2012) mentions that it is possible to use knowledge of the rhetorical organization to enhance communication and to expand knowledge in academic fields. As a result, the move analysis is one of the genre-based approach used to identify the structure of research articles (Amnuai, 2019). Undoubtedly, the analysis of RA abstracts has been one of the popularities among researchers across the globe. An abstract is a clarification or factual summary of a much longer report and is intended to provide readers with an accurate and concise understanding of the full article (Bhatia, 1993). In addition, informing prospective readers about the exact content of the article is the most important function of the abstract (Arsyard, 2014). By reading abstracts, readers will determine the value of the research if the study is useful to attract the attention of readers (Hyland, 2000; Martin, 2003). Ren & Li (2011) also state that a well-written research article abstract will therefore promote the text attached to it more efficiently. A variety of move analysis of English research article abstracts have been found and published in international and national journals from a wide range of disciplines which consisted of Oneplee (2008) on Scientifics, Darabad (2016) on Applied Linguistics, Applied Mathematics, and Applied Chemistry, Hwang et. at. (2017) on Nanoscience and Nanotechnology, Kosasih (2018) on Public Administration, Management, Fisheries Management, and Mathematics Education, and Saengsai and Pramoolsook (2017) on Sciences and Engineering. However, there are a few studies on the move analysis in the field of Chemistry, especially on ones that are published in an international journal only. For this reason, this research is carried out primarily in order to analyze move structures of Chemistry English research article abstracts published in an international journal.

2. Research Objectives

The objective of this present study is to analyze move structures of Chemistry English research article abstracts published in an international journal.

3. Literature Review

Research article (RA) is a significant communication channel through which researchers make their academic contributions public. Therefore, research articles provide a central focus for the investigation of English academic literacy (Swales, 1990). In the last 20 years, the research paper has devoted many studies to academic writing, particularly in its structure, social construction, and historical evolution (Samraj, 2002). Most of these studies focus on specific sections of research, such as Introduction (e.g., Swales, 1990, 2004; Jogthong, 2001; Samraj,

2002), Methods (Lim, 2006; Nguyen & Pramoolsook, 2015), Results (e.g., Brett, 1994; Thompson, 1993), or Discussion (e.g., Fallahi & Erzi, 2003; Holmes, 1997; Yang & Allison, 2003). Notwithstanding, move analyses of Abstract section are considered as an esteem study of this discriminative approach (Bhatia, 1993; Santos, 1996; Hyland, 2000; Oneplee, 2008; Kanoksilapatham, 2009; Ren & Li, 2011; Darabad, 2016; Hwan et. al., 2017; Saengsai & Pramoolsook, 2017; Kosasith, 2018; Amnuai, 2019; Vathanalaoha & Tangkiengsirisin, 2018; Phantama, 2000). As stated by Bhatia (1993), an abstract is a description or factual summary of the much longer report, and it is meant to give the reader an exact and concise knowledge of the full article. After a title or the RA topic, the abstract is the readers’ first confrontation with a text generally and often is the point at which the readers decide whether to continue reading, or to ignore it. In different words, they will determine the value of the research by reading abstracts, and the decision to judge if the research papers are worth reading or not is often made by readers through reading the abstracts (Hyland, 2000). Furthermore, Huckin (2001) clarifies that the RA abstracts have four uses that are distinctive. Firstly, it is as a quick summary of a whole research article abstracts are read. Secondly, they are part of the reader's decision-making process, to continuously read or not. Third, it is a preview that guides the reader, research article abstracts are considered. Lastly, it is large database services useful for professional indexers are indexed. Consequently, a well-written abstract will promote the text attached to it more effectively (Ren & Li, 2011). Move analysis is an analytical approach to the identification of text (Swales, 1990; 2004) and it has been used to analyze various types of genres, such as research articles, theses, essays (Nguyen & Pramoolsook, 2015; Saengsai & Pramoolsook, 2017; Amnuai, 2019). A move is "discoursal or rhetorical units performing coherent communicative functions in texts". Such approach can thus be seen to be valuable for both reading and writing. It is possible to use knowledge of the rhetorical organization to enhance communication and to broaden knowledge in academic fields (Kanoksilapatham, 2012). Moreover, typical patterns in research articles, such as Introduction, Method, Results, and Discussion sections consist of both indicative and informative abstracts (IMRD). The patterns of this are called “moves” (Swales, 1990; Bhatia, 1993; Taddio et al., 1994; Santos, 1996). The original studies on move are found in Swales (1990), Bhatia (1993), and Santos (1996). Since then, there has been a variety of research relating to this particular RA abstracts (Hyland, 2000; Oneplee, 2008; Kanoksilapatham, 2009; Ren & Li, 2011; Darabad, 2016; Hwan et. al., 2017; Saengsai & Pramoolsook, 2017; Kosasith, 2018; Amnuai, 2019; Phantama, 2000). The following tables are abstract move frameworks situated by Bhatia (1993) and Santos (1996).

Table 1 Bhatia’s (1993) framework (pp. 78-79)

Move	Function
Move 1: Introducing the purpose	The intentions, thesis, or hypothesis of the author that form the basis of the study are spelt out precisely here. It could also include the research objectives or goals or the problem the author wishes to address.
Move 2: Describing the methodology	The experimental design and information on the data, processes, or method(s) used and, if necessary, the scope of the research being reported is strongly indicated in this move by the author.
Move 3: Summarizing results	This is where the author comments on his findings and suggests solutions.

Move 4: Presenting the conclusion	This move is used to provide the authors with an interpretation of the findings and to draw conclusions from these interpretations. Including some indication of the implications and applications of the present findings is not unusual. It can be concluded, according to the above step, that different moves serve different purposes.

Table 2 Santos's (1996) framework (p. 485)

Move	Function
Move 1: Situating the research (Introduction)	Situates the research and indicating the gap.
Move 2: Presenting the research (Purpose)	Presents the research, raises hypothesis, and indicates the purpose.
Move 3: Describing the methodology (Methods)	Provides information on design and data analysis.
Move 4: Summarizing the results (Results)	Presents results and summarizes main findings.
Move 5: Discussing the research (Conclusion)	Interprets the implications of main findings and recommends for future research.

Based on reviews of related and previous literature, it is found that there are many research studies related to the analyses of RA abstracts, i.e., Darabad (2016) analyzed the rhetorical structure of research article abstracts from the three disciplines of Applied Linguistics, Applied Chemistry, and Applied Mathematics. A total of 63 international journal abstracts were selected randomly and analyzed adopting the five-move framework of Hyland (2000). The findings showed that the research abstracts from the three disciplines shared some similarities and variations. Hwang et al. (2017) examined the rhetorical features of the abstracts written by Vietnamese and English authors of the research articles in Nanoscience and Nanotechnology. For the abstract section, the framework used in the analysis was based on Hyland's five-move model. The result revealed that the most frequently used move structure was Purpose-Methodology-Results (P - M - R), pointing out that Nanoscience and Nanotechnology abstracts did not follow Hyland's (2000) model. The researchers also observed that the move structures of Vietnamese abstracts varied substantially from English abstracts, which may be attributed to cultural differences between the authors. Kosasih (2018), who reviewed 40 students' English thesis abstracts from the four different fields of Public Administration, Management, Fisheries Management, and Mathematics Education to describe the move structure and to compare the continuity of these cross-disciplinary English abstracts with the four-move structure of Bhatia (1993) and the five-move structure of Swales & Feak (2004). It was observed that the move structure of Aim-Method-Result (A - M - R) was often employed in abstracts, although only 15% and 10% of abstracts were in line with the five-move structure of Swales & Feak (2009) and the four-move structure of Bhatia (1993). Oneplee (2008) employed the abstract move pattern using theory from Santos (1996) as a framework to analyze the structures of one hundred scientific articles from two scientific journals, Science and Nature. The findings revealed that the abstract writing trends of both journals were similar in the sense that the researchers tended to focus on the results of the analysis (25.8%), followed by background information (21.8%), and draw conclusions (15.8%). Interestingly, the methodology was found

in only 11% of all the analyzed research abstracts. Vathanalaoha & Tangkiengsirisin (2018) investigated generic structures of Thai and international dental research article abstracts employing Kanoksilapatham's (2013) BPMRD nomenclature of the abstract analysis. The results revealed similarities and variations between the two datasets of Thai and international dental RA abstracts. According to these study reviews, the present study is conducting the move analysis of Chemistry RA abstracts published in an international journal to identify the moves that the writers of RA abstracts in this particular discipline desire to use in their abstract writing. To the best of our knowledge, Hyland's (2000) framework is more likely compatible with the corpus of this study as it covers a wide range of disciplines, which included Chemistry. Moreover, the studies of Darabad (2016) and Hwang et al. (2017), which analyzed the abstracts of Applied Chemistry, Nanoscience and Nanotechnology also adopted this framework. Therefore, Hyland's (2000) model on the RA abstracts analysis will be selected to identify moves of the target corpus of this present research. Table 3 below is Hyland's (2000) framework, the selected model.

Table 3 Hyland's (2000) Framework (p.67)

Move	Function
Introduction	Establishing context of the paper and motivates the research or discussion.
Purpose	Indicating purpose, thesis, or hypothesis, outlines the intention behind the paper
Method	Providing information on design, procedures, assumptions, approach, data, etc.
Product /Result	Stating main findings or results, the argument, or what was accomplished.
Conclusion	Interpreting or extending results beyond scope of paper, draws inferences, points to applications or wider implications.

4. Research Methodology

4.1 Data Collection

According to Ross (2010), the data is accurate whether the distribution is normal. For sample sizes above thirty, the normal distribution usually will be a good estimation of the actual way the responses are distributed. In other words, the sample mean of a sample size of at least thirty will be approximately normal. Therefore, forty English abstracts from Chemistry English RAs published in the Journal of Chemical Education during 2013-2020 were collected by using a purposive random sampling method to reach the optimum sample size. All of the RA abstracts in the corpus are reliable to be downloaded online as the journal is co-published by the ACS Division of Chemical Education. The publication also has electronic archival content available since the year 1924 (Vol. 1) to present days.

4.2 Data Analysis

After the forty RA abstracts are compiled, each of which was numerically coded CH1 to CH40. Hyland's (2000) framework was adopted for analyzing the move structure of the RA abstracts in the present study. The abstracts are analyzed by using sentence-level analysis because some moves can be realized with a single sentence or even a whole paragraph to represent as just one

move, until the new move is found appearing in the next sentence or paragraph. Therefore, a sentence or a group of sentences were classified into the same move (Saengsai & Pramoolsook, 2017). The move analysis of Chemistry RA abstracts published in an international journal was then carried out by the researchers.

4.3 Move Frequency Classification

The frequency of occurrence of each move was counted and coded following Kanoksilapatham (2005) to determine whether a move was obligatory, conventional, or optional. For example, if a specific move occurred in 100 %, it was considered 'obligatory', 60-99 % of it was considered to be 'conventional'. Otherwise, if a move's frequency was found less than 60%, it was considered 'optional'. However, a move that is not identified in the framework of Hyland (2000) will not be determined as a new one in the corpus unless it is found at or above 50 % (Nwogu, 1997).

4.4 Inter-coder Reliability

Two coders performed this analysis method collaboratively. It is the range to which, on repeated tests, a measurement method produces the same repeated results. In this process, the 'Percent Agreement' proposed by Frisby (2017) was used as a simple method of reporting inter-reliability to ensure the validity of abstracts in the Journal of Chemical Education. The criterion between the two coders coding the same units is whether the exact samples assigned to a given variable have been agreed upon. Following Kanoksilapatham (2005), a researcher from English for International Communication invited a Chemistry researcher with a PhD degree in Chemistry to help confirm the reliability and validity of the move results of the RA abstracts in the corpus. The results of the two coders were later compared and discussed in order to reach a 100% agreement (Saengsai & Pramoolsook, 2017).

5. Results

The analysis of the present study shows that forty abstracts of Chemistry English research articles have an average corpus word count of 251 words, and the number is above the normal length of approximately 200 words suggested by Hyland (2000). There is no question that all abstracts are situated in the first section of the corpus. This means that researchers who decide to publish their works in research articles have to prepare the abstract writing to reach the standard length of 200 words. However, this should be suggested by the requirement of each individual publication. In the corpus, twenty-six abstracts are written by the English native speakers. This corresponds to Saengsai & Pramoolsook (2017) that writing abstracts in English stresses the significance of the language to promote understanding all around the world. Furthermore, many of the RA abstracts in this corpus are written by using a four-move structure (57.5%) in terms of move analysis, which occurs in 23 out of 40 abstracts rather than using moves from the five-move model. However, the four most common moves are written differently from 14 abstracts in various sequences of the 1) Introduction, Purpose, Methodology, Result (IPMR), 2) Methodology, Result, Conclusion (PMRC), 3) Introduction, Purpose, Methodology, Conclusion (IPMC), and 4) Introduction, Methodology, Result, Conclusion (IMRC) pattern. Interestingly, as described in Hyland's (2000) framework, only 8 abstracts (20 %) contain the five moves (IPMRC). This can be suggesting that the writers of RA abstracts in the corpus prefer to use four moves rather than using the five moves in the abstracts. Table 4 below shows the prefer move patterns of Chemistry English RA abstracts in the corpus.

Table 4 The Move Pattern of Chemistry RA Abstracts

Move Pattern	Number of Abstracts
Five-Move Pattern	8 (20%)
I-P-M-R-C	8 (20%)
Four-Move Pattern	23 (57.5%)
I-P-M-R	14 (35%)
P-M-R-C	5 (12.5%)
I-P-M-C	3 (7.5%)
I-M-R-C	1 (2.5%)
Three-Move Pattern	9 (22.5%)
P-M-R	5 (12.5%)
I-M-R	2 (5%)
P-M-C	1 (2.5%)
M-R-C	1 (2.5%)

According to Table 4 above, the four outstanding move pattern of I-P-M-R in the corpus of Chemistry English RA abstracts can possibly be the case of the abstracts published in the Journal of Chemical Education. In terms of frequency classification of I-P-M-R moves, Methodology (M) is obligatory (100%), Purpose (P), Result (R), and Introduction (I) are conventional (90%, 90%, 70%), severally. However, the Conclusion (C) is an optional as it is the only move found less than 50%. The findings of this analysis suggest that the examined RA abstracts appear to have a four-move structure rather than having a five-move structure. Most of the abstracts begin with an Introduction (I) move, and end the section with Result (R). This should be emphasized that as the first part of the section, the writers of the corpus create the context of the paper and inspire the topic analysis, the objective of their research, followed by the provision of design material, procedures and result of the research article abstracts with the Result (R). The following are examples of the moves identified from the corpus of this present study.

[CH4] **Introduction...** *“The use of open-source materials is growing in popularity throughout higher education.”*

Purpose... *“This Communication investigates the impact on student performance in a second-year undergraduate analytical chemistry course when an open-source textbook is assigned.”*

Methodology... *“For two separate semesters, approximately 80 students were enrolled in such a course across five sections.”*

Result... *“Both student populations had no statistically significant difference across a variety of demographic comparisons, and both achieved a nearly identical average score on the ACS Analytical Chemistry exam provided as the final cumulative test in both semesters. Thus, no detrimental effect was observed when transitioning a course to an open-source textbook, while providing the advantage of utilizing a more affordable option for students amid the overall rising cost of higher education.”*

[CH30] **Introduction...** *“A massive open online course (MOOC), Exploring Everyday Chemistry (eeDc), was delivered four times between 2017 and 2019, attracting a worldwide audience of over 15 000 learners from a wide range of backgrounds.”*

Purpose... “This 4-week course was designed to show a variety of everyday applications of organic chemistry, targeted at high school students seeking to study a chemistry-related degree at university.”

Methodology... “A mix of video, text, polls, quizzes, and practical activities was incorporated with material designed to build on high school studies, highlighting aspects of university-level teaching and research, as well as showcasing some career opportunities for chemistry graduates.”

Result... “We monitored student attitudes toward this course, finding a consistent enthusiasm for the approach and selection of material.”

Even if the results indicate variations between the real procedure and the framework chosen, however; only eight abstracts closely match the model. This can demonstrate that chemist researchers who published their RA abstracts to this publication, the Journal of Chemical Education, tended to view their work in ways that do not comply with a common framework (Saengsai et. al., 2016; Saengsai & Pramoolsook, 2017). The results on the number of move types of the Chemistry English research article abstracts published in an international journal of the present study is shown in Table 5 below.

Table 5 Move of Chemistry English RA abstracts Published in an International Journal

Move Types	Journal of Chemistry Education																												Total									
	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9	CH10	CH11	CH12	CH13	CH14	CH15	CH16	CH17	CH18	CH19	CH20	CH21	CH22	CH23	CH24	CH25	CH26	CH27	CH28										
I	/		-	/			/		/		-	/		/		/		/		/		-	/		/		/		28 (70%)									
P	/	/		-	/		/		/		/		/		/		/		/		-	/		/		/		/	36 (90%)									
M	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	40 (100%)									
R	-	/	/	/	/	/	/	/	/	-	/	/	/	/	-	/	/	/	/	/	-	/	/	/	/	/	/	/	36 (90%)									
C	/	-	/	-	-	-	-	-	-	/	-	-	/	-	/	-	-	/	-	-	/	-	-	/	/	-	/	-	20 (50%)									
Number of Move Types	4	3	4	4	4	4	4	4	3	4	4	4	4	5	4	4	4	4	3	3	3	4	5	5	4	4	3	5	5	5	3	3	4	4	5	5	4	4

*Note: I = Introduction, P = Purpose, M = Methodology, R = Result, C = Conclusion

6. Conclusion

6.1 Summary of the Study

Aside from other research article parts, writing research article abstracts in English is one of the important elements. The objective of this present study is to analyze the move of Chemistry research article abstracts published in an international journal. The abstracts were collected from the Journal of Chemical Education published during 2013-2020. To investigate the English research article abstracts in this corpus, a five-move framework suggested by Hyland (2000) was adopted. The findings showed that the abstracts were written in different sequences using a four-move structure (57.5%). However, only eight abstracts resemble the model of I-P-M-R-C. It can be inferred that, instead of conforming to the framework, the analyzed abstracts appear to employ a mismatch structure. Furthermore, the Methodology, Purpose and Result (M, P, R) move were found to be obligatory and appear in almost all the research abstracts reviewed, while the moves in the Introduction and Conclusion were found to be less than the obligatory and conventional standards. The sequence of moves employed by the

writers of Chemistry in this corpus, however, is distinct from those described. The I-P-M-R can also be the situation of Chemistry English research article abstracts published in the Journal of Chemical Education. This should be pointing out that the writers in this field often start the abstracts with the Introduction move to create the context of the paper and inspire the study to be carried out, then they point to the objective of their studies with the Purpose move. Later, they give details about the procedures of the studies with the Methodology move. Eventually they end the abstract section with the Result move to describe the main findings of the studies.

6.2 Implication for Further Studies

The findings of this analysis will serve as a guiding point for Chemistry researchers who want to compose proper English RA abstracts. However, the present study has a limitation in that it can only be applied to the abstracts published in the Journal of Chemical Education. To find out more insightful knowledge on writing the RA abstracts to get published, ones from both national and international Chemistry journals should be more investigated. In terms of pedagogical implications, understanding how to write English research article abstracts, the researchers have to know how abstracts are structured and communicate with people in their discourse communities. The analyses of related articles from more publications should be done to get more insights of how the researchers write their abstracts. Discourse based interviews should also be conducted for a better understanding on how the researchers or novice researchers organize their writing in their RA abstracts. Moreover, the analyses of the rhetorical structures and linguistic features of RA abstracts in Chemistry could help students develop a more informed knowledge of the conventions and styles of writing a research article abstract in their field. It is suggested that this can help to generate quality abstracts and impactful research. Finally, the findings of this present study are expected to support and provide beneficial results for teachers in the lesson planning when they are directing their students or to write abstracts involved in the particular discipline and other related fields.

8. References

- Amnuai, W. (2019). Analyses of Rhetorical Moves and Linguistics Realizations in Accounting Research Article Abstracts Published in International and Thai-based Journals. *SAGE Open*, 9 (1), 1-9.
- Arsyad, S. (2014). The discourse structure and linguistic features of research article. Abstracts in English by Indonesian Academics. *The Asian ESP Journal*, 12, 191-217.
- Bhatia, V. K. (1993) *Analysing genre: Language use in professional settings*, New York: Longman.
- Brett, P. (1994). A genre analysis of the results section of sociology articles. *English for Specific Purposes*, 13(1), 47-59.
- Darabad, A. M. (2016). Move analysis of research article abstracts: *A cross-disciplinary study*. *International Journal of Linguistics*, 8(2), 125-140.
- Fallahi, M. M., & Erzi, M. (2003). Genre analysis in language teaching an investigation of the structure of the discussion of language teaching-journal articles. *IJAL*, 6(1), 69-81.
- Frisby, C.N. (2017). Sacrificing Dignity for Publicity: Content Analysis of Female and Male Athletes on “Sports Illustrated” and “EPN Magazine” Covers from 2012-2016. *Advances in Journalism and Communication*, 5, 120-135.
- Holmes, R. (1997). Genre analysis, and the social sciences: An investigation of the structure of research article discussion sections in three disciplines. *English for Specific Purposes*, 16 (4), 321-337.
- Huckin, T.N. (2001). Abstracting from abstracts. In: Hewings, M. (Ed.). *Academic writing in*

- context. University of Birmingham Press, Birmingham.
- Hüttner, J., et al. (2009) ESP teacher education at the interface of theory and practice: Introducing a model of mediated corpus-based genre analysis, *System*, 37(1), 99-109.
- Hwang, C. J., Nguyen, T., & Su, T. (2017). Move analysis for scientific abstract sections: a study of nanoscience and nanotechnology research article abstracts. *World Transactions on Engineering and Technology Education*, 15(1), 19-27.
- Hyland, K. (2000) *Disciplinary discourse: Social interactions in academic writing*, Harlow, England: Longman.
- Jogthong, C. (2001). *Research article Introductions in Thai: Genre analysis of academic writing*. Unpublished doctoral dissertation, West Virginia University.
- Kamler, B., & Thomson, P. (2006) *Helping doctoral students write: Pedagogies for supervision*, New York: Routledge.
- Kanoksilapatham, B. (2005) Rhetorical structure of biochemistry research articles. *English for Specific Purposes*, 24, 269-292.
- Kanoksilapatham, B. (2009) Generic structure of research article abstracts in sciences. *Journal of English Studies*, vol. 4, 95-111.
- Kanoksilapatham, B. (2012) Structure of research article introductions in three Engineering subdisciplines, *IEEE Transactions on Professional Communication*, 55 (4), 294-309.
- Kanoksilapatham, B. (2015) Distinguishing textual features characterizing structural variation in research articles across three engineering sub-discipline corpora. *English for Specific Purposes*, 37, 74-86.
- Kosasih, F. R. (2018). A genre analysis of thesis abstracts at a state university in Banten. *Lingua Cultura*, 9 (14). Retrieved from DOI: 10.21512/lc.v12i1.1963
- Lim, J. M. H. (2006). Method sections of management research articles: A pedagogically motivated qualitative study. *English for Specific Purposes*, 25(3), 282-309.
- Martin, P. M. (2003) A genre analysis of English and Spanish research paper abstracts in experimental social sciences. *English for Specific Purposes*, 22 (1), 25-43.
- Nguyen, T.T.L. & Pramoolsook, I. (2015a). Move Analysis of Method chapters by Vietnamese TESOL master's students. *Research Scholar: An International Refereed e-Journal of Literacy Explorations*, 3(1), 14-28.
- Nwogu, K. N. (1997). The medical research paper: Structure and functions. *English for Specific Purposes*, 16 (2), 119-138.
- Oneplee, J. (2008). Genre analysis of scientific abstracts: *A comparative study of Science and Nature journals (Unpublished master's thesis)*. Mahidol University, Thailand.
- Phantama, P. (2000). *The organization and the linguistic features of the abstracts of medical journals*. Unpublished master's thesis, Faculty of Graduate Studies, Mahidol University, Thailand.
- Ren, H. & Li, Y. (2011) A comparison study on the rhetorical moves of abstracts in published research articles and master's foreign-language theses. *English Language Teaching*, 4, 162-166.
- Ross, S.M. (2010). *Introductory Statistics*, Canada: ELSEVIER.
- Saengsai, Y., Issara, M. & Suwadee, P. (2016). *Move analysis of English scientific research article abstracts published in a Thai journal*, Paper presented at International Conference on English Language Studies, Amphoe Muang, Mahasarakam: Mahasarakam University.
- Saengsai, Y. & Pramoolsook, I. (2017) Move analysis of Science and Engineering PhD abstracts: Variations between the two disciplines in a Thai university. *Burapha Journal of Humanities and Social Sciences*, 25 (47), 305-326.

- Samraj, B. (2002). Introductions in research articles: Variations across disciplines. *English for Specific Purposes*, 21(1), 1-17.
- Santos, M. B. D. (1996). The textual organization of research paper abstracts in applied linguistics. *Text*, 16, 481-499.
- Swales, J.M. (1990). *English in Academic and Research Settings*. Cambridge: Cambridge University Press.
- Swales, J. M. (2004). *Research genres: Explorations and applications*. Cambridge: Cambridge University Press.
- Swales, J. M. & Feak, C. (2004). *Academic Writing for Graduate Students: Essential tasks and skills*. Michigan: University of Michigan Press.
- Swales, J.M. & Feak, C. (2009). When there is no perfect text: Approach to the EAP practitioners’ dilemma. *Journal of English for Academic Purposes*, 8 (1), 5-13.
- Taddio, A., Pain, T., Fassos, F. F., Boon, H., Ilersich, A. L., & Einarson, T. R., et al. (1994). Quality of nonstructured and structured abstracts of original research articles in the British Medical Journal, the Canadian Medical Association Journal and the Journal of the American Medical Association. *Canadian Medical Association Journal*, 150(10), 1611-1618.
- Thompson, D. K. (1993). Arguing for experimental fact’in science: a study of research article results sections in Biochemistry. *Written Communication*, 10(1), 106-128.
- Vathanalaoha, K., & Tangkiengsirisin, S. (2018). Genre Analysis of Experiment-based Dental Research Article Abstracts: Thai and International Journal. *3L: The Southeast Asian Journal of English Language Studies*, 24(3), 1-14.
- Yang, R., & Allison, D. (2003). Research articles in applied linguistics: Moving from results to conclusions. *English for Specific Purposes*, 22 (4), 365-385.

Supplies Administration of School Administrators under the Songkhla Primary Educational Service Area Office 3

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Abstract

The purposes of this research were 1) to study the supplies administration of school administrators under the Songkhla Primary Educational Service Area Office 3, 2) to compare the supplies administration of school administrators classified by variables; gender, age, educational background, work experience and school size in 2021 academic year and 3) to study the guidelines of the supplies administration of school administrators. The research samples were 346 teachers under the Songkhla Primary Educational Service Area Office 3. The research instruments were 1) a 5-rating scale questionnaire with reliability equal to .851, and 2) The research interview. The statistics used were percentage, mean ($\bar{x}$), standard deviation (SD), t - test, F – test, least significant difference (LSD), and content analysis.

The research found that the supplies administration of school administrators under the Songkhla Primary Educational Service Area Office 3, in overall and in individual aspects were at high level. 2) The comparison of the supplies administration of school administrators under the Songkhla Primary Educational Service Area Office 3 found that the teachers with different gender, age, educational background, and work experience were not different in overall opinions, but the teachers who work in different sizes of schools, there was a statistically significant difference in opinions at the .001 level. The guidelines for supplies administration of school administrators were school administrators must adhere to Ministry of Finance on Procurement and Regulations 2017 strictly because supplies work was a sensitive job, it must be careful. School administrators should focus on managing borrowing as much as possible because borrowing was the least practical aspect.

Keywords: supplies administration; school administrators; Songkhla Primary Educational Service Area Office 3

1. Introduction

The current school administration is an administration that has to deal with the rapid changes that have resulted in many changes. In particular, Thailand has changed its management structure in many ways. (Sirinya Siriprakhon. 2018) One of the changes in the management structure of Thailand is school management structure. The announcement of the Office of the Basic Education Commission (OBEC) has set the guidelines for structural reform and the process of Thai managing education to achieve policy unity and has a variety of practices.

Moreover, there is also a decentralization of powers to educational areas and schools as shown in the provisions that “giving the ministry to manage the education both academic administration, financial management, personnel management and general management directly to the educational service area office and the schools in the education area.” The decentralization will result in schools having flexibility in management, freedom for management and strength, be able to manage education with quality, having standards, and be able to continue improve. (Ministry of Education. 2007)

In terms of decentralized administration and financial management in education, they focus on transparent and accountable management by adhering to the principles of management that focuses on results by allowing the school to seek benefits from the assets contained in the school as well as providing income from management for the benefit of the learners. (Ministry of Education. 2007) For the supplies administration, it is one of the financial managements because the supplies administration is part of helping to enhance the quality of learners in teaching and learning. It is also one of the factors that will make the schools effective. (Chalermchai Uttakan. 2019)

Administration of supplies under the Public Procurement and Supplies Administration Act, B.E. 2017 in chapter 13 of supply Administration in article 112 that says “A State agency shall put in place the control and supervision of supplies in its possession to ensure that the use and administration thereof shall generate greatest appropriateness, value for money and utility to the State agency.” and in article 113 “The pursuit of activities under section 112, including the retention, recording, disbursement, loans, inspection, maintenance and disposal of supplies, shall be in accordance with the Rule prescribed by the Minister” (Public Procurement and Supplies Administration Act. 2017)

In the administration of supplies according to the Regulation of the Ministry of Finance on Public Procurement and Supplies Administration B.E. 2560 (A.D. 2017) to define rules, procedures and guidelines for government procurement and supplies administration. The administration of supplies by government agencies shall be carried out in accordance with Chapter 9 supply administration including Part 1 Collection, Record, Requisition Part 2 Borrowing Part 3 Maintenance and Inspection and Part 4 Disposal of Supplies. (Suwat Moonmuangsaen. 2020) In addition, supplies administration will be successful in accordance with the goals by relying on resources, including personnel that are sufficient and qualified, sufficient budget to support operations and efficient management system. For this reason, supplies administration is an important mechanism to enable personnel in the organization to work on supply with maximum efficiency and benefit. If personnel lack the principles of good supplies administration, it would result in the work being complicated and wasteful and it may cause the organization to waste resources that are more than necessary. (Wassana Kao-ien. 2019)

In addition to the worker must perform the supply correctly according to the regulations in order for the work to come out with efficiency and effectiveness, school administrators are another important factor that will help promote efficiency and effectiveness of supplies operations because the school administrator is considered as the person who has been appointed as the supervisor. School administrator can control within the school in accordance with the objectives of educational management. They can use the process to influence other workers in the school to enable them to achieve their goals. (Pong-isra Prayadsap. 2014)

Songkhla Primary Educational Service Area Office 3 is the district office that oversees and manages 193 schools under the supervision of 5 districts, consisting of Nathawi District, Chana District, Thepha District, Saba Yoi District. and Sadao District. All Schools under Songkhla Primary Educational Service Area Office 3 are aware of the importance of supplies administration by implementing the Regulation of the Ministry of Finance on Public Procurement and Supplies Administration B.E. 2560 (A.D. 2017). The process is carried out in four parts: Part 1 Collection, Record, Requisition Part 2 Borrowing Part 3 Maintenance and Inspection and Part 4 Disposal of Supplies. In the management and operations of the supplies, the school which is directed by the administrator is directly responsible for the procurement. The problems encountered from the administration of school administrators in the school supplies administration under the Songkhla Primary Educational Service Area Office 3 consisted of 3 aspects as follows: 1. In terms of personnel management, it was found that most of the personnel responsible for supplies work did not go through direct education in the field related to supplies management or some personnel have principles and theories but still lacking experience in the field of operation. In addition, the operations of the personnel were not continuous. This was because personnel were frequently relocating their workplaces or changing positions, causing a lack of continuity in supply operations. 2. In terms of financial management, it was found that budget allocations were usually allocated at the end of the fiscal year. This caused the use of the budget was not worth it and the operation was short-lived. The operation was not within the stipulated time. 3. In terms of management, it was found that many schools under the Songkhla Primary Educational Service Area Office 3 had delayed budget disbursement. There was a delay in procurement. It also did not focus on expediting budget disbursement as well. (Songkhla Primary Educational Service Area Office 3. 2020) In this regard, the school administrators must be the people who closely supervises for the school supplies because the management of good schools will help the school plans to meet the goals set.

Therefore, the researcher, as a worker in the Songkhla Primary Educational Service Area Office 3, which is responsible for the supplies administration, has focused on the supplies management process in order to use the research results as a guideline for the operation in accordance with the method that is accurate, transparent, honest, fair and for the maximum benefit to the organization. In addition, the results of this research are beneficial to officers or those working on supplies which will be aware and jointly find a way to manage the supply with the school administrators so that the operations of the supply will be carried out with speed and efficiency and they can apply the guidelines from the research to support the quality of education further.

2. Research Objectives

2.1 To study the supplies administration of the school administrators under the Songkhla Primary Educational Service Area Office 3

2.2 To compare the supplies administration of the school administrators under the Songkhla Primary Educational Service Area Office 3, classified by gender, age, educational background, work experience and the size of the school.

2.3 To study the guidelines of the supplies administration of the school administrators under the Songkhla Primary Educational Service Area Office 3

3. Literature Review

3.1 Definition of Supplies Administration

Supplies administration is a process of acquiring items by the procurement to support the organization to achieve its goals effectively. (Wassana Kaoian, 2019) The supplies must be suitable quality, clarity and transparency. The procurement and supplies administration must be done openly, provide opportunities for fair competition and disclosure of procurement information. (Suwat Moonmuangsaen, 2020)

3.2 Supplies Administration

3.2.1 Collection, Record, and Requisition

Collection and record mean systematic collection of supplies with accounting or control registration. (Yaowarak Chatwilai, 2018) The collection helps to keep the supplies safe and complete (Nattachai Kaewcharoenseethong, 2020) As for requisition, it means that the supplies are withdrawn from the school's procurement, the head of division must use the supplies bill to record in the account to control the requisition successfully. (Suwat Moonmuangsaen, 2020)

3.2.2 Borrowing

Borrowing means the use of materials in various cases by having written records of borrowing and entering into the borrowing control account accurately. (Rattaya Boonpleng, 2017) the return date of borrowing must be clearly set. (Pojanee Anusri et. Al, 2018)

3.2.3 Maintenance and Inspection

Maintenance means the process of keeping the supplies in good and usable condition by preparing a manual on the use and maintenance of the supplies. (Ratchadaporn Bunta, 2018) Inspection means checking the balance and availability of supplies. The audit committee has been appointed in order to comply with the regulations that have been set. (Yaowarak Chatwilai, 2018)

3.2.4 Disposal of Supplies

Disposal of Supplies mean bringing supplies that are not useful to that organization to distribute in various forms to reduce the existence of supplies in the organization. (Worathat Watchewaneopakorn 2020) Disposal of supplies will occur after verification. Any supplies is no longer necessary for the organization have to consider ordering to proceed with one of the following methods: sale, exchange, transfer, transformation, disposition, paying out of an account or register. (Suwat Moonmuangsaen 2020)

3.3 Research Related

Thanomsin Thavorn (2011) studied the problem of school supplies management under the Buriram Primary Educational Service Area Office 2 found that the opinion level of the school administrator and the head of procurement officer about school supplies management in overall and each aspect were at moderate. When comparing the level of opinion classified by status, position and experience in both overall and each aspect, there was no difference. When comparing the opinion levels classified by the size of the different schools, it was found that the overall school supplies management was not different.

Sudjai Inthosorn (2012) studied the opinions of the procurement officers on the problems of supplies management at Ramkhamhaeng University. It was found that the opinions of the procurement officers towards the overall supplies management were at a moderate level. When considering each aspect, it was found that the supplies staff had the highest average of supplies management problems.

Rattiya Boonpleng (2017) studied the opinions of teachers towards school supplies management in the Gratiem – Sakad network under the Surin Primary Educational Service Area Office 3, it was found that the teachers' opinions towards the school supplies management in overall and every aspect were at a high level. As for the results of the comparison of the opinions of teachers with different genders and experiences in supplies operations, it was found that the overall and individual results had no different opinions.

Woranuch Ni Chamnan et. al (2017) studied the conditions and problems of school supplies and asset management under the Loei Primary Educational Service Area Office 2, found that the school supplies and asset management conditions in overall was at high level. When considering each aspect, it was found that every aspect was at a high level.

Srisuda Chob-ngam (2020) studied the effectiveness of the school administrators' supplies management in Phatthalung Primary Educational Service Area office 2 found that the effectiveness of supplies management of school administrators under the Phatthalung Primary Educational Service Area Office 2 in overall and each aspects was at a high level. When comparing the effectiveness of supplies management of School administrators under the Phatthalung Primary Educational Service Area Office 2, it was found that teachers with different gender, age, educational background, work experience were not different in overall. When considering each aspect, it was found that teachers working in different school size had different opinions on the effectiveness of school administrators' supplies management with statistical significance at the .05 level.

Piyachat Changwatsuk et. al (2021) studied the opinions of teachers towards the management of supplies according to the principles of good governance of school administrators in the network to improve the quality of education in the primary education in Ratchaburi, Region 1 found that teachers' opinions towards the management of supplies according to the principles of good governance in overall and each aspect were at a high level. When compared according to different educational levels and experiences, it found that the teachers had no different opinions on the management of supplies according to the principles of good governance.

Sukanya Phimpha (2021) studied the management of supplies of schools in the network of Dome Pradit Schools, Nam Yuen District, Ubon Ratchathani Province under the Office of Ubon Ratchathani Elementary Education Area 5 found that the management of supplies of schools in the network group in overall and each aspect was at a high level.

4. Research Methodology

4.1 Population and Sample

The population consisted of 3,337 teachers of the schools in Songkhla Primary Educational Service Area Office 3 for the academic year 2021 (Songkhla Primary Educational Service Area Office 3. 2020). The sample consisted of 346 teachers of the schools in Songkhla Primary

Educational Service Area Office 3. Determine the sample size based on the ready-made table of Krejcie and Morgan and stratified random sampling by school size, then simple random sampling by lottery as in Table 1.

Table 1 Population and Sample Classified by School Size

School Size	Number of School	Population	Sample
Small	73	745	77
Medium	113	2,114	219
Big	7	478	50
Total	193	3,337	346

4.2 Research Variables and Research Scope

Independent Variables in this study are gender, age, educational background and work experience and school size. Dependent variables is supplies administration under Songkhla Primary Educational Service Area Office 3 based on the Regulation of the Ministry of Finance on Public Procurement and Supplies Administration B.E. 2560 (A.D. 2017) Chapter 9 supply administration consisting of;

- 4.2.1 Collection, Record, Requisition
- 4.2.2 Borrowing
- 4.2.3 Maintenance and Inspection
- 4.2.4 Disposal of Supplies

4.3 Data Collection Instrument

4.3.1 Questionnaire about supplies administration of school administrators five rating scale by Likert's. The reliability of questionnaires is .851. A total of 346 questionnaires were sent, and 346 were returned (100 %).

The problem from COVID-19 pandemic effects to the data collection in terms of sending questionnaires because we do not directly face the person. Sending online questionnaires may sometimes not receive a response. The researcher must use personal connection to collect them back.

4.3.2 Interview form on supplies administration of school administrators by interviewing 9 school administrators under Songkhla Primary Educational Service Area Office 3 separate by school size; small, medium, and big. The researcher used online platform to collect the information.

4.4 Data Analysis

The data analysis was separate into 2 parts;

The first part was a questionnaire. For this instrument, the researcher analyzed by using percentage, means, standard deviation, t-test, and one-way ANOVA. Analyzing the information on the supplies administration, which is an estimation scale model by finding the mean and standard deviation (S.D.) and compare the results with the criteria interpretation of the mean (Boonchom Srisaat. 2013) by dividing the scores according to the range as follows:

- 4.51-5.00 means being at the highest level
- 3.51-4.50 means being at a high level
- 2.51-3.50 means being at a moderate level
- 1.51-2.50 means being at a low level
- 1.00-1.50 means being at the lowest level.

The second part was interviewing. For this part, the researcher used online platform; Zoom, Google Meet, Line, Cisco Webex Meeting to collect the information and used the information to analyze the content and presented it as an essay.

5. Results

5.1 Analysis of supply administration of school administrators under Songkhla Primary Educational Service Area Office 3

Table 2 Average & Standard deviation of supply administration of the school administrators under Songkhla Primary Educational Service Area Office 3 in both overall and individual aspects.

Number	Supply Administration of School Administrators	n = 346		Level
		$\bar{X}$	S.D.	
1	Collection, Record, and Requisition	4.0726	0.3498	High
2	Borrowing	4.0458	0.3712	High
3	Maintenance and Inspection	4.0719	0.3658	High
4	Disposal of Supplies	4.0873	0.3481	High
Total		4.0715	0.3276	High

Table 2 found that overall was at a high level. When considering each part, it was found that all parts were at a high level. Disposal of supplies was the highest average, followed by collection, record and requisition, and maintenance and inspection respectively. Borrowing was the lowest average.

5.2 The comparison of the supplies administration classified by gender, age, educational background, work experience, and size of the school, the research results were summarized as follows;

5.2.1 The comparison results of the supplies administration classified by gender found that teachers of different genders, there were no different opinions in overall but when considering each aspect, it was found that the distribution of supplies, there was a statistically significant difference in opinion at the .01 level because the distribution of supplies was complicated. The distribution of supplies required collaboration with various agencies. This work required delicacy and prudence. This was why female teachers were more proficient in this field than male teachers.

5.2.2 The comparison results of the supplies administration classified by age found that teachers of different ages were no different opinions in overall and in each aspect.

5.2.3 The comparison results of the supplies administration classified by educational background found that teachers with different educational background were no different opinions in overall and in each aspect.

5.2.4 The comparison results of the supplies administration classified by work experience found that teachers with different work experience were no different opinions in overall and in each aspect.

5.2.5 The comparison results of the supplies administration classified by school size found that teachers with working in different size of school were different opinions in overall, there was a statistically significant difference in opinion at the .001 level. When considering each aspect, it was found that all aspects were significantly different at the .001 level. It shows that there were 2 different pairs. Therefore, pair differences were tested using the LSD (Least Significant Difference) mean comparison method. It was found that 1) the mean opinion level of teachers working in small-sized school compared with teachers working in big-sized school, had a statistically significant difference in opinions at the .001 level. 2) the mean opinion level of teachers working in medium-sized school compared with teachers working in big-sized school, had a statistically significant difference in opinions at the .001 level.

5.3 The guidelines for the administration of the school administrators from the research found that the big-sized schools have more supplies operations than medium-sized and small-sized schools. However, small and medium-sized schools can adapt and apply the guidelines for the administration of big-sized schools’ supplies. Whether it’s distributing supply for many personnel to be more responsible and involved, or it will be asking for budget support from external organization, both government organization and private organization. In addition, the school can organize various activities to earn money for the school to make the supplies administration more effective.

6. Discussion and Conclusion

6.1 The findings of this study can be discussed as follows; 1) The study of the supplies administration found that overall and each part was at a high level. When considering each part, it was found that all parts were at a high level. Disposal of supplies was the highest average, followed by collection, record, and requisition, respectively. Borrowing was the lowest average. It was consistent with the research results of Sukanya Pimpa (2021) studied the inventory and asset management in education network group of domepradit, Nam Yuen district, UbonRatchathani Province under the UbonRatchathani Primary Educational Service Area office 5. The results of the study found that the management of supplies and assets of schools in the network in overall and each aspect was at a high level.

6.2 The supplies administration classified by gender, age, educational background, work experience, and school size as follows;

6.2.1 Classified by gender, found that teachers of different genders had opinion on the supplies administration overall was no different. This is because in the opinions of female and male teachers, they have the same view on the administration of the school administrators’ supplies because the present society is a globalized society. It is not defined which gender is superior to which gender. All genders are equal. As a result, teachers with different genders, there are opinions on the supplies administration of the school administrators was no difference. The findings of the study are in parallel with Rattiya Boonpleng (2017), studied the opinions of teachers towards school supplies management, in the Kratiem Study Management Network – Sakaad Study Management Network under the Surin Primary Educational Service Area Office 3. It was found that teachers with different genders, there were no different opinions on the supply administration of the school administrators.

When considering each aspect, it was found that teachers of different genders had significantly different opinions on supply administration of school administrators regarding disposal of supplies at the .01 level. This is because the distribution of supplies is complicated. They have to work with various institutions. School must prepare sufficient documents for disposal of supplies. This is why female teachers are more proficient in this field than male teachers. The findings of the study are in parallel with Sudjai Inthosorn (2012) studied the opinions of procurement officers on supply management problems at Ramkhamhaeng University. It was found that the comparison of personal status of procurement officers classified by gender found that these factors affect in supply management differently.

6.2.2 Classified by age, it found that teachers with different ages had opinion on the supplies administration overall and each aspect no different. This is because age is not a factor affecting the expression of opinions on the supplies administration because in the administration of supplies, there will be the Ministry of Finance Regulations on Procurement and Public Procurement Management, B.E. 2560 (2017) as a guideline for the operation. All workers must adhere to these regulations in their work regardless of their age. This is consistent with the research of Srisuda Chopngam (2020) studied the effectiveness of supplies management of school administrators under Phatthalung Primary Educational Service Area office 2 found that teachers with different ages, there was no different opinions on the supply administration of the school administrators.

6.2.3 Classified by educational background, it found that teachers with different educational background having perspective on the supplies administration overall and each aspect no different. This is because in the supplies administration of school, the person in charge must be a teacher. The major fields that each teacher graduated are majors related to teaching. None of the teachers graduated directly from the supply department. As a result, all teachers have to start learning about new supply all the same. As a result, teachers with different educational background, there are opinions on the supplies administration of the school administrators was no difference. This is consistent with the research of Piyachat Changwatsuk et al. (2021) studies the teachers’ opinions towards the management of supplies according to the principles of good governance of the administrators of the schools in the network to improve the quality of education, Network 2, Ratchaburi Primary Educational Service Area Office 1, found that teachers with different levels of education, there were no different opinions on the supply management according to the principles of good governance.

6.2.4 Classified by work experience, it was found that teachers with different work experience having perspective on the supply administration overall and each aspect no different. This is because teachers who perform supplies duties are encouraged, support and self-development by attending meetings, training sessions, academic seminars and there is also always exchange the knowledge with various networks. As a result, teachers with different work experience, there are opinions on the supplies administration of the school administrators was no difference. This is consistent with the research of Thanomsin Thaworn (2011) studies problems in the supply administration under the Buriram Primary Education Service Area Office 2 found that teachers with different work experience, there was no different opinions on the supply administration of the school administrators.

6.2.5 Classified by school size, it was found that teachers who work in different school sizes, there are different opinions on supplies administration overall and in each aspect. This is because the supply administration in each school requires a budget to operate. The different sizes of schools affect budget allocation, it makes big-sizes school are allocated more budget than medium and small-sized schools. This is consistent with the research of Woranuch Nichamnan (2017) studies conditions and problems in the management of supplies and assets of schools under the Loei Primary

Educational Service Area Office 2 were found that conditions and problems in the management of supplies of teachers’ opinion with working in different size of school, there was different opinions.

6.3 The guidelines for the management of the school administrators from the research found that the big-sized schools have more supplies operations than medium-sized and small-sized schools. However, small and medium-sized schools can adapt and apply the guidelines for the administration of big-sized schools’ supplies. This is consistent with the research of Ratchadaporn Boonta (2018) studies problems and guidelines for the development of supplies management of secondary schools in the group of Saha Campus, Phanom Sarakham School Secondary Education Service Area Office 6 were found that school administrator should encourage teachers working in supplies to prepare manuals, forms of the procurement, distributing work to other personnel to take responsibility, and giving opportunity the teachers to admit to study the management of supply in various schools.

7. Research Implications

7.1 Implications for utilizing the research results

- 7.1.1 School administrators should encourage and support staff working on supplies to have knowledge, understanding of supply work by organizing training in every semester at least once per semester to ensure the standardization of supplies operations
- 7.1.2 School administrators should study and understand about the administration of supplies in the aspect of borrowing, especially in the matter of managing to fix and repair the supply to maintain its original condition before returning it if there is damage to the supply during borrowing.
- 7.1.3 The administrators of small and medium-sized schools should study or visit the field of supply administration in large schools in order to use them as a guideline for more efficient administration of school supplies.

7.2 Implications for further research

- 7.2.1 They should study on the factors affecting the supplies administration of the school administrators under the Songkhla Primary Educational Service Area Office 3
- 7.2.2 They should study on the problems of supplies administration of school administrators under the Songkhla Primary Educational Service Area Office 3.

8. References

- Boonchom Srisaard. (2013). *Basic research Revised edition*. Bangkok, Suwiriyan.
- Chalermchai Uttakan. (2019). Factors of parcel management affecting the efficiency of parcel management of academic parcels in Mahasarakham University. *Journal of Accounting and Management Mahasarakham University*, 12 (1), 56.
- Ministry of Education. (2007). *National Education Act, B.E. 2542, Amended (No. 3), B.E. 2553*. Bangkok, Prikwan Graffice.
- Ministry of Finance on Public Procurement and Supplies Administration B.E. 2560 (A.D. 2017). (2017, 23 August). *Government Gazette*, volume 134, chapter 210 d, pp 65 - 70.

- Nattachai Kaewcharoenthongthong. (2020). Studying the condition and problems of supplies management and development guidelines for supplies of the operator in primary care Suphanburi Province. *Boromarajonani College of Nursing Journal*, 3 (2), 80.
- Piyachat Changwatsuk and Urai Sutthiyam. (2021). Opinions of teachers towards the management of supplies according to the principles of good governance of educational institution administrators in the network to improve the quality of education, Network 2, Ratchaburi Primary Educational Service Area Office 1. *Silpakorn Education Research Journal*, 13 (1), 389.
- Pong-isra Prayadsap. (2014). *The Role of Educational Administrators Affecting the Development of Learners' Characteristics to Become an International Standard School under the Secondary Education Service Area 4, Pathum Thani Province* (Thesis, Master of Education). Rajamangala University of Technology Thanyaburi, Pathum- Thani.
- Potjanee Anusri, Somruay Apichatabutphong, Sawai Sirithongthavorn. (2018). Improving the parcel control process by a new process design method. *Academic Journal of the Pacific Institute of Management Science*, 4 (2), 212-213.
- Public Procurement and Supplies Administration Act, B.E. 2560. (2017, 23 February). *Government Gazette*, volume 134, chapter 24 a, page 47 - 48.
- Ratchadaporn Boonta. (2018). *Problems and guidelines for the development of school supplies management of secondary school in the group of Saha Campus, Phanom Sarakham under the Office of Secondary Education Service Area 6* (Thesis, Master of Education). Burapha University.
- Rattiya Boonpleng. (2017). *Teachers' opinions on school supplies management in the Kratiem- Sakad Kaona Education Management Network under the Surin Primary Education Service Area Office 3* (independent research, Master of Education). Ramkhamhaeng University, Bangkok.
- Sirinya Siriprakhon. (2018). *Administration of Educational Institutions Using the Principles of Good Governance of Ban Map Toei School under the Office of Primary Educational Service Area, Rayong 1* (independent research Master of Education). Krirk University, Rayong.
- Songkhla Primary Educational Service Area Office 3. (2020). *Action plan project to enhance morality, ethics and good governance in schools of Songkhla Primary Educational Service Area Office 3 for the fiscal year 2020*. Songkhla, Songkhla3.
- Srisuda Chopngam. (2020). *The effectiveness of the management of the supply under the Office of Phatthalung Primary Education Area 2* (independent research, Master of Education). Thaksin University, Phatthalung.
- Sudjai Inthosorn. (2012). *Opinions of supply officers on parcel management problems of Ramkhamhaeng University* (Research report, Master of Business Administration). Ramkhamhaeng University, Bangkok.
- Sukanya Pimpa. (2021). Management of supplies and assets of schools in the Dome Pradit School Network, Nam Yuen District, Ubon Ratchathani Province Under the Office of

- Ubon Ratchathani Primary Educational Service Area 5. *Journal of Innovation in Education and Research*, 5 (1), 120.
- Suwat Moonmuengsaen. (2020). *Conditions, Problems and Guidelines for Inventory Management in Secondary Schools under the 11th Inspectorate Area* (Thesis, Master of Education). Sakon Nakhon Rajabhat University, Sakon Nakhon.
- Thanomsin Thaworn. (2011). *Problems in the management of school supplies under the Buriram Primary Educational Service Area Office 2* (Thesis, Master of Education). Buriram Rajabhat University, Buriram.
- Wassana Kao-ien. (2019). *Guidelines for improving the performance of school supplies officers under the Office of Secondary Education Service Area 3, Phra Nakhon Si Ayutthaya Province* (Thesis, Master of Education). Phranakhon Si Ayutthaya Rajabhat University, Phranakhon Si Ayutthaya.
- Woranuch Nichamnan. (2017). Conditions and problems in the management of supplies and assets of schools under the Loei Primary Educational Service Area Office 2. *Graduate Studies Journal Valaya Alongkorn Rajabhat University under the royal patronage*, 11 (3), 180.
- Woratat Watcheenopakorn. (2020). Development of a database system related to supplies College of Social Communication Innovation, Srinakharinwirot University. *Academic Journal of Social Communication Innovation*, 8 (2), 155.
- Yaowarak Chatwilai. (2018). The Efficiency of Inventory Management of Sakon Nakhon Provincial Administrative Organization. *Graduate Studies Journal*, 15 (71), 55.

Roles of School Administrators in Promoting Students' Disciplines in Schools of Songkhla Primary Educational Service Area 3

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Abstract

This research aimed to (1) study roles of school administrators in promoting students' disciplines in schools of Songkhla Primary Educational Service Area 3, (2) compare roles of school administrators in promoting students' disciplines in schools of Songkhla Primary Educational Service Area 3 based on their different background such as age, sex, work experience, and size of school, and (3) study guidelines and proposals relating to roles of school administrators in promoting students' disciplines in schools of Songkhla Primary Educational Service Area 3. Krejcie & Morgan Table was used to determine the sample size in this study. 346 sample were randomly selected by the use of stratified random sampling and the simple random sampling by draw respectively. There were two research instruments which were (1) The 5-point-rating-scale questionnaire with .989 reliability, and (2) the interview form with questions relating to the resource management of school administrators in schools of Songkhla Primary Educational Service Area 3. Percentages, mean, standard deviation, t-test and One-Way ANOVA were used to analyze quantitative data.

The results revealed that (1) there was a high level of roles of school administrators in promoting students' disciplines in schools of Songkhla Primary Educational Service Area 3 in the overall aspect and dimensions. When study the level in each dimension of their roles, it was found that there were high levels of their roles in all dimensions., (2) There were significant differences among roles of school administrators in promoting students' disciplines in schools of Songkhla Primary Educational Service Area 3 who had different background such as age, sex, work experience, and size of school at .05 significant level. 3) the guidelines and recommendations of school administrators in promoting student's disciplines revealed that most school administrators emphasized on giving parents and community the opportunity to take part in determining school's formulation and measurement. The emphasis is also placed on promoting students' disciplines in diligence and collective responsibility in order to bring about more good people rather than the intelligent ones in the society.

Keywords: roles of school administrators, students' disciplines, Songkhla Primary Educational Service Area 3

1. Introduction

The Constitution of the Kingdom of Thailand (2017) in Chapter 5: Duties of the State Section 54 states that the state must ensure that all children receive an education for twelve years. From

pre-school to compulsory education with quality free of charge, undertake to ensure that young children receive care and development prior to admission to education under paragraph one; to develop the body, mind, discipline, emotions, society and intellect according to age. By promoting and encouraging local government organizations and the private sector to participate in the operation, the state must ensure that people receive the education they need in various systems, as well as lifelong learning and cooperation between states local government organization and the private sector in educational management at all levels. The state is responsible for implementing, supervising, promoting and supporting such educational management to ensure the international quality standards. In this regard, according to the law on national education, which must at least contain provisions relating to the preparation of national education plans and the implementation in accordance with the National Education Plan in which all education must aim to develop learners to be good, disciplined, proud of the nation, able to specialize according to their aptitude as well as responsible to the family, community, society and the nation. In addition, the 12th National Economic and Social Development Plan (2017) recognizes the importance of discipline. Therefore, the focus has been shifted to develop the quality of people in Thai society to be a person who has morals, ethics, discipline, public mind and knowledge including having to be ready physically, intellectually, emotionally, and morally and be able to keep up with the changes in order to lead to a knowledge-based society.

The situations that regularly occur in the country nowadays can be seen that most of the main reasons derived from the unwanted behavior of the people in the nation committing crimes without fear of civil law and many other violations. All are unwanted behaviors or lack of discipline of people in the nation itself. It can be seen that lack of discipline is an important problem that causes negative effects and affects individuals, organizations, society and the nation a lot.

Discipline is very important and necessary. From the above problems, it can be seen that the discipline is a part of the tool in driving the country considerably. Whether the country will be good or bad depends on the discipline of the people of the nation. Therefore, the management of education in educational institutions must realize and give importance to instilling and creating discipline in the learners which is in line with the National Education Act (2542). The purpose and principles in section 6 have been set forth that educational management must be for the development of Thai people to be complete human beings in body, mind, intelligence, and morality, ethics, discipline in life and able to live with others happily.

Strengthening discipline is necessary to cultivate from a young age as it is the age of learning. Children at this age need to be given accurate and good input. It is very important to create discipline for people because discipline will help raise the quality of life of the country in a good way. Educational institutions play a very important role in enhancing discipline. When discipline is established, the youth will grow up to be a complete person. Education Council Secretariat Ministry of Education (2019) in line with the concept of Buppha Hanphayung (2011) stated that creating prosperity for the nation discipline must be strengthened in the past life, and good discipline should begin at an early age. For this reason, the Secretariat of the Education Council, Ministry of Education have seen the importance of enhancing student discipline in basic education institutions. Therefore, guidelines for enhancing student discipline in educational institutions at the level of basic education have been established. The elements/indicators of the discipline have been divided into 4 aspects: School Compliance in

terms of putting oneself in the right time and respect for the rights of others Education Council Secretariat Ministry of Education (2019).

According to the Core Curriculum of Basic Education B.E. 2551 (2008), its aim and ultimate goal is to develop learners to be good, intelligent, happy, and have a potential for further education and occupation. After completing compulsory basic education, learners must have morals, ethics, desirable values, appreciations of one's self, discipline, practice according to the principles of Buddhism or their religion philosophy of the sufficiency economy. In the development of learners, according to the core curriculum of basic education, has defined 8 desirable characteristics in order to be able to live happily with others in society both as a Thai citizen and a citizen of the world Ministry of Education (2008)

The Office of Songkhla Primary Educational Service Area 3 has 193 schools under its affiliation, comprising Chana District, 50 schools, Nathawee District, 30 schools, Thepha District, 47 schools, Saba Yoi District, 31 schools, and Sadao District, 35 schools. Number of 3,337 students and 38,437 students, who have set the vision that Education development direction of Songkhla NEDA Region 3 for fiscal year 2021. The Office of Songkhla Primary Educational Service Area 3 is a model of management that aims for quality on the basis of multicultural society thoroughly and equally adhere to good governance. Carrying on the royal aspirations according to the philosophy of sufficiency economy and has a mission 1. Organize education to strengthen the stability of the nation, religion, monarchy Cultivate morals, ethics and happy coexistence in a multicultural society. 2. Promote and develop learners to have quality towards academic excellence and increase competitiveness. 3. Promote, support and develop learners to be learning persons have desirable characteristics and skills needed in the 21st century. 4. Develop executives, teachers and educational personnel to be professional 5. Create opportunities, equality; reduce inequality to ensure that the school-age population receives universal, equal and quality educational services. 6. Provide education to improve the quality of life that is environmentally friendly. Adhere to Sufficiency Economy Philosophy and Goals Sustainable Development Goals: SDGs. 7. Develop an education management system adhere to good governance by using consistent innovations to drive the development towards Thailand 4.0 and has one of its main goals that is, learners must have knowledge, morals, ethics, desirable characteristics according to the basic education curriculum and have the ability to compete.

The people who play an important role in enhancing the effective discipline of students in the school are teachers and school administrators. As teachers and school administrators play an important role as leaders in developing and promoting learners in various fields in educational institutions, they must instill student discipline. Raising awareness among students about discipline organize learning activities choose learning materials as well as the use of appropriate technology to enhance and develop learners. It is measured and evaluated using a variety of methods. It is a process that will serve as a base for students to develop in other areas as well. Leading to the ultimate goal is for students to grow up to be qualified personnel of the nation in the future. As the concept of Puangphaka Saeton (2011) indicated that discipline is an important factor that results in a country's development in a good way. If the nation has people who are undisciplined and no responsibility, there will be a crisis and the country will eventually fail. Discipline is an important thing that should be cultivated since childhood. Parents and teachers are closely related and have an important influence on the cultivation and

development of children's discipline. Therefore, the strengthening of student discipline in the school's educational setting is a direct role and responsibility of teachers and administrators.

In the situation such as that at Bannathawee School where the researcher works, the researcher is responsible for conducting student affairs directly. It is primarily responsible for overseeing the student council, which represents students who pass through the democratic election process in schools. The student committee consists of the student council president, student Vice President, Secretary and Subcommittee. There are a number of responsibilities and promoting student discipline is one of the duties of the student council. All student committees must assist teachers in promoting student discipline in schools and taking care of fellow students in the school at all levels. Since the morning activities start from walking into the school, lining up for activities in the morning in front of the flagpole, entering the classroom, eating lunch, brushing teeth in the afternoon and lining up to go home after school from past operations. It was found that what caused the students' problems in schools the most was their lack of discipline. From the overall assessment of the teachers involved together with the student committees, it was found that most of the students in the school still lacked discipline in many aspects, from little things, such as being late to class and school, illegal dress all the way to eating and not keeping the containers neatly. In addition, the self-assessment report (SAR) results of Bannathawee School indicated that in Standard 1, Quality of Learners, Issue 2, Desirable Characteristics of Learners, the evaluation result was 95.52%. When compiling the points that should be developed, it was found that activities that promote discipline and awareness of learners need to be developed. The researcher realized the importance of the cause of the problem that occurred. Combined with the past period, the researcher own self had experience traveling and doing activities at various schools under the Songkhla Educational Service Area Office, District 3 ranging from small, medium, large and extra large ones and found out that the problems has been aroused to all, not only at Bannathawee School. Therefore, the researcher noticed the difference in students especially concerning the matter of discipline. From the researcher's observation, the smaller the school, the more students are aware of discipline.

From the background and importance of the aforementioned problem, the researcher therefore wanted to know the process for enhancing student discipline in schools under the Songkhla Primary Educational Service Area Office 3, where the person who plays an important role in driving the process of enhancing student discipline is the administrator. Therefore, the researcher conducted a research to investigate the role of administrators in enhancing student discipline in educational institutions under the Office of Songkhla Elementary Education Service Area 3, in order to use the results of the research to plan, develop and improve the process of enhancing student discipline in educational institutions.

2. Research Objectives

2.1 To examine the roles of school administrators in promoting students' disciplines in schools of Songkhla Primary Educational Service Area 3.

2.2 To compare the roles of school administrators in promoting students' disciplines in schools of Songkhla Primary Educational Service Area 3, classified by gender, age, work experience and the size of the school.

2.3 To investigate the guidelines of the roles of school administrators in promoting students' disciplines in schools of Songkhla Primary Educational Service Area 3.

3. Literature Review

3.1 Definition of discipline

Discipline is to compliance with the rules, social regulations which is used as a guideline to control their behavior to live in a society with peace. (Office of the Basic Education Commission Ministry of Education, 2020) Standards to control the actions of individuals (Ausubel, 1972)

3.2 Definition of Roles of School Administrators

Roles of school administrators is the role of administrators in enhancing student discipline in educational institutions. According to the summary for administrators in enhancing student discipline in educational institutions basic education level of the Office of the Secretariat of the Education Council, Ministry of Education (2018), which is classified into 7 sections.

3.2.1 Implementation of the plan to strengthen student discipline in educational institutions

The administrators make a written plan to strengthen student discipline and proceed according to the plans that have been laid or prepared. When there is an error or suggestion, development and improvement must be carried out. Consultation was held with members of the school and the board of directors of the school. Also, there must be a regular assessment of student discipline enhancement plans.

3.2.2 Supervising and enhancing student discipline in educational institutions

Administrators are required to regularly supervise, monitor, rules, regulations and actions to strengthen student discipline. The results are recorded and the responsible persons report the results. During the follow-up, if the management notices that there is a problem, it must be corrected immediately. And it is important that all members understand the school's discipline and disciplinary policies. It has been informed of the right to play a role in enhancing student discipline in educational institutions.

3.2.3 In terms of promoting and enhancing student discipline in educational institutions

The management encourages parents those who are in charge or involved have access to information, information, news and documents related to policies, regulations and school regulations. It must make the learners feel valued and have a good attitude towards enhancing student discipline. Giving importance to and implementing the process of enhancing student discipline with a more complete quality and being a role model for discipline. Let teachers at all levels create plans to strengthen student discipline. It is integrated with classroom courses and is regularly assessed. By using the assessment results in each class to formulate strategies to improve the development of student discipline. At the classroom level, a student committee must be established to participate in the supervision, supervision and guidance of student discipline.

3.2.4 In the aspect of providing opportunities and participation of students in enhancing student discipline in educational institutions

Soontree Daengkaew et al. (2018) studied the condition and problems of student affairs administration to prevent drug problems at Rajapranukroh School 5 in the southern border provinces. There were different opinions on the condition and problems of student affairs administration to prevent drug problems. The study found that the administration of student affairs to prevent drug problems in general and in each aspect was at a high level with the management of community support systems and work networks as much as possible. However, problems in student affairs administration to prevent drug problems in general and in each aspect were at a low level. The administration of the drug prevention and problem solving system had the highest average. The guidelines for student affairs administration to prevent drug problems were that a committee should be established to monitor, monitor and supervise the operations in a systematic way. The results should be reported to find a way to prevent drug problems in schools and should be penalties on target students.

Uraivan Dechasit (2015) studied the study of the role of educational institution administrators in promoting morality student ethics under the Nakhon Si Thammarat Primary Educational Service Area Office 2, classified by work experience variables. It was found that the overall and each aspect were significantly different at the .05 level. The results of the comparison of the role of school administrators in promoting morality student ethics at different types of educational institutions, different work experiences. There are different roles in promoting morality and ethics of students in educational institutions.

Suthanyachanok Supyoi (2014) studied the role of educational institution administrators in moral development administration ethics in basic educational institutions Under the Office of Kanchanaburi Elementary Education Service Area 2. It was found that the results of the comparison of the roles of educational institution administrators in the administration of morality and ethics in basic educational institutions classified by school size were different. For each aspect, there was a high level of practice in every aspect. Sorted in order, the average is the aspect of student activities, environment management, school administration, curriculum management, supervision and teaching and the evaluation aspect.

4. Research Methodology

4.1 Population and Sample

The population consisted of 3,337 teachers of the schools in Songkhla Primary Educational Service Area Office 3 for the academic year 2021. The sample consisted of 346 teachers of the schools in Songkhla Primary Educational Service Area Office 3. Determine the sample size based on the ready-made table of Krejcie and Morgan and stratified random sampling by school size, then simple random sampling by lottery.

4.2 Research Variables and Research Scope

Independent Variables in this study are gender, age, work experience and school size. Dependent variables is supplies administration under Songkhla Primary Educational Service Area Office 3 based on the principle of enhancing student discipline in basic education institutions Education Council Secretariat Ministry of Education (2018), classified into 7 areas as follows:

4.2.1 Implementation of the plan to strengthen student discipline in educational institutions

- 4.2.2 Supervising and enhancing student discipline in educational institutions
- 4.2.3 In terms of promoting and enhancing student discipline in educational institutions
- 4.2.4 In the aspect of providing opportunities and participation of students in enhancing student discipline in educational institutions
- 4.2.5 In the aspect of promoting relationship between parents for enhancing student discipline in educational institutions
- 4.2.6 In terms of supervision measures of schools in enhancing student discipline in educational institutions
- 4.2.7 In terms of promoting the project to enhance student discipline in educational institutions

4.3 Data Collection Instrument

4.3.1 Questionnaire about roles of school administrators in promoting students’ disciplines in schools five rating scale by Likert’s. The reliability of questionnaires is .989

4.3.2 Interview form concerning the roles of school administrators in promoting students’ disciplines in schools under Songkhla Primary Educational Service Area Office 3. The interview questions covered the aspect of any problems or guidelines for using the role of administrators in enhancing student discipline in schools in each side as follows:

1. Implementation of the plan to strengthen student discipline in educational institutions
2. Supervising and enhancing student discipline in educational institutions
3. In terms of promoting and enhancing student discipline in educational institutions
4. In the aspect of providing opportunities and participation of students in enhancing student discipline in educational institutions
5. In the aspect of promoting relationship between parents for enhancing student discipline in educational institutions
6. In terms of supervision measures of schools in enhancing student discipline in educational institutions
7. In terms of promoting the project to enhance student discipline in educational institutions

4.4 Data Analysis

The data were analyzed by percentage, means, standard deviation, t-test, one-way ANOVA, and content analysis.

5. Results

5.1 Analysis of supply administration of school administrators under Songkhla Primary Educational Service Area Office 3

Table 1 Average & Standard deviation of roles of School Administrators in Promoting Students’ Disciplines in Schools under Songkhla Primary Educational Service Area Office 3 in both overall and individual aspects.

Number		n = 346	Level

	Roles of School Administrators in Promoting Students' Disciplines in Schools	$\bar{X}$	S.D.	
1	Implementation of the plan to strengthen student discipline in educational institutions	4.0795	0.4677	High
2	Supervising and enhancing student discipline in educational institutions	4.0541	0.5404	High
3	In terms of promoting and enhancing student discipline in educational institutions	4.0194	0.5202	High
4	In the aspect of providing opportunities and participation of students in enhancing student discipline in educational institutions	4.0329	0.5051	High
5	In the aspect of promoting relationship between parents for enhancing student discipline in educational institutions	4.0737	0.5061	High
6	In terms of supervision measures of schools in enhancing student discipline in educational institutions	4.0899	0.5060	High
7	In terms of promoting the project to enhance student discipline in educational institutions	4.0965	0.5278	High
Total		4.0669	0.4546	High

Table 1 found that overall was at a high level. When considering each part, it was found that all parts were at a high level. In terms of promoting the project to enhance student discipline in educational institutions was the highest average, followed by in terms of supervision measures of schools in enhancing student discipline in educational institutions, implementation of the plan to strengthen student discipline in educational institutions, in the aspect of promoting relationship between parents for enhancing student discipline in educational institutions, supervising and enhancing student discipline in educational institutions and in the aspect of providing opportunities and participation of students in enhancing student discipline in educational institutions. In terms of promoting and enhancing student discipline in educational institutions was the lowest average.

5.2 The comparison of the roles of school administrators in promoting students' disciplines in schools classified by gender, age, work experience, and size of the school, the research results were summarized as follows;

5.2.1 The comparison results of the roles of school administrators in promoting students' disciplines in schools classified by gender found that teachers of different genders, there were different opinions in overall and in each aspect, there was a statistically significant difference in opinion at the .01 level.

5.2.2 The comparison results of the roles of school administrators in promoting students' disciplines in schools classified by age found that teachers of different ages were different opinions in overall and in each aspect, there was a statistically significant difference in opinion at the .001 level.

5.2.3 The comparison results of the roles of school administrators in promoting students' disciplines in schools classified by work experience found that teachers with different work experience were different opinions in overall and in each aspect, there was a statistically significant difference in opinion at the .001 level.

5.2.4 The comparison results of the roles of school administrators in promoting students' disciplines in schools classified by school size found that teachers who worked in different size of school had different opinions in overall, there was a statistically significant difference in opinion at the .001 level. When considering each aspect, it was found that all aspects were significantly different at the .001 level.

5.3 Regarding the guidelines for the management of the roles of school administrators in promoting students' disciplines in schools, it was found that the schools has developed a plan to strengthen the discipline in the educational institution and has successfully implemented the plan according to the objectives. There are guidelines for making plans based on the principle of participation. Management plays an important role in the operation by clearly defining the indicators. Determine how to measure and evaluate in accordance with the specified objectives and indicators. Give morale and encouragement to the personnel who work. Administrators are good role models for teachers and personnel in schools and are role models for students. As schools are part of a community that plays a role in preparing students for morals and ethics, school administrators have a duty to coordinate with parents to support them to promote morality ethics for students. In the field of supervision measures of schools in enhancing student discipline in educational institutions, there must be an agreement within the class where students present their opinions. There are school rules by allowing teachers and parents to school committee are jointly determined Supervisory Executive Assign students and teachers to follow the rules. The agreement is jointly set and the management is assessed according to the specified indicators and in terms of promoting the project to enhance student discipline in educational institutions. The administrators visited every student's home, observing the behavior of students to see how much has been modified, as well as encouraging teachers' morale as appropriate and granting scholarships to outstanding students in each field, such as good studies, good behavior, good social contributions to announce to the public.

6. Discussion and Conclusion

6.1 The findings of this study can be discussed as follows; 1) The study of the roles of school administrators in promoting students' disciplines in schools found that overall and each part was at a high level. When considering each part, it was found that all parts were at a high level. In terms of promoting student discipline improvement projects in educational institutions, the average was highest, followed by supervision measures of schools in enhancing student discipline in educational institutions. In terms of promoting and enhancing student discipline in educational institutions the least average. This is because enhancing student discipline is a rather sensitive task and must have an understanding of the different behaviors of each student, be eloquent, have a tactic in discussing or negotiating and create rules that can control students. It takes the science and art to administer and be prepared to deal with violent incidents caused by problematic behavior of students. It was consistent with the research results of Suthanyachanok Supyoi (2014) who conducted the study of the role of educational institution administrators in moral development administration ethics in basic educational institutions under the Office of Kanchanaburi Primary Educational Service Area 2.) From the study, it was found that the overall level was at a high level. As for each aspect, there was a high level of practice, all of which were sorted by average.

6.2 The roles of school administrators in promoting Students' disciplines in schools classified by gender, age, work experience, and school size as follows:

6.2.1 Classified by gender, it was found that teachers of different genders had different opinion towards the roles of school administrators in promoting students' disciplines in schools. This is because of the sensitivity of the female and the look at the administrator with resolution and profound. When the female teachers work close to the administrator, they notice the administrators with care, understanding and the intention of working underneath. That's different from male teachers who look at the administrator with no attention to detail. It was found that teachers with different genders had different opinions towards the supply administration of the roles of school administrators in promoting students' disciplines in schools. The findings of the study are in parallel with Pranee Wongchan (2011) who conducted the study of the disciplinary administration of administrators in educational institutes under the Buriram Primary Education Service Area Office 2. The results of the study indicated that the administrators of the educational institutes had discipline administration according to the opinions of government teachers of different sexes. There was a statistically significant difference at the .05 level.

6.2.2 Classified by age, it was found that teachers with different ages viewed the roles of school administrators in promoting students' disciplines in schools differently, both overall and each aspect. This is because age is a factor affecting the expression of opinions on the roles of school administrators in promoting students' disciplines in educational institutions. The different of ages of teachers will show a variety of experiences, working styles. Teachers aged 50 years look at the administrators with understanding. Unlike teachers whose age ranges are less than 31 years old and 31-50 years old, they can only look at what the management has expressed without the analysis of the person behavior and are unable to see as they should. As a result, teachers of different ages had different opinions on the role of administrators in enhancing student discipline in schools. This is consistent with the research of Soontree Daengkaew (2018) who conducted the study of the condition and problems of student affairs administration to prevent drug problems at Rajaprajanukroh School 5 in the southern border provinces. There were different opinions on the condition and problems of student affairs administration to prevent drug problems.

6.2.3 Classified by work experience, it was found that teachers with different work experience having different perspective on the roles of school administrators in promoting students' disciplines in schools. This is because teachers with more than 10 years of working experience are skilled in supervising, teaching, and promoting discipline for students. Because of the experience of working for more than 10 years, through teaching, a large number of teachers have been trained and able to know and understand the behavior of each student very well. This results in profound knowledge and understanding of the process of promoting student discipline. Teachers who have more than 10 years of work experience have been through a lot of student discipline and understand how to promote such aspects. This gives a profound view of the administrators of these teachers. Looking through the promotion of executives but teachers with less than 5 years of practical experience and teachers with 5 to 10 years of practical experience do not fully understand the role of administrators in promoting discipline. Therefore, it may be invisible to the role of the administrators in promoting student discipline. As a result, teachers with different operating experiences have opinions on the role of administrators in enhancing student discipline in schools. This is consistent with the research of Uraivan Dechasi (2015) who conducted the study of the role of educational institution administrators in promoting morality student ethics under the Nakhon Si Thammarat Primary Educational Service Area Office 2, classified by work experience variables. It was found that the overall and each aspect were significantly different at the .05 level.



6.2.4 Classified by school size, it was found that teachers who work in different school sizes viewed the roles of school administrators in promoting students' disciplines in schools differently, both overall and in each aspect. This is because the small educational establishments can promote student discipline thoroughly because of the small number of personnel which are easy and convenient to control liaison. Concerning creating rules and penalties, it is not difficult. As a result, teachers working in small schools view that administrators in their schools can promote student discipline which contrary to the results gained from those working in medium and large educational institutions, indicated that it was quite difficult to do so. Due to the limitation of school size which has a large population strengthening the discipline, this job takes time and also requires access to the person. Teachers working in medium and large educational institutions, therefore, have lower average opinion than that of teachers working in small schools. This is consistent with the research of Suthanyachanok Supyoi (2014) who conducted study of the role of educational institution administrators in moral development administration ethics in basic educational institutions under the Office of Kanchanaburi Elementary Education Service Area 2. It was found that the results of the comparison of the roles of educational institution administrators in the administration of morality and ethics in basic educational institutions classified by school size were different.

6.3 The guidelines for the management of the roles of school administrators in promoting students' disciplines in schools found that the schools has developed a plan to strengthen the discipline in the educational institution and has successfully implemented the plan according to the objectives. There are guidelines for making plans based on the principle of participation. Management plays an important role in the operation by clearly defining the indicators. Determine how to measure and evaluate in accordance with the specified objectives and indicators. Give morale and encouragement to the personnel who work. Administrators are good role models for teachers and personnel in schools and are role models for students. As schools are part of a community that plays a role in preparing students for morals and ethics, school administrators have a duty to coordinate with parents to support them to promote morality ethics for students. In the field of supervision measures of schools in enhancing student discipline in educational institutions, there must be an agreement within the class where students present their opinions. There are school rules by allowing teachers and parents to school committee are jointly determined Supervisory Executive Assign students and teachers to follow the rules. The agreement is jointly set and the management is assessed according to the specified indicators and in terms of promoting the project to enhance student discipline in educational institutions The administrators visited every student's home. Observing the behavior of students to see how much has been modified, as well as encouraging teachers' morale as appropriate and granting scholarships to outstanding students in each field, such as good studies, good behavior, good social contributions to announce to the public. This is consistent with the research of Sittichai Sriwaurai (2018) who conducted the study of the guidelines for enhancing student discipline at the basic education level in Udon Thani Province. The results showed that there were eight guidelines for enhancing student discipline at the basic education level in Udon Thani Province, namely: Guideline 1, Enhancing Student Discipline on Diligence and Responsibility, Guideline 2, Enhancing Student Discipline in Economic, Guideline 3 Enhancing student discipline in terms of honesty and punctuality, Guideline 4 Enhancing student discipline in dressing and self-cleaning, Guideline 5 Enhancing student discipline in terms of unity among faculty, Guideline 6 Strengthen student discipline in adherence to rules, regulations, and regulations, Guideline 7 Enhancing student discipline in respect of politeness, humility and respect and Guideline 8 Enhancing the Discipline of Students of Kindness and Selfishness.

7. References

- Asubel, David P. (1972). *Ego Development and the Personality*. 3rd. New York : Grune and Stration. Inc ; 1956.
- Buppha Hanphayung. (2011). *Problems and guidelines for student discipline development at Wat Sutthawat School Chonburi Primary Educational Service Area District Office 3*. Master's degree Department of Business Administration Studies Faculty of Education. Chonburi: Burapha University.
- Bannathawee School. (2021, 11 May). *(Self Assessment Report : SAR)*.
- Education Council Secretariat Ministry of Education. (2018). *Discipline development*. Bangkok, Prikwan Graffic.
- _____. (2019). *Enhancing student discipline in educational institutions*. Bangkok, Prikwan Graffic.
- Ministry of Education. (2007). *National Education Act, B.E. 2542, Amended (No. 3), B.E. 2553*. Bangkok, Prikwan Graffic.
- Ministry of Education. (2008). *Objectives of the Basic Education Core Curriculum 2008*. Bangkok: Teachers Council Ladprao Printing House.
- _____. (2008). *8 desirable characteristics*. Bangkok: Teachers Council Ladprao Printing House.
- Office of the National Economic and Social Development Board. (2017). *Economic Development Plan and National Society No. 12 (2017-2021)*.
- Office of the Secretariat of the House of Representatives Constitution Drafting Committee. (2017). *Chapter 5 Duties of the State (Section 54)*. Bangkok: Secretariat Office House of Representatives.
- Office of Academic Affairs and Educational Standards. (2010). *Development guidelines measurement and evaluation Desirable Characteristics According to Basic Education Core Curriculum*. Bangkok: Printing House, Goods and Parcel Receiving Organization.
- Pranee Wongchan. (2011). *Disciplinary administration of administrators in educational institutions under the district office Buriram Primary Education District 2*.
- Master of Education Department of Educational Administration: Buriram Rajabhat University.
- Puangphaka Saeton. (2011). *A study of student discipline in the 3rd grade at Wang Chan Witthaya School*. Under the Education Service Area Office, District. Master's Degree Thesis Burapha University.
- Sittichai Sriwaurai. (2018). “Guidelines for enhancing student discipline at the basic education level in Udon Thani Province,” Research and Development Journal Loei Rajabhat University Year 14 (No. 47), page 89.
- Suthanyachanok Supyoi. (2014). *The role of educational institution administrators in the administration of moral development. ethics in basic educational institutions Under the Office of Primary Educational Service Area Kanchanaburi District 2*. Master of Education Program Department of Educational Administration. Kanchanaburi: Kanchanaburi Rajabhat University.
- Soontree Daengkaew. (2018). *Conditions and problems of administration Student Affairs to Prevent Drug Problems at Rajaprajanukroh School in 5 Southern Border Provinces* Faculty of Political Science: Hat Yai University.

Uraiwan Dechasit. (2015). *Executive role Educational institutions to promote morality student ethics under the Educational Service Area Office Nakhon Si Thammarat Primary School District 2. Walailak Cultural Ashram. Year 14 (No. 2), page 99.*

The Relationship between Competency of Administrators and the Administration of Intensive Islamic Study Curriculum under Primary Education Service in Three Southern Border Provinces

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Abstract

The objectives of this research were to study the competency of administrators, the administration of intensive Islamic study curriculum, the relationship between competency of administrators and the administration of Intensive Islamic study curriculum then, the guidelines to develop the competency of administrators that related to the administration of intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces. This study was conducted with 367 teachers and 9 school administrators participated in interview sessions.

The results showed that the competency of administrators was at a high level both overall and individual aspects. As well as the administration of intensive Islamic study curriculum was at a high level both overall and individual aspects. The result of correlations analysis showed that there were moderate and positive correlations between the competency of administrators and the administration of intensive Islamic study curriculum ($r = .835^{**}$) at a statistically significant level of .01. And guidelines to develop the competency of administrators that related to the administration of intensive Islamic study curriculum found that they should encourage all teachers for continuous self-improvement equally and integrate the learning process based on a context of multicultural education. Moreover, they should promote the participation of school network with related alliances for supporting the intensive Islamic curriculum.

Keywords: competency of administrators; administration of intensive Islamic study curriculum; Primary Education Service in Three Southern Border Provinces

1. Introduction

Education is one of the driving force toward sustainable development of the world. Sustainable Development Goal 4 Quality Education ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development. (Ministry of

Education. 2017) Especially, when the Muslim children in the three Southern border in Thailand enters the government's compulsory education management system, the education must be organized to be consistent with language identity culture and other constituent factors. (Ekkarin Sungtong. 2014.)

In terms of the management of education in accordance with the context of the area is stipulated in National Education Act of B.E. 2542 (A.D.1999) Section 6 Education shall aim at the full development of the Thai people in all aspects: physical and mental health; intellect; knowledge; morality; integrity; and desirable way of life so as to be able to live in harmony with other people. (Prime Minister's Office. 2020) Therefore, school administration in the three southern border provinces is imperative that executives have competency of the administration. That is a factor indicating that a person will perform outstandingly in a particular job and will help promote the overall success of the bureaucratic system. (Sakthai Surakitbowon. 2014.) Which create understanding and good relationship with the organization that is a better image for the school administrators in accordance with the needs of society, professions, organizational policies and the environment (Rukaiyah Adam. 2012.)

The competency of administration is an outstanding talent that can be able to drive school into the goals that have been set with efficiency and effectiveness. Especially, the competency of school administrators in Southern border provinces that provide education in the special development zone in different conditions in terms of identity, a way of life, language, religion, culture and educational management in a way that various. (Nutteera Meejun. 2019.) Administrators must rely on their knowledge, abilities and the nature of working in conflict situations to be able to coexist in the present society and the society of the future in peace and happiness according to their own state. And then they must learn and adapt to changes all the time. (Worapoj Wongkitrungruang. 2013) Therefore, the main role in the management of administrators is to arrange education to be consistent with differences in culture, gender, race, ethnic group, a way of life, religion, special abilities and social class. The administrators must use the principles of administration, both in school administration and having a broad vision in the context of the three southern border provinces. They must drive the development of teaching and learning in accordance with the intention of managing education in the area to be effective and in the school to have good results as well as being successful in education management. (Tikamporn Sompong. 2016.)

Therefore, the educational management policy has been set to be consistent with the needs and identity of the community, especially with the school where most parents want to their children study intensive religion. So, Islamic curriculum according to the basic education core curriculum B.E. 2551 (A.D. 2008) was announced to be used for primary and secondary schools where the community has a need for children to have a truly intensive Islamic education. In this regard, learner quality indicators have been established to serve as goals for learner development and to examine the quality of education at each educational level, as well as knowledge, skills or learning processes and desirable characteristics or values, morality and ethics of learners. (Bureau of Academic Affairs and Educational Standards. 2011)

However, the strategic education plan the special development zone of three Southern border provinces 20 Years (2017-2036) discussed the problems and challenges of education management in three southern border found that the using a language was different from the

other region because the dialect was the primary language of communication in this area and public schools lack participation in education management from people and communities in the area. As well as the parental dimension that focuses on the religious way. Especially in Islam, children are encouraged to attend schools that teach common subjects coupled with religion. Therefore, the administration of schools in the special development zones in the Southern border provinces should pay attention to the establishment of curriculum standards and to support and promote the development of the quality of such educational institutions to meet the standards. (Forward Section, Ministry of Education. 2017)

Therefore, the researcher, as a teacher in the Pattani Primary Educational Service Area Office 2, which is working in the school that open intensive Islamic curriculum, has focused on competency of administrators and the administration of Intensive Islamic study curriculum. in order to use the research results as a guideline for the operation in accordance with the method that is accurate, transparent, honest, fair and for the maximum benefit to the organization. In addition, the results of this research are beneficial to the schools in Primary Education Service in Three Southern Border Provinces to be used as information to administrators and related persons in educational institutions and lead to formulate guidelines for improvement, amendment, planning, development, and promoting and supporting the administration of schools to be more efficient in the future.

2. Research Objectives

1. To study competency of administrators under Primary Education Service in Three Southern Border Provinces.
2. To study the administration of intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces.
3. To study the relationship between competency of administrators and the administration of Intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces.
4. To study the guidelines to develop competency of administrators that related to the administration of intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces.

3. Literature Review

3.1 competency of administrators

3.1.1 Multicultural school administration

Multicultural school administration must demonstrate competence in multicultural management as well as understanding, positive attitude and awareness of multiculturalism. (Kwansuda Wongyaem. 2017) And understand their own culture, professional culture understand racial culture, religious culture, gender subculture and avoid cultural misconduct and deal with cultural diversity. There is the correct corporate culture information. (Nonnakorn Mangklasiri. 2017)

3.1.2 Personnel resource development

Personnel resource development means Efforts to promote and improve knowledge, competence, experience and attitude to personnel in the organization to be able to apply their knowledge, abilities, experiences and attitudes to Developing work for maximum benefits and in accordance with the context of the three southern border provinces. (Rukaiyah Adam. 2012.)

and should focus on teachers and educational personnel to have knowledge and competence. Be a learner all the time Emphasizes on the equality of learners in society in receiving education from many cultures, races, religions, genders, social statuses, both equal opportunities for education and equal opportunities for academic success study. (Tikamporn Sompong. 2016)

3.1.3 Integrating curriculum based on culture and way of life

Integrating curriculum based on culture and way of life demonstrate integrated education and lifestyle, cultural diversity, identity, local needs and local people learn to use a variety of formats, open to parents and communities. It was participated in the development of the curriculum for social development, the school has both Buddhist ways and the Islamic ways in the same school with both Thai Buddhists and Muslims. The school curriculum is tailored to the needs of the community. (Rungchatchadaporn Vehachart. 2013)

3.1.4 Network school building

Network school building demonstrate integrated education and lifestyle, cultural diversity, identity, local needs and local people Learn to use a variety of formats, open to parents and communities. Has participated in the development of the curriculum for social development, the school has both Buddhist ways and the Islamic way in the same school with both Thai Buddhists and Muslims. Therefore, the school curriculum is tailored to the needs of the community. (Tikamporn Sompong. 2016.)

3.2 The administration of intensive Islamic study curriculum

3.2.1 Learning management

Learning management means management of learning at each level should use a variety of methods. Emphasis on teaching and learning management, according to real conditions. Self-learning, learning together, learning from practice, integrated learning, and learning about morality. (Ministry of Education. 2008)

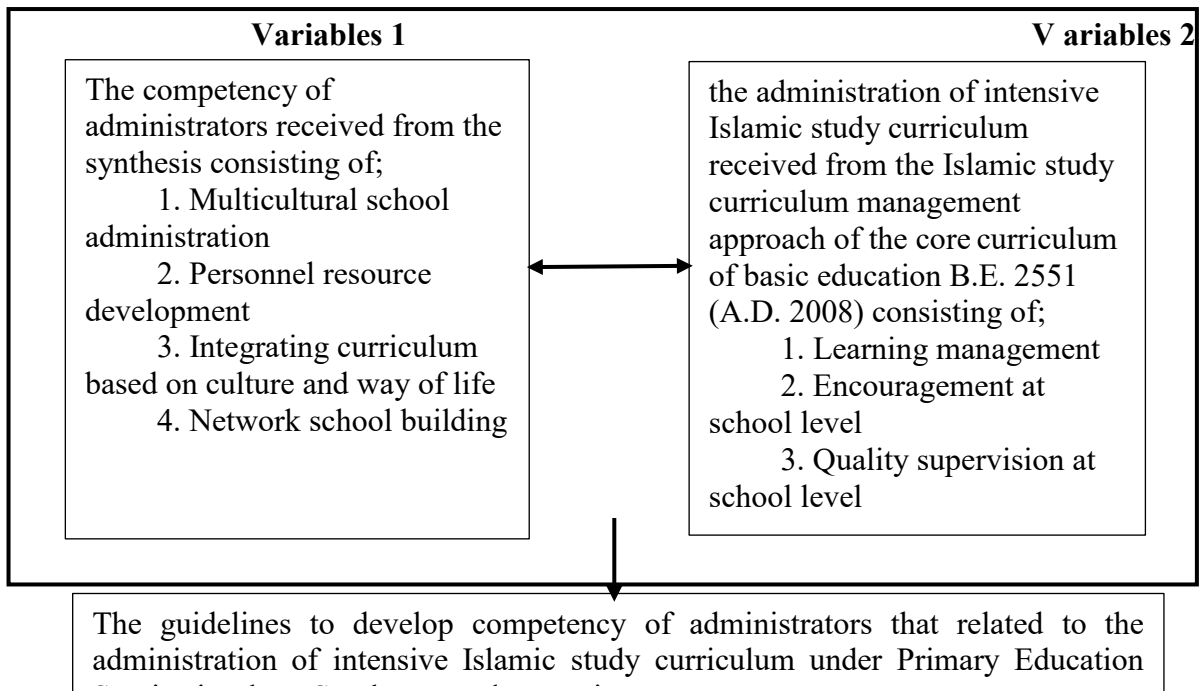
3.2.2 Encouragement at school level

Encouragement at school level means building understanding of teachers and educational personnel to change the paradigm in curriculum development for learning management, including measuring and evaluating with the standards and indicators as goals for integrated learning management teamwork skills, training, budget and resource support development of Islamic studies curriculum. (Ministry of Education. 2008)

3.2.3 Quality supervision at school level

Quality supervision at school level means developing school curriculum and implementing them with the highest efficiency and effectiveness. Educational institutions can implement a number of approaches, such as supervision, curriculum monitoring, quality assurance within research, and curriculum monitoring. (Ministry of Education. 2008)

3.3 Conceptual framework



Picture 1 Conceptual framework

4. Research Methodology

4.1 Population and Sample

The population consisted of 7,400 teachers of the schools under Primary Education Service in Three Southern Border Provinces for the academic year 2021. The sample consisted of 367 teachers of the schools under Primary Education Service in Three Southern Border Provinces. Determine the sample size based on the ready-made table of Krejcie and Morgan and stratified random sampling by provinces and school size, then simple random sampling by lottery as in Table 1.

Table 1 Population and Sample Classified by Provinces and School Size

Provinces and School Size	Number of School	Population	Sample
Pattani			
Small	7	88	4
Medium	97	2,286	114
Big	2	104	5
Yala			
Small	10	127	6
Medium	76	1,789	89
Big	3	198	10
Narathiwat			
Small	11	148	7
Medium	91	2,338	116

Provinces and School Size	Number of School	Population	Sample
Big	5	332	16
Total	302	7,400	367

4.2 Research Variables and Research Scope

4.2.1 Variables 1 in this study is competency of administrators under Primary Education Service in Three Southern Border Provinces from the synthesis consisting of;

4.2.1.1 Multicultural school administration

4.2.1.2 Personnel resource development

4.2.1.3 Integrating curriculum based on culture and way of life

4.2.1.4 Network school building

4.2.2 Variables 2 in this study is the administration of intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces according to the Islamic study curriculum management approach of the core curriculum of basic education B.E. 2551 (A.D. 2008) consisting of;

4.2.2.1 Learning management

4.2.2.2 Encouragement at school level

4.2.2.3 Quality supervision at school level

4.3 Data Collection Instrument

4.3.1 The questionnaire about competency of administrators five rating scale by Likert's. The reliability of questionnaires is .976.

4.3.2 The questionnaire about the administration of intensive Islamic study curriculum five rating scale by Likert's. The reliability of questionnaires is .981.

4.3.3 The interview form on the guidelines to develop competency of administrators that related to the administration of intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces.

4.4 Data Analysis

The data were analyzed by frequency, percentage, means, standard deviation, Pearson's product correlation coefficient, and content analysis. The second part was interviewing. For this part, the researcher used online platform for collecting the information and used the information to analyze the content and presented it as an essay.

5. Results

5.1 Analysis of competency of administrators under Primary Education Service in Three Southern Border Provinces

Table 2 Average & Standard deviation of competency of administrators under Primary Education Service in Three Southern Border Provinces in both overall and individual aspects.

Number	Competency of Administrators	n = 367		Level
		$\bar{X}$	S.D.	
1	Multicultural school administration	4.2183	0.6281	High
2	Personnel resource development	4.1757	0.6706	High
3	Integrating curriculum based on culture and way of life	4.1992	0.5937	High
4	Network school building	4.2148	0.6236	High
Total		4.2025	0.5829	High

Table 2 found that competency of administrators under Primary Education Service in Three Southern Border Provinces in both overall and individual aspects were at high level. When considering each part, it was found that all parts were at a high level. Multicultural school administration was the highest average, followed by network school building, and integrating curriculum based on culture and way of life. Personnel resource development was the lowest average.

5.2 Analysis of competency the administration of intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces

Table 3 Average & Standard deviation of the administration of intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces in both overall and individual aspects.

Number	The Administration of Intensive Islamic Study Curriculum	n = 367		Level
		$\bar{X}$	S.D.	
1	Learning management	4.2747	0.5712	High
2	Encouragement at school level	4.0747	0.6972	High
3	Quality supervision at school level	4.1235	0.6738	High
Total		4.1342	0.6118	High

Table 3 found that the administration of intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces in both overall and individual aspects were at high level. When considering each part, it was found that all parts were at a high level. Learning management was the highest average, followed by quality supervision at school level. Encouragement at school level was the lowest average.

5.3 Analysis of the relationship between competency of administrators and the administration of Intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces.

Table 4 Pearson’s product correlation coefficient between competency of administrators and the administration of Intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces

Competency of Administrators	The Administration of Intensive Islamic Study Curriculum (n=367)			
	Y ₁	Y ₂	Y ₃	Y
X ₁	.714**	.681**	.596**	.723**
X ₂	.649**	.712**	.652**	.741**
X ₃	.766**	.761**	.701**	.809**
X ₄	.738**	.775**	.740**	.821**
X	.773**	.791**	.727**	.835**

**statistically significance at .01

Table 4 found that the relationship between the competency of administrators and the administration of the intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces found that in both overall and individual aspects, was highly positive ($r=.835^{**}$) at the significance level of .01.

5.4 And the guidelines to develop the competency of administrators that related to the administration of intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces found that they should encourage all teachers for continuous self-improvement equally and integrate the learning process based on a context of multicultural education. Moreover, they should promote the participation of school network with related alliances for supporting the intensive Islamic curriculum.

6. Discussion and Conclusion

6.1 Competency of administrators under Primary Education Service in Three Southern Border Provinces in both overall and individual aspects were at high level. When considering each part, it was found that all parts were at a high level. Multicultural school administration was the highest average, followed by network school building, and integrating curriculum based on culture and way of life. Personnel resource development was the lowest average. This is because the school administrators have set a vision that takes into account the consistency of the school and the context of the community where there is a need to provide education, according to the way of life of the people in the area by providing a more intense Islamic curriculum in the school. There is coordination with networks and various sectors to come together to develop education management that is in line with the local context. The findings of the study are in parallel with Sinchai Suwanmanee (2015), studied public secondary schools administration model relevant to the multicultural social context: A case study of the three southernmost provinces found that the public secondary school administration model which relevant to the multicultural social context were relevant with the principle of three aspects of the multicultural education management includes equality, diversity and participation that are integrated with the 7'S model theory which includes shared value, strategy, system, structure, style, skills and staff.

6.2 The administration of intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces in both overall and individual aspects were at high level. When considering each part, it was found that all parts were at a high level. Learning management was the highest average, followed by quality supervision at school level. Encouragement at school level was the lowest average. This is because of the promoting and

supporting learning activities that emphasize morals and ethics. There is supervision of quality at the educational institution level with intensive supervision of Islamic study management. As well as giving importance to learning management that focuses on learners. The findings of the study are in parallel with Zulgornai Benya (2015), studied current status and problems of teaching and learning in the Islamic studies in the intensive curriculum in dual system schools, Pattani province found that were at high level as a whole.

6.3 The relationship between the competency of administrators and the administration of the intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces found that in both overall and individual aspects, was highly positive at the significance level of .01. This is because of the school administrators must build relationships with educational networks at the community level, various government and private agencies. Emphasis is placed on participation in various sectors to ensure quality education in the area. The findings of the study are in parallel with Kullanit Rooboon (2013) studied, the relationships between leadership styles of school administrators and effectiveness of academic administration in schools under the Office of Udon Thani Primary Education Service Area 3 found that leadership style of the school administrators correlated positively and significantly at the .01 level with academic administration effectiveness of the schools.

6.4 The guidelines to develop the competency of administrators that related to the administration of intensive Islamic study curriculum under Primary Education Service in Three Southern Border Provinces found that they should encourage all teachers for continuous self-improvement equally and integrate the learning process based on a context of multicultural education. Moreover, they should promote the participation of school network with related alliances for supporting the intensive Islamic curriculum. This is because the school administrators in the three southern border provinces understand the model of education management that is preferred by the people in the area. Therefore, educational institutions should be managed in the form of integration of work from all sectors for management. Therefore, the schools should be managed in the form of integration of work from all sectors. Study according to the needs of the community, especially coordinating with networks or educational institutions that are responsible for education in the area to help develop education with an intensive Islamic studies curriculum to meet the quality standards and needs of the local people. The findings of the study are in parallel with Banks and Banks (2015) mentioned that multicultural education is an idea, an educational reform movement, and a process whose major goal is to change the structure of educational institutions so that male and female students, exceptional students, and students who are members of diverse racial, ethnic, language, cultural, and religious groups will have an equal opportunity to achieve academically in school. It is necessary to conceptualize the school as a social system in order to implement multicultural education successfully.

7. Research Implications

7.1 Implications for utilizing the research results

7.1.1 School administrators should carefully consider the importance of developing personnel in each department.

7.1.2 School administrators should provide learning resources in the school. They should provide books related to the intensive Islamic studies curriculum.

7.1.3 School administrators should encourage teachers to develop teaching skills and they should create networks to exchange ideas on school administration.

7.2 Implications for further research

7.2.1 They should study on the competency of administrators in a multicultural society that affects the effectiveness of school administration.

7.2.2 They should study on personnel development in schools with multicultural contexts.

8. References

- Banks, J. A. and Banks, C. A. (2015). *Multicultural education : Issues and perspectives (10thed)*. Boston, Allyn & Bacon.
- Ekkarin Sungtong. (2014). Perspectives of Public School Administrators in the Three Southern Border Provinces on Multiculturalism and Multicultural Education. *Songklanakarin Journal of Social Sciences and Humanities*, 20 (3). 89-112.
- Kullanit Rooboon. (2013). *The relationships between leadership styles of school administrators and effectiveness of academic administration in schools under the Office of Udon Thani Primary Education Service Area 3*. (Thesis, Master of Education). Sukhothai Thammathirat Open University, Nonthaburi.
- Kwansuda Wongyaem . (2017). The Multicultural Community School Administration in Koh Mueng Pranakhon Si Ayutthaya. *Suan Dusit Graduate School Academic Journal*, 13(3), 127-146.
- Ministry of Education. (2017). *Report on the synthesis of Thai education indicators according to the target framework sustainable development*. Prikwan, Bangkok.
- Nonnakorn Mangklasiri. (2017). *The Multicultural Leadership of School Administrator under Secondary Educational Service Area in Bangkok*. (Thesis, Master of Education). College of Education Sciences, Dhurakij Pundit University, Bangkok.
- Nutteera Meejun. (2019). *School administrators' competencies for the partnership school project affiliated with the office of basic education commission*. (Thesis, Master of Technical Education). Rajamangala University of Technology Thanyaburi. Pathum Thani.
- Prime Minister's Office. (2020). *National education act of B.E. 2542 (A.D.1999)*. Retrieved from <https://cmi4.go.th/group/legal/> (April, 30, 2021).
- Rungchatchadaporn Vehachart. (2013). *Good character of administrators to multicultural society in the three Southern border provinces*. Thaksin University, Songkhla.
- Rukaiyah Adam. (2012). *Factor analysis of competencies of school administrators in the three Southern border provinces*. (Thesis, Master of Education). Prince of Songkla University, Pattani.
- Sakthai Surakitbowon. (2014). Significant competencies of professional administrators. *Sakon Nakhon Rajabhat University Journal*, 6(12), 165-184.
- Tikamporn Sompong. (2016). School administration for a multicultural society in three Southern border provinces. *Hatyai Journal*, (14)1, 97–107.
- United Nations Thailand. (2017). *Sustainable development goal 4 quality education*. Retrieved from <https://thailand.un.org/en/sdgs/4> (August, 9, 2021).
- Sinchai Suwanmanee. (2015). *Public secondary schools administration model relevant to the multicultural social context: A case study of the three southernmost provinces*. Thaksin University, Songkhla.

Zulgornai Benya.)2015). *Current status and problems of teaching and learning in the Islamic studies in the intensive curriculum in dual system schools, Pattani province*. (Thesis, Master of Education). Prince of Songkla University, Pattani.

Curriculum and Communication: The Concerns about Staff, Students, Instructors, and Policies at University Level in Thailand

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Abstract

This paper was produced because of the growing interest and concerns about useful and comprehensive curricula at the university level. This study looked closely at the viewpoints of stakeholders at an international college in Thailand in order to see how well students and teachers perceive the curriculum. Students and instructors were interviewed and surveyed in order to get an overall perspective and it is clear that there are some misunderstandings between each valued party. The major goals were to explore the perspective of students and teachers, as well as examine major factors within curriculum development. There could be more clarity in the overall use and direction of the curriculum and all stakeholders should have a say in balancing and improving future classes, events, meetings, and seminars. This paper could be useful in any institution looking at some strengths and weaknesses of their curricula. At the university studied in this research, revisions are required every 4 years, and therefore the comments and results of the survey can be utilized to make major and minor changes.

Keywords: Curriculum, university, stakeholders

1. Introduction

Education forms the betterment of community, society, nation, and the world because with the right education, we can establish culture, belief, values, attitude, and behavior that are instrumental in developing peaceful and harmonious coexistence with one another as well as with nature. Education teaches us to be the best person we can become because we apply ethics and accepted norms in all of our endeavors using our knowledge, talents, and skills. With a well-crafted curriculum, every student can be honed and prepared for life. A curriculum that is a product of idealism and realism can produce the idea of either essentialism, which tries to instill the most essential or basic academic knowledge and skills and character development that students need to become model citizens or perennialism, which aims to prepare students for life by developing their intellectual and moral qualities through emphasizing knowledge and the meaning of knowledge, servings to enhance student's critical thinking skills in their search for individual freedoms, human rights and responsibilities through nature. A curriculum that is both idealist and realist will give a better perspective and direction on how any academic endeavor would provide salient output in relation to the achievement of vision, mission, and goals of the program. In addition, it provides tangible aspiration, motivation, and drive to succeed to fulfill what we all hoped for in order to achieve the goals in order to materialize the idealistic vision that we are all hoping for.

However, over the past three years, many of the students have expressed concern that very few of their classes prepared them for future employment. In relation to such, this study will explore how a Thai curriculum is set up and how it should be altered to meet the needs of the future graduates of the program, especially considering the current pandemic that may be shifting the way in which classes take place in the near future. Finally, the reason that curricula are revised every four years is to adapt to a changing culture, environment, and changes in student populations and teacher resources. This study could give other institutions ideas to proceed in positive ways.

2. Research Questions

1. How are student and instructor stakeholders being affected by the current curriculum development plan?
2. What factors are salient in curriculum delivery and effectiveness?

3. Research Objectives

1. To explore the needs and feedback of students and teachers regarding curriculum development.
2. To identify factors that are important to curriculum development and implementation.

4. Curriculum Understanding

Curriculum development and assessment is an ongoing experience. According to Chailom (2019), “the main type of teacher education curriculum for educating professional teachers in Thailand is a five-year bachelor’s degree curriculum” (p. 216). This curriculum is basically designed to guide teachers and their represented school to successfully reach students. Unfortunately, according to a recent study by Kiatkheeree (2018) “However, the study found that student teachers could not make connections between theory from the university and practice into the school”(p. 5). Furthermore, because English is the method of communication in international schools, there is an element within the curriculum regarding language classes. That being said, Nonthaisong and Mantero (2017) stated that “It is important that teachers be given more effective training aimed at improving four main areas: knowledge of student-centered and communicative approach to teaching English, teaching techniques, material development, and communicative language assessment. Importantly, the training should be given on a regular basis over an extended period of time” (p. 86). After stakeholders understand the concepts and vision of a curriculum, the building can begin. Researchers Gericke et.al., (2020) questioned how the team should build a curriculum. They discussed interdisciplinary and multidisciplinary, along with the importance of citizenship and incorporating specific skill sets of those involved (p. 208-209).

The curriculum is designed and constructed for all those involved, however a PhD Student Qzi (2021) focused and believed that “The main goal is that educational projects should be structured in such a way that they focus on the student's personality and serve his personal and creative competence” (p. 30). This is important to understand because at the end of the day, the students must be the focus. Bailey (2021) adamantly added that “I am arguing that it is absolutely necessary for all teachers and administration to see the importance of making all children visible and valued and that they should include this idea into their curriculum plans and teaching practices” (p. 2). Finally, in consideration of both understanding and building,

Erstad and Voogt (2018) clearly stated that “First, technology as a social factor is embedded in the preconditions and arguments for new curriculum developments, as mentioned earlier in this article, since our societies are becoming more and more digital in all facets of social life” (p. 9). They go on to emphasize the need for digital literacies in a growing era of involvement with media and coding.

5. Importance of Curriculum Development

Teachers become educators for various reasons, and those reasons may evolve over time. However, at most universities there has to be involvement within curriculum development. In a recent study by Gericke et.al., (2020) they stated “Many teachers around the world want to develop their teaching and work interdisciplinary, but they feel they do not have the time because they need to keep up with the curricula” (p. 206). The curriculum usually involves hours of thought and involvement from a collection of stakeholders. In a similar study, Khasawneh (2022) “concluded that it is important to identify the importance of curriculum, teaching methods, and assessment methods” (p. 41). In this study, the number one issue is that the majority of students did not feel that their direct needs were being met according to class offerings and opportunities. Additionally, according to researchers Wijngaards-de Meij and Merx (2018), who examined learning goals via curriculum development, they found that stakeholders had different skills to contribute to the development of curriculum, which could include the skills and experiences of students. The literature found according to this phenomenon points in similar directions, which is, all stakeholders should and could have a voice in this planning process.

There was a bold take on Thailand curriculum in a 2018 paper about curriculum development. In this paper, it was discussed the lack of realistic or practical reform decisions that directly affect all stakeholders. They concluded that the term standardization could be a misdiagnosed term that gets lost in all the drama surrounding curriculum development (Suyaprom & Manmee, 2018, p. 94). In a similar exploratory study, Tamromlak (2021) speaks out about the potential lack of quality educators involved in the development and implementation process. This is a taboo topic for some, but reality for others in that highly qualified educators and policy makers need to help lead all development. Tamromlak also acknowledges the need to include media and technology skills as major facets of any new curriculum.

6. Methods

The researchers utilized a mixed method. An in-depth interview with both current students and current instructors, and distribution of survey questionnaires at a recognized international university in Thailand.

7. Qualitative Data Collection and Analysis

In-Depth interviews took place with 11 current students and 5 current teachers at the university by using either FB messenger video chat, or Line video chat. Coding charts were installed to analyze data by finding responses that were directly related to interview questions. Due to the pandemic situation all interviews were conducted online using a messaging service and all feedback was kept confidential and in original form from the participants. Snowball sampling

was used to collect participants and once the data were saturated and questions were answered, data collection and analysis was completed.

For the interview, participants were asked various questions regarding their perspectives about classes, teacher preparation and skill, and availability of training and seminars for stakeholders.

8. Quantitative Data Collection and Analysis

In order to satisfy the objectives of this study, questionnaires were distributed to the students of Naresuan University International College who were enrolled in school year 2020-2021. The questionnaires were distributed to the registered students via their university email. Only the third and fourth years were included in the survey because the researchers believe that they have enough time experiencing the current curriculum of their respective programs like the following: English for Business Communication, Tourism Management, International Business Management, and Human Resource Management.

Table 1: Population

Program	Year 3	Year 4	Total
English for Business Communication	20	33	
Tourism Management	23	29	
International Business Management	34	33	
Human Resource Management	19	12	
Total	96	107	203

Table 1 shows the number of students enrolled during the school year 2020-2021 who are in year 3 and 4 of their respective programs. There were 203 questionnaires that were distributed online and only 129 students responded to the survey.

The questionnaire that has been distributed to the students used the four-point Likert scale. It also has five sections: curriculum aims, curriculum system and content, curriculum implementation, curriculum resources, and curriculum evaluation.

Curriculum aims is about asking the respondents if their current respective curricula promote enthusiasm and stimulate their learning development as they prepare them for future employment.

Curriculum system and content deals about the respondents' satisfaction on the teaching and learning prepared for them in their every course.

Curriculum resources deals with the materials provided to respondents with regard to their academic development.

Curriculum evaluation reflects to the grades received and their experiences regarding the teaching and learning that they received.

Hence, this study aims to identify the areas that the program could improve as well as the areas that need enhancement in the creation of the future curricula of each program.

This quantitative section of this study utilized the descriptive statistics using the Mean and Standard Deviation. The results of this study utilized the Table of Mean Interpretation.

Table 2. Interpretation of Means

Mean	Interpretation
3.00 – 4.00	Agree
2.00 – 2.99	Slightly Agree
1.00 – 1.99	Disagree
0.01 - 0.99	Strong Disagree

9. Results

The goal of this study was to explore the usefulness and reality of a curriculum at an International College in Thailand. According to in-depth interviews with both students and teachers there is an obvious disconnect between what some instructors feel with the perception of students. Moreover, there is some anonymity between Thai lecturers and foreign lecturers. These concerns are all part of the curriculum and most definitely affect the learning environment and effectiveness of education.

Current students at the international college agreed that the current curriculum does not offer enough choice. That is, choice of both instructors and classes in which to enroll. For example, if a student has 2-3 required classes and then has room for 1-2 electives, in each faculty he or she has only 1-2 choices, so really there is no choice. When you examine another international college in Thailand, some of them offer over 20 courses as electives. Additionally, students expressed displeasure with some of the mandatory courses. Specifically, some students pointed out that they are studying tourism or business, but are forced to take multiple courses that are not directly related to their major. Students felt this was not useful and many students struggled academically because it is such a foreign topic for them. Many students also felt that some teachers are not actually teaching, but reading PowerPoint slides and giving exams they found online. One student in particular said that she could do that herself, and if that is the quality of education they are going to receive she should save her money and study alone. Finally, students were clear that they want more tangible classes, classes that prepare them for the future, not just classes that give assignments that are not beneficial to their career. Students expressed a need for a more professional and international education.

There were also positive comments from both students and teachers. One area of agreement from students is that they want more events as part of their university experience. A positive from the teacher interviews was that they all seem to understand the importance of documents, meetings, and events.

The curriculum discussion was very interesting from a teacher perspective. This was because of the huge disparity between Thai teachers and foreign teachers. In summary, there are differences in the priorities between Thai and Foreign teachers in terms of job expectations and there are differences in perspectives regarding salary, hours, and contributions. Foreign teachers are at risk with one year contracts, and that uncertainty could result in a desire to find more certainty in their careers. Foreign teachers also expressed discomfort with how many events and activities are in Thai language, often alienating them and potentially causing potential animosity between peers, when English is the expected mode of communication.

Basically, instead of working with each other and collaborating, it seems there are two sides, a Thai side and a foreign side, which could negatively affect the environment and attitude of the college.

Below are some snippets of the in-depth interviews with students and instructors, all answers were coded to answer research questions.

- Interview question for students: Do you think you have enough courses designated for the career you want?
 - “Other faculties have many options about electives and we get 1 or 2, I think we need more”
 - “Yes I think so we need more elective and less require that we do not use when we graduate. We translate all the time with our friend and family but we have to take it here it is not help”
- Interview question for teachers: What type of training or seminar would be beneficial?
 - “There is a need to go back to basics, that is, hands-on training about open communication and transparency between foreign and Thai staff.”
 - We need clear guidelines and expectations for events or required documentation so we can discuss problems and solutions knowing all the details.”

Regarding the quantitative side of this study, the results are as follows:

Table 3: Curriculum Aims

		Are your courses stimulate your enthusiasm to learning?	Do you think your courses meets your future development?	Do you think your courses stimulate your interests to study your specialized/major field?	Do you think your courses stimulate your interests to study your elective/minor field?	Do you think the curriculum meets the demands of your needs for future employment?	General Average Mean
N	Valid	129	129	129	129	129	
	Missing	0	0	0	0	0	
Mean		2.5116	3.0000	2.3566	2.0000	3.0000	2.5736
Std. Error of Mean		.06333	.00000	.04234	.00000	.00000	
Std. Deviation		.71933	.00000	.48086	.00000	.00000	

Table 3, CURRICULUM AIMS got a general average mean of 2.5736 which is interpreted as SLIGHTLY AGREE. It can be said that majority of the students neither agree nor disagree regarding the points of stimulating their enthusiasm to learning, stimulate their interest to study their major, minor, and elective courses. This can be attributed to the techniques used by the lecturers teaching the particular course provided to students. Since the delivery of instruction is in the English language, the lecturers are tasked to simplify the content of the course to students’ level of comprehension but at the same time providing the students the learning outcome that should be attained during the duration of the course. The lecturers need to construct their course syllabus to the level of their students for better transfer of knowledge. Based on the result, it can be inferred that the curriculum aims has been reached because students agree that it prepares them for their future development and employment. What is needed to be enhanced and improved is the management of teaching and learning among the lecturers.

Table 4: Curriculum System and Content

		Is the course content useful for me?	I am satisfied with the curriculum.	Is the teacher's teaching clear enough to understand?	Teaching goals and content are clear to understand.	The teaching content is challengeable for me.	General Average Mean
N	Valid Missing	129 0	129 0	129 0	129 0	129 0	
Mean		2.0000	3.0000	3.0000	3.0000	3.0000	2.8000
Std. Error of Mean		.00000	.00000	.00000	.00000	.00000	
Std. Deviation		.00000	.00000	.00000	.00000	.00000	

Table 4, CURRICULUM SYSTEM AND CONTENT got a general average mean of 2.8000 which is interpreted as SLIGHTLY AGREE. With regard to all the elements of Table 4, majority of the students are satisfied with the curriculum, teachers’ teaching is enough to understand as well as their course contents, and they are provided challenging tasks or activities, however, majority of them believe that the content is not useful for them. Based on the result if the course content is useful for them, it can be inferred that students don’t see the importance of some of the courses in every program since some of the courses are very structured to help them understand the development of building skills and knowledge. Hence, this can be associated to the findings of Rungswang & Kosashunhanan (2021) that reading in English made Thai students bored, feel incompetent and find reading task difficult. Since all the materials being used in teaching were in the English language. This can also be linked to the weak vocabulary development of the students that has a great relationship to reading comprehension.

Table 5: Curriculum Implementation

		Teachers pay attention to students' participation in class	I am satisfied with my teachers' professional knowledge	General Average Mean
N	Valid	129	129	
	Missing	0	0	
Mean		3.0000	3.0000	3.0000
Std. Error of Mean		.00000	.00000	
Std. Deviation		.00000	.00000	

Table 5, CURRICULUM IMPLEMENTATION got a general average mean of 3.000 which is interpreted as AGREE. With regard to all the elements of Table 5, majority of the students are satisfied their teachers' professional knowledge and for their being attentive to their students' participation in class. Since the students are satisfied with their teachers' professional knowledge, it is undeniable that the curriculum implementation is effective, however it is affected by how every course is being conducted. Hence, teachers are advised to enhance the content of their courses anchored on the students' level of comprehension because without comprehension, learning cannot be fully attained.

Table 6: Curriculum Resources

		I am satisfied with the multimedia teaching	I am satisfied with the teaching materials	I am satisfied with the assessment methods	General Average Mean
N	Valid	129	129	129	
	Missing	0	0	0	
Mean		3.0000	3.0000	3.0000	3.000
Std. Error of Mean		.00000	.00000	.00000	
Std. Deviation		.00000	.00000	.00000	

Table 6, CURRICULUM RESOURCES got a general average mean of 3.000 which is interpreted as AGREE. With regard to all the elements of Table 6, majority of the students are satisfied with multimedia teaching, teaching materials, and assessment methods. However, the result of Table 6 does not agree to the result of Table 3 that students have the enthusiasm to learning. Based the result of Table 6, it can be inferred that students only pay attention to their scheduled classes but they don't find time for self-study. Though they are provided with materials, it does not mean that they will read the materials provided. The might like the activities held in the classroom before or after every lecture but prior to the class schedule, students did not make any preparation to study the lessons.

Table 7: Curriculum Evaluation

		My grades reflect my learning level.	Examination contents reflect the course requirements	The curriculum provides better learning experience for me.	General Average Mean
N	Valid	129	129	129	
	Missing	0	0	0	
Mean		2.0000	2.0000	2.0000	2.0000
Std. Error of Mean		.00000	.00000	.00000	
Std. Deviation		.00000	.00000	.00000	

Table 7, CURRICULUM EVALUATION got a general average mean of 2.000 which is interpreted as SLIGHTLY AGREE. With regard to all the elements of Table 7, majority of the students are not satisfied with their grades, examination, and better learning experience. Since the big chunk of students' grades come from major examinations, getting low on the major examination leads to poor letter grades that's why students can say that they were not provided a better learning experience. In addition, requirements on their respective courses need to be satisfied however, if they did not submit, submitted late, or submitted under developed requirement, definitely can will be evaluated and graded based on quality of their submission. Without giving importance on the curriculum evaluation in view of the students, definitely they cannot be given a very good academic performance.

Table 8. Overall Means

Curriculum Section	General Average Mean
Curriculum aims	2.5736
Curriculum system and content	2.8000
Curriculum implementation	3.0000
Curriculum resources	3.0000
Curriculum evaluation	2.0000
General Average Mean	2.6700

Overall, the general mean of the current curriculum of the programs as shown in Table 8 based on the survey is 2.6700 which is interpreted as SLIGHTLY AGREE. Based on the results, it is undeniable to say that both parties, teachers and students, need to improve their current performance. The teachers need to enhance their teaching method so students will be interested to find time to study independently. The importance of major examination has to be highlighted to students as well as the importance of the requirements because the big portion of students

grades did not come from their performance in the classroom but rely mostly in their requirements and major examinations.

Thus, curriculum planning and development must include students and lecturers (and staff) because everyone is affected by its implementation. That being said, it can be a very time consuming activity and require many facilitators working together to create an effective plan. Some teachers may want to focus on their classroom, others may need more time with research, while others may have events, administrative duties, or teach at other faculties. Each university could exercise various strategies to lead the development of curriculum, and in any school student experience and opinions should be valued. This study did not include staff because they add another element of value and challenge which can be investigated in another study dedicated to their role, however, their skills and concerns should also be considered and valued. In the end, open communication, transparency of ideas and planning, and understanding everyone's individual roles in order to make one final product are paramount for a successful curriculum.

10. Recommendation & Implications for the Future

The current curriculum for two facilities at this international university were written 100% by Thai teachers. It seems that since all teachers on the payroll are stakeholders and each has value to the college, all members should be involved in the creation and follow-through of all matters pertaining to the curriculum. Furthermore, perhaps students should play an active role in the revision process, so that their experiences and voices could enhance the curriculum. Also events and activities should all be conducted and performed in English so that all students and staff can participate and contribute. While these recommendations may seem like common sense, they are not being practiced at this particular college. Finally, if Thai and foreign teachers are going to provide a positive atmosphere for students, there needs to be transparency and equality in hours worked, workloads, and overall communication. Obviously both Thai and foreign teachers have a great deal to offer a college and each brings in their own cultural experiences, so those should be welcomed and shared.

All university students are included in the vision and curriculum of their represented institution. As such, the experience and opinions of students, teachers, and all stakeholders involved should be heard so that more inclusive and modern curricula can be developed. This study proved to be very valuable so that we can see how various stakeholders view the current situation and still work well together, but there is always room for improvement. Specifically, before the revisions for new curricula begin, students could be surveyed or interviewed to get direct feedback about their previous years. Next, teams could be created that include teachers, staff, and students to address each section of a curriculum, and after they meet and come up with revisions, then each department could join together to make sure visions and ideas blend together into one coherent plan. Finally, graduates of the university could be contacted since they have left university and hopefully begun to experience worklife, and their knowledge of how classes did or did not prepare them for the workforce could prove to be beneficial and practical.

11. References

- Bailey, J. (2021). The Importance of Visibility in Curriculum and Teaching Practice. *Sarah Lawrance College*.
- Chailom, S. (2019), (March). Five-Year Curriculum of Teacher Education In Thailand; Gain or Pain?. In *International Academic Multidisciplinary Research Conference in London 2019* (p. 215).
- Gericke, N., Huang, L., Knippels, M. C., Christodoulou, A., Dam, F. V., & Gasparovic, S. (2020). Environmental citizenship in secondary formal education: The importance of curriculum and subject teachers. In *Conceptualizing environmental citizenship for 21st century education* (pp. 193-212). Springer, Cham.
- Khasawneh, M. (2022). The Relationship of Curriculum, Teaching Methods, Assessment Methods, and School and Home Environment with Learning Difficulties in English Language from the Students' Perspectives. *Journal of Innovation in Educational and Cultural Research*, 3(1), 41-48.
- Kiatkheeree, P. (2018, June). Insights into Teacher Education Curriculum in Thailand. In *Proceedings of the 4th International Conference on Frontiers of Educational Technologies* (pp. 5-9).
- Nonthaisong, K., & Mantero, M. (2017). The Impact of Language Policy in the Basic Education Core Curriculum in Thailand. *Indonesian Journal of EFL and Linguistics*, 2(2), 71-89.
- Mad, T. (2021). The Importance of using Curriculum Personal and Creative Competence. *Andijan State University*.
- Rungswang, A. & Kosashunhanan, K. (2021). The problem of using English reading strategies perceived by Thai EFL students: Implications for reading instructions. *International Journal of Research in Business and Social Science* (2147- 4478). 10. 496-505. 10.20525/ijrbs.v10i4.1248.
- Suyaprom, S., & Manmee, T. (2018). Education Reform in Thailand 4.0: A True Story or a Soap Opera. *Asian Political Science Review*, 2(2).
- Tamronglak, A. (2020). Impacts of the Thailand qualification framework–Public administration on public administration education in Thailand. *Journal of Public Affairs Education*, 26(3), 276-290.
- Wijngaards-de Meij, L., & Merx, S. (2018). Improving curriculum alignment and achieving learning goals by making the curriculum visible. *International Journal for Academic Development*, 23(3), 219-231.
- Zhou, H. (2016) Empirical Study on University Curriculum Satisfaction of University Graduates. *Open Journal of Social Sciences*, 4, 132-137. doi: 10.4236/jss.2016.41017.

BUSINESS AND MANAGEMENT

The Application of Balanced Scorecard Evaluation Model for Power Development Fund Management in Thailand

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Abstract

This study has proposed to evaluate the operation and management of power development fund in Thailand by apply balanced scorecard theory. This study used three different data collection methods following the concept of triangulation of qualitative data resources which included: 1) Secondary data, for example, books, journals, articles, theses, reports, and other documents 2) Interviews with key informants, for example, executives from Energy Regulatory Commission (ERC), the managers of power development fund in category A and B, the employees who work for power development fund in category A and B, the sub-district headmen and village headmen in communities, the residents in communities living in the areas that have received impacts and problems from power plant and receive benefits from the operation and management of power development fund, as well as propose community projects, and get approval or refusal by the power development fund and 3) Observation of the existing community projects around the power development fund in designated area. The total key informants for this researches were 102 key informants. This study used balanced scorecard to evaluate on the operation and management of power development fund in Thailand. By using balanced scorecard as evaluation model, it will help power development fund to improve on operation and management of power development fund under balanced scorecard model and it will help power development fund to have more effective and efficiency on operation and management of power development fund in Thailand.

Keywords: Balance Scorecard; Evaluation Model; Power Development Fund

1. Introduction

The “Power Development Fund (the Fund)” has been set up under the Office of the Energy Regulatory Commission (OERC) pursuant to the Energy Industry Act, B.E. 2550 (2007), with the following objectives: to be used as a capital to enhance extensive electrification to various localities, to decentralize the development to provincial areas; to develop or rehabilitate

localities affected by power plant operation; to promote the use of renewable energy and technologies for electricity industry operation that have minimal impact on the environment, with due consideration on the balance of natural resources; and to create fairness for power consumers,(Office of the Energy Regulatory Commission.(2016))

Since 2007, Power Development Fund have provided numerous benefits toward the stakeholders and residents who live around the power plant in each area. For example; the treatment and remedy are provided for residents who have been affected by the operation of power plant, job creation, increased income for community, promotion of renewable energy and technologies, and extension of electrification project to various localities, however recently the operation and management of power development fund in Thailand has faced with some problems. For example, the budget allocation for power development fund in each category is not appropriate because residents near the power plant do not get any benefit from the fund. The participation of the residents and stakeholders to examine and scrutinize the operation of community projects in designated area has also become a significant problem. Some community projects do not provide remedy or treatment to the residents and stakeholders affected by the operation of power plant. From those problems, it lead to evaluate the operation and management of power development fund in Thailand. The Balanced Scorecard Evaluation Model will use to be a tool to evaluation on the operation and management of power development fund in Thailand and to recommend appropriate model for power development fund operation and management in Thailand. After the evaluation and analysis of the results, it will come out with management model for operating and managing power development fund under balanced scorecard theory. and to recommend appropriate model for power development fund operation and management in Thailand.

2. Literature Review

This study focuses on the balanced scorecard theory to evaluate the operation and management of power development fund in Thailand. The balanced scorecard (BSC) was developed by Robert Kaplan and David Norton (R. S. Kaplan & Norton, 1996) in the early 1990s. It is noted to be a strategy management tool not only a measurement, where assessment, improvement, and reporting are linked together to form a strategic plan but the key to this plan is turning strategy into action. The balanced scorecard is useful for finding financial measures, but cannot predict future values of the company made through investments in customers, suppliers, employees, technologies, processes and the like. The balanced scorecard allows companies and organizations to clarify their visions and strategies, while translating them into action. It also provides feedback on the internal business processes and the external outcomes of those actions and is therefore able to be used as a continuous improvement tool for finding the most strategic performances and results (R. S. Kaplan & Norton, 1996). In this study, the BSC concept is adopted to assess the operation and management of power development fund because the perspectives of BSC cover the operation and management of power development fund. For example, the internal process is management of power development fund, the financial management is distribution of budget to formulate community project, the concept of knowledge and training for employees in power development fund and also the customers or stakeholders who are groups of people who receive the benefit or impacts from the operation and management of power development fund. With this theory, the BSC will help evaluate the performance of power development fund in Thailand and it will help find the appropriate model for power development fund in Thailand.

Recently, there has been research related to performance evaluation of power development fund in a specific location. For example; the study of the management of general and environmental projects by applying good governance of power development fund at Huay Pong district, Rayong province (Manida W. & Wisakha P. (2016)), the lesson from management of the power development fund, a case study of Plaukdaeng district area (Rayong province) (Supassorn K. (2013)). Some studies focus on the operation and management of power development fund in the specific location. For example, the developing achievement of Nam Phong Power Plant Energy Tax Fund, Khon Kaen province (Narong T., 2011), the people participation in clean energy fund activities for community development surrounding Kaeng Khoi Power Plant (Sahas A., 2013), Social Responsibility Communication of the Electricity Generating Authority of Thailand – North Bangkok Power Plant (Pawinsuda A.,2012), Guidelines for Community Empowerment in Management of the Nam Phong Power Plant Development Fund, Khon Kaen Province (Sakhorn U.,2021). For this research study does not focus on performance evaluation of power development fund in specific location but focus on power development fund in category A and B and also in different locations around Thailand.

3. Research Methodology

This study used three different data collection methods following the concept of triangulation of qualitative data resources which included:

1) Secondary data, for example, books, journals, articles, theses, reports, and other documents. Those secondary data must relate to the operation and management of power development fund in Thailand. This process is very important to receive the background knowledge about the operation and management of power development fund in Thailand and will be helpful for the gathering of data from the following process which support information from interviews and discussion.

2) Interviews with key informants, for example, executives from Energy Regulatory Commission (ERC), the managers of power development fund in category A and B, the employees who work for power development fund in category A and B, the sub-district headmen and village headmen in communities, the residents in communities living in the areas that have received impacts and problems from power plant and receive benefits from the operation and management of power development fund, as well as propose community projects, and get approval or refusal by the power development fund. The interview model has been in accordance with the conceptual framework which is related to the Balanced Scorecard theory (BSC).

3) Observation of the existing community projects around the power development fund in designated area.

This study also uses content analysis employed for the qualitative analysis in this study that includes: 1) read all information carefully 2) evaluation all the terms; code the word that best describes each piece of information 3) group the terms; coded terms and form a hierarchy 4) look for relationship between the concepts 5) give the concept's structure and 6) discusses the model.

The total key informants are 102, who are purposively selected by their roles and responsibility of each key informant. All selected key informants have provided information and assisted the researcher to evaluate the performance of the operation and management of power development fund. The location of power development fund covered power development fund in category A and B by the types of fuel mostly used for electricity generation in power plants in Thailand and the power plants operated by Electricity Generating Authority of Thailand (EGAT) in six provinces around Thailand; Lampang, Nonthaburi, Phra Nakorn Sri Ayutthaya, Chachoengsao, Khon Kaen, and Ratchaburi.

Table 1 The Fund Category (Office of the Energy Regulatory Commission, 2016)

Fund Category	Category A	Category B
Allocated Money/Year	More than 50 M Baht	More than 1 M Baht, but not exceeding 50 M Baht
Fund Management	CDC: 15-35 members TDC: 7 members	CDC: 15-35 members
Office Term	- CDC: 4 years, and not more than 2 consecutive terms. At the initial term, after two years' time, half of the committee members shall be discharged by drawing lots. - TDC: 2 years, and not more than 2 consecutive terms.	CDC: 4 years, and not more than 2 consecutive terms. At the initial term, after two years' time, half of the committee members shall be discharged by drawing lots.

Table 2 Details and Number of key informants

Key informants	Roles and Responsibility	Number of key informants
Executives from Energy Regulatory Commission (ERC)	Manage and set policy framework and regulation of power development fund in Thailand with the authority to approve the allocation of budget and manage budget, nominate the CDC and TDC representatives, and manage other related	4

Key informants	Roles and Responsibility	Number of key informants
	work of power development fund under the purpose of power development fund.	
The manager and employee of power development fund in six areas of the fund A and B	Manage and control the operation and management of power development fund in designated area, and work in their own position, for example, accounting, procurement and other related work for power development fund in designated area.	24
The sub-district headmen, the assistant sub-district headmen, and village headmen who are representatives of residents in community area.	Guide and lead residents in community on how to write and propose community projects. However, sometimes they are persons who write and propose community projects for residents in case the residents do not have knowledge on how to write and propose community projects. Some sub-district headmen, assistant sub-district headmen, and village headmen are also selected to the Community Development Committee (CDC) and Tambon Development Committee (TDC) representatives	20
The sub-district headmen, the assistant sub-district headmen, and village headmen who are representatives	Vote for community projects when public forums are organized and write and propose community projects. Some residents who live in communities also have responsibility to be Community Development Committee (CDC) and	54

Key informants	Roles and Responsibility	Number of key informants
of residents in community area. The residents who live in communities and receive any impact and problems from power plant and receive benefit from the operation and management of power development fund.	Tambon Development Committee (TDC) representatives. The groups of residents are divided into the group of residents who propose community projects and get approval from power development fund and the group of residents who propose community projects but do not get approval from power development fund	
	Total	102

4. Results

From interview with Energy Regulatory Commission (ERC) who manage and set policy framework and regulation of power development fund in Thailand with the authority to approve the allocation of budget and manage budget, it found that until now the power development fund in category A and B still operate and manage under objective of power development fund. The residents in each area participate in the operation and management of power development fund by participate in public forum that power development fund organized for vote and propose community projects. However the community projects that residents propose for community projects are not various and not outstanding.

The manager of power development fund in category A and B who manage and control the operation and management of power development fund in designated area, mention on the cooperation and co-ordination problem between government sector and public sector which lead to the problem on formulating community projects. The manager of power development fund in category A and B mention that some community projects proposed by residents and stakeholders were less efficient and less in quality which could not help develop community to the maximum.

From interview with the employees of power development fund in category A and B, it was found they have received the training and knowledge at least once or twice a year. Most trainings were about procurement and useful knowledge, for example, accounting and finance or new knowledge that could apply to work in the office. However, the employees of power

development fund said that the trainings that power development fund provided for them were not enough and they suggested power development fund provide more trainings.

From interview with sub-district headmen and village headmen who live around the operation of power plant and live around the operation of power development fund in designated area said that they had the opportunity to write the document to propose community project and also to teach residents on how to write and propose the community project. The power development fund had plan and budget to assign persons with knowledge on how to write and propose community project, and to teach and inform about how to write and propose community project.

From interview with the sub-district headmen and village headmen, it found the problem on the established of community projects around the power development fund in designated areas which were not continuous projects and were not long-term projects.

The sub-district headmen and village headmen who live in designated area mentioned that in some areas, there were problems of transparency and corruption situation in the operation and management of power development fund. The sub-district headmen suggested that the power development fund in some designated areas should be re-organized.

From interview with resident in communities living in the areas that have received impacts and problems from power plant and receive benefits from the operation and management of power development fund, it was found that they had the opportunity to participate in the power development fund through public forum. The residents were informed about the organization of public forum through voice announcement. Before residents attended public forum, the sub-district headmen in areas organize the pre-meeting with the residents to discuss the problems that they faced in the area, the problems that needed to be solved and what they wanted to improve in their community.

However, from interview it also found problems on the opportunity to examine and scrutinize the community project formulated in the area. The residents did not have opportunity to examine or investigate the process for establishing community projects that they had proposed. From interviews with residents in communities, they did not know about the existence of community project. In some areas, it was found that they perceive the existence of community projects. However, for some residents who were not interested in proposing community projects, they did not know about the existence of community projects.

From the observation among six designated areas, it was found that community projects were existed in areas and the sign board were set up to inform residents about the existence of community projects.

This study use Balanced Scorecard theory to evaluate the performance on the operation and management of power development fund in Thailand. With Balanced Scorecard theory, it will come out with concept which help to improve and develop the operation and management of power development fund.

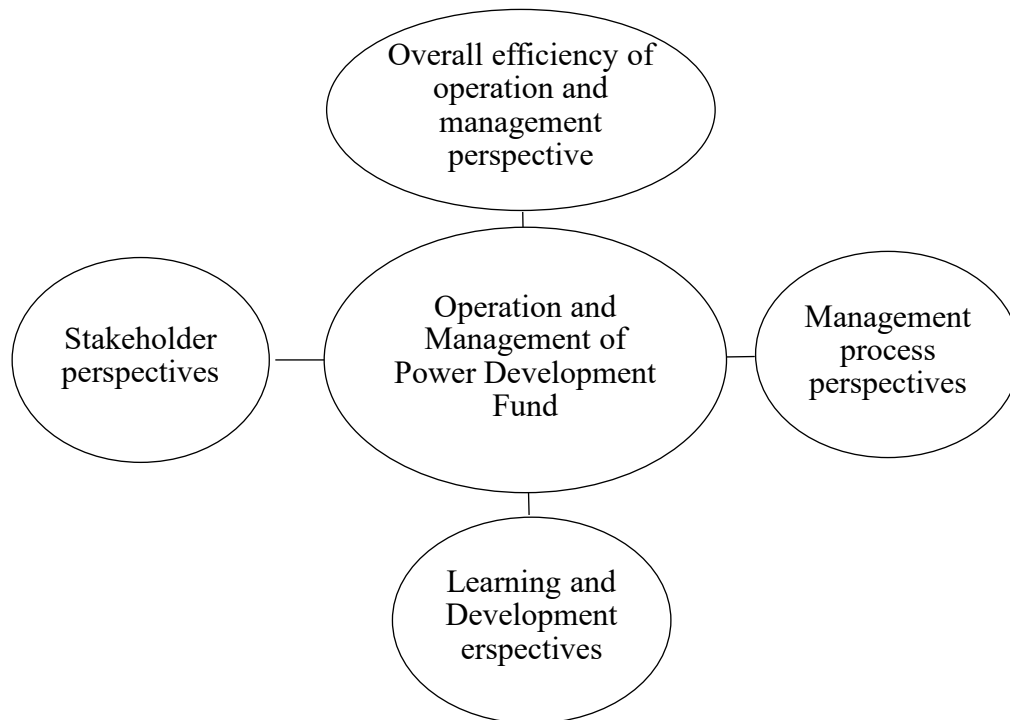


Figure 1 The Balanced Scorecard Theory (BSC)

The overall efficiency of operation and management will focus about ; the role of power development fund toward social and communities that receive impacts from the operation and management of power plant; the support of renewable energy and technology use which can reduce the impact of environmental problems; the decentralize development on job creation and increase income which related to the objective of power development fund on decentralize development to area; the enhancement on extensive electrification to various localities which help to make localities to develop related to the objectives of power development fund.

The management process perspective will focus about; the coordinating and participating with other sectors on operation and management of power development fund; the reporting of progress on operation and management of the power development fund in Thailand; the participating of residents toward the operation and management of power development fund; the accountability of power development fund toward the operation and management which provide benefits to all stakeholders, for example the responsibility of power development fund to manage and operate on the allocation of budget to stakeholders; the transparency on the operation and management of the power development fund which provide benefits to all stakeholders, for example the role of power development fund on operation and management which all of stakeholders can examine and scrutinize.

The stakeholder perspective will focus about; the opportunity to examine and scrutinize the operation and management of power development fund for example scrutinizing on the budget which allocate to formulate community projects; the perception toward knowledge on how to propose community projects; the participation opportunity toward the operation of power development fund for example; attending public forums, opportunity for proposing community projects.

Learning and Development perspective will focus about; the providing knowledge on supporting and training for employee of power development fund in Thailand; the amount of activities on training for employee of power development fund in Thailand; the providing on the activities and knowledge relating to learning and development perspective of power development fund in Thailand for example the knowledge on the regulatory of power development fund, the procurement regulation which related to the operation and management of power development fund.

5. Conclusion and Suggestion

This study use Balanced Scorecard theory to evaluate the performance on the operation and management of power development fund in Thailand. With Balanced Scorecard theory, it will come out with concept which help to improve and develop the operation and management of power development fund.

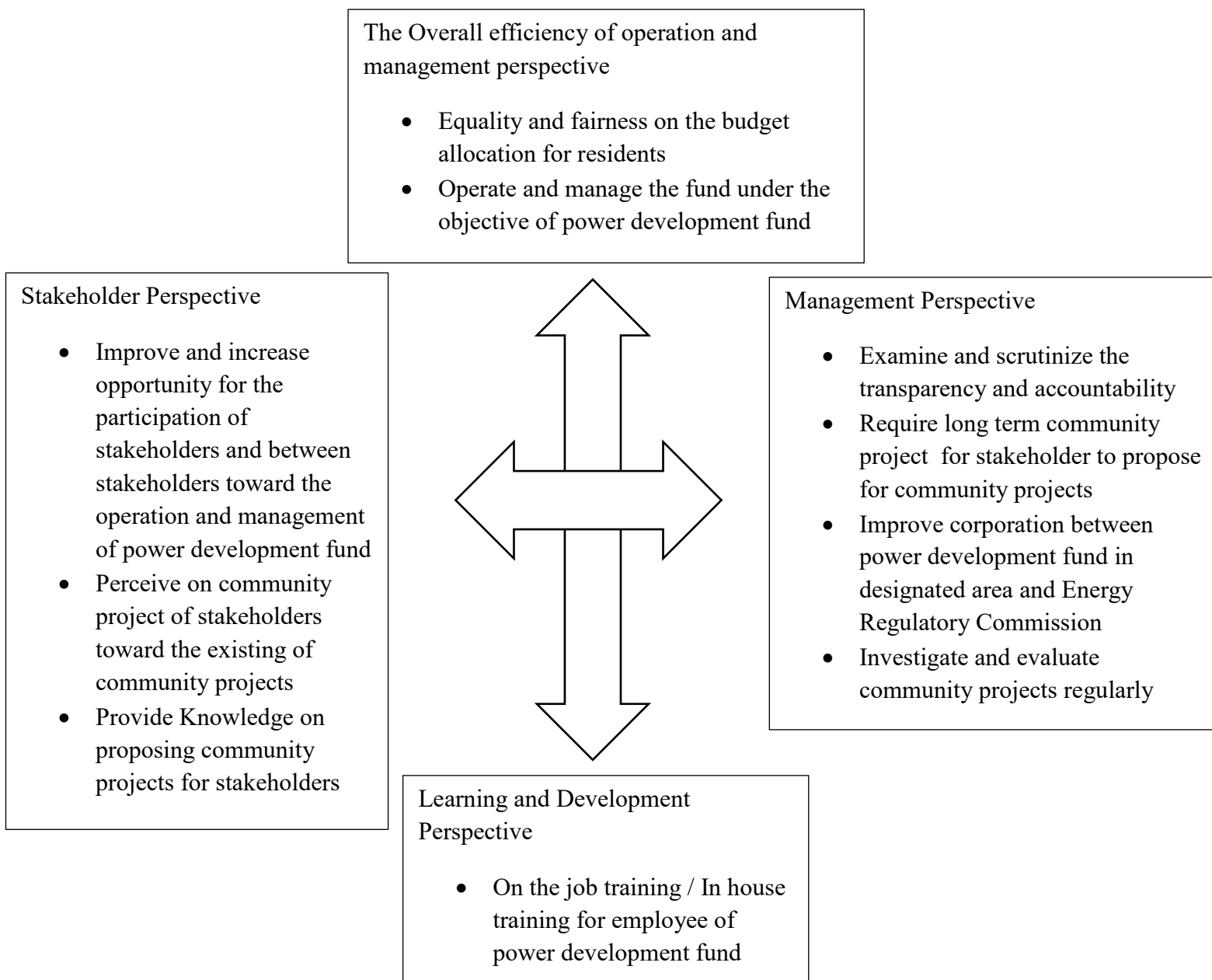


Figure 2 Appropriate Model from Balanced Scorecard Theory (BSC)

The Overall efficiency of operation and management perspective

From interview it found that, power development fund have faced the problems of the budget allocation by the Community Development Committee (CDC) to formulate community projects because CDC seems to allocate budget to one location more than other locations. The researcher recommends that the Community Development Committee (CDC) should allocate budget to residential areas with concern about the impact on the community from the operation of power plant. In the area with high impact, the Energy Regulatory Commission (ERC) should work with the Community Development Committee (CDC) in designated area to allocate more budget to formulate community projects which can help alleviate the impact. On the other hand, for the community less affected by the operation of power plant, the Energy Regulatory Commission (ERC) should work with the Community Development Committee (CDC) in designated area by allocating reasonable budget. The operation and management of power development fund should operate and manage follow the objective of power development fund. From interview with key informants also found that community projects proposed by residents and stakeholders were less efficient and less in quality than it should be and it could not help develop community to the maximum, therefore power development fund in designated areas should motivate resident to propose for community projects which make development to designated areas.

Management Perspective

From the interview, it was found that some power development funds have received comments from residents on the transparency of their operation and management. The Energy Regulatory Commission (ERC) should assign authorized person or a third party to investigate and scrutinize the operation and management of power development fund, which will help reduce the corruption and transparency problems.

From the interview, it was found that most community projects established around the power development fund in designated areas were not continuous projects so they were not long-term community projects. With long-term community projects, it can create sustainability to communities' areas and it can make development for communities areas, therefore the researcher recommend power development fund in designated area to motivate residents to propose for long-term projects.

From the interview, it was found that in some power development fund A and B faced problem on cooperation and co-ordination between government sector and public sector, therefore Energy Regulatory Commission (ERC) and power development fund should be the third party to enhance cooperation between the general public and government agencies. Such cooperation will help power development fund in designated area to be effective and efficient in operation and management, leading to successful operation and management.

From the interview with the Energy Regulatory Commission (ERC), it was found that the ERC assesses and evaluates the performance of power development fund by examining power development fund in category A and B by random sampling by types of fuel that is used to generate electricity in Thailand. As there are many power development funds in each category, it is difficult to evaluate and assess all power development funds. However, by random

sampling, there have been disadvantages because Energy Regulatory Commission (ERC) will not know the performance of all aspects of the operation and management of power development fund. The Energy Regulatory Commission (ERC) should assign authorized person to investigate and evaluate all power development fund in each category. With Energy Regulatory Commission (ERC's) visiting all power development funds, the Energy Regulatory Commission (ERC) will know all the problems faced by the power development fund and its stakeholders as well as their needs to develop community projects.

Stakeholder Perspective

The participating problem of residents and stakeholders to public forums also becomes one of the most important problems that CDC, the fund and its employees should cooperate with each other to find the way to encourage residents or stakeholders to participate in public forums which can provide opportunity for residents to propose community projects resulting in development in community areas. From the interview with residents or stakeholders who live around the power plant, it was found that they have perception problems toward the community projects. Some residents or stakeholders do not know that the community projects are established and formulated in their community area. They mentioned that the power development fund in designated area do not communicate and inform them about the formulation of community projects in their area. To solve the problem, power development fund should communicate with sub-district and village headmen who are representatives of residents and inform them about community projects. From interview with sub-district headmen and residents who live around the power plant, it was found that they do not possess knowledge on writing the document to propose community projects. Most of the proposed community projects are rejected because residents do not have sufficient ability and knowledge on proposing community projects. Therefore, Community Development Committee (CDC) or the Committees of the power development fund who are public representatives and employees should guide and assist residents or stakeholders on how to write the community projects.

Learning and Development Perspective

On the job training / In house training, it is very important that the Energy Regulatory Commission (ERC) and Power Development Fund in designated areas should concern and provide job trainings which are necessary for employees to apply to their job even if it is not directly related to their responsibility. Job trainings can provide benefits and advantages for employees in power development fund because employees need to know about the regulation on procurement, law and regulation about power development fund, knowledge about accounting and financing, etc. On the job training / in house training will improve working ability and efficiency for employees in the power development fund.

With applying balanced scorecard theory, it will help to improve on operation and management of power development fund and will make power development fund to have efficiency and effectiveness on operation and management. By apply balanced scorecard theory, it can create sustainability management for power development fund in Thailand.

This study's result will be given to Energy Regulatory Commission (ERC) as recommendation for the operation and management of power development fund.

6. References

- Kaplan, R. & Norton, D. (1996). *The strategy-focused organization: How balanced scorecard companies thrive in the new business environment*. Boston, MA: Harvard Business School Press. United State of America
- Manida W. & Wisakha P. (2016). *Management of General and Environmental Projects by Applying Good Governance of the Power development fund at Huay Pong sub district, Rayong province*. Graduate School of Environment Development Administration, National Institute of Development Administration (NIDA), Bangkok, Thailand
- Narong T. (2011). *The Developing Achievement for Nam Phong Power Plant Energy Tax Fund, Khon Kaen Province*. STOU National Research Conference 2011, p.461-468
- Office of the Energy Regulatory Commission. (2016). *Fact sheet: Power development fund*. Bangkok, Thailand
- Pawinsuda A. (2012). *Social Responsibility Communication of the Electricity Generating Authority of Thailand – North Bangkok Power Plant*, Thammasat University, Bangkok Thailand.
- Sahas A. (2013). *People’s Participation in Clean Energy Fund Activities for Community Development Surrounding Kaeng Khoi Power Plant II*, UTK Journal, 7(2).
- Supassorn K. (2013) ‘Lesson from Management of the Power Development Fund, A case study of Pluakdaeng District area (Rayong)’. National Institute of Development Administration. Bangkok, Thailand
- Sakhorn U. (2021) ‘Guidelines for Community Empowerment in Management of the Nam Phong Power Plant Development Fund, Khon Kaen Province’. Mahasarakham University, Thailand

Factors of E-procurement Adoption for the Business in Chonburi

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Abstract

The adoption and implementation of new technology and systems is an essential strategy for enhancing the efficiency and effectiveness of the organization. Efficiency and effectiveness are involved with the speed for servicing customer's needs and desires. Supply chain management contributes to the buyers and suppliers' performance. Procurement is one of the most important activities in the supply chain that affects the total performance of the organization. The adoption of electronics procurement (e-procurement) has become more popular in recent competitive business situations. According to the literature, the adoption of e-procurement enhances the customer satisfaction by improving the ability of procurement staff through the procurement performance. However, benefits of e-procurement adoption need to be studied and revealed for encouraging both top management and staff to invest and accept to apply for procurement activities. This study highlights the relevant factors of e-procurement adoptions for the business. The study includes the procurement and purchasing employees of the business in Chonburi. The data was collected by the structured questionnaire. Influencing factors are then statistically analyzed based on exploratory factor analysis (EFA) The results reveal that three important factors for e-procurement adoption are efficiency, ease of use and competitiveness.

Keywords: Competitiveness, Ease of use, Efficacy, E-procurement, Exploratory Factor Extraction

1. Introduction

The pandemic disruption has accelerated the technology adoption in various business sectors. Several technologies have been evolving in this decade and now creating the new normal such as flexible distance services and collaborative working. Procurement is an essential activity in the supply chain that is time consuming and involves a bunch of information from multiple suppliers and customers. The goal of procurement is to obtain the input for the operational processes including planning purchasing, distribution, inspection, and receiving activities. E-procurement is the electronics procurement process that implements all mentioned procurement activities through a web-based system. The use of e-procurement provides transparency, efficiency and fairness in many procurement functions such as searching for the raw materials, ordering, purchasing, and negotiating. E-procurement also enhances the competitiveness of the company and relationship with the partners in the supply chain. Success factors and perceived benefits of e-procurement implementation is a very interesting issue to study. It would help to encourage both the top management and operators to invest and use the

e-procurement technology platform. The study of Thailand e-procurement adoption is left to be dealt with. Consequently, the e-procurement adoption for the business in Chonburi is studied in this work. The data was collected in Chonburi because it is the province that has a high number of industrial estates. The collected data was statistically analyzed by using SPSS for extracting the relevant factors of e-procurement adoption in Chonburi. The statistical analysis that applied for this study is EFA.

This article is divided into four sections. The first section, introduction, identifies the study background and the gap of the problem. Section 2, literature review, discusses the related studies that contribute to the framework of this research. Section 3 explains the methodology of this work. Section 4 shows the results and data analysis from the experiment. Section 5 presents the discussion. Lastly, section 6, explains the conclusion of this work.

2. Literature Review

Information technology (IT) has been successfully developed and applied to use in various industries. Numerous industries have invested in IT systems into their organization for increasing organizational performance. Procurement is one of the most important and tedious activities in the supply chain that needs to be improved for enhancing efficiency. Therefore, e-procurement has become more popular in several organizations. E-procurement is the activity that performs the procurement process through the internet and the world wide web. It has potential for enhancing the procurement process to be simpler, faster and more efficient (Liu et al., 2011). However, the adoption of e-procurement in developing countries is not easy because the operators are afraid of the change in technology without studying about the advantages of IT adoption. Senior management team has to encourage their employees to accept the use of e-procurement technology instead of the traditional procurement by providing the knowledge about benefits and the necessity of e-procurement adoption. Afolabi et al., (2017) reported that the procurement stakeholder is required to link the digital technologies with the e-procurement process. This finding agrees with the study of

Oladapo (2007) that the use of digital technologies in Nigerian construction industry is less time consuming than the traditional activities. The opinion about e-procurement adoption is later studied by Aduwo et al., (2017). The opinions from project managers, and the consulting sector are surveyed. The results presented that the adoption of e-procurement needs support from top management and a positive attitude towards the use of technology.

Afolabi et al., (2019) studies the critical success factors (CSFs) for e-procurement adoption in the construction industry. The results illustrated that the reliability, affordability and fast internet services are the most critical success factor for adopting e-procurement technologies. The maximization of procurement effectiveness was studied by Morris et al.(2000). It was found that the e-procurement system is cost saving in the overall purchasing process. The literature review of e-procurement benefits are presented in Table 1.



Table 1 The literature review of e-procurement benefits.

Benefits of e-procurement	References				
	Gunasekaran and Ngai (2008)	Eadie et al. (2010)	Farzin and Nezhad (2010)	Eei et al. (2012)	Toktaş-Palut et al. (2014)
1. Cost saving	x	x	x	x	x
2. Increase process quality and efficiency		x	x		x
3. Minimize process error				x	x
4. Better Management	x		x	x	x
5. Time saving	x	x	x	x	x
6. Integrated information sharing				x	x
7. Improving supply chain transparency		x	x	x	x
8. Simplified purchasing process		x	x	x	x
9. Quicker response to problems		x			x

The goal of this article is to evaluate and validate e-procurement factors with the sample of business in Chonburi. At the beginning, EFA is applied to uncover the underlying structures of the three factors. A confirmatory factor analysis (CFA) is then used for confirming whether the original three factors can be classified into three factors. Three relevant factors for e-procurement adoption as routine tasks include efficiency, ease of use and competitiveness.

3. Methodology

The study was conducted and carefully taken in Chonburi to ensure that 192 respondents were using e-procurement programs for business as routine tasks. The 200 paper questionnaires were distributed to the company located in Chonburi, especially in Amata City Chonburi and 192 were returned (a response rate of 96 percent).

The respondents completed a 15-minute online survey, with (1) part of personal information (gender, educational level and working experience) and (2) the user’s perception toward using e-procurement programs.

Responses on the scales of opinions of the respondents toward the importance of each factor affecting choosing the third-party logistic providers were recorded on a 5-point Likert scale ranging from “totally important” to “totally not important” where “totally important” = 5 and “totally not important” = 1. This part was analyzed by using Exploratory Factor Analysis (EFA) to investigate and identify which factors could be common factor that presented the relationship among those factors, and to assess which factors were robust and which were to be eliminated because of poor performing.

Table 2 Sample Description (n=192)

Variables	Description	N = 192	Percent
Gender	Male	152	79.20
	Female	40	20.80
Educational Level	Lower than bachelor’s degree	9	4.70
	Bachelor’s degree	173	90.10
	Higher than bachelor’s degree	10	5.20
Working experience (Year)	1-3 years	174	90.60
	4-6 years	12	6.30
	7-9 years	6	3.10
	More than 9 years	0	0.00

Regarding a 192-returned survey distribution, the gender of the respondents were male respondents accounted for 79.20 percent of completed questionnaires, while females were

accounted at 20.80 percent. Educational levels of the surveyed respondents graduated bachelor’s degree with accounted at 90.10 percent. The experiences were mostly at the range of 1-3 years with 91.60 percent as shown in Table 2.

4. Data Analysis and Results

The quantitative survey consisted of 19 items conducted to assess what factors were important for e-procurement system users’ viewpoints. Exploratory Factor Analysis (EFA) was applied to this study. Three of the poor-performing items was removed from original 19 items, and the remaining of 16 items were analyzed and regrouped into 3 constructs.

Exploratory Factor Extraction

The factor load is the correlation coefficient between individual variables and common factor. After analyzing, principal component factors were obtained by merging variables which has relatively high factor loading. Table 3 presented rotated component matrix and the extracted 3 constructs.

Table 3 Rotated component matrix with 3 regrouped constructs and their composite reliability

Variables		Factor loading matrix			Composite Reliability	Extracted common factors
Item No.	Item	1	2	3		
12	E-procurement enhances work accuracy.	0.810			0.801	Construct 1: Efficiency
6	E-procurement helps collecting data effectively.	0.759				
15	E-procurement brings about the productivity.	0.681				
2	E-procurement can save costs.	0.645				
9	E-procurement create more opportunities for a business.	0.563				
3	E-procurement makes the company buy more software and hardware.	0.545				
13	E-procurement helps the users easier in making decision for their works.		0.763		0.783	Construct 2: Ease of use

4	E-procurement makes data transfer easier.	0.712		
7	E-procurement is beneficial for data presentation.	0.673		
10	E-procurement releases a complication to an easier task.	0.671		
16	E-procurement attracts more customers.	0.636		
1	The users find the ease when using e-procurement.	0.584		
17	E-procurement saves time and enhance a good management.	0.729	0.644	Construct 3: Competitiveness
11	E-procurement is needed for any-sized organizations.	0.702		
5	E-procurement reduces problems.	0.641		
14	E-procurement increases business competitiveness.	0.554		

Table 3 presented the modified measurement model and regrouped-variable constructs. The assessment of factor loading and composite reliability of each regrouped construct (Efficiency, Ease of use, and Competitiveness) were showed 0.801, 0.783, and 0.644, respectively. The items with a factor loading of less than 0.50 were considered as weak index items of common factors. The common factors were assigned a label to show potential attributes of individual factor and the common. Therefore, there were 3 of important factors of using e-procurement system from the users' viewpoints for their works in Chonburi.

5. Discussion

In the modern world business and getting into the new situation of work-from-home jobs, a tendency to remove some paper-related or time-consuming activities has occurred to many companies in these days. E-procurement offers significant benefits for the organizations. Regarding this study and findings of regrouped-variable constructs with factor loading of higher than 0.50, the e-procurement users were giving the importance of using e-procurement by categorizing into 3 important issues as following.

1. Efficiency

Cost/time savings

Referring to a purchasing department, it involves receiving complete visibility on the information transferring, database interaction and ongoing performance of an entire data. Comparing to the traditional purchasing system, it consumed time and involved human's activities in almost every step of the process. With e-procurement system, it is easier for users to spot issues with their workflow to organize the better purchasing processes (Kahn, 2020). The department could increase a productivity in areas of the business with time saving, for instance, strengthening the relationships with suppliers, assessing supplier.

The users can improve communication with shorter transaction time in the organizations. E-procurement uses the Information Communication Technology (ICT) in the procurement of goods and services by individual users and organizations (Munubi, Kinanga, & Ondiba, 2017). It allows the business to get tasks done in a real time, and the future process will not be restrained by waiting for certain transactions to be completed. For example, the purchase-to-pay automation helps the business eliminating repeatable steps and labor-intensive tasks in the business activities such as digital purchase requisition, purchasing orders, approval tasks, the notifications and so on.

Value-focused productivity

In general, e-procurement system enables the organizations to more accurately and efficiently aggregate how much they spend corporation in various purchased products areas. Apart from the benefits including reducing cycle times, it has a significant impact on the cost reduction, and revenue generation potential for the businesses due to the fact that the products can get to the markets faster and e-procurement allows the business to position itself to capture the market share from the first-to-market position that can be linked to the third issue of competitiveness. However, to measure the productivity, it requires the input and output data in the system such as the information of volume, and etc. (Organisation for Economic Co-operation and Development, 2019).

2. Ease of use

Simplification of configuration and scale

One of the most beneficial values of using e-procurement system is the flexibility to design the applications or tasks to fit with the individual firm and stakeholders' needs. The firms can arrange and implement an automated purchasing system solutions that affect direct positive impact on the business, for example, sourcing of products or services from a single point, the data visibility collected across the automated modules and stored in the central hub, more rapid payment receiving, improved flow of documents, and ease-of-use for queries and amendments by buyers or suppliers.

Real-time transparency

E-procurement system can improve the transparency and integrity in the service such as the process of sourcing, ordering, auctioning, and others. It has been recognized globally as an important tool to monitor the flow or any misuse of power (Sohail & Cavill, 2008). The process of transparency has detailly been defined in the e-monitoring mechanism in the purchasing processing and reporting. According to the study of Belisari, Binci, and Appolloni (2020), it was claimed that the relationship between suppliers and buyers was based on the

trust, clarity and transparency to enable sharing the needs by the buyer side and the updates to the supplier side.

The functional focus

Customizable options can be the approach that should be applied to launch the platform of e-procurement to the real needs of the users, including buyers and suppliers. The adoption of the right-to-target platforms or functions can meet the partners' expected benefits (Belisari et al., 2020). For e-procurement system, the software itself does not solve problems, yet it is necessary to know how it works, for example, the private businesses normally focus on the output, therefore the functions of system might help the business know the purchasing process lead-time development, information tracking through vendors' contracts, etc.

3. Competitiveness

Strategic implementation

The competitive dimensions cannot be delivered without an effectively managed strategic viewpoints and implementations. The successfully implemented e-procurement influences an efficient savings and contributions, for example, The study of government e-procurement in the western Balkans and former soviet states in Eastern Europe found that it was considerably estimated savings with the range from 5% to 15% of total public procurement (Ferrand, 2019). Shakyra (2015) claimed that motivating the employees and suppliers was the good governance with the focus of the saving impact for the organization. For instance, nowadays the supplier relationships and development were on the focus, and the collaborative relationships were built with the every-tier suppliers.

Collaborative development

The collaborative procurement is not new, but the construction has been developed and changed for a long time. The use of technological solutions involved organizational changes and affected the business-to-business (B2B) management on how business can spend more attention to strategic activities. The benefit of collaborative procurement is to reflect the partnering culture and associated processes being used widely in different industries. For example, the study by Piera, Roberto, Giuseppe, and Teresa (2014) showed the quantitative terms of benefits received with the implementing a model of e-procurement collaboration were successful by various stakeholders getting involved in the process of value creation (such as the collaboration between business and suppliers, the better management of centralized accessible points by employees, the availability of indicators for assessing the performances by all stakeholders, and the quality services received by customers (Piera et al., 2014).

6. Conclusion

It is widely claimed that the importance of e-procurement was viewed as a tool to improve the process of traditional procurement, and also as a reform with a shift to a culture for current organizations. The findings suggested that the reasons that the firms should use e-procurement to leverage the organizational enhancement were efficiency, ease of use and competitiveness.

Many firms can improve the business transaction speed through the utilization of e-procurement systems. The concept of e-procurement was built upon the concept of enterprise resource planning (ERP) systems which allow the firms to automate their internal processes and make them easier for transactions. Moreover, e-procurement is expected to be integrated into the wider Purchase-to-pay (P2P) value chain with the trend toward computerized management.

7. References

- Afolabi, A. O., Owolabi, J. D., Ojelabi, R. A., Oyeyipo, O., & Aina, D. A. (2017). Development of a web-based tendering protocol for procurement of construction works in a tertiary institution. *Journal of Theoretical and Applied Information Technology*, 95(8), 1595-1606.
- Afolabi, A., Ibem, E., Aduwo, E., Tunji-Olayeni, P., & Oluwunmi, O. (2019). Critical success factors (CSFs) for e-Procurement adoption in the Nigerian construction industry. *Buildings*, 9(2), 47.
- Belisari, S., Binci, D., & Appolloni, A. (2020). E-procurement adoption: A case study about the role of two Italian advisory services. *Sustainability*, 12(18), 7476.
- Eadie, R., Perera, S., & Heaney, G. (2010). Identification of e-procurement drivers and barriers for UK construction organisations and ranking of these from the perspective of quantity surveyors. *Journal of Information Technology in Construction*, 23-43.
- Eei, K. S., Husain, W., & Mustaffa, N. (2012). Survey on benefits and barriers of e-procurement: Malaysian SMEs perspective. *International Journal on Advanced Science Engineering Information Technology*, 2(6), 14-19.
- Farzin, S., & Nezhad, H. T. (2010). E-procurement, the golden key to optimizing the supply chains system. *International Journal of Economics and Management Engineering*, 4(6), 837-843.
- Ferrand, A. (2019). *e-Procurement: lessons from interventions and approaches from Emerging Economies of Eastern Europe and Western Balkans (Helpdesk Report)*. Knowledge, evidence and learning for development. https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/14762/670_eProcurement_lessons_from_interventions_and_approaches_from_Emerging_Economies_of_Eastern_Europe_and_Western_Balkans.pdf?sequence=1&isAllowed=y
- Gunasekaran, A., & Ngai, E. W. (2008). Adoption of e-procurement in Hong Kong: an empirical research. *International Journal of Production Economics*, 113(1), 159-175.
- Ibem, E. O., Aduwo, E. B., Ayo-Vaughan, E. A., Uwakonye, U. O., & Owolabi, J. D. (2017). E-procurement use in the Nigerian building industry. *International Journal of Electronic Commerce Studies*, 8(2), 219-254.
- Kahn, Z. (2020, January 28). *E-Procurement: A Good Way to Increase Productivity In The Digital Age*. Customer Think. <https://customerthink.com/e-procurement-a-good-way-to-increase-productivity-in-the-digital-age/>
- Liu, Q., Sun, S. X., Wang, H., & Zhao, J. (2011). A multi-agent based system for e-procurement exception management. *Knowledge-Based Systems*, 24(1), 49-57.
- Morris, A., Stahl, A., & Herbert, R. (2000). *E-procurement: streamlining processes to maximize effectiveness*. Luminant Worldwide Corporation, USA.

- Munubi, K. Z., Kinanga, R., & Ondiba, K. P. (2017). Effects of electronic procurement on organizational performance: a case study of major supermarkets in Nairobi County. *International Academic Journal of Procurement and Supply Chain Management*, 2(3), 92-105.
- Organisation for Economic Co-operation and Development (2019). Productivity in Public Procurement A Case Study of Finland: Measuring the Efficiency and Effectiveness of Public Procurement. <https://www.oecd.org/gov/public-procurement/publications/productivity-public-procurement.pdf>
- Piera, C., Roberto, C., Giuseppe, C., & Teresa, M. (2014). E-procurement and E-supply Chain: Features and Development of E-collaboration. *IERI Procedia*, 6, 8-14.
- Oladapo, A. A. (2007). An investigation into the use of ICT in the Nigerian construction industry. *Journal of Information Technology in Construction*, 12, 261-277.
- Shakya, R. K. (2015). *Good governance in public procurement: An evaluation of the role of an e-procurement system* (Doctoral dissertation, Capella University). <https://worldbank.academia.edu/DrRajeshShakya>
- Sohail, M., & Cavill, S. (2008). Accountability to prevent corruption in construction projects. *Journal of Construction Engineering and Management*, 134(9), 729-38.
- Toktaş-Palut, P., Baylav, E., Teoman, S., & Altunbey, M. (2014). The impact of barriers and benefits of e-procurement on its adoption decision: An empirical analysis. *International Journal of Production Economics*, 158, 77-90.

The Impact of Influencers on Consumers' Purchase Intentions

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Abstract

The purpose of this study is to compare online and offline channels in order to determine how influencer attributes affect customer purchase intention. Credibility, attractiveness, and trustworthiness are three significant attributes. There are 210 respondents drawn from a convenience sample of locals throughout Thailand. According to SEM (Structural Equation Modeling). The findings indicated that online and offline trustworthiness had a significant effect on consumer purchase intention, which may be the key to a corporate strategy that influences customer purchase intentions.

Keywords: influencers; credibility; attractiveness; trustworthiness; purchase intention

1. Introduction

Now influencer marketing can be used for both online and offline campaigns. Online and offline influencers are now essential conversion tools because they can attract customers and steer them in their purchase process. Numerous opinion leaders have established themselves as influential members of online communities and have been demonstrated to be a source of advice for other consumers (Casaló, Flavián, & Ibáñez-Sánchez, 2020). Three main factors impact consumer purchasing intention; credibility, attractiveness, and trustworthiness (S. W. Wang & Scheinbaum, 2018). Influencer credibility is determined by consumer perception and level, which impacts how fast target audiences make decisions. The credibility factors increase when consumers have positive attitudes toward a brand. Credibility also comes from word of mouth, and that includes influencers as well. Influencers typically have different levels of followers, and the number of these followers and their relative influence also impacts how customers make purchase decisions (Djafarova & Rushworth, 2017). Influencer attractiveness speaks to the lure and the desired behaviour that positively affects customer intention. The endorser's emotions, opinions, likes, and views on traditional and social media and the Influencer's attitude toward issues and trends also impact their attractiveness. For offline influencers, visibility, relevance, celebrity, and image contribute to product or service desirability. When a customer has a positive attitude towards an influencer, this positivity is reflected on the brand, leading to a higher purchase intention.

On the other hand, if an influencer generates negative feelings or attitudes, the target audience is less likely to buy the promoted product. Note that this negative word of mouth also spreads quickly (Fang & Jiang, 2015). Influencer trustworthiness is another crucial metric for consumers. An endorser's trustworthiness affects consumer attitudes and impacts whether positive or negative messages are consequential to a consumer's purchase intention. Trust and affinity will often determine how persuasive an influencer's recommendation is and how well they perform as a spokesperson. In the end, influencer marketing must align perceived value, needs and brand affinity. Each of these affects consumers in different ways, but they all work towards a common goal: increasing customer purchasing intention (Praxmarer & Rossiter, 2009).

Influencer marketing is a strategy that is increasingly used to raise brand awareness, encourage trial, adaption and ultimately engagement. Through their social media activities, posts, videos, opinions, collaborations, events, and interviews, influencers contribute to the overall marketing campaign of a growing number of organizations (Lim, Radzol, Cheah, & Wong, 2017).

The purpose of this study is to compare the following customer perception factors that are influenced by influencers in online and offline channels: credibility, trustworthiness, and attractiveness. The findings of this study can be applied to business strategies to meet customers' needs successfully.

2. Literature Review

Influencer marketing is a strategy that focuses on using opinion leaders to drive a brand message to a particular target market (Byrne, Kearney, & Macevilly, 2017). An influencer or endorser aligns with the core values of a company's products or services and then presents a favourable brand message to actual or potential consumers. An influencer provides information and context that is meant to encourage purchase decisions. Influencer marketing is popular among marketers because it tends to be more credible and trustworthy than paid advertising (Grafström, Jakobsson, & Wiede, 2018). Influencers can be celebrities, macro or micro-influencers, artists and athletes. In this research, celebrity refers to a famous artist or professional athlete (Fang & Jiang, 2015).

Celebrities can break through the media clutter to gain a receiver's attention. Endorsers can raise brand recognition, awareness, and engagement (Charbonneau & Garland, 2005a). Influencers encode and communicate the brand message to target audiences using traditional media channels, print, TV, and their own social media channels like; Instagram, Facebook, YouTube, etc. (Brown & Fiorella, 2013). After sending brand messages to target audiences, the celebrity's image will reflect on the brand if successful. In other words, the celebrity's image is associated with the brand, which is picked up by consumers (Charbonneau & Garland, 2005a).

Traditional influencer strategies that use ads, appearances and celebrity endorsements are not new. This tactic has been used since marketing began, well before the advent of social media and the recent influencer trend (Grafström et al., 2018). When selecting influencers, criteria such as influencer popularity, target audience match, risk of controversy and costs are factors

a company needs to consider (Erdogan & Baker, 2000). This influencer centric research focuses on three factors influencing customer purchase intention for online and offline channels. These are influencer attractiveness, influencer credibility, and influencer trustworthiness (S. W. Wang & Scheinbaum, 2018). As mentioned, customer purchase intention or customer behaviour is affected by several factors. Influencers' credibility, attractiveness, and trustworthiness in online and offline channels impact a consumer purchase intention (Yau & Ho, 2015).

2.1 Influencer Attractiveness

First, online channel or social media is popular among marketers as consumers of all ages. Marketers use influencer campaigns to make customers talk about their products by driving word of mouth (Jaakonmäki, Müller, & vom Brocke, 2017). The attractiveness of social media influencers can affect positive outcomes, attitudes and purchase intentions (Lim et al., 2017). Attractiveness is a factor that can lead to positive purchase intentions. Furthermore, influencers need to make sure their followers feel delighted with their content and not let on that this is paid content. Consumers tend to have a negative attitude towards remunerated influencer content (Grafström et al., 2018).

The attractiveness of posted content can be observed by the views, comments, and likes on social platforms such as Blogs, Instagram, Facebook, Twitter and YouTube. Companies collaborate with influencers to attract online consumers by creating discount codes that followers can use. The company will know which Influencer has better results and is most effective in delivering the marketing strategy (Veissi, 2017).

H₁: Attractiveness: Impact of online Influencer on purchase intention

In offline channels, influencers are mostly seen as presenters or role models and are essential in marketing. Many companies use them to promote their brand and create brand awareness. Sometimes, consumers may buy more based on a positive role model's recommendation rather than their perception or feeling about the brand. This stems from the link between physical attractiveness perception of a role model identification brand purchasing intention (Praxmarer & Rossiter, 2009). Furthermore, a presenter's professional capacity can provide information about a brand to those who do not have it or lack the experience (Zhou & Dong, 2014).

The emotional statements and opinions of the role model can reinforce consumer attitudes and make the purchase decision doubt free (Pavel, 2014). The source's attractiveness can impact the customers' perception comes from likeability, familiarity, and repetitive media exposures (Charbonneau & Garland, 2005b). Furthermore, Erdogan and Shank stated that the information received from an attractive source is accepted because the receiver agrees (Charbonneau & Garland, 2005a). The more attractive a presenter is, as a source, the more it will increase positive perceptions about a product or service, which will extend to the consumer purchase intention. Many companies choose a famous or well-known individual to be their presenter or spokesperson to attract customer interest. For instance, Taokaenoi (Thai seaweed snack product company) chose GOT7, a Korean boy band, to present in 2016. They used the marketing campaign "Taokaenoi's seven dolls with GOT7" because of the solid fan base in Thailand and China. This was an excellent opportunity for Taokaenoi to promote their products in both markets. This campaign successfully gained traction from customers who favour GOT7 (Sereemanopat, 2017).

H₂: Attractiveness: Impact of offline Influencer on purchase intention

2.2 Influencer Credibility

Credible influencers must be trustful, factual, and unbiased (O’Neil, Eisenmann, & Holman, 2020). credibility will create positive attitudes in the mind of consumers and build brand awareness (X. Wang & Yang, 2010). If readers receive biased or inaccurate information, an influencer's credibility will be diminished. Influencers with many followers will risk losing credibility if they give the wrong information or have unethical behaviours (Grafström et al., 2018). Credibility was an essential factor in determining the influence of electronic word of mouth on consumer purchase intention (Braatz, 2017). Positive word of mouth creates more credibility for the brand and the Influencer (Keller & Fay, 2016).

Online influencer credibility is a vital part of electronic Word-Of-Mouth (eWOM). Influencers communicate directly with followers through the Internet, with recommendations and reviews. This eWOM affects customer decision-making (Brown & Fiorella, 2013). Trustworthiness is more significant than expertise, and this holds when individuals evaluate the credibility of eWOM (Xiao, Wang, & Chan-Olmsted, 2018). Due to the high level of credibility, buying behaviour is affected by other consumers. Word of mouth is now an essential part of marketing. 70% of consumers consider word of mouth more reliable and trustworthy than advertising (Grafström et al., 2018). For this reason, companies should focus on word of mouth and use influencers to contribute to this strategy. The collaborations between brand communication and an influencer are relevant and can come in many ways, including sharing sponsored content and brand events (Evans, Phua, Lim, & Jun 2017).

A company can use micro-influencers to promote their brand. A micro-influencer is considered any Instagrammer, blogger, journalist, or YouTuber having a small but attentive follower-base (less than 100,000 followers) with a high engagement level (Zietek, 2016). The difference between an influencer and a celebrity is that an influencer is more accessible and approachable than a celebrity (Grafström et al., 2018). A micro-influencer who shares an opinion or recommendation about a brand they use and usually endorse do so for a fee (Rebelo, 2017). Another type of Influencer is a macro-influencer; they have more followers, up to 1,000,000. An influencer with more than 1,000,000 followers is considered a celebrity (Fernandes, 2018). Interactivity and social advocacy also impact credibility. YouTube influencers, who frequently interact with viewers, have social solid advocacy relevance and thus influence consumer attitudes (Xiao et al., 2018).

H₃: Credibility: Impact of online Influencer on purchase intention

A celebrity's credibility is most important in the selection process. When he or she is hired for offline endorsements, celebrities must be trustworthy, recognizable and have a low controversy quotient (Charbonneau & Garland, 2005a). Celebrities render messages more credible because of the high level of trustworthiness and interest they generate (Brorsson & Plotnikova, 2017). In offline environments, celebrities are used as communication tools; marketers harness their ability to persuade beyond just their celebrity status (Grafström et al., 2018). Offline marketing influencers are also seen as endorsers or brand collaborators. Celebrity image is not static, and the risk of losing public favour is always there. A credible endorser can influence consumer beliefs, attitudes, and behaviours (Charbonneau & Garland, 2005a). An influencer who is perceived as a role model induces trust in his or her audience (Dix, Phau, & Pougnet, 2010).

H₄: Credibility: Impact of offline Influencer on purchase intention

2.3 Influencer Trustworthiness

The term trustworthiness is akin to reliable, dependable and honest (Ahmad, Farooq, & Iqbal, 2014). Reference groups, influencers and celebrities can positively or negatively influence a target audience's attitudes. An organization can benefit from an influencer's good reputation, popularity and trustworthiness. Trust can come from an endorser's experience (Ahmad et al., 2014) and may depend on how target audiences perceive influencers (Friis-jespersen, 2017). Trustworthiness is closely related to product purchase intention and can help increase the creditability of an influencer or endorser. A more trustworthy influencer can significantly impact consumers (Fang & Jiang, 2015). Marketers can use such influencers as trusted sources to shape consumers attitudes. Endorsers can enhance positive feelings toward a brand. Customers perceive brands as trustworthy if the Influencer is trustworthy, honest, credible, and believable (Aziz, Ghani, & Niazi, 2013).

With electronic commerce growing worldwide for the online channel, people like to shop online because it is convenient, easy to search, compare prices, and save time (Lalwani, 2017). An excellent way to increase purchase intentions is with influencers. Influencer marketing can be used as a communications tool for followers. This is true for Instagram, Twitter, Facebook and all Social Medias (Grafström et al., 2018). Most consumers trust the influencers they follow; they listen to their opinions (Hwang & Zhang, 2018) and trust brands promoted by these influencers, increasing purchasing intentions in the process.

A company will choose an individual seen as most credible and trustworthy, a famous blogger or a celebrity who writes reviews authentically and credibly (De Veirman, Cauberghe, & Hudders, 2017). The people, who follow her, see the post and believe in her suggestions. They may even purchase the product even if they know she got it for free (Lisichkova & Othman, 2017). In addition, the purchasing intention will depend on how famous the Influencer is, on how many followers he or she has and if the customer understands that the product was presented in collaboration with a company. All these factors impact on trust (Grafström et al., 2018).

H₅: Trustworthiness: Impact of online Influencer on purchase intention

A brand can do offline marketing by hiring an influencer an expert or working in collaboration with a celebrity. As mentioned before, when consumers see an endorser participating in a campaign, they will receive a brand message and evaluate whether this Influencer is trustworthy or not (Lisichkova & Othman, 2017). Some brands seek collaborations with experts. Expertise is a gauge or certificate; when combined with popularity and professional skill, target audiences will judge whether this expert is trustworthy. This will generate optimistic attitudes towards the brand, leading to higher purchasing intentions (Chen, Lu, Lee, & Lo, 2011). When customers trust influencers, it is because of their experiences and knowledge (Casaló et al., 2020)

H₆: Trustworthiness: Impacts of offline Influencer on purchase intention

The careers of the 399 people respondents were put in 7 categories: the first being students with 229 people or 57.39% of the total, self-employed at 24 or 6.02%, retired with 23 representing 5.76%, government employees at 59 or 14.79%, company employees with 46 or 11.53%, unemployed at 6 or 1.50% and finally other careers with 12 respondents or 3% of total sample size.

The last construct of the descriptive statistic is sector or region. There are 23 respondents from Northern (5.76%), 271 for Northeastern (67.92%), 74 in Central (18.55%), 8 in Western (2.01%), 7 in Eastern (1.75%) and 16 in Southern (4.01%).

Table 1 Structural equation model indices

Model	Chi-square	RMSEA	GFI	AGFI	CFI	IFI	PGFI	PNFI
SEM	356.667 ($p=0.000$)	.049	.927	.900	.986	.986	.675	.777

Table 1 shows fit indices for structural equation model. Chi-square = 356.667 ($p=0.000$), p should be less than 0.001 (Gerbing & Anderson, 1988). RMSEA = 0.049, recommended less than 0.08 (MacCallum, Browne, & Sugawara, 1996). GFI = 0.927, GFI should be more than 0.90 (Gerbing & Anderson, 1988). AGFI = 0.900, should be more than 0.800 (Cheung & Rensvold, 2002). CFI = 0.986, suggested greater than 0.90 (Hu & Bentler, 1999). IFI = 0.986, good for larger than 0.90 (Bollen, 1989). PGFI = 0.675, greater than 0.50 is recommended and PNFI = 0.777, more than 0.50 is preferred (Mulaik et al., 1989).

Table 2 indicates the strength and direction of two variables (higher correlation and stronger association). According to standards about correlation coefficient sizes, the coefficient range should be +.81 to 1.00 or -.81 to -1.00 (Very strong association). This indicates that all of the variables have very strong associations. According to table 2, all values under its column are less than the dark frame, which is good. Moreover, the values in the yellow frame should be more than the values under its column.

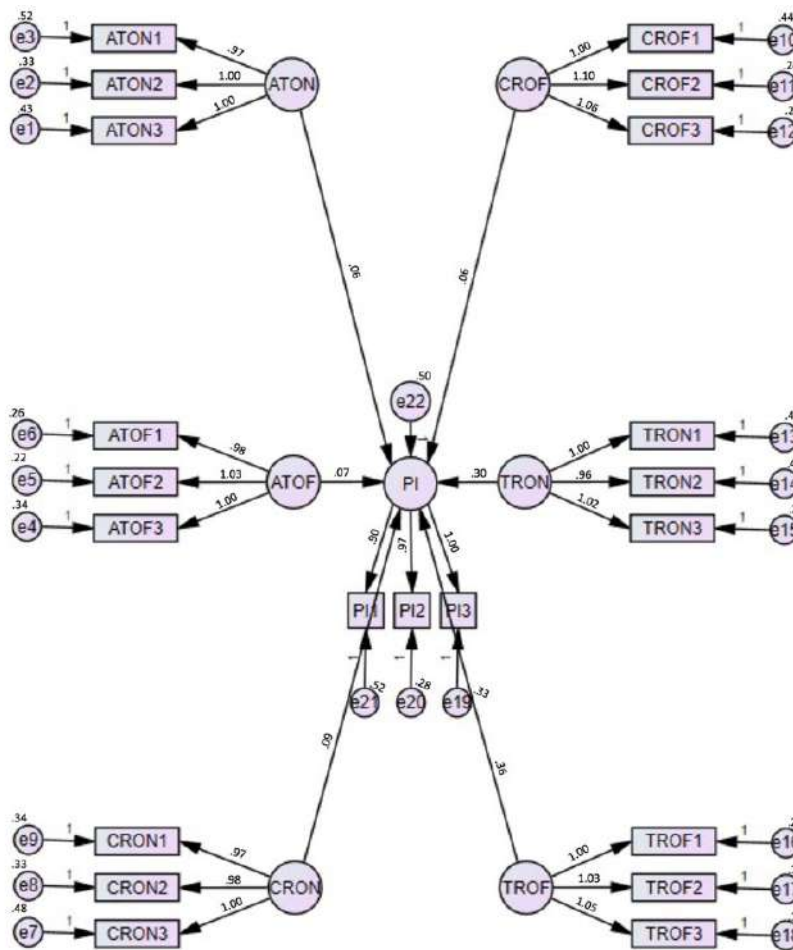
Table 3, factor loading is the relationship between each variable (0.957 is the most significant value). ATOF2 Brand presenter promotes the product through traditional advertising matches my personality, is the strongest association. Composite reliability or CR measures internal consistency and is measured scale reliability; according to a recommendation, composite reliability should be more than 0.80 (Brunner & Süß, 2005). In table 3, composite reliability in all constructs is more than 0.80. AVE or Average variance extracted should be more than 0.5 (Urbach & Ahlemann, 2010). In these findings, all of the constructs has AVE more than 0.5.

Table 2 Discriminant Validity

	TROF	TRON	CROF	CRON	ATOF	ATON	PI
TROF	0.954						
TRON	0.818	0.923					
CROF	0.788	0.792	0.937				
CRON	0.771	0.847	0.852	0.920			
ATOF	0.598	0.571	0.678	0.671	0.945		
ATON	0.672	0.718	0.705	0.792	0.672	0.909	
PI	0.822	0.821	0.765	0.784	0.61	0.692	0.914

Table 3 Convergent Validity

Constructs and scale items	Factor loading	Composite reliability	Average variance extracted
Purchasing intention		0.938	0.836
PI1 I will probably buy the recommended product	0.875		
PI2 Using the recommended product sounds interesting	0.936		
PI3 If I had to choose again, I would pick the recommended product	0.930		
Online Attractiveness		0.935	0.827
ATON1 A promotion of the product through an influencer's social media attracts to my interest	0.889		
ATON2 Publication through Influencer's caption meets my needs	0.928		
ATON3 Publication through Influencer's caption is significant to my value	0.911		
Offline Attractiveness		0.961	0.892
ATOF1 Brand presenter promotes the product through traditional advertising meets my needs	0.945		
ATOF2 Brand presenter promotes the product through traditional advertising matches my personality	0.957		
ATOF3 Brand presenter promotes the product through traditional advertising is significant to my value	0.932		
Online Credibility		0.943	0.847
CRON1 number of influencer followers on social media has impact on the influencer credibility which increase a brand credibility	0.927		
CRON2 Recommendations and opinions from an online influencer impact on my perceived value of products	0.929		
CRON3 An influencer who specialize in that product type creates more credibility	0.905		
Offline Credibility		0.955	0.877
CROF1 Celebrity reputation increases a brand message credibility	0.909		
CROF2 Special Influencer on (e.g. expertise, athlete) increase credibility in the perceived value of that product	0.955		
CROF3 Influencer who perceived as a role model induce more credibility	0.945		
Online Trustworthiness		0.945	0.852
TRON1 I would believe an influencer post when they used the product or service already	0.913		
TRON2 An influencer's opinion can change my purchase intention	0.904		
TRON3 I trust an influencer who is knowledgeable about a product and has a product experience	0.952		
Offline Trustworthiness		0.945	0.911
TROF1 I trust an expert who reviews the product and tell the good and the bad side of the product	0.913		
TROF2 I listen to recommendations of the product or service from an expert before I decide to buy it	0.904		
TROF3 I trust in the collaboration with an expert who has expertise and professional skills	0.952		



Structural equation model (SEM)

This research on the impact of influencers on consumer purchase intention resulted in the above SEM model as shown in table 4. The 6 factors studied were: online attractiveness, offline attractiveness, online credibility, offline credibility, online trustworthiness, and offline trustworthiness of influencers. The findings indicate that online Influencer's attractiveness do not have relationship with purchase intention. Hypothesis 1 is not supported because the p value is more than 0.01. Moreover, offline influencer attractiveness does not influence a relationship with purchase intention. Hypothesis 2 is rejected according to p value is more than 0.01.

The impact of offline influencer credibility on purchase intention. Online influencer credibility has no relationship with purchase intention. Hypothesis 3 is declined due to p value being more than 0.01. Offline influencer credibility has no relationship with purchase intention. Hypothesis 4 is not supported because the p value is more than 0.01.

The impact of online influencer trustworthiness on purchase intention. Hypothesis 5 has a strong relationship with online influencer trustworthiness and purchase intention ($t = 4.392$, $p < 0.001$, $\beta = 0.30$). Hypothesis 5 is supported from $p < 0.001$, significant.

Moreover, the impact of offline influencer trustworthiness on purchase intention. Offline influencer trustworthiness has strong impact to purchase intention ($t = 6.171$, $p < 0.001$, $\beta = 0.36$). Hypothesis 6 is supported from $p < 0.001$, significant.

Table 4. Regression paths

Hypothesis	Regression coefficients	paths	Standard path	Critical value)	ratio (t- <i>p</i>	Results
H1	ATON → PI		.059	1.069	.285	Not Supported
H2	ATOF → PI		.067	1.578	.115	Not Supported
H3	CRON → PI		.086	1.031	.302	Not Supported
H4	CROF → PI		.064	.943	.346	Supported
H5	TRON → PI		.304	4.392	***	Supported
H6	TROF → PI		.363	6.171	***	Supported

p* < 0.01; *p* < 0.001.

6. Discussion and Conclusion

There are, to date, no comprehensive studies on the impact of online and offline influencers on consumer purchase intention. This research aimed to collect and analyze relevant information from primary and secondary sources and related data from various studies. Our goal was to examine the factors that consumers considered essential, leading to influencers impacting customers' purchasing intentions. The following factors impact online and offline channels: credibility, trustworthiness, and attractiveness. By considering these 6 independent variables, this research found that influencer trustworthiness impacts purchase intention in online and offline support channels (Fang & Jiang, 2015; Hwang & Zhang, 2018). Unlike the other 4 factors: online attractiveness, offline attractiveness, online credibility, and offline credibility that contrast with other studies that have a weak relationship with purchase intention (Charbonneau & Garland, 2005a; Grafström et al., 2018). In practical terms, marketers should incorporate the trustworthiness factor in their influencer marketing communications effort to reach better and impact customer purchasing intention. However, they must also consider the relevant external factors to align themselves or mitigate unintended implications.

7. Practical Implication

Today people pay more attention to influencers than in the past, and that is because they play an increasing role in online and offline marketing. People trust and believe influencers because of their perceived knowledge and experience.

By using influencer marketing to gauge customer intention, marketers can consider influencer trustworthiness as a determining factor. Our research proved that online and offline influencer trustworthiness strongly impacts customer purchasing intention.

From the study, customers would believe an influencer's post when they used the product or service already, which means a marketer can promote their products. When influencers use a product for a period of time and then review it, the ensuring recommendation sticks. In addition, an influencer's opinion can change the purchase intention, which means influencer persuasion can convince consumers to buy the brand.

When paying a talented influencer to induce people to purchase a product, this can affect the efficacy of the recommendation and thus either increase or decrease a customer's purchase intentions. Lastly, customers trust an influencer who is knowledgeable about a product and has a product experience, here marketing campaigns can use the expertise factor to guarantee product quality. This in turn can increase the customer's belief in the product, leading to higher purchase intentions and higher sales.

Offline influencer trustworthiness can affect customer purchase intention in marketing. This strategy can help promote the launch of a new product. According to the study, a consumer's trust in an influencer increases when the reviews explore both the pros and cons of a product. Customers also listen to a recommendation of the product or service from an influencer before I decide to buy it, suggests marketers can use a well-known influencer as a presenter. Well-known influencers have more trust appeal than normal people; the Influencer's opinion, good or bad, can impact purchase intention. Lastly, customers trust in the collaboration of an influencer who has the expertise and professional skills, suggests that the expertise can be a strong part of the event during a grand opening or a new product launch. The expertise can showcase both the brand quality and experience, so when a customer believes in the expertise and the product recommendation, their purchase intention will rise.

However, external factors can alter results when using an influencer marketing strategy. To have practical implementation of an influencer strategy requires a careful analysis of external environments. A marketer has to identify possible situations, consider how the strategy will fare in various scenarios, and proceed accordingly.

8. References

- Ahmad, N., Farooq, O., & Iqbal, J. (2014). Credibility of Celebrity Endorsement and Buying Intentions an Evidence from Students of Islamabad, Pakistan. *International Letters of Social and Humanistic Sciences*, 20. <https://doi.org/10.18052/www.scipress.com/ILSHS.20.1>
- Aziz, S., Ghani, U., & Niazi, A. (2013). Impact of celebrity credibility on advertising effectiveness. *Pakistan Journal of Commerce and Social Sciences*, 7, 107–127.
- Bollen, K. (1989). *Structural equations with latent variables* Wiley.
- Braatz, L. A. (2017). *Influencer marketing on instagram : consumer responses towards promotional posts: the effects of message sidedness*.
- Brorsson, A., & Plotnikova, V. (2017). *Choosing the right social media influencer. : A quasi-experiment to explore the impact of influencer_ different characteristics*.
- Brown, D., & Fiorella, S. (2013). Influence Marketing. In *Que Publishing*.
- Brunner, M., & Süß, H.-M. (2005). Analyzing the Reliability of Multidimensional Measures: An Example from Intelligence Research. *Educational and Psychological Measurement*, 65, 227–240.
- Byrne, E., Kearney, J., & Macevilly, C. J. (2017). The Role of Influencer Marketing and Social Influencers in Public Health. *Proceedings of the Nutrition Society*, 76.
- Casaló, L. V., Flavián, C., & Ibáñez-Sánchez, S. (2020). Influencers on Instagram: Antecedents and consequences of opinion leadership. *Journal of Business Research*, 117, 510–519.
- Charbonneau, J., & Garland, R. (2005a). Celebrity or athlete? New Zealand advertising

- practitioners’ views on their use as endorsers. *International Journal of Sports Marketing and Sponsorship*, 7(1), 29–35. <https://doi.org/10.1108/ijsms-07-01-2005-b006>
- Charbonneau, J., & Garland, R. (2005b). Talent, Looks or Brains? New Zealand Advertising Practitioners’ Views on Celebrity and Athlete Endorsers. *Marketing Bulletin*, 16.
- Chen, L. S.-L., Lu, W. T., Lee, Y. H., & Lo, C.-Y. (2011). Switching online channel brand to offline channel brand. *First International Technology Management Conference*, 279–283. IEEE.
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, 9(2), 233–255.
- De Veirman, M., Cauberghe, V., & Hudders, L. (2017). Marketing through Instagram influencers: the impact of number of followers and product divergence on brand attitude. *International Journal of Advertising*, 36(5), 798–828. <https://doi.org/10.1080/02650487.2017.1348035>
- Dix, S., Phau, I., & Pougnet, S. (2010). “Bend it like Beckham”: The influence of sports celebrities on young adult consumers. *Young Consumers*.
- Djafarova, E., & Rushworth, C. (2017). Exploring the credibility of online celebrities’ Instagram profiles in influencing the purchase decisions of young female users. *Computers in Human Behavior*, 68, 1–7.
- Erdogan, B. Z., & Baker, M. J. (2000). Towards a practitioner-based model of selecting celebrity endorsers. *International Journal of Advertising*, 19(1), 25–42. <https://doi.org/10.1080/02650487.2000.11104782>
- Evans, N. J., Phua, J., Lim, J., & Jun, H. (2017). Disclosing Instagram Influencer Advertising: The Effects of Disclosure Language on Advertising Recognition, Attitudes, and Behavioral Intent. *Journal of Interactive Advertising*, 17(2), 138–149. <https://doi.org/10.1080/15252019.2017.1366885>
- Fang, L., & Jiang, Y. (2015). Persuasiveness of Celebrity Endorsed Advertising and a New Model for Celebrity Endorser Selection. *Journal of Asian Business Strategy*, 5(8), 153–173. <https://doi.org/10.18488/journal.1006/2015.5.8/1006.8.153.173>
- Fernandes, A. (2018). *Understanding influencer endorsement in the luxury sector*. 1–79. Retrieved from <https://repositorio.ucp.pt/handle/10400.14/25938>
- Friis-jespersen, C. (2017). Celebrity endorser ’ s credibility : effect on consumers ’ attitude toward advertisement Factors influencing vloggers. *Business and Economics, Master’s Level*, 1–70.
- Gerbing, D. W., & Anderson, J. C. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411–423.
- Grafström, J., Jakobsson, L., & Wiede, P. (2018). The impact of influencer marketing on consumers’ attitudes. *Marketing Management*, (May), 1–77. Retrieved from <https://www.diva-portal.org/smash/get/diva2:1214105/FULLTEXT01.pdf>
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Hwang, K., & Zhang, Q. (2018). Influence of parasocial relationship between digital celebrities and their followers on followers’ purchase and electronic word-of-mouth intentions, and persuasion knowledge. *Computers in Human Behavior*, Vol. 87, pp. 155–173. <https://doi.org/10.1016/j.chb.2018.05.029>

- Jaakonmäki, R., Müller, O., & vom Brocke, J. (2017). The Impact of Content, Context, and Creator on User Engagement in Social Media Marketing. *HICSS*.
- Keller, E., & Fay, B. (2016). How to use influencers to drive a word-of-mouth strategy. *Warc*, (April), April. Retrieved from https://www.engagementlabs.com/wp-content/uploads/2016/05/How_to_use_influencers_to_drive_a_wordofmouth_strategy.pdf https://0-www-warc-com.lispac.lsbu.ac.uk/content/article/bestprac/how_to_use_influencers_to_drive_a_wordofmouth_strategy/107290
- Lalwani, D. (2017). *Young consumers online and offline channel purchase behaviour*.
- Lim, X. J., Radzol, A. R. M., Cheah, J.-H., & Wong, M. W. (2017). *The Impact of Social Media Influencers on Purchase Intention and the Mediation Effect of Customer Attitude*.
- Lisichkova, N., & Othman, Z. (2017). *The Impact of Influencers on Online Purchase Intent*.
- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1(2), 130–149. <https://doi.org/10.1037/1082-989X.1.2.130>
- Mulaik, S. A., James, L. R., Van Alstine, J., Bennett, N., Lind, S., & Stilwell, C. D. (1989). Evaluation of Goodness-of-Fit Indices for Structural Equation Models. *Psychological Bulletin*, 105(3), 430–445. <https://doi.org/10.1037/0033-2909.105.3.430>
- O’Neil, J., Eisenmann, M., & Holman, M. (2020). A mixed methods examination of how people assess the credibility of sources used by public relations practitioners. *Journal of Promotion Management*, 26(1), 75–96.
- Pavel, C. (2014). Using Visual Content in Your Marketing. *Quaestus Journal*, 164–168.
- Praxmarer, S., & Rossiter, J. (2009). Physically attractive presenters and persuasion: an experimental investigation of alternative explanations for the "Patzer effect. *8th International Conference on Research in Advertising (ICORIA)*, 1–7.
- Rebelo, M. (2017). *How influencers’ credibility on Instagram is perceived by consumers and its impact on purchase intention, Masters’ Thesis*. (May), 1–92. Retrieved from [https://repositorio.ucp.pt/bitstream/10400.14/23360/1/TESE_FINAL PDFA.pdf](https://repositorio.ucp.pt/bitstream/10400.14/23360/1/TESE_FINAL%20PDF.pdf)
- Sereemanopat, A. (2017). Adaptation of South Korean Leading Music Companies’ Marketing Strategy in Globalization Case Study in Thai Market. *Chulalongkorn University*, 210093.
- Urbach, N., & Ahlemann, F. (2010). Structural equation modeling in information systems research using Partial Least Squares. *Journal of Information Technology Theory and Application*, 11.
- Veissi, I. (2017). Influencer Marketing on Instagram. *Bachelor’s Thesis Degree Programme in International Business*, 3–60. Retrieved from http://essay.utwente.nl/72442/1/Ewers_MA_BMS.pdf
- Wang, S. W., & Scheinbaum, A. C. (2018). Enhancing brand credibility via celebrity endorsement: Trustworthiness trumps attractiveness and expertise. *Journal of Advertising Research*, 58(1), 16–32.
- Wang, X., & Yang, Z. (2010). The effect of brand credibility on consumers’ brand purchase intention in emerging economies: The moderating role of brand awareness and brand image. *Journal of Global Marketing*, 23(3), 177–188.
- Xiao, M., Wang, R., & Chan-Olmsted, S. (2018). Factors affecting YouTube influencer marketing credibility: a heuristic-systematic model. *Journal of Media Business Studies*,

- 15, 1–26. <https://doi.org/10.1080/16522354.2018.1501146>
- Yau, H. K., & Ho, T. C. (2015). The influence of subjective norm on behavioral intention in using E-learning. *International MultiConference of Engineers and Computer Scientists 2015, IMECS 2015*, Vol. 2, pp. 912-914 BT-Lecture Notes in Engineering and Com. Retrieved from <http://www.scopus.com/inward/record.url?scp=84937948313&partnerID=8YFLogxK>
- Zhou, X., & Dong, C. (2014). Study on the Impact of Network Interactivity on Purchase Intention in the Social Media Era. *International Journal of Business and Social Science*, 5(6), 259–266. Retrieved from http://www.ijbssnet.com/journals/vol_5_no_6_may_2014/30.pdf
- Zietek, N. (2016). *Influencer Marketing: the characteristics and components of fashion influencer marketing*.

What Drives A Transition from Natural Rubber to Other Types of Farming in Thailand: A Proposed Conceptual Framework

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Abstract

The Thai natural rubber farmers are undergoing transition to other types of farming due to continuous decline in the natural rubber price in the last decade. Over five million small-scale farmers are facing a financially vulnerable situation and need support from related agencies in the price crisis. This research examines and collects empirical evidence in the transition from natural rubber to other types of farming from the extant literature. The purpose is to create a framework of transition for the Thai natural rubber farmers revealing the drivers, the inhibitors, and their relationships that can influence the transition. The framework will be in line with the current transition models but adapted for the unique situation of Thailand. It will be underpinned by the social exchange theory, which accounts for the behaviour to change, and the theory of change, which identifies the activities or interventions leading to the desired outcome. The framework development process is expected to offer a thorough understanding of the reasons for the transition from natural rubber to other types of farming and the optimal configuration that leads to successful transition.

Keywords: Transition in agriculture; Transition framework; Social exchange theory; Theory of change.

1. Introduction

Transition from natural rubber farming to other types of farming is an important agenda for the Thai government to help farmers overcome financial hardship in view of the fluctuations and decline of the natural rubber price in the last decade. Six million Thai natural rubber farmers in over 60 provinces in Thailand have confronted financial problem because of continued decrease in income. In 2019, the Office of Agricultural Economics reported that the average cost of producing natural rubber sheets was 2.26 AUD/kg whereas the average natural rubber sheet price was 2.12 AUD/kg (Office of Agricultural Economics, 2019). It can be seen that there was no margin of profit in natural rubber farming. Until now, the situation has remained unchanged.

The small-scale farmers are the most vulnerable group of farmers during the price crisis. They are most likely the ones to exit from natural rubber farming (Kongmanee & Ahmed, 2019; Nicod et al., 2020). Small-scale farmers comprise 90% of the Thai natural rubber farmers (Jongrungrat et al., 2014 as cited in Tanielian, 2018) or approximately 5.4 million in number (Rubber Authority of Thailand, 2019). Kampan (2017); Kittitornkool et al. (2019); Tanielian (2018) recommended to change from monoculture rubber farming to polyculture farming by applying agroforestry system to decrease farming expense and increase family income. Thus, the Thai government encourages farmers to convert from natural rubber farming to other types of farming by providing a financial package support of 2,535 AUD/ha minimum to those who apply for farming transition (Boonthong et al., 2019). The government has set a target of reducing natural rubber plantations in the country to 3.30 million hectares by 2021 (Rubber Authority of Thailand, 2019). However, the actual reduction in natural rubber plantations is far below the government's target. From 2016 to 2020, the total actual reduction is about 0.21 million hectares meaning that on average the reduction rate is only 0.05 million hectares per year. Hence, the estimated natural rubber plantations in 2021 are 3.47 million hectares. The gap between the estimation and the target is 0.17 million hectares. It is a huge gap which will take three or more additional years to achieve. Surprisingly, the number of natural rubber farmers is not always on the decrease. In 2019, there was an increase in number of farmers undertaking natural rubber farming implying that there were newcomers in addition to existing natural rubber farmers. These observations suggest that transition in the natural rubber farming business is a complicated process. Not only that some natural rubber farmers are not interested in the government's subsidy package for transition but also there are newcomers to the trade in 2019 with about 0.5 million households (Department Agriculture of Extension 2021) even when there is seemingly no profit margin in this business.

To expedite the transition from natural rubber to other types of farming, the reasons behind the decision making of the small-scale natural rubber farmers to convert or not to convert need to be fully understood. Despite the significance of this problem, there is only one study in Thailand to date analyzing the causes of the problem. (Somboonsuke & Kongmanee, 2018) opine that there are many reasons for the slow transition. Among them, a lack of proactive government policies is a major inhibitor. According to the authors, the Thai government has not played a leadership role in formulating effective policies. During high rubber prices, the government focused only on increasing rubber-growing hectares, whereas during low rubber prices, it focused on price policies only. Continuous research in many aspects for intercropping rubber-based production systems was lacking. The farmers were blamed for not transitioning to intercropping rubber-based production system but waiting for support from the government instead. Nevertheless, one major shortcoming of their findings is that the view is not from the farmers' perspective and therefore the actual picture may not be fully revealed. As such, further research is needed to investigate the factors affecting the decision of farmers to (or not to) transit from natural rubber to other types of farming. Also, how these factors can be converted to enablers to expedite transition needs to be explored. To fill this gap, a framework exploring the reasons for the transition from natural rubber to other types of farming as well as the configuration to the transition outcome is presented in this paper.

2. Research Questions and Objectives

This research contributes to the transition from natural rubber to other types of farming of natural rubber farmers in Thailand. Two research questions and two research objectives are presented.

2.1 Research questions

In this study, the following research questions are raised:

- What are the factors affecting the Thai farmers’ decision to transit from natural rubber farming to other types of farming?
- How do the key enabling conditions contribute to the outcome of transition?

2.2 Research objectives

This research attempts to achieve the following objectives:

- To find out why some Thai natural rubber farmers change to other types of farming, but others do not.
- To understand the relationships among the various factors that influence the outcome of farming transition.

3. Literature Review

3.1 Current situation of farming transition in Thailand

To many small-scale farmers in Thailand, natural rubber farming is a family business which is now at the turning point because of the price fluctuations in the last decade due to changes in global economy. As a consequence, six million Thai farmers have been in some sort of financial crisis for more than eight years. Farmers changed their behaviours to handle the price crisis by re-contracting the share-tapping, changing the selling pattern from individual selling to collective selling to increase their bargaining power. Moreover, changes of cropping systems using new technologies and cooperation with the manufacturers are also leveraged to increase family income (Kampan, 2017; Nicod et al., 2020; Tanielian, 2018). Abandoning monoculture farming of natural rubber plantation to rubber-agroforestry system (rubber-AFS) is recommended (Kittitornkool et al., 2019). It can improve farming productivity by applying intercropping in rubber mono-crop fields for saving household expenses and increasing income, and at the same time optimising farmland capacity and farm management. However, changing from monoculture to polyculture system is not easy to succeed because of a lack of experienced local leadership (Andriesse & Tanwattana, 2018).

3.2 Review of previous studies on farming transition

Farmers’ intention to transit from natural rubber to other types of farming is related to certain drivers that accelerate the transition and some inhibitors that slow down the transition. Different cases might involve different sets of drivers and inhibitors. Using a case in Sweden as example, drivers for transiting to vegetable growing include personal interest, wellbeing, making money, and awareness of sustainability values (Drottberger et al., 2021). In the case of strong climate awareness, the drivers are more related to environmental improvement to increase farming efficiency (Grüneis et al., 2018; Kragt et al., 2017; Singh et al., 2021). Thus, drivers to improve land usage include soil types and weed control to increase farming efficiency (Alskaf et al., 2020; Hogarth, 2017; Latawiec et al., 2017).

There are also obstacles to the transition. The most common inhibitors are low skills of farmers in production, management, and marketing in the farming business. In production, farmers lack the technical skills. Furthermore, sharing of production information is needed (Alskaf et al.,

2020; Drottberger et al., 2021; Grüneis et al., 2018; Hogarth, 2017; Latawiec et al., 2017; Singh et al., 2021). In the management and marketing area, farmers lack management skills and financial support (Alskaf et al., 2020; Drottberger et al., 2021; Kragt et al., 2017; Latawiec et al., 2017; Singh et al., 2021). In addition, farmers need social networking to share and exchange information and knowledge (Alskaf et al., 2020; Drottberger et al., 2021; Hogarth, 2017; Kragt et al., 2017).

As shown in Table 1, the drivers and the inhibitors of the transition can be divided into four categories. They are the economic, social, environmental, and technological aspects. It can be seen that the drivers to the transition are related to the benefits or rewards of the transition. For example, farmers who intend to change because they perceive the value of the change, believe in the appropriate outcome after the change is underpinned by economic exchange. Thus, the social exchange between farmers, community, researchers who are involved in the changing process influence the transition. In contrast, some farmers are reluctant to change because of a lack of knowledge, technical skills, or networking or financial support that can be solved by enabling knowledge sharing, networking of farmers, and the appropriate support from the government.

Table 1 Categories of drivers and inhibitors

Dimension	Drivers	Inhibitors
Economic	- Financial benefit Drottberger et al. (2021); Góngora et al. (2019); Kragt et al. (2017); Latawiec et al. (2017); Louah et al. (2017); Morgan et al. (2015); Stanciu et al. (2018)	- Lack of financial support during transition - Financial risks Alskaf et al. (2020); Drottberger et al. (2021); Góngora et al. (2019); Kragt et al. (2017); Latawiec et al. (2017); Singh et al. (2021)
Social	- Personal interest - Wellbeing - Strengthening of grass-root institutions - The communication between researchers and farmers to facilitate the implementation of sustainable soil management solutions - The degree of autonomy with which young farmers make decisions - Support for farmers - The degree of autonomy with which young farmers make decisions Drottberger et al. (2021); Grüneis et al. (2018); Singh et al. (2021)	- Lack of skill in communication - Weakness of networking - Farmer's behaviour such as awareness of opportunity in supporting from third party - Ability of grass-roots level to learn and adaptive - Lack of encouragement increased reduced tillage uptake. - Inadequate flow of information to farmers, - Farmers' behaviour - Policy and political uncertainty - Cognitive Alskaf et al. (2020); Drottberger et al. (2021); Hogarth (2017); Kragt et al. (2017); Louah et al. (2017); Singh et al. (2021)
Environmental	- Sustainability values - Awareness of environmental raising - Weather conditions Alskaf et al. (2020); Drottberger et al. (2021); Grüneis et al. (2018); Kragt et al. (2017); Singh et al. (2021)	- Lack of information on the co-benefits and climate change benefits of carbon farming practices - The level of ecological knowledge Kragt et al. (2017); Louah et al. (2017)
Technological	- Increased agricultural productivity - Soil type - Weed control - The level of education and training received by young farmers	- Lack of skills in technical during transition and technological risks - Lack of labour - Lack of practical knowledge exchange - Lack of skills in business management

Dimension	Drivers	Inhibitors
	- The extent to which the farm has embraced innovation - Knowing another adopter Alskaf et al. (2020); Grüneis et al. (2018); Hogarth (2017); Kragt et al. (2017); Latawiec et al. (2017)	- Lack of ongoing training and information Alskaf et al. (2020); Drottberger et al. (2021); Góngora et al. (2019); Grüneis et al. (2018); Hogarth (2017); Latawiec et al. (2017)

3.3 Framework and model used in previous studies

Transition in agriculture is complex because different aspects are involved, such as the environmental, social, economic, and technological. Several frameworks have been developed for the transition in agriculture to understand the complexity of the transition. For example, the multi-level perspective (MLP) has been applied to posit through interaction processes within and among: technological niches, sociotechnical regimes, sociotechnical landscape (El Bilali, 2019; Geels, 2002). The transition model and theory was originally developed by Nancy K. Schlossberg in 1981. She defines transition as any event or non-event that results in changed relationships, routines, assumptions, and roles. Also, she identifies four major sets of factors that influence a person’s ability to cope with a transition: situation, self, support, and strategies, which are also known as the 4 S’s (Anderson et al., 2021). Another example is the efficiency–substitution–redesign (ESR) framework first introduced by Hill and MacRae (1996). ESR can be used for the analysis of the decision-making process and messages of the decisions. Also, it can be used to understand farmers’ changing farming practices and the trajectories (Dupré et al., 2017); Padel et al. (2019). It is true that better understanding of farmers’ decision-making process in the transition can help establish the support measures to contribute to a sustainable farming system. Dupré et al. (2017) contend that understanding farmers’ viewpoint and decisions during the transition supports the key player who develops a policy for the agricultural sector to announce an appropriate supported measurement for farmers. It can be claimed that the existing transition frameworks focus on understanding the complexity of the changes in the transition process. Moreover, the different context of agriculture has different factors to contribute to the transition. It is very important to know the necessary factor and sufficient factors for supporting the transition in a specific circumstance.

3.4 Underpinning theories used to account for farming transition

Studying the transition from natural rubber to other types of farming can be separated into two phases. Phase one is the making decision process to transition from natural rubber to other types of farming. Phase two is investigating the relationship of the condition leading to transition outcomes. Social exchange theory is applied to posit through making decision process and theory of change is applied to investigate the configuration leading to the transition outcome.

3.4.1 Social exchange theory

Reasons for making the decision to transit are very important for understanding farmers’ behaviour. Social exchange theory is one of the most significant conceptual paradigms for understanding behaviour in management, social psychology, and anthropology disciplines (Cropanzano et al., 2017). All social exchange theories treat social life as involving a set of transactions between two or more parties in a specific order (Mitchel et al., 2012 as cited in Cropanzano et al., 2017). It follows the premise that humans strive for a positive outcome, meaning to maximize benefits and minimize costs when engaging in an exchange (Cropanzano & Mitchell as cited in Gebregziabher & Soltani, 2019). It aligns with the outcome when farmers

make the decision to transit from natural rubber to other types of farming. The exchanges can be based on rationality (e.g., exchanges for self-interest), altruism (e.g., exchanges that benefit others), principles of the community (e.g., exchanges for the common good of a group), status or authority ranking (e.g., exchanges based on formal or informal position), and market (e.g., exchanges based on market value). Moreover, the resource in exchange process can be love, status, information, money, goods, and services (Foa & Foa as cited in Cropanzano & Mitchell, 2005). Resources are the factors that influence the transition when measuring between reward and costs when people compare among their expectations, previous experiences, or alternatives. Rewards and costs are the turning points for making a decision to transit or change. It can form two relationships of exchange connections. There are economic exchange and social exchange that demonstrate different terms of benefit. Economic exchange refers to the situation when farmers transit to other types of farming and need immediate monetary and material gains during the process of transition. On the other hand, social exchange is a long-term relationship. It can infer to the family's farming business that parents established the farm business but the rate of return from investment decreases recently.

3.4.2 Theory of change

Transition in agriculture can be described as a changing process in agriculture. How change happens for individuals, groups, organizations, and communities are known as theories of change. Thus, theory of change represents the ability to comprehend how engagement and learning may facilitate change, as well as how progress toward goals can be measured (Thornton et al., 2017). Stakeholders are encouraged to describe the causal pathways using theory of change (Lam et al., 2021). The main elements of the theory of change include input resources, research activities, research outputs, outcomes, and impact (Thornton et al., 2017). Thomas et al. (2018) use a worked example to demonstrate the possibility of qualitative comparative analysis (QCA) to aid with complex syntheses after identifying early theories of change in a previous investigation. They conclude that the worked example demonstrates how the QCA reveals that the earlier theories of change cannot tell the difference between "effective" and "very successful" interventions.

3.5 Methodologies commonly used in farming transition research

3.5.1 Exploring drivers and inhibitors

Different methods to reveal drivers and inhibitors can be found in previous studies in farming transition. Some of the most well-known methods that are used include semi-structured interview, questionnaire survey, focus group meeting, and Q-methodology as shown in Table 2. These methods have their different benefits but can complement one another. For instance, the advantages of the questionnaire survey are user-friendliness, versatility, accessibility, and uniformity whereas the advantage of the interview is flexibility, adaptability, catching non-verbal behaviours, and uniformity. Both methods can be conducted face-to-face, or via telephone calls (Latawiec et al., 2017). In comparison, focus group meetings allow the collection of all types of agreement and dissatisfaction expressions, as well as involvement and sharing of understandings, perspectives, motivations, and thoughts (Iofrida et al., 2018). Singh et al. (2021) claim that the questionnaire survey can be complemented by focus group meetings and interviews. Q-methodology is a relatively new approach to exploring individual opinions to construct aggregation that represents the collective subjectivity of people who scored high on that factor (Góngora et al., 2019; Louah et al., 2017). Time and cost need to be organised carefully. Appropriate duration for data collection contributes to the robustness of the raw data. For example, to complete a questionnaire with 178 items can take more than 60 minutes which

can affect the quality of data collected due to fatigue of the respondent (Morgan et al., 2015). The cost of doing the research is another important consideration. In general, cost saving can be achieved by using new technology. For example, Latawiec et al. (2017) used telephone calls to interview participants to save the cost of transportation. Alskaf et al. (2020) sent the questionnaire survey to participants at 2000 copies but only 479 replied (24% return rate). Standardisation is important for the quality of raw data that can influence the data analysis process. Method that provides clear information for each process, such as Q-methodology, contributes to a good quality of research study. Q-methodology has six main processes, which include developing a concourse, selecting Q-sample, selecting P-sample, Q-sorting, data analysis, and factors interpretation. However, the methodology is quite time-consuming. Louah et al. (2017) report that their Q-sort process took 2 hours to complete that the long sorting and the tiring process might annoy the participants.

In summary, each research method has both advantages and disadvantages. Researchers must clearly pick the appropriate one. This study explores factors affecting farming transition decision which are based on individual viewpoints. As such, Q-methodology is considered most appropriate. Q-methodology with the associated set of theoretical and methodological concepts are suitable in exploring subjective views or individual perspective (Brown, 1993; Ramlo, 2015; Watts & Stenner, 2012). Despite it is still a quantitative method, the focus of the Q-methodology is more on qualitative research studies than quantitative research studies.

Table 2 Methods for exploring drivers and inhibitors in social research

Author	Aim	Method	Pro	Con
Drottberger et al. (2021)	To give insight into the condition of young market gardeners in Sweden, to identify challenges to the creation of new sustainable small-scale horticultural businesses, and to recommend solutions to support this group of producers in overcoming these barriers.	- A semi-structured interview of 14 participants	- Flexibility - Adaptability - Catching non-verbal behaviours	- Time-consuming (1-1.5 h a time) - Need the influencer of the interviewer to avoid bias
Singh et al. (2021)	Present a multi-scalar and multi-indicator assessment by profiling resilience throughout India's agro-climatic zones, based on the development of a Climate-Resilient Agriculture Index that incorporates environmental, technological, socioeconomic, institutional, and infrastructural dimensions.	- A questionnaire survey of 220 households - A detailed interview of 14 households - A semi-structured interview of 36 stakeholders - A focus group discussion 6 times	- Researchers familiar with the participant's context because of research site take time for 10 months - Data from questionnaires were complemented by interviews and focus groups	- Time-consuming - Cost
Alskaf et al. (2020)	Analyzes the reasoning for the adoption of various cultivation techniques, particularly the impediments to reduced till-age adoption, with the goal of benefiting policymakers and researchers	- A questionnaire survey of 2000 farms	- User-friendliness - Adaptabilities	- Low rate of return - High rate of uncompleted data - Costs

Author	Aim	Method	Pro	Con
	and spreading smart agriculture practices.			
Góngora et al. (2019)	Analyzes the various ways in which young farmers in one of Spain's main livestock regions undergo the process of integration into the livestock sector (Catalonia).	- Q-method by interview 24 participants	- The viewpoints of participants are a constructed aggregate that represents the shared subjectivity.	- Time-consuming (45 min a time)
Grüneis et al. (2018)	Analyses of local, "bottom-up" adaptation efforts in Tyrolean Mountain agriculture, which could be triggered by both climatic and non-climatic causes.	- A semi-structured interview of 20 participants	- Flexibility - Adaptability	- Need supplemented data to gain further understanding
Hogarth (2017)	Examines the historical drivers and barriers to three mitigation efforts in Brazil: no-till agricultural development, deforestation reduction, and greater ethanol displacement of gasoline.	- Review of existing literature - A semi-structured interview of 11 experts	- Flexibility	- Lack of standardization
Latawiec et al. (2017)	To gain a better understanding of the importance of the underlying elements that lead to or inhibit changes in land management in the Brazilian Amazonian state of Mato Grosso.	- A focus group meeting of 25 participants - A questionnaire survey by phone interview of 250 farmers	- A focus group meeting was supplemented the phone interviews. - Flexibility - Cost	- The phone interviews were held by a third party. It might be leading to bias.
Kragt et al. (2017)	To find out what motivates them to embrace carbon farming practices and participate in carbon farming policy initiatives.	- A questionnaire survey of 150 participants	- A rich dataset by 2 survey waves before and after the climate policy change.	- High rate of irrelevant response

3.5.2 Exploring configurations favourable to transition

Conditions to contribute to an outcome in complex situations, such as the transition in the agricultural sector, will be many. So, the relationships of conditions to contribute to the transition are important to reveal. The most famous models that investigate relationships between variables are regression analysis (Alskaf et al., 2020; Latawiec et al., 2017) and qualitative comparative analysis (QCA) (Arvola et al., 2020; Davis et al., 2019) as shown in Table 3. Regression analysis and QCA have different approaches to an explanation. For instance, the net or average effect of a variable on the outcome is often accessed through regression analysis. It is an “effect-of-cause” approach. In contrast, QCA is a “cause-of-effects” approach. Typically, casual configurations (combination of cause) are used to account for the outcome. The idea of regression causation is based on a tendential or correlational relationship and probability/statistical theory, whereas necessary and/or sufficient relationships is the concept of causation within QCA. This study focuses on the relationship of enabling conditions leading to the transition from natural rubber to other types of farming. QCA is a comparison method that combines qualitative case-oriented and quantitative variable-oriented aspects (Youn et al., 2017). It is particularly suitable for research in which the relationships between circumstances and outcomes are unclear. It can be utilized to develop theory in complex

situations (Jordan et al. 2011) such as the policy analysis (Arvola et al., 2020) and the transition in agriculture and the environment (Roig-Tierno et al., 2017; Stanciu et al., 2018; Youn et al., 2017; Zhang et al., 2021).

Table 3 Methods for identifying casual relationships

Author	Topic	Method
Arvola et al. (2020)	What drives is smallholder tree growth? Enabling conditions in a changing policy environment	Qualitative comparative analysis (QCA)
Alskaf et al. (2020)	The uptake of different tillage practices in England	- A logistic regression model
Davis et al. (2019)	The use of qualitative comparative analysis to identify pathways to successful and failed sanitation systems	Qualitative comparative analysis (QCA)
Latawiec et al. (2017)	Improving land management in Brazil: A perspective from producers	- A probit analysis (regression with binary dependent variable)

In QCA, primary data and secondary data can be used to develop the conditions and calibration process. For instance, the use of secondary data for developing the casual conditions and calibrating the conditions and outcome sets was applied by many studies (Llopis-Albert et al., 2018; Stanciu et al., 2018; Youn et al., 2017; Zhang et al., 2021) whereas primary data were collected from interviews, focus group meetings, and field research (Arvola et al., 2020; Davis et al., 2019). Highly accurate account of conditions contributing to the accuracy of the configurations can be obtained by combining the social network analysis (SNA) and QCA. The findings can present more accurate configurations leading to an outcome (Yamasaki & Spreitzer, 2006). The method requires the identification of cases and the condition and outcome sets. Ideally, less than five conditions in a case study design with a small (e.g., 10–15) or moderate (e.g., 16–100) number of cases should be used because in QCA all conceivable configurations of conditions are evaluated. Methodological variation within QCA is an important element of calibrating conditions and outcome sets for the accuracy of configurations. Two most common variants of QCA are crisp-set QCA and fuzzy-set QCA (Roig-Tierno et al., 2017). In brief, crisp-set QCA is the first QCA variant. The goal of this type is to simplify complex setups using Boolean logic and to uncover configuration models with various causal configurations. Crisp-set QCA employs categorical conditions based on a dichotomy, with each condition assigned the values 1 – present/true, or 0 – absent/false. However, in social reality, many variables such as quality and satisfaction cannot be graded as only true or false. That is the reason for the development of fuzzy-set QCA. It was created in response to the limitations of crisp-set QCA (Roig-Tierno et al., 2017). Fuzzy-set QCA allows for the possibility of partial membership. It provides for more differentiation and description precision as shown in Table 4. In this study, fuzzy-set QCA will be applied because it is consistent with the social reality that divides the quality of level to not only true or false. Lastly, a truth table includes all potential condition configurations, as well as the number of cases that fall into each configuration and the cases' consistency. The final solution of the combination of conditions leading to successful transition is presented within this stage.

Table 4 Features of primary methodological variations within QCA

Variant	Feature
Crisp-set QCA	1 – present/true (full membership), or 0 – absent/false (full non membership)
Fuzzy-set QCA	0 = absent (non-membership) 0.33 = more absent than present 0.67 = more present than absent 1 = present (full membership)

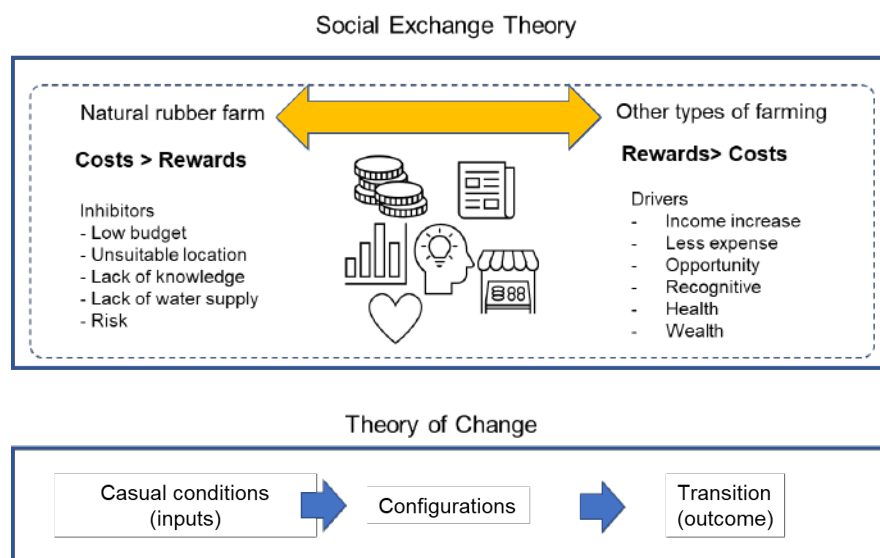


Figure 1 *Theoretical underpinning*

In summary, the Thai natural rubber farmers, especially, the small-scale farmers have been impacted by the price crisis. Changing from monoculture to polyculture is recommended by the researcher and the government provides funds to the transition from monoculture to polyculture. However, the number of natural rubbers transitioning to other types of farming is less than expected. Reasons for the farmer to transit to other types of farming and inhibitors preventing them from abandoning monoculture farming need to be explored to clearly understand the decision-making process of the farmers. Comparison between the pros and cons of the transition can help farmers make their decisions. If the farmers perceive the reward of the transition is higher than the cost, the transition may occur. This is underpinned by social exchange theory as shown in Figure 1. It can be a social exchange or economic exchange depending on the farmers' viewpoints to the transition from natural rubber to other types of farming. In addition, to contribute to the transition outcome, the casual condition has to be investigated to determine the relationship of the condition leading to the transition outcome. It is the sequence of events that leads to the transition. Only one condition alone cannot attribute to the transition outcome. The combination of the conditions needs to be investigated. This is underpinned by the theory of change which is interested in understanding how inputs of the changing process influence the outcome of changing process. Multiple relationships of the input can lead to different outcome.

4. Research Methodology

This research is based on literature research. There is information on the current situation of natural rubber farming transition in Thailand, farming transition, transition framework and

model, underpinning theories used to account for farming transition, and methodologies commonly used in farming transition research. The proposed conceptual framework is developed based on the previous studies. Finally, the appropriate methods are introduced for answering research questions, what are the factors for the Thai farmers to transition from natural rubber farming to other types of farming and how do the key enabling conditions contribute to the outcome of transition. Q-methodology and QCA, the appropriate methods, are presented in this section.

4.1 Q-methodology

Q-methodology is an appropriate method to explore drivers and inhibitors that influence the transition from natural rubber to other types of farming. The main process of Q-methodology includes six main processes. Firstly, developing a concourse is the stage that statements of drivers and inhibitors are collected from the literature review to be validated by experts and farmers through interviews. The wide range of viewpoints from different experts and practitioners are beneficial for developing a concourse. Secondly, selecting a Q-sample is a process after gathering all the information for developing a concourse. The Q-sample is selected from the concourse. It typically includes 30 to 60 sentences or about a third of the total concourse. Thus, to create a heterogeneous Q-set that represents variation rather than proportionality, the most different ideas should be selected. Thirdly, selecting a P-sample is a stage of selection of the participants who are going to sort the Q-sample in the stage of Q-sorting. The description of P-sample selection is explained in the next section. Q-sort demonstrates a participant's understanding of the topic being studied as operationally understood by the placement of items, interpreted by the sorter, empowering each participant to explain his viewpoints. The outcome is correlated and factor analyzed with the person chosen to represent the point of view (McKeown & Thomas, 2014). Q-grid is used in the Q-sorting process. Figure 2 presents the face-valid dimension of the Q-grid that runs from most unlikely to most likely. Fifthly, the data analysis process is conducted by the software that uses factor extraction method. This stage is a quantitative approach that uses the statistical method. Lastly, the factor interpretation process is conducted when the results are obtained from the factor loading. At the end of the process, the group of statements are revealed.

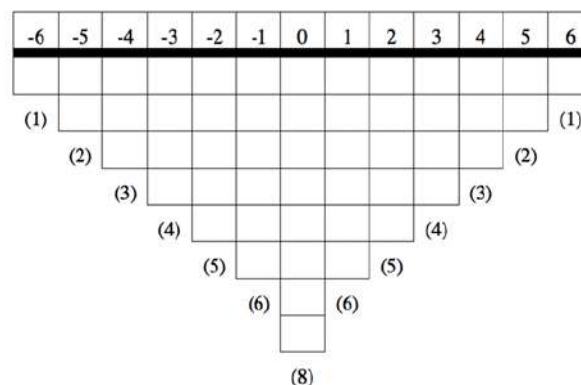


Figure 2 *Q-grid*

4.2 Qualitative Comparative Analysis (QCA)

The appropriate method for investigating the relationship of the conditions is Qualitative Comparative Analysis (QCA). QCA consists of five main processes. There are the processes

of developing a research question, identifying cases, identifying the conditions and outcome sets, calibrating condition and outcome sets, constructing a truth table, and analysing the truth table (Setzke et al., 2020). Developing a research question is an important stage of QCA. The appropriate research questions for a QCA approach would aim to discover the necessary and sufficient circumstances for achieving the desired outcome. In this study, the research question is “How do the key drivers and inhibitors contribute to the outcome of transition?” which aligns well with the QCA’s objective. The next step is to identify the case. The cases are the natural farmers who have transited to other types of farming and the farmers who have not transited yet. Normally, the step of identifying the conditions and outcome sets can be applied from primary data or secondary data. This study applies the finding of drivers and inhibitors from Q-methodology and uses them as conditions of QCA for investigating the relationships between them. It can be claimed that factors from Q-methodology are credible and valid. They contribute to the accuracy of the combination of conditions in QCA. It is a relatively new technique and appropriate for this study. At this stage, conditions and an outcome are identified. The next process is to calibrate the conditions and the outcome sets. This stage is a quantitative approach. The methodological variation for this study is the fsQCA. The last stage is the construction of a truth table. The relationships of the conditions are presented. Also, the necessary condition and sufficient conditions leading to the transition are shown.

5. Proposed conceptual framework

This study adopts the constructionist approach to find out the social fact of transition. Figure 3 presents the conceptual diagram of this study. The inhibitors prevent farmers from initiating the transition because of the feared loss whereas the drivers push the establishment of transitions. It can be claimed that the farmers’ perception of the transition depends on their individual viewpoint to evaluate the rewards and costs. The reasons behind the decision-making decision are underpinned by social exchange theory that involves rewards and costs of the transition. Under this theory, farmers are motivated to obtain a valuable reward in exchange for something that they must abandon or something valuable (cost).

The factors contributing to the transition will be many. The combination of enabling factors is investigated to contribute to the transition from natural rubber to other types of farming. This assumption is consistent with the theory of change. The theory focuses on the inputs, activities, outputs, and impact outcomes to contribute to change. Each combination of conditions can lead to a different transition outcome. It does not matter if different combinations of factors exist as long as the result influences the transition.

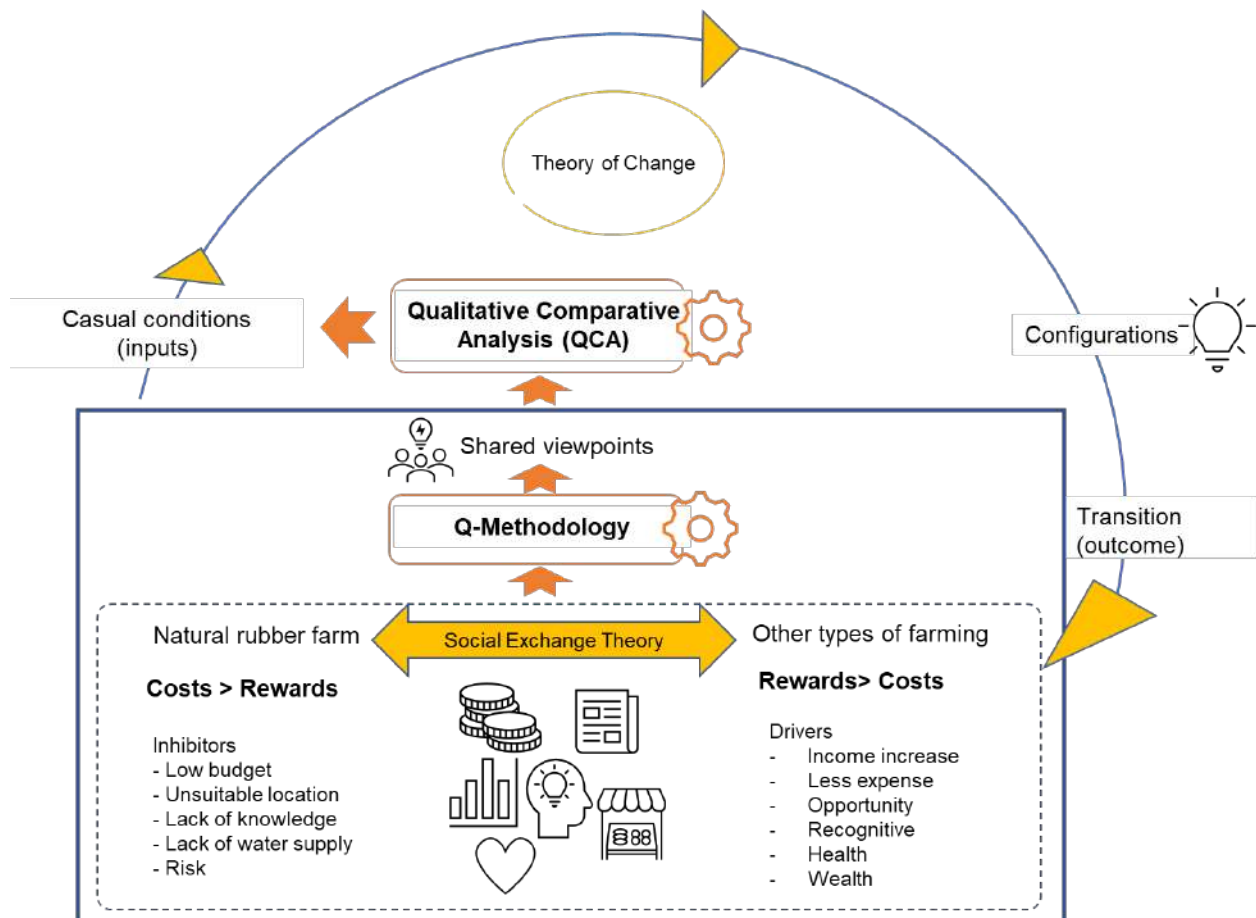


Figure 3 Conceptual diagram

6. Conclusion

This investigation is based on the previous studies in transition from natural rubber to other types of farming in Thailand. The decline of and fluctuation in natural rubber prices impact on the farmers' family income. Monoculture natural rubber plantations need to be abandoned, and polyculture is recommended to increase farmers' family income by increasing the diversity of farming products hence value and decrease expense. Also, the Thai government provides funds for the transition, but relatively few farmers participated in the transition program. The reasons behind the decision-making process are worth investigating to expedite the transition from natural rubber to other types of farming. This paper puts forward a proposed concept framework that guides the study on the factors affecting the farming transition in the case of the Thai natural rubber farmers. It is contended that the decision-making process to adopt transition is underpinned by social exchange theory and the theory of change. The positive and the negative benefits of the transition need to be compared from the farmers' personal viewpoints. Q-methodology will be applied to help identify and rank the factors (including drivers and inhibitors) affecting the transition from the perspective of the natural rubber farmers. Q-methodology combines the benefits of quantitative and qualitative approaches. It contributes to the quality of the findings of this study. Moreover, the configurations of factors leading to the favourable transition outcome need to be investigated. This is underpinned by the theory of change. The input factors that lead to the transition outcome will be explored by

applying QCA. It can help explain why change happens in some cases but not the others. The shared viewpoints from Q-methodology will be used as casual conditions in a Qualitative Comparative Analysis (QCA) to determine the favourable configurations leading to transition.

6.1 Contributions of the study

The contributions of the study are threefold. They comprise the practical, theoretical, and methodological aspects. For the expected practical contributions of this study, firstly, the findings can help enhance farmers’ understanding of farming transition. Secondly, the findings can help develop policies to reduce the area of natural rubber plantation. Thirdly, the study can help improve the sustainability of the small-scale farming. Lastly, it can help better utilise resources to promote farming transition. For the expected theoretical contributions, the finding can contribute to knowledge of drivers and inhibitors involved in farming transition in the context of small-scale natural rubber farmers in Thailand and how they should be leveraged to influence outcome. Also, this study is a novel application of social exchange theory and theory of change in farming transition research. For the expected methodological contribution, this study is the first attempt to synthesise Q-methodology and QCA for exploratory qualitative studies. The approach is more rigorous and adds to the strength and accuracy of the research findings.

6.2 Limitations of the study and direction for future research

This study focuses on small-scale natural rubber farmers in Thailand to explore the reasons for them to make their decisions in transiting from natural rubber to other types of farming. For future research, other natural rubber producing countries should be investigated to explore if there are differences in the factors or viewpoints of the farmers in the transition from natural rubber to other types of farming.

7. References

- Alskaf, K., Sparkes, D. L., Mooney, S. J., Sjögersten, S., & Wilson, P. (2020). The uptake of different tillage practices in England. *Soil Use and Management*, 36, 18.
<https://doi.org/10.1111/sum.12542>
- Anderson, M. L. P. L. P. C. N. C. C., Goodman, J. P., & Schlossberg, N. K. E. (2021). *Counseling Adults in Transition, Fifth Edition : Linking Schlossberg's Theory with Practice in a Diverse World*. Springer Publishing Company.
<http://ebookcentral.proquest.com/lib/rmit/detail.action?docID=6688808>
- Andriesse, E., & Tanwattana, P. (2018). Coping with the End of the Commodities Boom: Rubber Smallholders in Southern Thailand Oscillating Between Near-poverty and Middle-class Status. *Journal of Developing Societies*, 34(1), 77-102.
<https://doi.org/10.1177/0169796x17752420>
- Arvola, A., Brockhaus, M., Kallio, M., Pham, T. T., Chi, D. T. L., Long, H. T., Nawir, A. A., Phimmavong, S., Mwamakimullah, R., & Jacovelli, P. (2020). What drives smallholder tree growing? Enabling conditions in a changing policy environment. *Forest Policy and Economics*, 116. <https://doi.org/10.1016/j.forpol.2020.102173>
- Boonthong, T., Klinsukon, C., & Punsin, P. (2019). *Challenging of Thai natural rubber farmers: the perspective to the new policy*.
- Brown, S. R. (1993). A Primer on Q Methodology. *Operant Subjectivity*, 16(3/4).

- Cropanzano, R., Anthony, E. L., Daniels, S. R., & Hall, A. V. (2017). Social Exchange Theory: A Critical Review with Theoretical Remedies. *Academy of Management Annals*, 11(1), 479-516. <https://doi.org/10.5465/annals.2015.0099>
- Cropanzano, R., & Mitchell, M. S. (2005). Social Exchange Theory: An Interdisciplinary Review. *Journal of Management*, 31(6), 874-900. <https://doi.org/10.1177/0149206305279602>
- Davis, A., Javernick-Will, A., & Cook, S. M. (2019). The use of qualitative comparative analysis to identify pathways to successful and failed sanitation systems. *Sci Total Environ*, 663, 507-517. <https://doi.org/10.1016/j.scitotenv.2019.01.291>
- Department Agriculture of Extension (2021). *Number of Natural Rubber Farmers* <https://production.doae.go.th/site/login>
- Drottberger, A., Melin, M., & Lundgren, L. (2021). Alternative Food Networks in Food System Transition—Values, Motivation, and Capacity Building among Young Swedish Market Gardeners. *Sustainability*, 13, 4502. <https://doi.org/10.3390/su13084502>
- Dupré, M., Michels, T., & Le Gal, P.-Y. (2017). Diverse dynamics in agroecological transitions on fruit tree farms. *European Journal of Agronomy*, 90, 23-33. <https://doi.org/10.1016/j.eja.2017.07.002>
- El Bilali, H. (2019). The Multi-Level Perspective in Research on Sustainability Transitions in Agriculture and Food Systems: A Systematic Review. *Agriculture*, 9(4). <https://doi.org/10.3390/agriculture9040074>
- Gebregziabher, D., & Soltani, A. (2019). Enclosures in people's minds: perceptions and attitudes in the Tigray region, Ethiopia. *Forest Policy and Economics*, 101, 1-14. <https://doi.org/10.1016/j.forpol.2019.01.012>
- Geels, F. W. (2002). Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research Policy*, 31, 18.
- Góngora, R., Milán, M. J., & López-i-Gelats, F. (2019). Pathways of incorporation of young farmers into livestock farming. *Land Use Policy*, 85, 183-194. <https://doi.org/10.1016/j.landusepol.2019.03.052>
- Grüneis, H., Penker, M., Höferl, K.-M., Schermer, M., & Scherhauer, P. (2018). Why do we not pick the low-hanging fruit? Governing adaptation to climate change and resilience in Tyrolean mountain agriculture. *Land Use Policy*, 79, 11. <https://doi.org/10.1016/j.landusepol.2018.08.025>
- Hill, S. B., & MacRae, R. J. (1996). Conceptual Framework for the Transition from Conventional to Sustainable Agriculture. *Journal of Sustainable Agriculture*, 7(1), 81-87. https://doi.org/10.1300/J064v07n01_07
- Hogarth, J. R. (2017). Evolutionary models of sustainable economic change in Brazil: No-till agriculture, reduced deforestation and ethanolbiofuels. *Environmental Innovation and Societal Transitions*, 24. <https://doi.org/10.1016/j.eist.2016.08.001>
- Iofrida, N., De Luca, A. I., Gulisano, G., & Strano, A. (2018). An application of Q-methodology to Mediterranean olive production – stakeholders' understanding of sustainability issues. *Agricultural Systems*, 162, 46-55. <https://doi.org/10.1016/j.agry.2018.01.020>
- Kampan, P. (2017). Sustainability and Competitiveness of Thailand's Natural Rubber Industry in Times of Global Economic Flux. *Asian Social Science*, 14(1). <https://doi.org/10.5539/ass.v14n1p169>
- Kittitornkool, J., Kaewwongsri, P., Tongkam, P., Bumrungsri, S., & Sawangchote, P. (2019). Livelihoods of small-scale rubber farmers: A comparative study of rubber

- agroforestry systems and monocropping rubber plots in Southern Thailand. *Kasetsart Journal of Social Sciences*, 40, 420-426. <https://doi.org/10.34044/j.kjss.2019.40.2.09>
- Kongmanee, C., & Ahmed, F. (2019). Detecting trajectories in rubber farms in southern Thailand. *International Journal of Recent Technology and Engineering (IJRTE)*, 8(2S), 663-642.
- Kragt, M. E., Dumbrell, N. P., & Blackmore, L. (2017). Motivations and barriers for Western Australian broad-acre farmers to adopt carbon farming. *Environmental Science and Policy*, 73, 115. <https://doi.org/10.1016/j.envsci.2017.04.009>
- Lam, S., Dodd, W., Wyngaarden, S., Skinner, K., Papadopoulos, A., & Harper, S. L. (2021). How and why are Theory of Change and Realist Evaluation used in food security contexts? A scoping review. *Eval Program Plann*, 89, 102008. <https://doi.org/10.1016/j.evalprogplan.2021.102008>
- Latawiec, A. E., Strassburg, B. B. N., Silva, D., Alves-Pinto, H. N., Feltran-Barbieri, R., Castro, A., Iribarrem, A., Rangel, M. C., Kalif, K. A. B., & Beduschi, T. G. F. (2017). Improving land management in Brazil: A perspective from producers. *Agriculture, Ecosystems and Environment*, 240. <https://doi.org/10.1016/j.agee.2017.01.043>
- Llopis-Albert, C., Merigo, J. M., Xu, Y., & Liao, H. (2018). Application of Fuzzy Set/Qualitative Comparative Analysis to Public Participation Projects in Support of the EU Water Framework Directive. *Water Environ Res*, 90(1), 74-83. <https://doi.org/10.2175/106143017X15054988926550>
- Louah, L., Visser, M., Blaimont, A., & de Cannière, C. (2017). Barriers to the development of temperate agroforestry as an example of agroecological innovation: Mainly a matter of cognitive lock-in? *Land Use Policy*, 67, 86-97. <https://doi.org/10.1016/j.landusepol.2017.05.001>
- McKeown, B., & Thomas, D. (2014). *Q Methodology*. SAGE Publications, Inc. <https://doi.org/10.4135/9781483384412>
- Morgan, M. I., Bhullar, D. W. H. N., & Loi, N. M. (2015). Landholder adoption of low emission agricultural practices: A profiling approach. *Journal of Environmental Psychology*, 41. <https://doi.org/10.1016/j.jenvp.2014.11.004>
- Nicod, T., Bathfield, B., Bosc, P.-M., Promkhambut, A., Duangta, K., & Chambon, B. (2020). Households' livelihood strategies facing market uncertainties: How did Thai farmers adapt to a rubber price drop? *Agricultural Systems*, 182. <https://doi.org/10.1016/j.agry.2020.102846>
- Padel, S., Levidow, L., & Pearce, B. (2019). UK farmers' transition pathways towards agroecological farm redesign: evaluating explanatory models. *Agroecology and Sustainable Food Systems*, 44(2), 139-163. <https://doi.org/10.1080/21683565.2019.1631936>
- Ramlo, S. (2015). Mixed Method Lessons Learned From 80 Years of Q Methodology. *Journal of Mixed Methods Research*, 10(1), 28-45. <https://doi.org/10.1177/1558689815610998>
- Roig-Tierno, N., Gonzalez-Cruz, T. F., & Llopis-Martinez, J. (2017). An overview of qualitative comparative analysis: A bibliometric analysis. *Journal of Innovation & Knowledge*, 2(1), 15-23. <https://doi.org/10.1016/j.jik.2016.12.002>
- [Record #224 is using a reference type undefined in this output style.]
- Setzke, D. S., Böhm, M., & Krcmar, H. (2020). *Combining the Case Survey Method and Qualitative Comparative Analysis for Information Systems Research* Americas Conference on Information Systems,

- Singh, N. P., Anand, B., Singh, S., Srivastava, S. K., Rao, C. S., Rao, K. V., & Bal, S. K. (2021). Synergies and trade-offs for climate-resilient agriculture in India: an agro-climatic zone assessment. *Climatic Change*, 164, 26. <https://doi.org/10.1007/s10584-021-02969-6>
- Somboonsuke, B., & Kongmanee, C. (2018). CAUSES OF PROBLEMS IN DRIVING DIVERSIFY PRODUCTION SYSTEMS IN RUBBER PLANTATIONS: ROOTS OF PROBLEMS AND ALTERNATIVES OF RUBBER FARMERS UNDER DECLINING RUBBER PRICES. *Journal of Business Administration and Social Sciences Ramkhamhaeng University*, 3, 16.
- Stanciu, S., Bichescu, C., Căpățînă, A., Drăgan, G.-B., & Florea, A.-M. (2018). Enablers and inhibitors of collaborative network development in organic food industry: A fuzzy set qualitative comparative analysis (fsQCA) *Contemporary Economics* 12(4), 15. <https://doi.org/10.5709/ce.1897-9254.288>
- Tanielian, A. (2018). Sustainability and Competitiveness in Thai Rubber Industries. *The Copenhagen Journal of Asian Studies*, 36(1), 50-78.
- Thomas, R., Reed, M., Clifton, K., Appadurai, N., Mills, A., Zucca, C., Kods, E., Sircely, J., Haddad, F., Hagen, C., Mapedza, E., Woldearegay, K., Shalander, K., Bellon, M., Le, Q., Mabikke, S., Alexander, S., Leu, S., Schlingloff, S., Lala-Pritchard, T., Mares, V., & Quiroz, R. (2018). A framework for scaling sustainable land management options. *Land Degradation & Development*, 29(10), 3272-3284. <https://doi.org/10.1002/ldr.3080>
- Thornton, P. K., Schuetz, T., Förch, W., Cramer, L., Abreu, D., Vermeulen, S., & Campbell, B. M. (2017). Responding to global change: A theory of change approach to making agricultural research for development outcome-based. *Agricultural Systems*, 152, 145-153. <https://doi.org/10.1016/j.agsy.2017.01.005>
- Watts, S., & Stenner, P. (2012). *Doing Q Methodological Research: Theory, Method and Interpretation*. SAGE Publications Ltd. <https://doi.org/https://www-doi-org.ezproxy.lib.rmit.edu.au/10.4135/9781446251911>
- Yamasaki, S., & Spreitzer, A. (2006). Beyond Methodological Tenets: The Worlds of QCA and SNA and Their Benefits to Policy Analysis. In *Innovative Comparative Methods for Policy Analysis* (pp. 95–120). MA: Springer US.
- Youn, Y.-C., Choi, J., de Jong, W., Liu, J., Park, M. S., Camacho, L. D., Tachibana, S., Huudung, N., Bhojvaid, P. P., Damayanti, E. K., Wanneng, P., & Othman, M. S. (2017). Conditions of forest transition in Asian countries. *Forest Policy and Economics*, 76, 14-24. <https://doi.org/10.1016/j.forpol.2016.07.005>
- Zhang, J., Luo, J., & Li, J. (2021). Agricultural co-operatives participating in supply chain integration in China: A qualitative comparative analysis. *PLoS One*, 16(4), e0250018. <https://doi.org/10.1371/journal.pone.0250018>

Factors Affecting Intention to Use Food Delivery Applications During Covid-19: A Case of Thailand

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Abstract

Technology has altered the planet, and the internet has disrupted the life of human stimuli. All processes evolve from standard practice to an online format to fulfil the enormous human response to technology. Additionally, food delivery applications have impacted the traditional food industry (FDA). FDA gives numerous benefits, including simplicity, excellent quality and consistency, and trustworthiness. As a result, this research focused on the elements influencing consumers' intention to purchase food delivery services during Thailand's coronavirus pandemic. The data was gathered from 801 respondents who have used food delivery applications in various locations in Thailand. Genders, ages, user experience, selected applications, frequency of use, and spending were all included in the demographic information. The research used aesthetic appeal and formality, PAD theory, to examine the factors influencing customers' propensity to utilise food delivery applications during the coronavirus pandemics.

Keywords: Aesthetic appeal, Aesthetic formality, PAD theory, Food delivery application (FDA)

1. Introduction

The world of the present was pushed by technology, and smartphones have a significant impact on creating new lifestyles for millions of people worldwide. Smartphone usage has increased substantially because of its various uses. Research from many trustable sources shows that phone users globally will be around 5 billion in a few years (GSMA, 2020). More than 3.7 billion people access the internet on their mobile phones, and more than 12 million people in the world have an Internet-of-things technologies connection. (GSMA, 2020). Several corporations have invented mobile-based applications to tap into the pool and generate more revenue. Food delivery apps or FDA are among the top ranks in high growth smartphone apps (Statista, 2020). According to Statista (2020), the whole industry of the food delivery application market was worth US\$107.4 billion. The three major markets for food delivery applications are China, the United States, and India. During 2019–2024, the FDA industry is projected to increase at around 10-12% a year globally (IMARC, 2020). According to Statista (2020), it shows that FDA stands to gain both companies and customers by making online order

processing and offline delivery quicker, more efficient, and more convenient. But this research will investigate the field of the intention of users to use the food delivery application during covid-19 in Thailand.

To minimise the virus's transmission and infections, most countries promote many regulations for public use. Consumers are scared to dine out or use shared facilities. This brought tremendous losses for offline restaurants. The restaurant industry is predicted to have reached \$899 billion in 2020 before COVID-19 spread (National Statistics, 2020). According to the projections, the number of diners in restaurants declined about 32% from February to September of 2020 because of many strict regulations that many countries applied to create fewer infectors (Statistia, 2020). Significantly, the scope of Thai markets individually reaches 78 - 84 million orders a year in 2020, while it is predicted the number of orders will be around 90 - 100 million in 2021 (Kbank, 2020). Due to the many lockdown sessions applied and the unskilled government lack of stimulation to import vaccines to the country, this brings ongoing lockdown most of the year 2021, and Quarters 2 and 3 are predicted to be all extended lockdowns. This brings the Thai market in terms of food delivery industry which can generate faster growth than many countries because Thai people who are in the middle to high income tend to order food through food application instead of picking up by themselves to prevent infection and follow the government regulations (Kbank, 2020). K bank expects that in 2024, a vast number of low-income people will shift to middle income, and the number of smartphone users will be higher than 80% (Kbank, 2020). Many big companies in Thailand want to reap some market shares after seeing the opportunity and potential growth of the food delivery business. During the Covid-19 epidemic, food delivery applications benefited both consumers and restaurants by fulfilling the demand of consumers standards in terms of convenience, fast delivery, and personal safety while restaurants can generate revenue for surviving and sustaining the business during pandemic (Cho et al., 2019; Roh & Park, 2019). To maintain and enhance more customers, every company in the FDA in Thailand still is not making a profit yet. They just want to keep present customers re-order, and new potential customers try the services while overall net losses around \$130 million (Bangkokpost, 2020). But every company will increase fees after customers become addicted to using food delivery applications, then that time will be time for generating profit.

The FDA serves as a bridge between restaurants and their customers, bringing convenience to customers and restaurants. The research expects consumers who joined the FDA during Covid-19 will still use the food delivery application. Earlier research has examined social influence, ease of use, satisfaction, service quality, accessibility, performance expectancy, and points of view on consumption value and technology resistance. According to the research, PAD (pleasure, arousal, dominance) is an emotion that is influenced by aesthetic appeal and aesthetic formality that affect customers' behaviour intentions toward products or services (Chang et al., 2014) and persuade consumers to enter a website emotionally. Moreover, limited analysis has been conducted to investigate the elements that affect the FDA's decision to continue utilising them. Furthermore, the present Covid-19 scenario makes the findings even more pertinent. The possibility of more lockdowns curfews motivates us to investigate the variables that encourage customers to revisit the FDA from an environmental psychology viewpoint.

Studying the factors that affect the intention of consumers to use food delivery applications during the covid-19 situation is the leading research problem that this study intends to solve. This research can help people in the food business, especially newcomer entrepreneurs, with food delivery services to better understand users' emotions, behaviour, and perception of food delivery applications and create food delivery applications more attractive. This research aims to investigate and analyse the intention of users to use food delivery applications during Covid-19 in Thailand and to know the factors involved in the decision making of using food delivery applications.

3. Literature Review

3.1 Food delivery applications (FDA)

Food delivery application (FDA) is an application-based service in categories that allow users to order food from an online application. Its food will be delivered to the area where users place the location Self-created adapted from. The FDA followed the contactless delivery strategy during the Covid-19 crisis to guarantee safety for customers and delivery. The FDA has also launched several new plans, along with delivering fundamentals to consumers, providing Covid-19 health coverage to delivery partners, establishing a pandemic relief fund, and trying to ensure that restaurant owners strictly follow standards of hygiene at all stages of the food preparation, preparing food, and packing steps (Goyal, 2020). Consumers who experience a lot level of risk to get infected during Covid 19, and also less product interaction, a lower perceived advantage on food delivery applications, and fewer online food transactions, are also less inclined to buy food through food delivery applications (Mehroliya, Alagarsamy, & Solaikutty, 2020). Perceived usefulness was positively linked with the willingness to continue using new technologies such as mobile payment and utilise resumption models, to show that confidence in applications, particularly those that require fees, is a component of the technology's features and quality of information and that continued use of such applications is a consequence of the technology fundamental (Talwar et al., 2020). On the other hand, these studies remain inaudible on the emotional components of consumers generated by food delivery applications. Furthermore, during the pandemic, FDA is distributing not just food but also essential commodities like medicine and deliver to consumers' doorsteps, further strengthening consumers' emotional attachment to food delivery applications.

3.2. Aesthetic appeal

Aesthetic appeal refers to the level of happiness and satisfaction that customers have from adopting food delivery applications (Chang et al., 2014). According to earlier studies, aesthetic enjoyment is expressed in emotions that guide behaviour (Reppa et al., 2020). Scholars agree that aesthetic formality stimulates strong feelings in shopping online (Chang et al., 2014), resulting in increased customer loyalty. Prior research has found that interface aesthetics influence hedonic customers (Reppa et al., 2020) and express a wide range of emotions in response to the aesthetic quality of food delivery applications. Furthermore, even during the COVID-19 crisis, food delivery applications changed their designs to promote a sense of security and safety by explicitly stating food preparation and distribution requirements. This

information is likely to build a customer base and reduce the risk of infection throughout the food delivery procedure. Food delivery applications aesthetic appeal adds to the application users' enjoyment, excitement, and sensation of power. Engaging with food delivery applications with a higher aesthetic appeal will bring happiness and engagement or be a solid persuasive tool.

3.3 Aesthetic formality

Aesthetic formality means well-organized or convenient food delivery applications with a user-friendly interface. (Chang et al., 2014). It suggests that the homepage of an application is intended to encourage economic usability through legible and simple phrases (Chang et al., 2014). Past research provides that aesthetic appeal plays a significant part in performing online transactions and forming relationships. For instance, Kumar et al. (2018) find that the look of contents on web pages and a suitable colour scheme, readability, and clean language are linked to emotions and influences loyalty. Chang et al. (2014) believe that a poor outlook of products will decrease good feelings. FDA's and other internet businesses focus on building web pages as enjoyable as appropriate. This contains appealing designs, proper text design and size, and a background that is easy to navigate. Consumers may quickly discover their favourite restaurants using apps with greater visual formality, further invoking PAD feelings. During the pandemic, for example, Food delivery service providers were providing consumers with graphical depictions of the food preparation and delivery process to reassure them of their preventive precautions. In company landing sites and the container of the supplied food, FDAs were explicitly displaying specifics of the essential measures that network operators implement in addition to regulatory standards. Consumers may experience delight, excitement, and a sense of control due to such activities, which are channelled through the readable typefaces and aesthetic formality of applications.

3.4 Pleasure arousal dominance (PAD) theory

From an empirical studies viewpoint, the PAD theory describes individual emotions or feeling toward products or services that affect evaluation to responsiveness (Huang et al., 2017). Researchers identify the three main feelings that occur once people are subjected to any stimuli. The degree to which customers are fulfilled, happy, friendly, or cheerful is considered a pleasure (Yang et al., 2020). The degree to which customers are excited or attentive refers to arousal (Chang et al., 2014). Dominance is a psychological concept that reflects a customer's independence or authority to control (Hall et al., 2017). PAD theory has been studied in several aspects of technology adoption and behaviour. There are several reasons to adopt PAD to this research; this study uses PAD in the scope of food delivery applications. Moreover, the pandemic problem has produced responses in individuals, which may be measured by PAD, which shows a visual framework for investigating the impacts of sensory influences on consumers' emotions.

3.5 Hypothesis

The research hypothesises that:

Hypothesis 1: Aesthetic appeal is positively affected by Pleasure.

Hypothesis 2: Aesthetic appeal is positively affected to Arousal.

- Hypothesis 3: Aesthetic appeal is positively affected by Dominance.
 Hypothesis 4: Aesthetic formality is positively affected by Pleasure.
 Hypothesis 5: Aesthetic formality is positively affected Arousal.
 Hypothesis 6: Aesthetic formality is positively affected by Dominance.

4. Research Methodology

4.1 Design: survey context and data collection

This research collects 801 participants to answer online questionnaires. This research was collected by distributing the online form of questionnaire to participants who experienced FDA all around Thailand. And google docs is the platform the study used to create questionnaires for a fast, comfortable, and high standard. Also, the online form allows the research to gather more participants in a shorter time. In this research, the target group is people using food delivery applications during covid-19 in Thailand. Participants who experienced FDA can give a trustable and accurate review or information after using food delivery applications. The factors related to intention to buy in the FDA during covid-19 in Thailand.

This research investigates the factors that affected intention to buy through food delivery applications during covid-19 in Thailand. This research is quantitative research using an online questionnaire survey to collect data. There are two variables in this research, independent and dependent variables. Independent variables included demography (Gender, Ages), Frequency of usage, Preference FDA, Average spending per transaction. The dependent variables included Factors that affect intention to buy through FDA.

This research investigates the intention of customers to buy products from food delivery applications during the coronavirus pandemic in Thailand. This research contained an online survey by using online questionnaires to collect data. The study included two parts:

- Part 1: the questionnaire about demography, frequency of usage, average spending per time.
- Part 2: the questionnaire about Aesthetic appeal and formality, PAD

This research applied a 7-point Likert-type scale as a reason for more accuracy when collecting the data: Follow by (1.) Extremely likely to (7.) Extremely unlikely. The research program implied in the statistical analysis and hypothesis measurement model is SPSS. For SPSS, used to find a descriptive that concluded mean, SD, and regression.

5. Results

This research has designed the questionnaire by adapting from previous research and consulting with an advisor to approve and check several details such as relevant questions, questions characteristics, Fit content, languages used, and adding or cutting content approved by the advisor.

5.1 Preliminary analyses

Based on table 4.1, the sample size is 801 participants from the online questionnaire survey, followed by each characteristic. 1. Female (62.3%) has a **more significant** number than male (37.7%), 2. **The age** group of people below 25 years old (73.6%) is the **most prominent**

data does not show multicollinearity, and it can perform analysis by Multiple regressive analysis (MRA).

The measurement model of the hypothesis has thirteen variables:

Hypothesis 1: AP to DOM model. R square equals 0.594 or 59.4% provides Aesthetic appeal describing the variance of the dependent variable. Hypothesis1 Aesthetic appeal is positively affected to Dominance based on standardised coefficients is 0.771 with a statistically significant (i.e., $\beta = 0.771, p < 0.001$). This result was support hypothesis 1.

Hypothesis 2: AP to PLS model. R square equal 0.604 or 60.4% shows Aesthetic appeal describes the variance of the dependent variable. Hypothesis2 Aesthetic appeal is positively affected to pleasure according to standardised coefficients is 0.777 with a statistically significant (i.e., $\beta = 0.777, p < 0.001$). This result was support hypothesis 2.

Hypothesis 3: AP to ARO model. R square equals 0.357 or 35.7% shows Aesthetic appeal describes the variance of the dependent variable. Hypothesis3 Aesthetic appeal is positively affected to Arousal according to standardised coefficients is 0.597 with a statistically significant (i.e., $\beta = 0.597, p < 0.001$). This result was support hypothesis 3.

Hypothesis 4: AF to DOM model. R square equals 0.578 or 57.8% shows Aesthetic formality describes the variance of the dependent variable. Hypothesis4 Aesthetic courtesy is positively affected to Dominance according to standardised coefficients is 0.760 with a statistically significant (i.e., $\beta = 0.760, p < 0.001$). This result supported hypothesis4.

Hypothesis 5: AF to PLS model. R square equals 0.380 or 38.0% shows Aesthetic formality describes the variance of the dependent variable. Hypothesis5 Aesthetic courtesy is positively affected to pleasure according to standardised coefficients is 0.617 with a statistically significant (i.e., $\beta = 0.617, p < 0.001$). This result supported the hypothesis5

Hypothesis 6: AF to ARO model. R square equals 0.307 or 30.7% shows Aesthetic formality describes the variance of the dependent variable. Hypothesis6 Aesthetic courtesy is positively affected to Arousal according to standardised coefficients is 0.554 with a statistically significant (i.e., $\beta = 0.554, p < 0.001$). This result supported hypothesis6.

6. Discussion and Conclusion

Technology has been involved in living life since people cannot live without social media in this era. All developers put several innovative and high-performance features in their development products and services to satisfy customers in terms of convenience, high performance, etc. Even in the food industry, developments create an application of food delivery that allows users to order food through the applications and rider (food deliver) will deliver the food order to your place. Food delivery applications are choices for every person because of promotion and discount code, Fast delivery, High standard and quality, accurate estimated time delivery. To follow the trend of food delivery applications in Thailand that estimated to be many times bigger in following years (Kbank, 2020). Thus, this research aims to investigate the factors that affect the intention of customers to buy through food delivery applications during covid-19 in Thailand. And the study adopted aesthetic appeal and formality that positively affects PAD that links with brand experience to continued usage intention and

word-of-mouth as a question to verify some of these factors that affect the choice to buy in food delivery applications.

Based on the research, the result shows that aesthetic appeal and formality positively affect PAD (pleasure, arousal, dominance). These factors make PAD become reliable and accurate emotional criteria. Moreover, PAD also positively affects brand experiences because dynamic measures generate reviews that later become good or bad experiences after-used. After all, brand experiences positively affect continued usage intention, and word-of-mouth by experienced become a criterion to whether continue or stop using food delivery applications. Good professional will create positive review word-of-mouth while bad experience creates negative word-of-mouth. Based on the research result, Aesthetic appeal and formality, PAD (pleasure, arousal, and dominance), Brand experience, continued usage intention and word-of-mouth were variables that affected customers' choice to buy through food delivery applications during covid-19 in Thailand. And the result was being supported by similar previous research. Firstly, Kumar and shah (2020) claim that aesthetic appeal and formality are supported by PAD that affected revisit food delivery application during covid-19. This research helped other researchers who investigated similar contents about factors that affect intention to buy through food delivery applications. Using aesthetic appeal and formality, PAD, are criteria factors. Aesthetic appeal and formality are the base emotional criteria, while PAD is the main contribution in this research that affects buying choices.

For the practical and managerial implications, this research aims to understand the factors that affect buying products from food delivery applications. On the other hand, this research requires other researchers or application developers to use this source of information to study factors that affect intention to use through food delivery applications during covid-19 in Thailand. This research allows app developers to understand the factors that influence buying decisions to improve the application to satisfy customers. This statistics result will help researchers and app developers understand Thais users' perception toward food delivery applications.

In the limitation part, the research has a problem with data collection. The researchers collected data from all participants all over Thailand that may lead to uncovering, and unspecific data used according to some areas may have different perspectives. Moreover, the research focuses on pair variables instead of the whole variable, which may scope in terms of variables that may not represent complete aspects. On the other hand, the research shows only specific factors that researchers want to investigate that those factors affected or not; the study provide partly of aspect factors while it cannot represent the whole components.

7. References

- Bangkokpost. (2020). Thai food delivery market is taking off. Retrieved September 22, 2021, from <https://www.bangkokpost.com/business/2019015/thai-food-delivery-market-taking-off>
- Chang, S. H., Chih, W. H., Liou, D. K., & Hwang, L. R. (2014). The influence of web aesthetics on customers' PAD. *Computers in Human Behavior*, 36, 168-178.
- Cho, M., Bonn, M. A., & Li, J. J. (2019). Differences in perceptions about food delivery apps between single-person and multi-person households. *International Journal of Hospitality Management*, 77, 108-116.
- Goyal, D. (2020). Summary of all of Zomato's COVID-19 related initiatives. Retrieved August 5, 2021, from <https://www.zomato.com/blog/covid-19-initiatives>
- GSMA. (2020). The smartphone economy. Retrieved September 13, 2021, from <https://www.gsma.com/mobileeconomy/>
- Hall, M., Elliott, K., & Meng, J. G. (2017). Using the PAD (pleasure, arousal, and dominance) model to explain facebook attitudes and use intentions. *The Journal of Social Media in Society*, 6(1), 144-169.
- Huang, M., Ali, R., & Liao, J. (2017). The effect of user experience in online games on word of mouth: A pleasure-arousal-dominance (PAD) model perspective. *Computers in Human Behavior*, 75, 329-338.
- IMARC. (2019). Global online food market. Retrieved October 10, 2021, from <https://www.imarcgroup.com/global-online-food-delivery-market>
- Kaur, P., Dhir, A., Ray, A., Bala, P. K., & Khalil, A. (2020). Innovation resistance theory perspective on the use of food delivery applications. *Journal of Enterprise Information Management*.
- Kbank. (2020). Food delivery businesses set to expand due to intensifying. Retrieved September 21, 2021, from <https://kasikornresearch.com/en/analysis/k-econ/business/Pages/z3128-Food-Delivery.aspx>
- Kbank. (2020). โภคกิจ Food Delivery. Retrieved August 21, 2021, from <https://kasikornresearch.com/th/analysis/k-social-media/Pages/Food-Delivery-FB-10-11-20.aspx>
- Kumar, D. S., Purani, K., & Viswanathan, S. A. (2018). Influences of 'appscape' on mobile app adoption and m-loyalty. *Journal of Retailing and Consumer Services*, 45, 132-141.
- Kumar, S., Dhir, A., Talwar, S., Chakraborty, D., & Kaur, P. (2021). What drives brand love for natural products? The moderating role of household size. *Journal of Retailing and Consumer Services*, 58, 102329.
- Mehroliya, S., Alagarsamy, S., & Solaikutty, V. M. (2021). Customers response to online food delivery services during COVID-19 outbreak using binary logistic regression. *International journal of consumer studies*, 45(3), 396-408.
- Miniero, G., Rurale, A., & Addis, M. (2014). Effects of arousal, dominance, and their interaction on pleasure in a cultural environment. *Psychology & Marketing*, 31(8), 628-634.
- National Statistics. (2020). Statistic of restaurant industry. Retrieved October 21, 2021, from <https://restaurant.org/research/restaurant-statistics/restaurant-industry-facts-at-a-glance>
- Reppa, I., McDougall, S., Sonderegger, A., & Schmidt, W. C. (2021). Mood moderates the effect of aesthetic appeal on performance. *Cognition and Emotion*, 35(1), 15-29.
- Roh, M., &

Park, K. (2019). Adoption of O2O food delivery services in South Korea: The moderating role of moral obligation in meal preparation. *International Journal of Information Management*, 47, 262-273.

Talwar, S., Dhir, A., Khalil, A., Mohan, G., & Islam, A. N. (2020). Point of adoption and beyond. Initial trust and mobile-payment continuation intention. *Journal of Retailing and Consumer Services*, 55, 102086.

Purchase Decision Model of Running Shoes Using Multiple Regression Analysis: A Comparative Study Between Beginners and Advanced Runners

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Abstract

The objective of this research was to examine the factors affecting consumer's purchase decision of running shoes. More specifically, to examine a nine-dimensional construct of independent variables using design, comfort, flexibility, durability, motion control, breathability, price, brand reputation, and current trend. This research employs an empirical study by means of the questionnaire survey method. The opinions were collected from 180 beginning runners who have had experiences in using running shoes in their routine exercises and 180 advanced runners who had expert in running shoes performance and technology selected by using purposive sampling technique. The data will be analyzed using descriptive statistical analysis and examined using enter multiple regression statistical analysis. The result found that, brand reputation, current trend, comfort, design, price, and flexibility affecting consumer's purchase decision of running shoes in the context of beginners. It also found that, comfort, brand reputation, motion control, current trend, design, price, and flexibility affecting consumer's purchase decision of running shoes in the context of advanced runners. Such results are useful for the manufacturers in determining product strategies on how to enhance the factors for the purpose of increasing the likelihood of customer purchase decision.

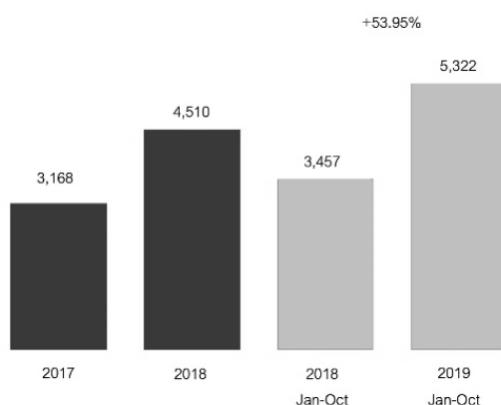
Keywords: running shoes, purchase decision, sports accessory, runners, athletes

1. Introduction

In nowadays' society, people are increasingly interested in and cherish healthiness and well-being. The trends in the style of living and lifestyle have changed rapidly in accordance with social and technological influences, especially health-care trends among people of all ages and genders and the interest in exercise of various forms are becoming intensely popular. As a result, sports and fitness related businesses such as apparel and sports equipment have continued to gain popularity.

Running can be considered as a start of exercise for many people because it is a convenient, easy-access sport that does not require a lot of equipment and can be performed alone.

Nowadays, running as an exercise is becoming more popular among Thai people, as can be seen from many running events such as mini marathon, half marathon and marathon being held across the country, with a large number of professional runners and general people participating. The fitness trend has also created opportunities for other related businesses such as apparel and sports equipment. It is definitely that when consumers become more interested in exercise, they would inevitably try to purchase more equipment and sports apparel as well. Also, the trend that the new generation seeing apparel and sports shoes as a fashion rather than utilization aspect alone corresponds to the continual increase in import value of sports shoes since 2017. The statistics of the import of sports shoes in the past 3 years (2017-2019) has increased in value. In 2019 (Jan.-Oct.), the value was as high as 5,322 million Baht, which is an increase of 53.95% from the same period last year as shown in Picture.1. (Department of Business Development, 2019) This confirms that sportswear and sports equipment business can still grow prosperously. Based on this aforementioned background, the researcher is interested in studying the factors that influence people regarding the decision to purchase or choose running shoes, in order to know the personal differences in choosing running shoes between people who just begin running (beginners) and those with experience of running regularly (advanced runners).



Picture: 1 The statistics of the import of sports shoes in the past 3 years (2017-2019)

Source: Information and Communication Technology Center (2019)

The need to study the factors that influence the decision-making process for consumers who are purchasing running shoes is due to the fact that before an individual purchase a merchandise, especially the high-price items, there are many certain, step-by-step processes involved: recognizing the necessity, researching and gathering information, comparing and evaluating the options, deciding to purchase, and post-purchase evaluation to compare the results of use with initial expectations. The study included the people involved in the purchase processes: Initiators, Influencers, Decider, Buyer, and User. Influences from the marketing, the consumer themselves, and the current circumstances also tend to affect consumers' decision-making on the purchasing (Panwar et al., 2019, pp.36-44, Prasad & Jha, 2014, pp.335-351). As a result, consumer purchase decision can be a major source of sustained growth and profit and a strong asset in order to obtain competitive advantages *especially* in the market for sports equipment.

This study presents a review of the literature and the theoretical framework with an analysis of the empirical literature to support this framework and summarizes the optimization of purchase decision model on consumer's purchase decision of running shoes when comparative study

between beginner and advanced runners. More specifically, this study was to examine a nine-dimensional construct of independent variables using design, comfort, flexibility, durability, motion control, breathability, price, brand reputation, and current trend. In this study, the researcher proposes a simplified algorithm to categorize and define the beginner and advanced runners based on the: experience (years) and *intent of exercise*. Thus, for the research conducted in this paper, the researcher was interested in studying the influence of the above variables. The paper is organized as follows. First, the conceptual framework of the study is presented, followed by the methodology and results. Finally, the conclusions and discussion of the research are presented.

2. Research Objectives

The objective of this research was to examine the factors affecting consumer's purchase decision of running shoes. More specifically, to examine a nine-dimensional construct of independent variables using design, comfort, flexibility, durability, motion control, breathability, price, brand reputation, and current trend.

3. Literature Review

The decision processes are the decision-making processes undertaken by consumers in regard to a potential market transaction before, during, and after the purchase of a product or service. The consumer decision-making process can seem mysterious, but all consumers go through basic steps when making a purchase to determine what products and services will best fit their needs. The consumer decision making process is the method used by marketers to identify and track the decision making process of a customer journey from start to finish. It is broken down into 5 individual stages. The stages of the buyer decision process were first introduced by John Dewey in 1910. Later studies expanded upon Dewey's initial finding. (Engel et al., 1968)

1. Problem recognition: the first step of the consumer decision-making process is recognizing the need for a service or product. Recognize what the problem or need is and identify the product or type of product which is required.

2. Information search: the consumer researches the product which would satisfy the recognized need. Information is not only gathered about stuff and on things but from people via recommendations and through previous experiences with various products.

3. Evaluation of alternatives: generally, the information search reveals multiple products for the consumer to evaluate and understand which product would be appropriate. The consumer evaluates the searched alternatives. This is the time when questions start being asked. Is this really the right product for me do? Once the customer has determined what will satisfy their want or need they will begin to seek out the best deal. This may be based on price, quality, or other factors that are important to them.

4. Purchase decision: the customer has now decided based on the knowledge gathered what to purchase and where to purchase what they desire. After the consumer has evaluated all the options and would be having the intention to buy any product, there could be now only two things which might just change the decision of the consumer of buying the product that is what the other peers of the consumer think of the product and any unforeseen circumstances.

5. Post purchase behavior: this stage is a key stage for the company and for the customer likewise. These stages are important to keeping customers. Customers match products with their experiences on whether they are either content or discontent with the

product. This affects the decision process for resemblant purchases from the same company in the future. (Nicosia, 1966, Bettman, 1979, Yang & Ziv, 2010)

A review of prior studies indicates that researchers have studied the relationship between product factors and purchase decision. Many researchers have investigated the purchase decision though quality of product and price. They need to understand what factors might influence their customers’ decision which indicated that product quality, price, and promotion are able to explain purchase decision. (Juliana et al., 2021, pp.114-121, Imaningsih, 2018, pp.260-271, Novansa & Ali, 2017, pp.621-632, Panwar et al., 2019, pp.36-44) Some of the factors that affected the purchase decision of sports shoes were as follows: product quality, product design, perceived price, brand image, product feature, and social influence.

Various models have been proposed by numbers of researchers with their model of consumer buying decision for all kinds of sport products/services such as the consumer consideration in purchase decision of SPECS sports shoes product (Widyastuti & Said, 2017, pp.199-207), the strategy analysis of consumer purchase decision in online stores (Riantini et al., 2019, pp.426-431), the influence of celebrity endorser, brand image, and brand trust on consumer purchasing decisions of Nike brand sport shoes (Putra & Ningrum, 2019, 208-218), factors influencing the decision to buy running shoes for different types of sports (Maiphoom, 2021, pp.119-132, Siriwatthanasest, 2015), factors influencing customer decision on buying sport shoes by basketball players (Srisuk, 2020), and a decision-making process on buying running shoes, including how product quality, brand image, and price perception impact the purchase decision of running shoes. (Steven et al., 2021, pp.1289-1297)

Although the literatures about the relationship between the mentioned variables and purchase decision are rich, however no work has been focused on the relationship of the mentioned variables on purchase decision of running shoes products from the perspective of beginner and advanced runners in Thailand.

4. Research Methodology

1. Research Instruments

For the research instruments, the questionnaire structure consists of 3 sections

1.1 Background: the questions cover research variables including gender, age, distances, purchasing factors; the purpose is to have further understanding on the investigated subjects.

1.2 Independent Factors: there was 27 items covering 9 dimensions including design, comfort, flexibility, durability, motion control, breathability, price, brand reputation, and current trend

1.3 Purchase Decision: there was 8 items covering 5 steps including problem recognition, information search, evaluation of alternatives, purchase decision, and post purchase behavior.

In section 1 and 2, the researchers redesigned by the concepts of the study of marketing factors that affect the buying decisions of sport shoes, reference was made to Maiphoom, 2021, pp.119-132. In section 3, researchers have also adapted from the study of customer purchase decision model, reference was made to Novansa & Ali, 2017, pp.621-632, Imaningsih, 2018, pp.260-271, and Panwar et al., 2019, pp.36-44. For the set of variables in purchase decision, researchers

have created questions related to purchase decision processes. To measure the level of purchase decision, the researchers has analyzed since the process that customers start paying attention, demand awareness, and to analyze behaviors of purchase decision whether to purchase or not.

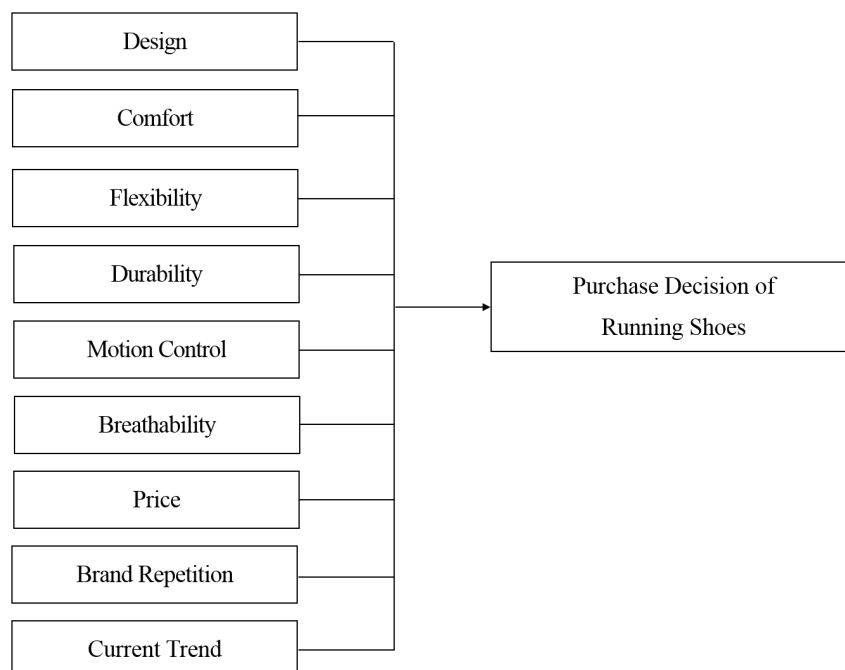
Questionnaires using 5-point Likert scale with anchor of (1) ‘strongly disagree’ to (5) ‘strongly agree’ can reduce variability in the results that may be differences and enhances reliability of the responses. All questionnaires have been checked on content accuracy by professionals to analyze each question as measuring tools and to test on sample group that is similar to the reality by 35 people to test the quality of both overall and each question. The questionnaire achieved an IOC value of 0.975 and the Cronbach’s alpha were calculated, the reliability coefficient overall for the entire scale was 0.836 and the results of each item is more than 0.8, meaning that the questionnaire has high reliability.

2. Data Collection

The opinions were collected from 180 beginners who have had running experiences (less than 3 years) in using running shoes in their routine exercises and 180 advanced runners who had expert in running shoes performance or technology (more than 3 years running experiences) selected by using purposive sampling technique. The data were obtained from survey questionnaires

3. Data Analysis

The data will be analyzed using descriptive statistical analysis and examined using enter multiple regression statistical analysis. The research framework is as follows.



Picture: 2 Conceptual Model

5. Results

Descriptive Analysis

The main purpose of using descriptive analysis is to describe the basic features of the data in this study. Results revealed that the personal factors of the sample group for this research. In

considering the personal factors of beginner, most of them (62.78%) were male. The highest range of their age (41.67%) was between 25-39 years. About 61.50% had running experience for fun run (5 km) program. While the personal factors of advanced runners, most of them (63.89%) were male. The highest range of their age (53.33%) was between 25-39 years. About 37.87% had running experience for mini marathon (10 km) program. A fuller description of the participants is shown in Table 1.

Table 1: Personal Factors

Personal Factors	Beginners		Advanced Runners	
	Frequency	Percent	Frequency	Percent
<i>Gentle</i>				
Male	113	62.78	115	63.89
Female	67	37.22	65	36.11
Total	180	100.00	180	100.00
<i>Age (years)</i>				
Gen-X (40-54)	49	27.22	52	28.89
Gen-Y (25-39)	75	41.67	96	53.33
Gen-Z (10-24)	56	31.11	32	17.78
Total	180	100.00	180	100.00
<i>Distances</i>				
Fun Run (5 km)	138	61.60	86	25.44
Mini Marathon (10 km)	77	34.38	128	37.87
Half Marathon (21 km)	9	4.02	104	30.77
Marathon (42.195 km)	0	0.00	20	5.92
Total	224	100.00	338	100.00

Table 2: Purchasing Factors

Purchasing Factors	Beginners		Advanced Runners	
	Frequency	Percent	Frequency	Percent
<i>Prices of shoes (THB)</i>				
Less than 1,000	20	10.00	0	0.00
1,000-2,000	43	21.50	0	0.00
2,001-3,000	35	17.50	6	3.33
3,001-4,000	46	23.00	28	15.56
4,001-5,000	33	16.50	69	38.33
5,001-6,000	20	10.00	36	20.00
6,001-7,000	3	1.50	33	18.33
More than 7,000	0	0.00	8	4.44
Total	180	100.00	180	100.00
<i>Brands</i>				
Nike	115	22.12	121	20.07
Adidas	127	24.42	133	22.06
Hoka	6	1.15	54	8.96
Mizuno	29	5.58	84	13.93
Asics	43	8.27	67	11.11
Under Armour	34	6.54	30	4.98
Skechers	33	6.35	10	1.66
New Balance	45	8.65	29	4.81

Analysis of variance (ANOVA) of the respondents, it was found that consumer purchase decision based on independent factors was significant ($p < 0.01$). Based on Cohen's rules for effects sizes, the coefficient of determination (R^2) was 0.835 for the overall correlation between the purchase decision of advanced runners and the independent factors of design, comfort, flexibility, durability, motion control, breathability, price, brand reputation, and current trend as shown in Table 6. It is evident from the regression coefficients (B) and p-values that comfort, brand reputation, motion control, current trend, design, price and flexibility are significantly and positively related to purchase decision of smart watch, with p-value 0.000, 0.000, 0.000, 0.001, 0.000, 0.000 and 0.025, respectively while durability and breathability are not significantly in the context of advanced runners.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \varepsilon \quad (1)$$

$$Y_{Be} = 0.750 + 0.1336 X_1^{**} + 0.1452 X_2^* + 0.0813 X_3^* + 0.0152 X_4 + 0.0924 X_5 \\ + 0.0438 X_6 + 0.1142 X_7^{***} + 0.2091 X_8^{**} + 0.1700 X_9^{**} \quad (2)$$

$$Y_{Ad} = 0.134 + 0.1263 X_1^{**} + 0.2180 X_2^{***} + 0.1010 X_3^* + 0.0283 X_4 + 0.1325 X_5^{**} \\ + 0.0326 X_6 + 0.1214 X_7^{**} + 0.1620 X_8^{**} + 0.1279 X_9^{**} \quad (3)$$

Model of Purchase Decision of Running Shoes: A Comparative Study between Beginners and Advanced Runners: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \varepsilon$ where, X is the independent variable, (design, comfort, flexibility, durability, motion control, breathability, price, brand reputation, and current trend) and Y is the dependent variable (purchase decision) as shown in equation 1.

According to equation 2, model of beginner purchase decision of running shoes, significant value for design, comfort, price, brand reputation and current trend are 0.001, 0.016, 0.001, 0.001 and 0.000 respectively, which indicates that design, comfort, flexibility, price, brand reputation towards purchase decision are more than 99% ($p\text{-value} < 0.01$). Also significant value for flexibility is 0.039, which indicates that flexibility towards purchase decision is more than 95% ($p\text{-value} < 0.05$). While significant value for durability, motion control and breathability are 0.676, 0.073 and 0.336, respectively which indicates that mentioned variables towards purchase decision are less than 99% ($p\text{-value} > 0.01$). Therefore, this indicates that durability, motion control and breathability have no association with purchase decision.

According to equation 3, for advanced runners, model of purchase decision of running shoes, significant value for comfort, brand reputation, motion control, current trend, design and price are 0.000, 0.000, 0.000, 0.001, 0.000 and 0.000, respectively, which indicates that comfort, brand reputation, motion control, current trend, design and price towards purchase decision are more than 99% ($p\text{-value} < 0.01$). Also significant value for flexibility is 0.025, which indicates that flexibility towards purchase decision is more than 95% ($p\text{-value} < 0.05$). While significant value for durability and breathability are 0.381 and 0.296, which indicates that durability and breathability towards purchase decision are less than 99% ($p\text{-value} > 0.01$). Therefore, this indicates that durability and breathability have no association with purchase decision.

The empirical data showed a positive relationship between design, comfort, flexibility, price, brand reputation, current trend and purchasing behavior for both beginner and advanced runners. The results were in line with previous that marketing factors could reflect consumer

behavior and purchase decision of running shoes or sports products. As highlighted by mentioned previous research that the customers with strong attitude toward intention to purchase would be had purchase decision in order to respond the sports products or sports equipment.

6. Discussion and Conclusion

This research examined the purchase decision model of running shoes using multiple regression analysis which compare between beginners and advanced runner. The objective of this research was to examine the factors affecting consumer's purchase decision of running shoes. More specifically, to examine a nine-dimensional construct of independent variables using design, comfort, flexibility, durability, motion control, breathability, price, brand reputation, and current trend. The data were obtained from questionnaires and then carefully analyzed via multiple regression statistical analysis.

The study found that most beginners run at fun-runs and at mini-marathon distances. Experienced and advanced runners were found to often run mini-marathon, half-marathon, and full marathon distances. The study found that the variables which influence the decision to buy running shoes were similar for people in both groups, although the order of influence of those variables were different between groups. The research findings are discussed in the following paragraphs.

The variable that had the most influence in the decision to buy running shoes for beginners was brand reputation. The second most influential variable was the current trend, since most beginners often lacked information about running shoes. For this reason, the purchase decision often mainly relied on brand reputation and popular current trends that emerged in the present. The next most influential variable was comfort, with this study finding that most beginners sought shoes to help them start running without risking injury. For this reason, the comfort variable was one of the main purchase decision.

The next most influential variable was design, with most beginners often deciding to buy a shoe based on the design of each shoe, including its beauty, originality, colors, and patterns that matched their exercise outfit. The next most influential variable was price. Data from this research found that beginners often choose running shoes at affordable prices which are appropriate for starting to run, and which felt worth buying. Flexibility was the last variable that influenced the decision to buy running shoes. The beginners had demands for shoe flexibility because they thought it would improve their running.

For advanced runners, the results indicate that the most influential variable was comfort, since experienced runners know that wearing comfortable shoes results in improved efficiency during each run, help them run for longer, and lessen their injuries. The next most influential variable was brand reputation because experienced runners often believe in the qualities of running shoes that many world-class athletes choose to wear. In addition, runners who wear shoes from famous brands tend to be impressed by them, resulting in repeat purchases. Therefore, brand reputation is found to be a highly influencing factor for the decision to purchase running shoes.

The next variable was motion control. This variable was not given high importance by beginners, which differed from experienced runners who choose to buy running shoes for the motion control offered. This is because when running—regardless of distance—shoes that have

good motion control can reduce the total running time. The next most influential variables for experienced runners in descending order include current trends, the design, price, and flexibility. This study’s results indicate that the aforementioned variables are the main influencing factors that both beginner and experienced runners use during the purchase decision-making process.

Besides the above explanation of the research results, the researchers also present a strategy to increase customer purchase decisions. Running shoe brand owners should adopt a strategy that focuses on marketing communication by collecting patterns of various presentations which are developed to create a brand, such as social media or running influencers connection to increase brand awareness among runners at all levels. This strategy would help improve understanding of consumer demand.

The researchers also recommend that marketers who develop communication strategies should consider other factors as well, including prioritization in which consumers must be the center of planning strategy, audience in which chosen forms of media should be related to the target consumer and suit the product, media through flexible communication, agile communication, including finding e-commerce platforms, and e-commerce and search which should be convenient to access or purchase in large volumes.

8. References

- Bettman, J. R. (1979). Memory factors in consumer choice: A review. *Journal of Marketing*, 43(2), 37-53.
- Department of Business Development. (2019). *Business Analysis in 2019*. Retrieved July 19, 2021, from https://www.dbd.go.th/download/document_file/Statistic/2562/T26/T26_201911.pdf
- Engel, J.F., Kollat, D.T. & Blackwell, R.D. (1968). *Consumer Behavior*. New York: Holt, Rinehart & Winston.
- Imaningsih, E. S. (2018). The model of product quality, promotion, price, and purchase decisions. *Jurnal Ekonomi*, 23(2), 260-271.
- Information and Communication Technology Center. (2019). *Trade Report*. Retrieved August 9, 2021, from <http://tradereport.moc.go.th/Report/Default.aspx?Report=MenucomRecode&ImExType=0&Lang=Th>
- Juliana, J., Pramezwaray, A., Patricia, V., Josephine, J., Lewinsky, S., & Putra, H. D. (2021). Understanding the Determinants of Hotel Consumer Trust: A Perspective Commitment-Trust Theory. *International Journal of Social and Management Studies*, 2(2), 114-121.
- Maiphoom, U. (2021). The relationship between marketing mix marketing mix factors and the process of purchasing sports shoes among elderly customers in Bangkok. *Valaya Alongkorn Review (Humanities and Social Science)*, 11(1). 119-132.
- Nicosia, F. (1966) *Consumer Decision Processes*. New Jersey: Prentice Hall.
- Novansa, H., & Ali, H. (2017). Purchase Decision Model: Analysis of brand image, brand awareness and price (Case study SMECO Indonesia SME products). *Saudi Journal of Humanities and Social Sciences*, 2(8), 621-632.
- Panwar, D., Anand, S., Ali, F., & Singal, K. (2019). Consumer decision making process models and their applications to market strategy. *International Management Review*, 15(1), 36-44.
- Prasad, R. K., & Jha, M. K. (2014). Consumer buying decisions models: A descriptive study. *International Journal of Innovation and Applied Studies*, 6(3), 335-351.
- Putra, P. Y., & Ningrum, S. (2019). The influence of celebrity endorser, brand image, and brand trust on consumer purchasing decisions of Nike brand sport shoes in Surabaya. *Journal of World Conference (JWC)*, 1(1), 208-218.

- Riantini, R. E., Andini, S., Florencia, M. M., & Rabiah, A. S. (2019). E-Marketing Strategy Analysis of Consumer Purchase Decision in Indonesia Online Sports Stores. *International Conference on Information Management and Technology (ICIMTech)*, 1, 426-431.
- Siriwatthanaset, S. (2015). *Factors affected to the satisfaction on buying Nike sport shoes in Bangkok and Metropolitan region* (Dissertation Degree). Thammasat University, Bangkok, Thailand
- Srisuk, J. (2020). *Customer Decision on Buy NIKE Brand Sport Shoes by Basketball Players at the University in Bangkok* (Theses Degree), Siam University, Bangkok, Thailand.
- Steven, W., Purba, J.T., Budiono, S. & Adirineko, G.P. (2021). How product quality, brand image and price perception impact on purchase decision of running shoes?. *Proceedings of the International Conference on Industrial Engineering and Operations Management, Sao Paulo, Brazil*, April 5 - 8, 2021, 1289-1297.
- Widyastuti, S., & Said, M. (2017). Consumer consideration in purchase decision of SPECS sports shoes product through brand image, product design and price perception. *International Journal of Supply Chain Management*, 6(4), 199-207.
- Yang, H. & Ziv, C. (2010). *Consumer Decision Making*. in Jagdish Sheth & Naresh Malhotra (eds.), Wiley International Encyclopedia of Marketing, New York: Wiley.

The Effect of Monetary Policy on Stock Returns under Different Firm Characteristics

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Abstract

This paper examines the effect of monetary policy on stock returns of firms in Thailand under different firm characteristics which are firm size, leverage, sales growth and liquidity. Based on the data of 101 companies from various sectors, I find that all firm characteristics affect the sensitivity of firms' stock returns to changes in monetary policy. The level of leverage has the largest impact as leverage is directly connected to changes in the interest rate. Highly leveraged firms are adversely impacted when interest rates increase as these firms need to pay a higher interest rate for their outstanding debt and follow-up financing. The other characteristics, while not being as influential as leverage, still affect the sensitivity of stock returns to interest rate changes. The stock returns of larger firms with a high leverage, a low sales growth and lower liquidity are more affected by changes in the interest rate.

Keywords: monetary policy, stock returns, interest rate, leverage, liquidity

1. Introduction

Monetary policy is the approach taken by the central bank to stimulate a country's economy and therefore the stock market. It is a topic that should be studied closely as changes in the stock market will affect the wealth of both people and firms in a country. Different firms will be affected differently by the implementation of monetary policy, depending on the characteristics of the firm. The private sector, according to Bjornland and Leitemo (2009), has a significant impact on monetary policy decisions made by the central bank. According to the New-Keynesian theory, the central bank has some control over the real interest rate as a result of the fact that prices are sticky in nature. Changes in interest rates will influence factors that have a relation with asset prices such as discount rate, or stock returns. According to Pearce and Roley (1984), the interpretation of daily stock price movements is often shown as announcements in the media. In many cases, they would state that the stock prices had fallen as a result of factors such as "disappointing unemployment figures". Changes in stock prices, on the other hand, are caused by more than just internal issues within firms. According to Ali, Adeeb, and Saeed (2014), a government's attempt to affect the overall market through its policies is accomplished by controlling the supply and availability of money.

This paper studies the effect of monetary policy on stock returns under different firm characteristics using empirical methods, using data and information from previous studies to provide insight into the relation between these factors. While previous researches explained

how monetary policy affects stock returns, they generally provide little information under different firm characteristics. There are good reasons to believe that while firms are in the same country, they will react differently to monetary policy under different firm characteristics. Eriotis et. al (2007) stated that when proxy firm's size with sales, firms with bigger size will be able to bear less risk and be more diversified. They will be able to lend money from banks easier than their smaller counterparts. On the other hand, smaller firms will be more affected by changes in monetary policy. Hence, firm characteristics are an important factor in considering the impact of monetary policy on stock returns.

First, I will study the effect of monetary policy on stock returns in general. Second, I will investigate the impact of monetary policy on stock returns under different country characteristics, which are firm size, leverage, sales growth and liquidity. I examine companies listed in the Stock Exchange of Thailand (SET). My study is different from previous research in the way that I examine how the reaction of stock returns to a monetary policy change depends on different firm characteristics. It is necessary to investigate whether stock returns react differently to monetary policy under a different firm size, degree of leverage, sales growth and liquidity, i.e. whether the returns respond more sensitive to a policy change. If it is true, the central bank might change its policy in a different way. Studying how different firm characteristics affect the reaction of the stock returns to interest rate changes will help policymakers to predict the effect of a target rate change on the stock market.

2. Research Objectives

Previous studies focus on the effect of monetary policy on stock returns. This paper studies the effect under different firm characteristics. Bernanke and Kuttner (2005) presented evidence of the impact of monetary policy on stock returns, but they left out the firm characteristic in calculating the effect. I believe that firm characteristics should be considered when observing the effect of monetary policy on stock returns as different firms will have different responses to monetary policy depending on their attributes. Factors such as the firm size, leverage, sales growth and liquidity will affect how a firm's stock reacts to changes in monetary policy. Larger firms will have larger sales resulting in less impact when compared to their smaller counterparts. I anticipate that firms larger in size will be less sensitive to changes in monetary policy. Leverage is when a firm uses borrowed capital to expand their own assets and increases the return of investment. When a firm is “highly leveraged”, it means that a firm has more debt than equity. When a firm borrows money, it increases potential opportunities in increasing its own asset, but at the same time it also increases their own risk in the case that the investment does not work out. I expect that companies which are highly leveraged have a higher risk of a stock value reduction and hence, react more sensitive when interest rate increases. An increase in sales growth indicates that the firm is profitable. I expect that stock returns of companies with a high sales growth will be less sensitive to changes in monetary policy. Liquidity refers to the firms' ability in converting assets into cash. In the market, cash is considered to be the most quickly and easily to use in converting to other assets; thus making it the most liquid asset. A firm with high liquidity means it can convert its assets into cash quickly and can easily cover its short-term debts. I anticipate that monetary policy has a greater effect on firms with a low liquidity than firms with a high liquidity.

I examine the intensity of impact from monetary policy on stock returns under different firm characteristics by using data from various firms in Thailand.

First, I will look into the effect of changes in interest rate on various firms. Conover, Jensen and Johnson (1999) states that the period following the decrease in discount rate is classified as an expansive monetary environment and called the period following the increase in discount rate as a restrictive monetary environment. Due to this, I expect the relation between discount rate and stock returns to be negative. This leads to the first question:

“Does an increase in the interest rate have a negative effect on stock return?”

Second, I will divide the firms by using firm size, leverage, sales growth, and liquidity. This will show if the changes in interest rate affect firms differently depending on different firm characteristics. If a firm is large in size, they will likely be able to support itself better compared to smaller firms. So, stock returns should be less affected by monetary policy. Dividing the firms by firm characteristics will provide information on whether stock returns are affected by firm characteristics when considering the effect of monetary policy. This gives the second question:

“Does the stock of firms which are larger in size react less to an increase in the interest rate?”

This also is the speculation with leverage, sales growth, and liquidity. Firms with high leverage should have more impact from changes in interest rate, as they have more debt than equity. I come up with the third question:

“Does the stock of firms which are highly leveraged react more to an increase in the interest rate?”

Moreover, firms with high sales growth should have less impact from changes in interest rate as firms should be able to stabilize themselves. I setup the fourth question:

“Does the stock of firms which have high sales growth react less to an increase in the interest rate?”

Also with the liquidity, firms with high liquidity should be affected less by changes in interest rate as they are able to cover their short-term debt with their liquid assets. This gives the fifth question:

“Does the stock of firms which have high liquidity react less to an increase in the interest rate?”

In previous research (Ioannidis and Kontonikas (2006), Bissoon et al. (2016)), it was found that monetary policy, as measured by changes in the interest rate and money supply, has a negative association with stock returns. Expectations about the future performance of the economy and, in particular, the performance of prices are affected by monetary policy decisions. Based on these expectations, economic agents set their pricing policies. Interest rates are influenced by inflation expectations, which in turn influence aggregate supply and demand in the economy. The relevance of inflation expectations in the economy is illustrated by the fact that firms' projections of future costs and revenues are critical in deciding the prices and levels of production of goods and services offered, and that these projections are correlated with stock returns. High (low) stock returns are related with an expansionary (contractionary) monetary policy, and vice versa. This negative relationship is likewise predicted by the hypothesis. Because the price of a stock is equal to the present value of future projected dividends, lower interest rates result in higher stock values in the long run. Based on this reasoning, I could set the first hypothesis.

Hypothesis 1: Interest rate increases have a negative impact on stock returns.

A theoretical model was developed to give companies the opportunity to change funds, to test the impact of monetary policy on such firms. For a business to meet the conditions of access to finance in the market, or intermediaries. The company will need to determine the size of its

investment in the project that is equivalent to the size of its assets. According to Dogan (2013), the firm size can be measured by total assets. If a company exceeds its size limit, it can take over the financial markets and dramatically increase its stock price growth. How profitable a company is will depend on its monetary condition, and the value of its stock. Companies that are likely to be financially vulnerable and profitable will often be smaller companies. These small and fledgling companies are most at risk of debt. These small companies will suffer monetary losses, as their profits and stock prices drop. So, from the experience from the theoretical model, I can hypothesize that:

Hypothesis 2: Firms larger in size are less sensitive to changes in monetary policy.

Leverage is the use of borrowing and debt instead of financial capital by the owners of that company. Debt-to-equity (DER) ratio is viewed as debt and equity of the company. Baxter (1967) finds that firms with a high degree of leverage have a higher probability of bankruptcy and hence a higher cost of debt capital. Leverage also has both negative and positive effects. When a company uses a profit-driven growth loan, it becomes more affordable and thrives in terms of stock and market financing. But on the other hand, when the company is unable to repay the loan after they have taken out a loan, when the owner could not make a profit for the company, the chance for that company to grow will be zero. It will also have consequences, and great risks when the company is highly leveraged, thereby breeding debt and the company will be on the verge of bankruptcy. Companies with high financial leverage at such a time when interest rates rise will not have many opportunities to accumulate capital in time, and the ability to accumulate capital is also weaker.

Hypothesis 3: Firms with a low degree of leverage are less sensitive to changes in monetary policy.

According to Almajali et al. (2012), there are many different ways to measure financial performance. A company's earnings in relation to its sales, for example, are shown by its return on assets, which explains the ability of an organization to utilize its assets, and the return on equity, which exposes the amount of profit an investor receives in exchange for their investment. In previous research by Zelgalve (2014), the return on equity (ROE) is the proportion of profit generated by a corporation for every monetary unit of equity invested in the company. ROE does not specify how much cash will be distributed to shareholders because the amount depends on the company's choice on dividend payments as well as the amount of appreciation in the stock price. In contrast, the fact that it exists provides a good indication of whether or not the company is capable of producing a return that is sufficient to compensate for the risk that an investment may involve (Berman, Knight, 2013). Despite the fact that firms have a direct incentive to alter sales when their typical prices are sticky, Guimaraes and Sheedy (2011) stated that this is the case. Particular shocks would cause firms to alter their sales; only aggregate shocks cause a conflict between the need to adjust through sales and the need to consider strategic issues. Firms with high sales growth have a higher sales revenue and more capital available and therefore, are less dependent on borrowing money. Hence, they are less affected by interest rate changes. That leads to the hypothesis.

Hypothesis 4: Firms with high sales growth are less sensitive to changes in monetary policy.

Inflation shock refers to a sudden change in the pace of money growth that was not anticipated by the central bank. The majority of economists believe that a positive money shock leads the

interest rate to fall while simultaneously raising output and employment, at least in the short run. To put it another way, they feel that the liquidity benefit surpasses the anticipated inflationary impact on business (Christiano, 1991). Zuhroh (2019) stated that a firm's liquidity indicates its ability to fulfill its short-term obligations. With high liquidity, it displays that a firm has enough current assets to fund its own operations without having to rely on external sources of funding. From that I can come up with the following hypothesis.

Hypothesis 5: Firms with a high liquidity are less sensitive to changes in monetary policy.

3. Literature Review

3.1 Effect of an interest rate change on stock returns

Moya-Martinez, Ferrer-Lapeña and Escribano-Sotos (2015) stated that an increase in interest rate will also cause the rise in capital cost for firms, affecting firms' stock price. They also pointed out heavily indebted consumers will have reduced demand for firms' products; thus having a negative impact on firms' share price. Hafer (1986) investigated and found that increases in discount rate will reduce stock price. He stated that the move towards tighter policy will reduce future corporate cash flows, making stock prices decline. Ali, Adeeb and Saeed (2014) also concluded in their study that stock market returns negatively respond to the increase in discount rate, meaning that increases are worse for investors while decreases are better for them. They also pointed out that with decreases in discount rate, banks shall have more funds for lending; thus firms will lend money for their development. Bissoon, Seetanah, Bhattu-Babajee, Gopy-Ramdhany and Seetah (2016) concluded in their study that interest rate value has a negative relationship with stock price. They also highlighted that during the financial crisis people did not look up to bank rate as a reference in decision to invest, but they lost confidence in bank notes and were reluctant to make an investment. Ahmad, Rehman and Raoof (2010) stated in their study that increases in interest rate increase the cost of business which lowers the stock return. Ogbedor, Ifeanyi, Adesola, Nathaniel and Gregory (2021) investigated on how interest rate, inflation and stock price relate. Their findings suggest that, although interest rate has a negative effect on stock returns, it does not have a joint effect with inflation. Furthermore, they also showed that stock returns and inflation do not exhibit a joint effect on interest rate either. Generally, all of the studies that use interest rate as monetary policy show that rises in interest rate will result in decline of stock return.

3.2 Firm size

Cihan Yalçın, Spiros Bougheas and Paul Mizen (2012) showed that the size of businesses is measured by the total asset value of that business. This makes an important value in a business as increasing assets is also increasing the size of the business. To be able to increase the value of the business's assets in the market. The business must have a high degree of access to finance, and to do that, the business must have collateral. When the financial intermediaries of the business are independently reduced in the form of distribution, the enterprise will ensure an increase in assets, and also in the size of the company. In fact, the growth of assets in certain secured businesses will have a positive effect on small-scale enterprises with lower total assets when compared to large-scale enterprises. As a result, I may find that small businesses are more sensitive than large businesses to changes in collateral of a certain size.

Businesses large and small both have the same critical factor in balance sheet strength, and for the same reason. It's debt, it's the downside of the company's size and assets. Typically, companies that are in debt are more likely to have to finance their projects through financial

intermediaries. From there, affecting the debt of the business will lose the balance of the secured assets of that business. However, in another case of the enterprise's collateral, the enterprise's existing debt will not be affected too much. Debt will also gradually decrease as the size of the company is increased. Based on previous research, it is possible to predict that firm size has a negative effect on the impact of monetary policy on stock returns. Pratiwi and Badjra (2020) concluded in their study that firm size has a positive effect on stock returns. Murniati (2016) also provided information on stock returns. These studies indicate that with larger companies with their amount of assets when compared to smaller firms, they are able to gain more profitability, so their stock price will increase. With a positive effect from firm size on stock returns, the impact of monetary policy should have less impact on stock returns; thus firm size has a negative effect on the impact of monetary policy on stock returns.

3.3 Leverage

Champion (1999) concluded that the use of leverage is a way to improve performance, and also pointed out that if too much debt is used, it will increase the capital of equity financing. Modigliani and Miller (1958) first proposed MMI (non-capital structure), arguing that if the market is perfectly competitive, then how the company's account is organized is no longer important. The theory also considers that the non-existent information is asymmetric, and the displayed information is credible (Hamada, 1969. Hatfield, Cheng and Davidson, 1994. Stiglitz, 1974). In their conclusion, the reduction in the weighted average cost of capital under the mixed capital structure is due to the increase in leverage ratio (WACC), while the company's debt position is better because the debt level is lower than the equity. Miller (1977) pointed out that if investors and companies are taxed in a competitive financial market, the equilibrium value of leveraged financial companies and unlevered companies will be equal. Masulis (1980) pointed out that non-debt tax shields exist for depletion allowances, depreciation, and investment tax credits, overturning the leverage irrelevance theorem. M&A theory is regarded as the foundation of capital structure theory. Jensen and Meckling (1976) pointed out that the conflict of interest between the company manager and the owner (equity agency cost) or the conflict of interest between the debt holder and the company owner will generate agency costs. Rajan and Zingales (1995) conducted a study on 7 countries from 1987 to 1990 and found that there is an inverse relationship between changes in leverage and stock returns, and the larger the company, the more obvious this relationship is. They also concluded that profitability is negatively related to leverage. Companies with less debt are often high-profit companies with a lower risk of bankruptcy. Bhatti, Majeed, Rehman, and Khan (2010) studied the effect of leverage to stock price for Pakistani companies. They found that a high level of leverage will lead to high risk in the stock returns. The value may increase in the short-term but in the long-term the value will surely decrease. From this, it is likely that leverage will have a positive correlation with the effect of monetary policy on stock returns, as companies have more obligation to pay-off their debt, they are more sensitive to increase in interest rates.

3.4 Sales growth

Lau et. al (2002) stocks and return sales growth are negatively correlated. Their research also reflects the asset base established to support business operations. Hermelo (2007) pointed out that it is very important to design an effective and efficient company growth plan to ensure that private and public resources are not wasted. The larger the company, the lower the growth rate, until the company can no longer continue to expand. The higher the profit, the more it helps the company to expand and invest more. It can be found that, in addition to achieving higher growth rates through external financing, companies with high returns can also obtain

more funds from their original investments. Tahir et. al (2013) pointed out that sales and revenue growth will directly affect the market value and rate of return of real and unreal industries. At the same time, he said that various expenses will also affect sales and revenue growth. It is found that the market value ratio and earnings per share have a relatively positive impact on stock earnings, but sales growth will not be very large. Menike (2015) concluded that the very small impact of sales growth is due to the inefficiency of a country. In the UK, they found that sales growth will not have a big impact on stock returns. Eldomiaty (2010) pointed out two theories in many influencing factors, namely the growth scale theory and the learning theory. The growth scale theory pays more attention to the relationship between scale and enterprise growth. The learning theory is to value the cost function behavior of the learning result of the enterprise. He pointed out that these two theories can be mutually improved. The research methods of these two theories are also different. The growth scale relationship is tested by the sales ratio and the learning theory is tested by the cost ratio. It then uses a combination of these two ratios to find its relationship to company growth. Such an approach needs to take into account the relationship between corporate sales and the growth of fixed assets. At this time, if the company reduces the investment in repurchase, it will get a positive return. At this time, if the capital market is full of confidence in the management, it is precisely because of the high financing needs to increase investment expenditures. This also shows that the company has great investment opportunities. Lamont (2000) pointed out that stock returns and investment should have a positive relationship. This relationship often occurs when the company's stock price and investment are both rising, but the discount rate is falling. He concluded that a negative covariant relationship between investment and stock returns will occur if investment lags behind investment decisions and expenditures. This delay will prevent the company from coordinating investments when the discount rate changes. This delay will also directly affect future changes in response to investment desires. This means that the result of the change in the equity risk premium is the change in the discount rate, and the reduction in investment is due to the increase in the discount rate. Pranata, and Pujiati (2015) stated in their study that they define sales growth as the indication of a firm's success and use it to predict the future growth. Further, they revealed that a firm with large sales growth should have sufficient funds to sustain themselves. Based on this theory, sales growth should have a negative relation with the effect of monetary policy on stock returns, as a firm that is able to sustain itself should be less sensitive to increase in interest rate.

3.5 Liquidity

In a business, there are always short-term responsibilities that the business is forced to fulfill. These short-term obligations of an enterprise all depend on its liquidity. Liquidity shows a measure of a company's ability to meet short-term obligations. According to a study by Wulandari (2013), a hypothesis has been proposed about the liquidity signal of a company that is able to pay and fulfill its obligations well about the short-term of that business. This is a positive sign that the business can find potential and long-term investors in the business. When a firm has experienced an increase in the liquidity value of the company, it will lead to the added value of that business. Liquidity is an important factor that contributes to creating a certain value for a business to succeed and develop in the long run.

According to Pranata, and Pujiati (2015), liquidity indicates a firm's ability to make payment to their short-term debt. The company that is able to make the payment means that it has more current assets than current debt. Based on this information, firms with high liquidity will be able to pay their short-term obligations, meaning that they will likely be less sensitive to the effect of monetary policy on stock returns.

4. Research Methodology

I collect monthly data of stock returns and quarterly data of firm characteristics from the Stock Exchange of Thailand and monthly interest rates from the Bank of Thailand. I use total assets for the firm size, total liabilities divided by total owner equity for the leverage, change of total sales for the sales growth and current assets divided by current liabilities to measure the liquidity. I run regressions investigating the impact of interest rate changes on stock returns. First, I study the relation between an interest rate change and the firms' stock returns using a simple linear regression. Then, I group all firms by the level of firm size, leverage, sales growth and liquidity. I split the firms into three groups for each firm characteristic and run simple linear regressions for all groups to examine the effect of monetary policy on the firms' stock returns under different firm characteristics.

I run regressions to investigate the relation between an interest rate change and stock returns. Hence, I use the following simple linear regression:

$$R_{i,t} = \alpha + \beta_1 \Delta i_t + \epsilon_t \quad (6)$$

where

$R_{i,t}$ is the monthly stock return of firm i in month t,

Δi_t is the monthly change in the interest rate in month t

and ϵ_t is the error term for month t.

The monthly stock return is the dependent variable and monthly interest rate change is the independent variable. Both variables are quantitative variables.

According to the list of firms listed on the Stock Exchange of Thailand (SET), I discovered that there are 829 companies. As a result, I calculate the sample size using the following formula¹.

$$Sample\ Size = \frac{N \frac{z^2 p(1-p)}{e^2}}{\frac{z^2 p(1-p)}{e^2} + N - 1}$$

N is the population size (829)

z is the z-value at a confidence level of 90% (1.65)

p is the sample proportion (0.5)

e is the margin of error (7.67%)

$$Sample\ size = 101.63$$

Given that the result is 101.63, I round down to 101 for the sample size. The list of the 101 randomly selected firms is attached in the appendix.

After determining the number of companies that should be included, I select companies at random and collect information from financial statements going back three years in every quarter.

$$Firm\ size = \ln (Total\ Assets)$$

I use the natural logarithm of total assets to reduce the number of variables to be considered while finding regression.

$$Leverage = Total\ Liabilities \div Total\ Owner's\ Equity$$

¹ <https://www.wallstreetmojo.com/sample-size-formula/>

$$\text{Sales growth} = \frac{S_{n+1} - S_n}{S_n}$$

$$\text{Liquidity} = \text{Current Assets} \div \text{Current Liabilities}$$

After that, I group the firms into three groups of each factor based on the above formulas and gather stock prices every month for 5 years, so that I have 60 data points per firm. Further, I use monthly interest rates from the Bank of Thailand.

5. Results

The data I use to calculate were taken from 101 companies from The Stock Exchange of Thailand. For the firm size, I categorized all companies into 3 groups, small, medium, and large firm size. The boundary for small firm size is the value lower or equal than 21.0482, value over 24.1480 for large-sized firms, and value in between for medium-sized firms. Hence, small firms have a size of less or equal than 1.3839 billion THB total assets. Large firms have a size of more than 30.7145 billion THB total assets.

Table 1: Firm size grouping

Firm size					
Boundary	Small	≤ 21.0482	Quantity	Small	22
	Medium	≤ 24.1480		Medium	63
	Large	≤ 27.2477		Large	16
				Total	101

This table shows the groups of various-sized firms. I categorize 22 firms into small-sized, 63 into medium-sized, and 16 into large-sized firms.

For the Leverage, I categorize all companies into 3 groups, low, medium, and high leverage. The boundary for low leverage is the value lower than 1.0000, high leverage is above 2.0000.

Table 2: Leverage grouping

Leverage					
Boundary	Low	< 1.0000	Quantity	Low	52
	Medium	≤ 2.0000		Medium	31

High	> 2.0000	High	18
		Total	101

This table shows the groups of various-sized firms. I categorize 52 firms into low leverage, 31 into medium leverage, and 18 into high leverage.

For the Sales Growth, I categorize all companies into 3 groups, low, medium, and high sales growth. The boundary for low sales growth is the value lower than 0.6000, and high leverage is above 0.7000.

Table 3: Sales growth grouping

Sales Growth					
Boundary	Low	< 0.6000	Quantity	Low	31
	Medium	≤ 0.7000		Medium	44
	High	> 0.7000		High	26
				Total	101

This table shows the groups of various-sized firms. I group 31 firms into low sales growth, 44 into medium sales growth, and 22 into high sales growth.

For the liquidity, I categorize all companies into 3 groups, low, medium, and high liquidity. The boundary for low liquidity is the value lower than 1.2000, and high liquidity is above 2.0000 (more than two times more current assets than current liabilities).

Table 4: Liquidity grouping

Liquidity					
Boundary	Low	< 1.2000	Quantity	Low	40
	Medium	≤ 2.000		Medium	27
	High	> 2.000		High	34
				Total	101

This table shows the groups of various-sized firms. I group 40 firms into low liquidity, 27 into medium liquidity and 34 into high liquidity.

The following tables show the results of the regressions.

Interest rate

Table 5: Regression of stock returns against interest rate change for all firms

Regression Statistics	
Multiple R	0.6800
R Square	0.4625
Adjusted R Square	0.4532
Standard Error	0.3050
Observations	60

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	-1.0970***	0.3451	-3.1787	0.0024	-1.7879	-0.4062
Interest rate change	0.1172***	0.0166	7.0638	2.28E-09	0.0840	0.1505

*, **, *** indicate that the coefficient is statistically significant at 10%, 5% and 1% levels, respectively.

The tables above show the relation between interest rate changes and stock returns. The multiple R is 0.6800, which means that interest rate has a positive relation with stock returns. R square of 0.46245 tells that interest changes can explain about 46% of the stock returns. The P-value is lower than 0.01, so the coefficient is statistically significant. The data shows a positive relation between interest rate changes and stock returns. The results are the opposite of hypothesis 1, in which I predicted that stock returns reduce when the interest rate goes up.

Firm size

Table 6: Regressions of stock returns against interest rate change divided by firm size

	Interest rate change coefficient	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Small size	-0.0184*	0.0098	-1.8629	0.0677	-0.0382	0.0013
Medium size	0.0599***	0.0084	7.0906	2.45E-09	0.0429	0.0768
Large size	0.0548***	0.0070	7.8252	1.49E-10	0.0408	0.0689

*, **, *** indicate that the coefficient is statistically significant at 10%, 5% and 1% levels, respectively.

From the above information and data, I calculated the parameters in 101 enterprises. The P-value of medium and large sizes are very small meaning that the coefficients of these two are very reliable. Small size is statistically significant at a 10% level. The data shows that stock returns of larger firms are more sensitive to changes in monetary policy. This result is the opposite of hypothesis 2 which stated that firms larger in size are less sensitive to changes in monetary policy.

Leverage

Table 7: Regressions of stock returns against interest rate change divided by leverage

	Interest rate change coefficient	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Low leverage	0.0097	0.0104	0.9307	0.3559	-0.0111	0.0305
Medium leverage	0.1219***	0.0129	9.4259	3.72E-13	0.0960	0.1478
High leverage	0.1688**	0.0179	2.4985	0.0176	0.1390	0.1927

*, **, *** indicate that the coefficient is statistically significant at 10%, 5% and 1% levels, respectively.

The P-value for medium and high leverage is small, which means the coefficient values are reliable to use in the regression. For low leverage, however, the P-value is higher than 0.05, so the coefficient may not be reliable compared to medium leverage. The results show that firms with high leverage are more sensitive to changes in monetary policy. The data supports hypothesis 3

Sales growth

Table 8: Regressions of stock returns against interest rate change divided by sales growth

	Interest rate change coefficient	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Low growth	-0.0781	0.0697	-1.1214	0.2669	-0.2178	0.0614
Medium growth	0.0850***	0.0156	5.4706	1.08E-06	0.0539	0.1162
High growth	-0.0483***	0.0164	-2.9445	0.0047	-0.0812	-0.0154

*, **, *** indicate that the coefficient is statistically significant at 10%, 5% and 1% levels, respectively.

The table shows some insight for the sales growth. The P-value of the medium and high growth are very low, so the coefficients are highly reliable. For low growth, the P-value is above 0.10, indicating that the coefficient is not statistically significant. In hypothesis 4, I predicted that the firms with high sales growth will be less sensitive to changes in monetary policy. The data supports the hypothesis.

Liquidity

Table 9: Regressions of stock returns against interest rate change divided by liquidity

	Interest rate change coefficient	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Low Liquidity	0.0129	0.0348	0.3716	0.7115	-0.0569	0.0828
Medium Liquidity	0.0487***	0.0113	4.3081	6.70E-05	0.0261	0.0714
High Liquidity	0.0204**	0.0225	2.1905	0.0368	-0.0247	0.0655

*, **, *** indicate that the coefficient is statistically significant at 10%, 5% and 1% levels, respectively.

The P-values of medium and high liquidity are low, which indicates that the coefficients are reliable. This data shows support for hypothesis 5 which stated that monetary policy has a smaller effect on firms with a high liquidity.

Judging from the result, I can see that, firm characteristics have an impact on the sensitivity of stock returns to interest rate changes. The data shows that stock returns increase when interest rates increase which contradicts hypothesis 1. Stock returns of larger firms react more to interest rate changes which is the opposite of hypothesis 2. I find support for hypothesis 3, i.e. firms with a high degree of leverage are more sensitive to changes in monetary policy. The data shows support for hypothesis 4, i.e. firms with high sales growth are less sensitive to interest rate changes. Further, I find support for hypothesis 5, which stated that firms with a high liquidity are less sensitive to changes in monetary policy. The chosen firm characteristics

are not the only factors that have an impact on stock returns in response to monetary policy. There are other factors such as politics, epidemics and economics that affect the changes in the stock price.

6. Discussion and Conclusion

Firm characteristics do have impacts on how reactive a firm is to a change in interest rates. The stock price will react less to interest rate changes when the firm has a small size, lower leverage, high sales growth and high liquidity. Small firms are less affected by interest rate changes as they are less dependent on borrowing and external capital and are more likely to use their own capital because they have less possibilities to receive funds from banks and other financial institutions than larger firms. Stock prices will react more to interest rate changes when firms are highly leveraged as they have more financial obligations and hence are more affected by interest rate increases. Firms with a high sales growth are less affected as they have higher sales revenues and thus, more self-generated capital and depend less on borrowing money. Hence, they react less to an interest rate increase or decrease. Firms which are highly liquid react less to monetary policy changes as these firms have sufficient own capital / funds and rely less on borrowing money. Therefore, they are less impacted by interest rate changes.

In regards to changes in stock returns according to monetary policy, the data shows that when the interest rate goes up, stock returns will increase as well.

Regardless of the effect of firm characteristics, there are still factors that were not considered in the research. Factors like political effects or the ongoing pandemic. These factors would also have an influence on the sensitivity of stock return to monetary policy and have an influence on stock returns directly.

These findings provide information on existing theories. Firms with different characteristics will have different impacts on stock price from monetary policy. Monetary policy influences stock returns of firms differently. I find that not only the extent of the monetary policy impacts the magnitude of the stock returns’ reaction but also the firm characteristics. These results have implications for existing theories and practitioners. The Bank of Thailand should implement monetary policy cautiously while considering the characteristics of domestic firms. Investors might observe the actions of the Bank of Thailand carefully and can expect a larger impact on stock returns of larger firms with a high degree of leverage, a low sales growth and a low liquidity if the central bank changes the interest rate.

7. References

- Ahmad, M. I., Rehman, R., & Raoof, A. (2010). Do interest rate, exchange rate effect stock returns? A Pakistani perspective. *International Research Journal of Finance and Economics*, 50, 146-150.
- Ali, F., Adeeb, B., & Saeed, S. (2014). Impact of monetary policy on stock returns: Evidence from manufacturing sectors of Pakistan. *Basic Research Journal of Business Management and Accounts*, 3(2), 28-38.
- Almajali, A. Y., Alamro, S. A., & Al-Soub, Y. Z. (2012). Factors affecting the financial performance of Jordanian insurance companies listed at Amman Stock Exchange. *Journal of Management research*, 4(2), 266.

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- Baxter, N. D. (1967). Leverage, risk of ruin and the cost of capital. *the Journal of Finance*, 22(3), 395-403.
- Berman, K., & Knight, J. (2013). *Financial intelligence, revised edition: A manager's guide to knowing what the numbers really mean*. Harvard Business Review Press.
- Bernanke, B. S., & Kuttner, K. N. (2005). What explains the stock market's reaction to Federal Reserve policy?. *The Journal of finance*, 60(3), 1221-1257.
- Bhatti, A. M., Majeed, K., Rehman, I. U., & Khan, W. A. (2010). Affect of leverage on risk and stock returns: evidence from Pakistani companies. *International Research Journal of Finance and Economics*, 58(58), 32-49.
- Bissoon, R., Seetanah, B., Bhattu-Babajee, R., Gopy-Ramdhany, N., & Seetah, K. (2016). Monetary policy impact on stock return: Evidence from growing stock markets. *Theoretical Economics Letters*, 6(05), 1186.
- Bjørnland, H. C., & Leitemo, K. (2009). Identifying the interdependence between US monetary policy and the stock market. *Journal of Monetary Economics*, 56(2), 275-282.
- Champion, D. (1999). The joy of leverage. *Harvard Business Review*, 77(4), 19-19.
- Christiano, L. J. (1991). Modeling the liquidity effect of a money shock. *Federal Reserve Bank of Minneapolis. Quarterly Review-Federal Reserve Bank of Minneapolis*, 15(1), 3.
- Conover, C. M., Jensen, G. R., & Johnson, R. R. (1999). Monetary environments and international stock returns. *Journal of Banking & Finance*, 23(9), 1357-1381.
- Doğan, M. (2013). Does firm size affect the firm profitability? Evidence from Turkey. *Research Journal of Finance and Accounting*, 4(4), 53-59.
- Eldomiaty, T. I. (2010). The contribution of sales revenue management to firm growth: a test of two competing models. *International Journal of Revenue Management*, 4(2), 131-144.
- Eriotis, N., Vasiliou, D., & Ventoura-Neokosmidi, Z. (2007). How firm characteristics affect capital structure: an empirical study. *Managerial Finance*.
- Guimaraes, B., & Sheedy, K. D. (2011). Sales and monetary policy. *American Economic Review*, 101(2), 844-76.
- Hafer, R. W. (1986). The response of stock prices to changes in weekly money and the discount rate. *Review*, 68.
- Hamada, R. S. (1969). Portfolio analysis, market equilibrium and corporation finance. *The Journal of Finance*, 24(1), 13-31.
- Hatfield, G. B., Cheng, L. T., & Davidson, W. N. (1994). The determination of optimal capital structure: The effect of firm and industry debt ratios on market value. *Journal of Financial and Strategic Decisions*, 7(3), 1-14.
- Hermelo, F. (2007). The determinants of firm's growth: an empirical examination.
- Ioannidis, C., & Kontonikas, A. (2006). *Monetary policy and the stock market: some international evidence*. University of Glasgow, Department of Economics.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, 3(4), 305-360.
- Lamont, O. A. (2000). Investment plans and stock returns. *The Journal of Finance*, 55(6), 2719-2745.
- Lau, S. T., Lee, C. T., & McInish, T. H. (2002). Stock returns and beta, firms size, E/P, CF/P, book-to-market, and sales growth: evidence from Singapore and Malaysia. *Journal of multinational financial management*, 12(3), 207-222.
- Masulis, R. W. (1980). The effects of capital structure change on security prices: A study of exchange offers. *Journal of financial economics*, 8(2), 139-178.

- Menike, L. M. C. S. (2015). Capital structure and financing of small and medium sized enterprises: Empirical evidence from a Sri Lankan survey. *Journal of Small Business and Entrepreneurship Development*, 3(1), 54-65.
- Miller, M. H. (1977). Debt and taxes. *the Journal of Finance*, 32(2), 261-275.
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review*, 48(3), 261-297.
- Moya-Martínez, P., Ferrer-Lapena, R., & Escibano-Sotos, F. (2015). Interest rate changes and stock returns in Spain: A wavelet analysis. *BRQ Business Research Quarterly*, 18(2), 95-110.
- Murniati, S. (2016). Effect of capital structure, company size and profitability on the stock price of food and beverage companies listed on the Indonesia Stock Exchange. *Information Management and Business Review*, 8(1), 23-29.
- Ogbebor, P. I., Adesola, A., Nathaniel, O., & Gregory, O. (2021). Stock returns, inflation and interest rate In Nigeria. *Journal of Economics and International Finance*, 13(3), 106-116.
- Pearce, D. K., & Roley, V. V. (1984). *Stock prices and economic news* (No. w1296). National bureau of economic research.
- Pranata, D., & Pujiati, D. (2015). The effect of liquidity, profitability, sales growth, and dividend policy on stock prices after the implementation of IFRS. *The Indonesian Accounting Review*, 5(2), 169-178.
- Pratiwi, L. H., & Badjra, I. B. (2020). THE INFLUENCE OF PROFITABILITY, FIRM SIZE, AND INTEREST RATE OF STOCK PRICE.
- Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The journal of Finance*, 50(5), 1421-1460.
- Stiglitz, J. E. (1974). On the irrelevance of corporate financial policy. *The american Economic review*, 64(6), 851-866.
- Tahir, S. H., Sabir, H. M., Alam, T., & Ismail, A. (2013). impact of firm's characteristics on stock return: a case of non-financial listed companies in Pakistan. *Asian Economic and Financial Review*, 3(1), 51-61.
- Wulandari, D. R. (2013). Effect of profitability, operating leverage, liquidity on firm value with capital structure as an intervening variable. *Accounting Analysis Journal*, 2(4), 455-463.
- Yalcin, C., Bougheas, S., & Mizen, P. (2012). The impact of firm-specific characteristics on the response to monetary policy actions. *Central Bank Review*, 4(1), 1-30.
- Zelgalve, I. B. E. (2014). Return on equity and company characteristics: An empirical study of industries in Latvia. *The 8th International Days of Statistics and Economics, Prague*.
- Zuhroh, I. (2019). The Effects of Liquidity, Firm Size, and Profitability on the Firm Value with Mediating Leverage. *KnE Social Sciences*, 203-230.

8. Appendix

Firm	Size	Leverage	Sales Growth	Liquidity
2S	Medium	Low	Medium	High
7UP	Medium	Low	Low	Low
A	Medium	High	Low	High
A5	Small	High	Low	High
AAV	Large	Medium	High	Low
ABICO	Medium	Low	Medium	Low

ABM	Small	High	High	Low
ACC	Small	Low	Medium	Medium
ACE	Medium	Low	High	Medium
ACG	Small	Medium	Low	Low
ADVANC	Large	High	High	Low
AFC	Medium	Low	Low	High
AGE	Medium	Medium	Medium	Low
AH	Medium	Medium	Medium	Low
AHC	Medium	Low	Low	High
AI	Medium	Low	High	High
AIE	Medium	Low	High	High
AMC	Medium	Low	Medium	Medium
APEX	Medium	Low	High	Medium
APP	Small	Medium	Low	Medium
ASIA	Medium	Low	High	Low
BA	Large	Medium	High	Low
BGC	Medium	High	Low	Low
BCH	Medium	Medium	Low	Medium
BCP	Large	Medium	Low	Medium
BCPG	Large	Medium	Low	Medium
BCT	Small	Low	Medium	High
BEC	Medium	Medium	Low	High
BEM	Large	Medium	High	Low
BGRIM	Large	High	Low	Medium
BH	Medium	Low	Medium	High
BIG	Medium	Low	Medium	High
BJC	Large	Medium	Medium	Low
BJCHI	Medium	Low	Low	High
BKD	Medium	Low	High	Medium
BM	Small	Low	Low	Low
BPP	Large	Low	High	Medium
BR	Medium	Medium	Medium	Low
BRR	Medium	High	High	Low
CAZ	Medium	High	Medium	Low
CBG	Medium	Low	Medium	Low
CCET	Medium	High	Low	Low
CCP	Medium	Medium	Medium	Low
CEN	Medium	Low	Low	High
CGD	Medium	High	High	Low
CITY	Small	Low	High	High
CK	Large	High	Medium	Low
CM	Medium	Low	Low	High
CMAN	Medium	Medium	Medium	Low

CMR	Medium	Low	Medium	Low
CPF	Large	Medium	Low	Low
CSS	Medium	Medium	Medium	Medium
DCC	Medium	Low	Medium	Low
DRT	Medium	Low	Medium	Medium
EGCO	Large	Medium	Medium	High
EKH	Small	Low	Medium	High
EMC	Medium	Low	High	Medium
EP	Medium	Medium	High	Low
ESSO	Small	Medium	Medium	Low
EVER	Medium	High	High	Medium
GC	Small	Medium	Medium	Medium
GSTEEL	Medium	Medium	Low	Low
GYT	Medium	Low	Medium	Medium
HTECH	Medium	Low	Low	High
HUMAN	Medium	Low	Medium	High
IT	Medium	Medium	Medium	Medium
K	Small	High	High	Medium
KSL	Large	Medium	Medium	Low
KUN	Small	Medium	High	Medium
LEE	Medium	Low	Medium	High
MAJOR	Medium	Medium	High	Low
MCS	Medium	Low	Low	High
MILL	Medium	High	Medium	Low
MSC	Medium	Low	Medium	Medium
NC	Small	Low	Medium	Medium
OCC	Small	Low	Medium	High
ORI	Medium	Medium	High	High
PLE	Medium	High	Medium	Low
PM	Medium	Low	Medium	High
PRG	Medium	Low	Medium	Low
PSH	Large	Low	Medium	High
QLT	Small	Low	Medium	High
RBF	Medium	Low	Medium	High
S	Large	Medium	High	Medium
SGP	Large	High	Medium	Low
SLP	Small	Low	Low	High
SNP	Medium	Low	Low	Medium
SSC	Medium	Low	Medium	Low
SSP	Medium	High	Low	Medium
STC	Small	Low	High	Low
T	Small	Medium	Medium	Low
TC	Medium	Low	Low	High
TFG	Medium	Medium	Low	Low



THG	Medium	Medium	Medium	Low
TNP	Small	Low	Medium	Medium
TWP	Medium	Low	Low	High
UT	Small	Low	Low	High
VGI	Medium	Low	Low	Medium
W	Small	Low	High	High
WP	Medium	High	Low	High
XPG	Medium	Low	High	High

Assessing the Perception of Bank's Consumers on Banking Innovation and Behavioral Intention in Developing Country: A Case of Competitive Environment in Laos Banking Industry

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Abstract

Due to Laos banking competitive environment, the investigation of Laos consumers' trust and risk perception on banking innovation and behavioral intention is the focus of the current study. A huge increase in commercial bank deposits and the promotion of financial inclusion to reduce financial inequalities have inspired the researchers to explore consumers' behavioral intention to participate in the bank along with observing the effect of banking innovation, as well as securing sustainable development through economic growth and social conditions. The data were collected from 384 participants currently living in Vientiane Capital, Lao PDR by using a questionnaire survey with the seven points Likert-Scale. For data analysis, the structural equation modeling (SEM) approach has been utilized to test the proposed hypotheses by using the Amos statistical program. The results show a significant effect of all six hypotheses including the influence of consumer perceived trust on banking innovation, perceived risk, and behavioral intention. Besides, the negative effect of consumer perceived risk on banking innovation and behavioral intention has been confirmed. Moreover, there was a confirmation of banking innovation on consumers' behavioral intention. The findings illustrated perceived trust is the most influential factor determining banking innovation ($\beta = 0.761$), followed by affecting behavioral intention ($\beta = 0.508$). This study would benefit Laos commercial banks by enhancing consumers' preferences, stimulating the Laos banking industry's overall performance, and reducing financial inequalities through financial inclusions. However, this research paper is limited to a niche sample group in Vientiane Capital, specific indicators, and unexpended potential effects and resistance factors.

Keywords: perceived trust; perceived risk; banking innovation; Laos banking

1. Introduction

The Lao People's Democratic Republic (Lao PDR) is a small landlocked country in which located in Southeast Asia (Asian Development Bank, 2017). Understandably, in the Southeast Asia region, Laos is a small and underdeveloped country or least-developed country (LDC). Nevertheless, Laos is also considered as the resource-rich country in promoting the economy through sustainability (Kyophilavong et al., 2018). The Bank of Lao PDR (BOL) reported that

Laos GDP per capita is recorded as LAK 24 million or worth approximately USD 2,642 and the nominal GDP of Lao PDR is LAK 172,612 billion in 2020 in which the growth fell to 3.28% from 5.46% of the base year 2019 (Bank of the Lao PDR, 2020). Even though Laos economy has maintained strong growth over years, the growth trend was slightly decreased as which 7.02% since 2016 and continuously fell to 6.85% in 2017, 6.29% in 2018, 5.46% in 2019, and 3.28% in 2020 respectively. In contrast, the inflation rate has risen over the years which continuously increased from 0.38% in 2017 to 2.04% in 2018, 3.32% in 2019, and 5.07% in 2020 respectively (Bank of the Lao PDR, 2020). The BOL demonstrated that the shrinking GDP and rising inflation rate were causing form a weakening in domestic production, the depreciation of Lao Kip against the USD currency has affected a higher imported production cost, and the lockdown restrictions and psychological anxiety on the Covid-19 pandemic (Bank of the Lao PDR, 2020). Moreover, shrinking GDP and rising inflation also influent national development in such many circumstances. These effects include rising unemployment rate, economic downturn, social inequality, poverty rate, and on (Ward et al., 2016). Even though the negative impact of the Covid-19 pandemic has decelerated world economic recovery, the crisis was turning into an opportunity to accelerate the digital transformation reversibly (World Bank, 2021). Undeniably take this into account, starting with the banks, digital transformation considerably provides a convenient sense in order to promote and easily use in financial capital which can lead to the transaction of money across the boundaries as international banking (Baldwin & Mauro, 2020). Notwithstanding, the digital adoption rate in Laos was contrary to the global acceleration by resulting in only 15% of digital platforms adoption rate of the sample firms has observed (World Bank, 2021).

Along with the path, the United Nations Partnership Framework (UNPF) of 2017 – 2021 has been established by the United Nation in Lao PDR (UNL) to support the country in achieving the sustainable development goals (SDGs) (The United Nations in Lao PDR, 2020). Under the first goal of SDGs, no poverty, there were 23.2% of Laos people living below the national poverty line in 2012 – 2013 and targeted to be reduced to 16.2% in 2020 by the support from a partnership of Laos Governor and the UN (The United Nations in Lao PDR, 2020). Despite the income per capita being raised consequent to decline in poverty incidence, inequality has increased (Asian Development Bank, 2017; Demircug-Kunt et al., 2018) and financial inclusion is relatively low (Demircug-Kunt et al., 2018). Asian Development Bank (ADB) indicated that the national poverty line was dropped from 39.1% in 1997 to 23.2% in 2012 (Asian Development Bank, 2017). As the effects of poverty have been decreased gradually, it is truly stated that the Lao economy and poverty reduction within the nation is progressively implanted as the key elements to escalate the sustainable economic growth and sustained poverty alleviation (Kyophilavong et al., 2018) through the efficiency of public finance management (PFM), as well as, especially, the efficiency of budget execution which will result in the effectiveness of the operational performance and the resource allocation in order to reach the objectives of development and improvement in the effort onto tackle the poverty alleviation and to enhance the developmental process (Toto Same, 2008). To reach the fourth goal of SDGs, quality education, the 2021-UNPF is pursuing equality in Laos education (The United Nations in Lao PDR, 2020). In 2015 there was 51% of grade 1 enrolment of primary education with pre-school experience, and by the end of 2020, there was a total of 64.7% of children and youth have access to equitable quality basic education and vocational skills (The United Nations in Lao PDR, 2020). Besides, the most recent literacy rate of Lao PDR was 84.66% in 2015 (UNESCO Institute for Statistics, 2021). According to Morgan and Trinh (2019), the financial literacy rate of Laos was 12.5 in which the score was ranged lower than other

developing countries in the ASEAN economy. They claimed that the higher rate would have a positive impact on an individual's saving behavior and reflect on financial services accessibility relatively. It is undeniable to argue that the literacy rate in education and also the basic access to healthcare services plays a huge role in developing and enhancing the wellbeing of people within the country through sustainability. As a consequence, these two components are encountered as the human development index (HDI), measured by the health and knowledge of the population which means that increasing literacy, as well as education, and life expectancy and health can lift up the quality of life (Ranis et al., 2006). However, income inequalities have raised around the globe in recent decades, although increased at a different speed. For instance, highest in the Middle East and lowest in Europe, the 10% of richest people are worth up to 40% of global income. In order to reduce income inequalities and accomplish the tenth goal of SDGs, global solutions are required to promote economic inclusion, improve the regulation and monitoring of financial markets and institutions, encourage foreign direct investment within regions, and facilitate the flow of human capital and safe migration regardless of races, gender, nationality, ethnicity, or sex (UNDP in Lao, n.d.). The UNDP in Lao illustrated that the inequalities notably increase within rural areas which are significantly different from the urban gap. Furthermore, they have suggested the policymakers increase the service access especially for the most vulnerable group, enhance their livelihoods, and equal access to resources are needed with the better targeted and more explicit. Moreover, the social protection systems are demanded to scale up rapidly and widely to achieve significant coverage of the poor (UNDP in Lao, n.d.). Considerably, income inequality can be looked at in the welfare distribution as a whole (Epprecht et al., 2008) in order to reach the level of development within the country sustainably. Furthermore, it is substantially clear that the trade, particularly free trade affects the income distribution in both the long term and short term, and it is arguably agreed by the cost of producing products, goods, and services; for example, cost of labor, land rentals.

According to the Global Findex Database (GFD) 2017, in Lao PDR, the inequalities have widened and financial inclusion remains low even though the economy has been grown in the past decade (Demirguc-Kunt et al., 2018). Among ASEAN economies, Laos has ranged as the third-lowest level of financial access in which Cambodia and Myanmar were ranged after. Moreover, the evidence from GFD demonstrated a limited number of 29% of its population have accessed financial institutions, about 6% own a debit card, and approximately 3% have a credit card. However, Laos is affording to increase financial services supply, for instance, ATMs and financial literacy programs. To increase financial access, financial inclusion is an alternative to brings equal opportunities for all members of a nation to assess, use, and reach a formal financial system nationwide began with the ability to access a transaction account which is the first step toward financial inclusion that allows the bank account owner to store money and process financial transactions (Nanda & Kaur, 2016). In order to increase financial inclusion and reduce financial inequality as the tenth goal of SDGs in the Lao PDR, the Banque pour le Commerce Extérieur Lao Public (BCEL) as one of the country's leading banks has launched “Community Money Express” in 2015 (Loo, 2019). The aim is mainly to reduce the limitation to access financial services by allowing microfinance institutions to expand widely to the rural areas with the utilization of commercial bank branches (Loo, 2019). The UN Capital Development Fund (UNCDF) has collaborated and worked with the BOL and Central Bank to establish several initiatives including; making financial services are more accessible and inclusive for poor people in the rural areas by building financial infrastructures, improving the capacity of financial service providers, as well as adjusting policy and regulatory environment;

making financial inclusion available to all people regardless of gender, sex, races, nationality, ethnicity, geographic location, and income level through evidence-based financial inclusion policy; and accelerating financial inclusion and women's economic participation by shaping finance transformations inclusively (UN Capital Development Fund, 2020). Lastly, the National Assembly has approved that the BOL has accomplished its implementation under the working programs on the promotion of financial inclusion, payment system development, and the capital market for the 2020 targets (Bank of the Lao PDR, 2020). At the end of 2020, there was 64.62% of the GDP increase in bank deposits, 48.94% raised of the GDP in credits which slightly increased by 3.16% of the total in non-performing loans (NPLs), growing of 16.33% marked on broad money supply, and international reserves were sufficient coverage of 4.81 months of the country's import.

In the perspective of commercial banks in the Lao PDR, there was a scarcity of consumer's intention and behavior study and be devoid of the understanding of consumers' perspectives. The empirical evidence has not been visualized. With the limited evidence, the consumer's behavioral intention to participate and use banking services is the first step prior to the investigation of banking innovation and acceptance. Therefore, the objectives of this research paper aim to (i) assess consumer's perception of banking innovation and behavioral intention to participate in Laos banking, (ii) investigate the role of banking innovation on consumer's behavioral intention, (iii) understand Laos consumers in Laos banking environment, and (iv) suggest the potential stakeholders and policymakers who possibly benefit from this research paper in the path towards SDGs.

2. Literature Review

2.1. Laos banking overview

In Laos banking environment, there was intense competition with 44 commercial banks countrywide, at the end of 2020, consisting of three state-owned banks, a specialized bank, three joint-venture banks, eight private banks, eight subsidiary banks, and twenty-one foreign branch banks (Bank of the Lao PDR, 2020). Besides, the BOL also exhibited that there were 115 commercial bank branches, 42 exchange bureaus, 1,336 ATMs, 4,578 EDC countrywide, and 1,629,448 ATM cards. In 2020, the total of commercial bank's deposit was 102,523.24 billion LAK increasing by 16.78% from the base year which mainly divided into terms deposits as 51.51%, saving deposits as 28.87%, and current deposits as 19.62% of the total deposit respectively (Lao Statistics Bureau, 2021). Morgan and Trinh (2019) positioned Laos digital financial services as in a nascent stage since no fintech startup offering formal digital financial services and the existence of Laos commercials banks are rarely to adopt digital financial services, on the other hand, in the development and trial stage. Even though the internet has been introduced for centuries, only half of Laos people accessed the internet (52.54%) while 64.14% of Laos people own mobile-enabled cellular (Lao Statistics Bureau, 2021).

2.2. Perceived trust

Gefen et al. (2003) has defined perceived trust as the consumer's positive perception of service usage either comfortable or secured regardless of concern and fear in any situation. The trust of the consumer is varied in different countries even though in the same continent and region, despite similarities in concepts and circumstances (Anneli Järvinen, 2014). Some scholars illustrated the trust factor had a direct effect on behavioral intention to use internet banking in Thailand (Namahoot & Laohavichien, 2018) and Scotland (Yousafzai et al., 2009), mobile money services adoption in Ghana (Narteh et al., 2017), and mobile banking services adoption

in Palestine (Jouda, 2020). As such internet banking, mobile banking, as well as electronic banking are the subset of banking innovation (Rani, 2015), and as a financial technology that is a core of banking innovation (Puschmann, 2017), the overview of perceived trust towards banking innovation is thus further hypothesized to illustrate the generalization of innovation in the Laos banking industry instead of the traditional banking service solutions. In addition, Muñoz-Leiva et al. (2017) found that perceived trust had a negative effect on mobile banking application users' perceived risk, and the higher level of trust would eliminate consumers' perceived risk (Yousafzai et al., 2009). Therefore, trust in the bank is a key indicator determining consumer intention to use banking services.

H1: Consumer's perceived trust has a positively direct influence on banking innovation.

H2: Consumer's perceived trust has a negatively direct influence on perceived risk.

H3: Consumer's perceived trust has a positively direct influence on behavioral intention to use banking services.

2.3. Perceived risk

Glover and Benbasat (2010) and (Fortes & Rita, 2016) view perceived risk as a negative perception of an individual whether fear or anxiety of their personal information would be insecurely kept, which creates a barrier for them to use the services. The previous study has examined consumers' risk perception toward online shopping, the results confirmed the negative influence of risk on the consumer's online shopping in India (Thakur & Srivastava, 2015). A similar study of mobile payment system acceptance also confirm a negative relationship of perceived risk on the intention to use (Liébana-Cabanillas et al., 2018). Namahoot and Laohavichien (2018) and Yousafzai et al. (2009) also hypothesized the negative direct effect of perceived risk on the behavioral intention to adopt internet banking and their results showed a strong effect. Besides, this negative effect was confirmed by Jouda (2020).

H4: Consumer's perceived risk has a negatively direct influence on banking innovation.

H5: Consumer's perceived risk has a negatively direct influence on behavioral intention to use banking services.

2.4. Banking innovation

Oxford Learner's Dictionaries (n.d.) define innovation as the newly introduced ideas, things, or the ways of doing something. Trivedi (2015) discussed the innovation in banking as new products and services, new technology and channels, new institutions, and new business models, as well as the new marketplace were encapsulated. With the growth of information technology and innovation in the banking sector, the bank is able to provide better service, securer, and faster to their consumers, for instance, electronic banking, mobile banking, and internet banking (Rani, 2015). Financial technology or fintech is a core of banking innovation and essential for financial services institutions (Puschmann, 2017). The adoption of fintech is varied by the commercial banks, for B2C services, such as online credit application (financing), Robo-advisory (investments), and video conferencing (advice) which primarily provided by the banks to the end-consumers and enhanced consumer relationship in parallel (Puschmann, 2017). Furthermore, banking innovation can retain the bank consumers in addition to affected consumer intention (Agolla et al., 2018).

H6: Banking innovation has a positively direct influence on behavioral intention to use banking services.

3. Research Methodology

3.1. Scope of the study, data collection method, and sampling procedures

The study focuses on the participants who currently live in Vientiane Capital, Lao PDR. The Laos population was 6,492 million people in 2015 (Lao Statistics Bureau, 2016). According to the sample size calculation proportion of population formula by Cochran (1963), where the proportion of the population that needs to be randomized was 0.50 (maximum variability) and critical value of the standard normal distribution for the 95% confidence interval with $\pm 5\%$ precision. Thus, the needed sample size was 384 approximately. Bentler and Chou (1987) have suggested the minimum required sample size around 250 to 500 to adopt the structural equation modeling (SEM) approach, hence, the 384 samples are adequate.

3.2. Questionnaire design and instruments

The current study was implementing the seven-point Likert Scale in the survey stage (Joshi et al., 2015). The questionnaire survey aimed to explore the trust and risk perception of Laos people toward banking innovation and their behavioral intention to participate in Laos commercial banks. There were three parts included in a questionnaire; (i) demographic information and banking services usage profile; (ii) the questions regarding perceived trust, perceived risk, banking innovation, and behavioral intention where the respondents are required to score the measurement items from 1 as the lowest effect to 7 as the highest effect (Joshi et al., 2015); and (iii) the suggestions regard to the questionnaire survey. Therefore, the questions used in the questionnaire has exhibited in table 1.

Table 1: The constructs and scaled items used in the questionnaire survey.

Constructs	Items (Questions)	Adapted from
PT	PT1: I think that the bank will maintain the terms and commitments.	(Muñoz-Leiva et al., 2017)
	PT2: I think that the bank is reliable.	(Muñoz-Leiva et al., 2017)
	PT3: The bank is trustable.	(Muñoz-Leiva et al., 2017)
PR	PR1: Others may know the information about my transaction with the bank.	(Muñoz-Leiva et al., 2017)
	PR2: When I have a banking transaction with the bank, there is a significant risk.	(Muñoz-Leiva et al., 2017)
	PR3: I think that when I do any transactions with the bank is a risky choice.	(Muñoz-Leiva et al., 2017)
INN	INN1: The bank has innovative services and products such as ATMs, m-banking, internet banking, e-wallet, and so on.	(Agolla et al., 2018)
	INN2: Banking innovation has made the transfer of money easier.	(Agolla et al., 2018)
	INN3: Banking innovation has made banking services cheaper.	(Agolla et al., 2018)
	INN4: Banking innovation has made banking transaction services easier.	(Agolla et al., 2018)

BI

BI1: Assuming I have opened the bank account, I intend to participate in such a bank.	(Faham & Asghari, 2019; Muñoz-Leiva et al., 2017)
BI2: If I open the bank account of one bank, I predict that I would continue to participate as a customer.	(Faham & Asghari, 2019)
BI3: I plan to hold the bank account for a certain period.	(Faham & Asghari, 2019; Muñoz-Leiva et al., 2017)
BI4: I intend to improve my financial stability.	(Brown & Taylor, 2016)

3.3. Analytical tools

IBM SPSS Statistic version 26 with KAU license was used in this study for descriptive statistical data analysis. Spriestersbach, Röhrig, Du Prel, Gerhold-Ay, and Blettner (2009) reviewed those descriptive statistics can be separated into categorical and continuous parameters. This research mainly uses categorical data, nominal (gender, age, marital status, etc.), and ordinal data (the scaled items with the levels of effect). The frequency and percentage were calculated for nominal data while mean, standard deviation, skewness, and kurtosis were calculated for ordinal data. After descriptive statistics estimation, IBM SPSS Amos was a powerful software program to support the research theory by using structural equation modeling (SEM) which helps to extend the standard multivariate analysis methods including, factor analysis as well as path analysis. Amos helps to build a relationship among variables to have accuracy and validity (IBM, n.d.; Ullman & Bentler, 2003). Thus, Amos was an appropriate program for analyzing collected data and testing hypotheses (Ullman & Bentler, 2003).

3.4. Pilot test

Questionnaires are used to collect quantitative and qualitative data by testing it before the actual implementation through non-target population groups of 30 respondents with the reliability test of the questionnaire with Cronbach's alpha coefficient (Makhoul, 1975). In this regard, this is to analyze the questionnaire's reliability before applying it to the samples which have the criteria for considering the reliability, the criteria for determining the confidence of Cronbach's alpha coefficient is the value of higher than 0.7 would represent the high-reliability level and acceptable (Makhoul, 1975). After the examination, the Cronbach's alpha value of all constructs including banking innovation (0.844), perceived trust (0.867), perceived risk (0.793), and behavioral intention (0.869) respectively, therefore, was represented the reliability since all values are greater than 0.7.

4. Research Findings

4.2. Descriptive statistics

As illustrated in table 2, a total of 384 Laos participants who live in Vientiane Capital, Lao PDR was represented as a sample group for the current study. About three-five of participants is female (60.94%) and one-third are male (36.98%). The age group of 21 to 30 is majority (91.4%) and mainly single (90.63%). Most of them hold bachelor's degrees (80.21%). The student is accounted for 63.28 percent, followed by the employee at 19.79 percent, and business owner at 8.07 percent, respectively. Nearly half of participants have a monthly income level

lower than 1,500,000 Kip (45.83%) and in the range of 1,500,001 to 3,000,000 Kip (45.57%). In the case of banking service usage, two-five have used banking services less than three times a month (41.93%), and approximately a quarter has used banking services 3 to 6 times a month (27.34%). On the other hand, there are 38 participants (9.90%) who have never used banking services.

Table 2: Descriptive statistics.

	Classification	Frequency	Percent
<i>Gender</i>	Male	142	36.98
	Female	234	60.94
	Other	8	2.08
<i>Age</i>	< 20	23	5.99
	21 - 30	351	91.41
	> 30	10	2.60
<i>Marital Status</i>	Single	348	90.63
	Married	31	8.07
	Divorced	5	1.30
<i>Educational Levels</i>	Under Primary School	9	2.34
	Primary School	2	0.52
	Secondary School	5	1.30
	Vocational Certificate	3	0.78
	High Vocational Certificate	33	8.59
	Bachelor's degree	308	80.21
	Higher than bachelor's degree	24	6.25
<i>Occupations</i>	Student	243	63.28
	Teacher	6	1.56
	Employee	76	19.79
	Manager/Head	7	1.82
	Farmer	2	0.52
	Business Owner	31	8.07
	Other	19	4.95
<i>Monthly Income Levels</i>	Lower than 1,500,000 Kip	176	45.83
	1,500,001 – 3,000,000 Kip	175	45.57
	3,000,001 – 4,500,000 Kip	23	5.99
	Higher than 4,500,000 Kip	10	2.60
<i>Banking Services Usage</i>	Never	38	9.90
	Less than 3 times a month	161	41.93
	3 - 6 times a month	105	27.34
	7 – 10 times a month	42	10.94
	More than 10 times a month	38	9.90
Total		384	100.00

4.3. Confirmatory factor analysis

Confirmatory factor analysis (CFA) is a fundamental approach of SEM to assess the validity of the purposed variables and measurement model. The current study has assessed the normality of data distribution, the measurement model fit indices, the convergent validity, and the discriminant validity. Mean, standard deviation (s.d.), skewness, and kurtosis were examined to illustrate the normality of data distribution (McCormick & Salcedo, 2017). Mardia (1970) has introduced multivariate skewness and kurtosis measurement and Liu et al. (1999)

supported the concept of the measurements for assessing the symmetry deviation of the collected data. Moreover, West et al. (1995) suggested the appropriate value of skewness and kurtosis value of underneath 2 and 7 respectively to elucidate the normality. The normality of data distribution has been tested and exhibited in table 3. The mean of constructs and scaled items were ranged from 5.09 (PR2) to 6.26 (PT2) and the standard deviation (s.d.) was started from 0.887 (BI1) to 1.545 (PR2). All values of skewness of the measured constructs were a negative number representing the left-skewed distribution (West et al., 1995), which ranged from -1.104 (PR construct) to -0.841 (BI construct). Besides, all values of kurtosis indicate the peaked distribution (West et al., 1995), which was illustrative from 0.302 (BI construct) to 0.968 (PR construct).

Table 3: Test of normality.

Constructs and scale items	Mean	s.d.	Skewness	Kurtosis
INN	6.04		-0.932	0.438
INN1	6.17	0.918		
INN2	6.13	0.935		
INN3	5.89	1.035		
INN4	5.97	1.041		
PT	5.99		-1.059	0.758
PT1	6.03	0.989		
PT2	6.26	0.905		
PT3	6.22	0.915		
PR	5.46		-1.104	0.968
PR1	5.37	1.512		
PR2	5.09	1.545		
PR3	5.37	1.419		
BI	6.01		-0.841	0.302
BI1	6.17	0.887		
BI2	6.01	0.968		
BI3	5.92	1.037		
BI4	5.94	1.005		

Hair et al. (2013) suggested the fit indices for the overall CFA measurement model as the following: chi-square should be large ($P < 0.05$), CMIN/df < 3.00 , RMR < 0.08 , AGFI > 0.08 , PGFI > 0.05 , IFI > 0.90 , TLI > 0.90 , CFI > 0.90 , and RMSEA < 0.08 . Therefore, the overall CFA measurement model achieving the recommended fit indices; chi-square = 188.894 ($P < 0.001$), CMIN/df < 2.660 , RMR = 0.056, AGFI = 0.900, PGFI = 0.630, IFI = 0.967, TLI = 0.958, CFI = 0.967, and RMSEA = 0.066.

The convergent validity stage is to be measuring the factor loading, average variance extract (AVE), and composite reliability of the constructs and scaled items. The assessment of internal relationships within factors was measured by factor loading which has the threshold of 0.50 to address the agreeableness of the internal scaled items (Hair et al., 2013). The AVE estimation elucidates the assessment of the variance of latent variables comparative with the variance of measurement error, the worth of AVE of each construct should be more noteworthy than 0.50 (Fornell & Larcker, 1981). The interior consistency of latent variables and internal variables was estimated by the composite reliability, the worth was important to be higher than the cut-off of 0.70 to show a solid relationship within factor (Hair et al., 2013). As exhibited in table

4, even though the INN construct has contained the lower loaded item, INN1 at 0.754, the deduction would produce a small improvement of the factor loading, the remainder would be more reflect the actual outcome, and the item achieved the threshold. These criteria are also implemented to the perceived trust, perceived risk, and behavioral intention constructs. The factor loading of all scaled items illustrates the agreeableness of internal relationship (Hair et al., 2013). The AVE of the measured constructs accomplished Fornell and Larcker's (1981) criteria. In the same vein, there was an acceptance of internal consistency within the measured constructs (Hair et al., 2013). Hence, the convergent validity of the measurement model was confirmed.

Table 4: Convergent validity.

Constructs	Scale Items	Factor Loading	AVE	Composite Reliability
INN	INN1	0.754	0.659	0.885
	INN2	0.845		
	INN3	0.808		
	INN4	0.836		
PT	PT1	0.724	0.710	0.879
	PT2	0.891		
	PT3	0.901		
PR	PR1	0.718	0.688	0.867
	PR2	0.937		
	PR3	0.819		
BI	BI1	0.777	0.673	0.891
	BI2	0.856		
	BI3	0.801		
	BI4	0.844		

The heterogeneous constructs are identified by discriminant validity estimation (Fornell & Larcker, 1981; Henseler et al., 2015). The bivariate correlation coefficient of constructs is required to be lower than its squared AVE value indicating none-multicollinearity (Fornell & Larcker, 1981). Despite the perceived trust and the behavioral intention having a high correlation at 0.805, the squared AVE of perceived trust and the behavioral intention was higher beyond their correlations at 0.843 and 0.820 respectively (see table 5). Hence, the measured constructs were unique because the correlation values achieved the threshold.

Table 5: Bivariate correlations showing the discriminant validity.

	Sqr. AVE	INN	PT	PR	BI
INN	0.812	0.812			
PT	0.843	0.746	0.843		
PR	0.830	0.267	0.160	0.830	
BI	0.820	0.724	0.805	0.273	0.820

4.4. Structural equation modeling and path analysis

The SEM model fit indices are confined with the thresholds (Hair et al., 2013); chi-square = 188.894 ($P < 0.001$), CMIN/df < 2.660, RMR = 0.056, AGFI = 0.900, PGFI = 0.630, IFI = 0.967, TLI = 0.958, CFI = 0.967, and RMSEA = 0.066. To imply and discuss to the crucial points, the absolute value of standardized coefficient beta has used to visualize the essential

and strong relationship among path effects, the higher value indicates the level of priority and stronger effect (Vogt, 2015).

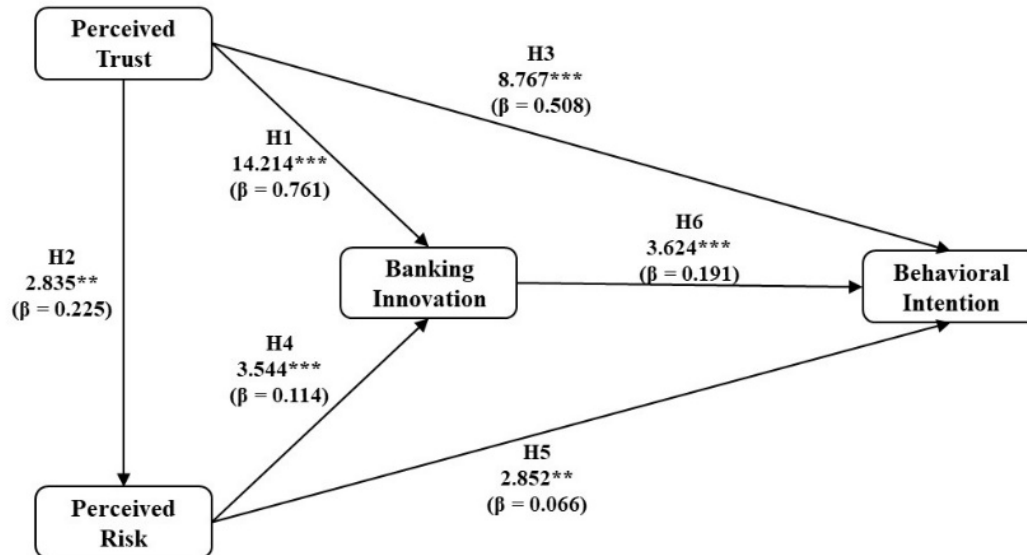


Figure 1: The structural model.

As demonstrated in figure 1 and table 6, there are a confirmation of H1, the positive influence of consumer perceived trust on banking innovation ($\beta = 0.761$, $t\text{-value} = 14.214$, $p < 0.001$) (Namahoot & Laohavichien, 2018; Narteh et al., 2017; Yousafzai et al., 2009). In the same vein, Jouda (2020) point out the positive relationship of consumer's perceived trust on mobile banking adoption. H2, negative impact on consumer perceived risk ($\beta = 0.225$, $t\text{-value} = 2.835$, $p < 0.01$) (Muñoz-Leiva et al., 2017; Yousafzai et al., 2009), and H3, and significantly effect on consumer's behavioral intention ($\beta = 0.508$, $t\text{-value} = 8.767$, $p < 0.001$) (Jouda, 2020; Namahoot & Laohavichien, 2018; Narteh et al., 2017; Yousafzai et al., 2009), respectively. Besides, H4 and H5, the negative influences of consumer perceived risk on banking innovation ($\beta = 0.114$, $t\text{-value} = 3.544$, $p < 0.001$) (Namahoot & Laohavichien, 2018; Yousafzai et al., 2009) and behavioral intention ($\beta = 0.066$, $t\text{-value} = 2.852$, $p < 0.01$) (Fortes & Rita, 2016; Glover & Benbasat, 2010; Jouda, 2020; Liébana-Cabanillas et al., 2018; Thakur & Srivastava, 2015) are respectively supported. Lastly, H6, the finding has confirmed the effect of banking innovation on consumer behavioral intention ($\beta = 0.191$, $t\text{-value} = 3.624$, $p < 0.001$) (Agolla et al., 2018; Puschmann, 2017). Therefore, all of six hypotheses are significantly supported.

Table 6: The result of hypothesis testing.

Hypotheses	Path Effects	Standardized Coefficient Beta (β)	t-value	p-value	Result
H1	PT $\rightarrow$ INN	0.761	14.214	***	Supported
H2	PT $\rightarrow$ PR	0.225	2.835	0.005**	Supported
H3	PT $\rightarrow$ BI	0.508	8.767	***	Supported
H4	PR $\rightarrow$ INN	0.114	3.544	***	Supported
H5	PR $\rightarrow$ BI	0.066	2.852	0.004**	Supported
H6	INN $\rightarrow$ BI	0.191	3.624	***	Supported

Denote that; **p-value < 0.01 and ***p-value < 0.001

5. Research Implications

5.1. Theoretical implications

As the research framework is limited to specific factors inclusive of perceived trust, perceived risk, banking innovation, and behavioral intention, there might be other factors that determine consumer behavioral intention to participate in Laos banking. Future research might be investigated and extended the research model to deeper understand consumer intention. Trust and risk perception are crucial for banking services either online or offline services, hence, the extension and remain these two factors is a median. Since the banking innovation is in the first stage of development, future research might further explore banking innovation adoption and acceptance in a step forwarded. In addition, in order to implement in terms of development and improvement, enhancing and strengthening policies and strategic framework should be relatively involved by heavy reliance on the wellbeing of people as its main duty in order to lift the living standard of people. By saying this, the human development index (HDI) is more important to significantly measure how people are governed and provided in public welfare, i.e., life expectancy in healthcare services and literacy in education in order to achieve and reach sustainable development in this contemporary world. Undeniably, these aforementioned key determinants can decrease some of the social issues and social conditions in such circumstances as income inequality, poverty alleviation, the gap between rich and poor, social inequality, equality, and equity in communities respectively. Therefore, to support the citizens, the public sector, as well as private sector should be cooperatively addressed in taking into account these problems in order to promote income generation, support employment or workforce, and economic development with environmental sustainability, regardless of sex, race, gender, nationality, ethnicity and forth.

5.2. Practical implications

There were two aspects to be implied based on the current research findings. First, the implications for commercial banks. The perceived trust in banking innovation ($\beta = 0.761$) and behavioral intention ($\beta = 0.508$) are the two highest priorities in this study. Besides, banking innovation was significantly influenced consumer behavioral intention. Trust-building is the key strategy to enhance the positive perception of consumers. Moreover, trust and risk are controversial, hence, the higher trust level would eliminate consumer's perceived risk as proven by the second hypothesis. Banking innovation can persuade consumers' intention to participate in a bank. The faster banking innovation services provider would gain consumer preferences and competitive advantage over rivals, especially for a highly competitive environment in the Laos banking industry. And second, the implication for policymaker and Laos Governor. To promote financial inclusion towards SDGs, the cooperation of policymaker and Laos Governor is necessary to heavily build financial technology infrastructures along the way with create awareness to them that allow the people in a rural area to access financial services equally and the positive financial attitude would be built in parallel. This can result in the development through an implication on socioeconomic policies and development programs in order to reach high standardization of innovation and technologic advancement where people can easily get accessed through the services securely when they are using banking innovation both online and offline. In addition, it also provides room for future research to implement in terms of how to reduce poverty alleviation and inequality in the country, especially in Lao PDR because the distribution of poverty and inequality is significantly crucial as it helps the policymaker and program designers to outline the programs and projects in order to reduce those problems of poverty and social inequality. More importantly, due to large regional

inequalities within the country and the government's strong commitment to its goal and determinants of reducing poverty and eradicating hunger, the government's commitment to poverty and inequality is expected to be a major threat in order to generate information to its citizens and also the policymakers to effectively implement the programs and develop practitioners, creating new projects to cope with the problems in the Lao PDR. This can also refer to the difference in geographical location, for example, rural areas and urban areas. Simply stated that living in different places is substantially provides distinctively different in terms of social conditions. As we have recently seen in nowadays news, people, who reside in outskirts areas particularly desire to move themselves to urban areas in order to seek a better life, jobs, wages to be able to increase their living standard. Understandably, those migrants can considerably be an impacted tool to alleviate the poverty so that the government sectors should take more responsibility to the migrations as it is one of the possible development strategies in order to reach high security and stability in strengthening the country and building the trust of people to the government. Apart from providing people to have more secure jobs, it also enhances the skills of workers, shifting from unskilled labor to skilled labor even though the migrants from local areas are tended to be originally poorer than an urban area. This tendency will substantially reach sustainable development in declining inequality and poverty, in turn, it will also increase the standard of living for people in particular.

6. Conclusion

Lao PDR is an emerging economy with a high growth rate, in contrast, deceleration in growth trend since 2016 (Bank of the Lao PDR, 2020). Nevertheless, Laos is also considered as the resource-rich country in promoting the economy through sustainability. Especially in the Laos banking sector, there is intense competition inclusive of forty-four commercial banks and several non-bank financial institutions countrywide. Despite the level of competition is being high, banking innovation and financial technology are in a nascent stage or in the first step of building financial innovation infrastructures (Morgan & Trinh, 2019). The researchers thus witness the study of Laos people's trust and risk perception on banking innovation and their behavioral intention to use banking services and participate in a bank as a consumer. Consumer trust in banks are varied in different countries (Anneli Järvinen, 2014). The current study found that consumer perceived trust has the most priority predicted on banking innovation ($\beta = 0.761$) and consumer's behavioral intention ($\beta = 0.508$) respectively. Consumer perceived risk had negatively effect on banking innovation ($\beta = 0.114$) and consumer's behavioral intention ($\beta = 0.191$). To avoid the unpreferable effect, the banks are needed to create a higher level of trust in the end-consumer which causes the reduction of consumer's perceived risk ($\beta = 0.225$) (Yousafzai et al., 2009). Lastly, banking innovation is an important aspect that could not be denied since it produces a positive outcome on consumers' behavioral intention to use banking services ($\beta = 0.191$). Hence, the fastest banking innovation adopter can gain consumers' preferences beyond competitors. Undeniably, having high technology and advanced innovation substantially assists the customers to satisfy with the services provided. In addition, having customer's trust also results in having a high standard of increasingly developmental level in such many circumstances in order to reach a high level of development with environmental sustainability and to increase economic integration which is one of the strategic frameworks to raise the poor people out of the poverty. These developments include increasing economic growth, escalating literacy rate in education, accessing healthcare services, improving income distribution, reducing the poverty rate, diminishing inequality, eradicating hunger, enhancing social condition, and decreasing unemployment rate.

The current study uncovered a significant effect of consumers' perception towards banking innovation and behavioral intention in a competitive environment in the Laos banking industry. The major contribution theoretically unveils perceived trust and perceived risk were necessary for the banks needed to be built, especially as a financial institution in developing economies. The adoption of banking innovation leads the way to consumers' behavioral intention. The theoretical framework has required a confirmation from the future study to explore and investigate in a different context. In addition, there were several limitations have found in this study. First, the limited number of participants and the area of the study in Vientiane Capital might not represent the generalizability. Second, there are a few factors that have been identified and investigated. The other essential factors are ignored, for instance, banking service quality, bank's reputation, cultural aspects, as well as individual characteristics. Third, this study is unaddressed the banking intention resistance factors in addition to perceived risk. Thus, we suggest future research to further study a broader scope, integrating and extending the different factors, and evaluating the additional resistance aspect.

7. References

- Agolla, J. E., Makara, T., & Monametsi, G. (2018). Impact of banking innovations on customer attraction, satisfaction and retention: The case of commercial banks in Botswana. *International Journal of Electronic Banking*, 1(2), 150. <https://doi.org/10.1504/IJEBANK.2018.10016653>
- Anneli Järvinen, R. (2014). Consumer trust in banking relationships in Europe. *International Journal of Bank Marketing*, 32(6), 551–566. <https://doi.org/10.1108/IJBM-08-2013-0086>
- Asian Development Bank. (2017). *Lao PDR: Accelerating structural transformation for inclusive growth*. <https://doi.org/10.22617/TCS179052-2>
- Baldwin, R., & Mauro, B. W. di. (2020). Economics in the Time of COVID-19. In *Economics in the Time of COVID-19* (Issue May).
- Bank of the Lao PDR. (2020). Annual economic report 2020. In *Bank of the Lao PDR*. https://www.bol.gov.la/en/fileupload/06-07-2021_1625541074.pdf
- Bentler, P. M., & Chou, C.-P. (1987). Practical issues in structural modeling. *Sociological Methods & Research*, 16(1), 78–117. <https://doi.org/10.1177/0049124187016001004>
- Brown, S., & Taylor, K. (2016). Early influences on saving behaviour: Analysis of British panel data. *Journal of Banking and Finance*, 62, 1–14. <https://doi.org/10.1016/j.jbankfin.2015.09.011>
- Cochran, W. G. (1963). *Sampling Techniques* (2nd ed.). John Wiley and Sons, Inc.
- Demirguc-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution. In *The Global Findex Database*. Washington, DC: World Bank. <https://doi.org/10.1596/978-1-4648-1259-0>
- Epprecht, M., Minot, N., Dewina, R., Messerli, P., & Heinimann, A. (2008). The Geography of Poverty and Inequality in the Lao PDR. In *Food Policy* (Issue May 2014).
- Faham, E., & Asghari, H. (2019). Determinants of behavioral intention to use e-textbooks: A study in Iran's agricultural sector. *Computers and Electronics in Agriculture*, 165, 104935. <https://doi.org/10.1016/j.compag.2019.104935>
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1),

- 39–50. <https://doi.org/10.1177/002224378101800104>
- Fortes, N., & Rita, P. (2016). Privacy concerns and online purchasing behaviour: Towards an integrated model. *European Research on Management and Business Economics*, 22(3), 167–176. <https://doi.org/10.1016/j.iedeen.2016.04.002>
- Gefen, Karahanna, & Straub. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly*, 27(1), 51. <https://doi.org/10.2307/30036519>
- Glover, S., & Benbasat, I. (2010). A comprehensive model of perceived risk of e-commerce transactions. *International Journal of Electronic Commerce*, 15(2), 47–78. <https://doi.org/10.2753/JEC1086-4415150202>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). *Multivariate Data Analysis: Pearson New International Edition* (7th ed.). Pearson Education Limited.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- IBM. (n.d.). *IBM SPSS Amos - Overview - United States*. IBM Software Business Analytics. Retrieved November 13, 2019, from <https://www.ibm.com/us-en/marketplace/structural-equation-modeling-sem>
- Joshi, A., Kale, S., Chandel, S., & Pal, D. (2015). Likert scale: Explored and explained. *British Journal of Applied Science & Technology*, 7(4), 396–403. <https://doi.org/10.9734/BJAST/2015/14975>
- Jouda, H. (2020). Expanding TAM and investigating the factors that effect consumer intention to adopt mobile banking in Palestine. *Financial Internet Quarterly*, 16(3), 29–50. <https://doi.org/10.2478/fiqf-2020-0017>
- Kyophilavong, P., Senesouphap, C., & Yawdhacksa, S. (2018). Resource Booms, Growth and Poverty in Laos: What Can We Learn from Other Countries and Policy Simulations? *SSRN Electronic Journal*, July. <https://doi.org/10.2139/ssrn.2366924>
- Lao Statistics Bureau. (2016). Result of population and housing census 2015. *Lao Statistics Bureau*, 2015, 282. <https://doi.org/10.1002/ejoc.201200111>
- Lao Statistics Bureau. (2021). *Lao PDR Statistical Yearbook 2020* (1st ed.). https://laosis.lsb.gov.la/board/BoardList.do?rootId=2103000&menuId=2103101&lang=en&bbs_bbsid=B404&keyword=&searchType=undefined
- Liébana-Cabanillas, F., Muñoz-Leiva, F., & Sánchez-Fernández, J. (2018). A global approach to the analysis of user behavior in mobile payment systems in the new electronic environment. *Service Business*, 12(1), 25–64. <https://doi.org/10.1007/s11628-017-0336-7>
- Liu, R. Y., Parelius, J. M., & Singh, K. (1999). Multivariate analysis by data depth: Descriptive statistics, graphics and inference. *Annals of Statistics*, 27(3), 783–858. <https://doi.org/10.2307/120138>
- Loo, M. K. L. (2019). Enhancing financial inclusion in ASEAN: Identifying the best growth markets for Fintech. *Journal of Risk and Financial Management*, 12(4), 181. <https://doi.org/10.3390/jrfm12040181>
- Makhoul, J. (1975). Linear prediction: A tutorial review. *Proceedings of the IEEE*, 63(4), 561–580. <https://doi.org/10.1109/PROC.1975.9792>
- Mardia, K. V. (1970). Measures of multivariate skewness and kurtosis with applications. *Biometrika*, 57(3), 519–530. <https://doi.org/10.1093/biomet/57.3.519>
- McCormick, K., & Salcedo, J. (2017). *SPSS reg Statistics for Data Analysis and Visualization*. John Wiley & Sons, Inc. <https://doi.org/10.1002/9781119183426>
- Morgan, P. J., & Trinh, L. Q. (2019). Fintech and financial literacy in the Lao PDR. *SSRN*

- Electronic Journal*, 933. <https://doi.org/10.2139/ssrn.3398235>
- Muñoz-Leiva, F., Climent-Climent, S., & Liébana-Cabanillas, F. (2017). Determinants of intention to use the mobile banking apps: An extension of the classic TAM model. *Spanish Journal of Marketing - ESIC*, 21(1), 25–38. <https://doi.org/10.1016/j.sjme.2016.12.001>
- Namahoot, K. S., & Laohavichien, T. (2018). Assessing the intentions to use internet banking. *International Journal of Bank Marketing*, 36(2), 256–276. <https://doi.org/10.1108/IJBM-11-2016-0159>
- Nanda, K., & Kaur, M. (2016). Financial inclusion and human development: A cross-country evidence. *Management and Labour Studies*, 41(2), 127–153. <https://doi.org/10.1177/0258042X16658734>
- Narteh, B., Mahmoud, M. A., & Amoh, S. (2017). Customer behavioural intentions towards mobile money services adoption in Ghana. *The Service Industries Journal*, 37(7–8), 426–447. <https://doi.org/10.1080/02642069.2017.1331435>
- Oxford Learner’s Dictionaries. (n.d.). *Definition of Innovation*. Retrieved November 24, 2021, from <https://www.oxfordlearnersdictionaries.com/definition/english/innovation>
- Puschmann, T. (2017). Fintech. *Business & Information Systems Engineering*, 59(1), 69–76. <https://doi.org/10.1007/s12599-017-0464-6>
- Rani, I. (2015). *A Study of Impact Of Information Technology In Indian Banking Industry*. 4(6), 23–30.
- Ranis, G., Stewart, F., & Samman, E. (2006). Human Development: Beyond the Human Development Index. *Journal of Human Development*, 7(3), 323–358. <https://doi.org/10.1080/14649880600815917>
- Spriestersbach, A., Röhrig, B., Du Prel, J. B., Gerhold-Ay, A., & Blettner, M. (2009). Descriptive statistics. *Deutsches Arzteblatt*, 106(36), 578–583. <https://doi.org/10.3238/arztebl.2009.0578>
- Thakur, R., & Srivastava, M. (2015). A study on the impact of consumer risk perception and innovativeness on online shopping in India. *International Journal of Retail & Distribution Management*, 43(2), 148–166. <https://doi.org/10.1108/IJRDM-06-2013-0128>
- The United Nations in Lao PDR. (2020). 2019 progress report: Lao PDR - United Nations partnership framework 2017-2021. In *United Nations Lao PDR*. <https://laopdr.un.org/en/124332-lao-pdr-united-nations-partnership-framework-sustainable-development-2017-2021-2019-progress>
- Toto Same, A. (2008). *Windfall Management for Poverty Reduction: Improving Public Finance Management*. April.
- Trivedi, S. R. (2015). Banking innovations and new income streams: Impact on banks’ performance. *Vikalpa: The Journal for Decision Makers*, 40(1), 28–41. <https://doi.org/10.1177/0256090915573616>
- Ullman, J. B., & Bentler, P. M. (2003). Structural equation modeling. In *Handbook of Psychology*. John Wiley & Sons, Inc. <https://doi.org/10.1002/0471264385.wei0224>
- UN Capital Development Fund. (2020). *Doubling Financial Inclusion in the ASEAN Region by 2020*. <https://www.uncdf.org/download/file/127/1517/doubling-financial-inclusion-asean0pdf>
- UNDP in Lao. (n.d.). *Goal 10: Reduced inequalities*. Retrieved November 4, 2021, from <https://www.la.undp.org/content/laopdr/en/home/sustainable-development-goals/goal-10-reduced-inequalities.html>
- UNESCO Institute for Statistics. (2021). *Literacy rate, adult total (% of people ages 15 and*

above) - Lao PDR | Data.

<https://data.worldbank.org/indicator/SE.ADT.LITR.ZS?end=2015&locations=LA&start=1995&view=chart>

- Vogt, W. (2015). Standardized regression coefficient. In *Dictionary of Statistics & Methodology*. SAGE Publications, Inc. <https://doi.org/10.4135/9781412983907.n1871>
- Ward, J. D., Sutton, P. C., Werner, A. D., Costanza, R., Mohr, S. H., & Simmons, C. T. (2016). Is decoupling GDP growth from environmental impact possible? *PLoS ONE*, 11(10), 1–14. <https://doi.org/10.1371/journal.pone.0164733>
- West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with nonnormal variables: Problems and remedies. In *Structural equation modeling: Concepts, issues, and applications*. (pp. 56–75). Sage Publications, Inc.
- World Bank. (2021). *Lao PDR Economic Monitor: A Path to Recovery* (Issue August).
- Yousafzai, S., Pallister, J., & Foxall, G. (2009). Multi-dimensional role of trust in internet banking adoption. *The Service Industries Journal*, 29(5), 591–605. <https://doi.org/10.1080/02642060902719958>

Content Validity of Self- rating Scale of Self-directed Learning (SRSSDL) for Applying with Employees in The Workplace

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Abstract

The 21st Century has brought unprecedented changes, especially during the COVID-19 pandemic. Employees in the workplace are no longer rely on formal classroom trainings or traditional suggested online and offline courses from Human Resources Development to re-skill and up-skill themselves. Employees need to stand on their own to take the initiative in diagnosing their learning needs, formulating learning goals, identifying the need of material resources for learning, choosing, and implementing appropriate learning strategies, and evaluating learning outcomes for themselves which all these essential processes adopted from the concept of self- directed learning (SDL). Therefore, self-directed learning appears to be an essential characteristic to keep up with the demand of war of work. As there is no brief, absolute, and precise instrument currently available to measure learners' self-directedness in the workplace, this paper has studied and obtained the consensus from a panel of experts on the content validation of self- rating of self-directed learning (SRSSDL) whether this instrument can be efficiently applied with employee in the workplace.

Keywords: Self-directed learning (SDL); Self-rating scale of self-directed learning (SRSSDL), Content Validity

1. Introduction

In the past three decades, most of the research on self-directed learning and learner self-directedness has focused on higher education environments (Kai, 2009, p. 23). The development of self-directed learning skills has become one of the critical focuses for adult education (Williamson, 2007, p. 66). However, self-directed learning is not only relevant in institutions or formal education, but it also relevant in work organizational environment (Ellinger, 2004, p.158).

Although numbers of research of self-directed learning in workplace are not as many as in education environment, there are some interesting researches in the work-related implications of self-directed learning has been on the increase (Confessore & Kops, 1998, p. 365). Several

researches have studied and noted respective benefits for the organization's competitiveness to have high SDL employee in the workplace for example 1) high SDL employees are able to adapt to changes in their environments better, have high potential to reskill and upskill by themselves, to remain resilient when confront with careers changes, challenge assignments, and unexpected changes and obstacles in the organization (Guglielmino, 1997, p.209), 2) high SDL employees can provide more focused learning in highly specialized field (Merriam & Caffarella, 1991, p. 272), 3) high SDL employees trend to have more engagement and job effectiveness as this learning paradigm accommodates individuals' learning styles and objectives, they normally learn from their own work experiences and then able to directly apply their learning at work (Houston & McNamara, 1999, p. 3). With all these sample benefits, most of organization are finding the practical ways to promote SDL concept and develop their employees to become effective self-directed learners (Baruch, 2006, p. 125 & Guglielmino, 2008, p. 1) especially when the 21st century arrived with digitalization and globalization.

Since 2019, when the world has been facing with COVID-19 pandemic situation, ways of work in the organizations all over the world have been significantly impacted and changed as well as the way of developing employees in the organization. Employees are requested to keep up-skill and re-skill themselves by their own way instead of fully relying on the formal trainings and developments suggested by Human Resources Development Department. Most of employees are reported struggled, frustrated and some of them could not effectively catch up with the new knowledges and skills as per organization's expectations. (Katy, M. (2022). Therefore, the development of requisite skills and attribute to enhance employees' self-directedness to help employee and organization to overcome these challenges is now crucial required. For Human Resources Development to design the precise strategic approaches to build up employees' self-directedness, we primarily need to assess the current self-directed learning level of our employees in the organization. Therefore, identifying the precise instrument for measuring level of employee SDL must be the first thing to be solved. After exploring relevant research, the author has found that 1) there is no brief, absolute, and precise instrument currently available to measure learner self-directedness in the workplace, most of available instruments were designed for student in healthcare context 2) there are different kinds of instruments based on what are the components that each instrument would like to focus. Literature characterizes SDL as a concept with two related components. The first component encompasses the personal attributes necessary for SDL and the second component views SDL as a process that the learner must be able to enact.

After exploring available SDL measurement tools, the author found that 60 questionnaire items in five board areas each consisting of 12 items in Williamson's (Williamson, 2007, p. 66) SRSSDL covers to assess skills required in learning process as well as behaviour and learning motivation. Furthermore, the purpose of this tool is interesting, it is designed that the person who response to SRSSDL item will not only reveal their own level of self-directedness in learning but will also have the opportunity to develop an insight into self-directed learning and better understanding of the concept which is crucial for developing of self-directedness, independent and lifelong learning (Williamson, 2007, p. 66) The result from this SRSSDL can

precisely guide for individual development approach to enhance their requisite skills to become self-directed learners.

Before applying SRSSDL with employee in workplace, the validity and reliability of the instrument is needed to be confirmed. For validity, it is determined as its three common forms including content, construct, and criterion-related validity (Lynn, 1986, p. 382). Since content validity is prerequisite for other validity, it should receive highest priority during instrument developments (Zamanzadeh, et.al., 2015, p. 165). Besides, SRSSDL was initially designed for the student in healthcare context not employees in the workplace, and it is designed before the world faces Covid-19 pandemic, the content validity should be a critical step to take to reconfirm whether each items response to the workplace context and the recent century. Therefore, this study will firstly focus on content validity of SRSSDL and other types of validity such as construct validity and reliabilities will be explored in the next study.

2. Research Objectives

This paper aims to validate the content in self- rating scale of self-directed learning (SRSSDL) whether it can apply with employee in workplace context

3. Literature Review

3.1. SDL definition and characteristics: Malcolm Knowles (Knowles, 1975, p. 18) considered applying the concept of self-directed learning, observed in informal learning projects during the early 1970s (Tough, 1979, p. 28), to formal education. He defined self-directed learning as:

... a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. (Knowles, 1975, p. 18)

Guglielmino (Guglielmino, 1977, p. 6) mentioned that a person who is ready for self-directed learning will have the willingness and the skill to engage in self-directed learning activities. According to Hiemstra (Hiemstra & Brockett, 1994, p. 89) and Brookfield (Brookfield, 1986, p. 40), self-directed learning is a process in which learners are responsive for planning implementing and evaluating their own learning and are expected to work independently or with others in order to achieve pre-set learning goals. There are other researchers (Blackwood, 1994, p.47; Merriam & Caffarella, 1991, p. 272) who defined the definitions of self-directed learning in the way that repeat knowles' definition (knowles, 1975, p.18). However, there is no common definition of self-directed learning. Hiemstra and Brockett (Hiemstra & Brockett, 2012, p.155) mentioned that self-directed learning will be happen when 3 components consist of (1) person including characteristics such as motivation, resilience, and self-concept (2) process involving learning skills, and technological skills (3) context including the environmental and socio-political are balanced. Garrison (Garrison, 1997, p.18) is also defined self-directed learning is an approach where learners are motivated to assume personal responsibility and collaborative control of the cognitive (self-monitoring) and contextual (self-

management) processes in constructing and confirming meaningful and worthwhile learning outcomes. From many researches, Knowles’s definition is mostly used and be foundation to develop self-directed learning in education institute and workplace. In brief, the literature characterizes SDL concepts with two related components. The first component incorporates the personal attributes necessary for its SDL such as having a goal oriented, personal autonomy, self- management, self-efficacy, and motivation. The second component views SDL as an essential process that learner must be able to enact. In this paper, the author would like to define SDL as learner proactive process to take the initiative in learning rather than passively waiting to be taught as reactive learners. Their learning is more meaningful and purposeful, with greater motivation resulting in longer retention. They are more responsible in their own lives, having benefited from the self-disciplining process of their learning.

3.2. SDL measurement tools : Exploring relevant research in the past three decades on SDL related measurement tools, although several authors have published scales for measuring SDL, there have been questions about their validity. Guglielmino’s SDL readiness scale (SDLR) is a practical instrument designed for measuring individuals’ attitude, skills and abilities, necessary for SDL readiness (Guglielmino, 1977, p.93). However, criticism was levelled against the original SDLR regarding its reliability, validity, and failure to confirm its eight-factor structure when applied to various racial and class populations. (Long, 1984, p.709-715). And as SDLR is the instrument to assess only perception, there is still a need for instrument to assess self-directed learning behavior that are different from the simple measuring of perceptions at readiness for self-directed learning (Brockett and Hiemstra, 1991, Cited by Williamson, 2007, p.67). After Guglielmino, the Bartlett-Kotrlík Inventory of Self-Learning (BKISL) was developed for population in work environments (Bartlett & Joe, 1999, p. 185). It consists of eleven factors and includes measures of personal, social, and environmental variables that may affect self-learning. However, the psychometric properties of the BKISL are questioned as well as its reliability in different cultures also needs further investigation (Cho, 2006, p. 53) and since 2010, it hardly to find any research mentioned , applied or studied this tool further. In 2001, Fisher had developed SDLRS by using principal components analysis involving 201 nursing students with three factors are introduced which are self-management desire for learning and self-control with five- point Likert-scale type, 40 items, firstly tested with 201 nursing students. However, from the report of Hendry and Ginns (Hendry & Ginns, 2009, p. 918) found four factors instead of three in their research against on Fisher’s SDLRS (Fisher, King & Tague, 2001, p. 516). Hendry and Ginns concluded that the feature was not stable accross different types of students and recommended further research. In 2007, Williamson developed the Self-Rating Scale of Self-Directed Learning (SRSSDL) (Williamson, 2007, p. 66) . Instead of measuring readiness like the Guglielmino SDLR and the Fisher SDLR, the SRSSDL was developed to measure levels of self-directed learning behaviors. Following a review of Guglielmino’s, Knowles’, Candy’s, Hiemstra’s and Brookfield’s works, Williamson developed an instrument with the 60 items categorized into five broad areas, each consisting of 12 items. The categories included: awareness (understanding the factors that contribute to being self-directed learners); learning strategies (strategies recommended for being self-directed learners); learning activities (activities often used in self-directed learning); evaluation (attributes that help learners monitor their learning activities) and interpersonal skills (skills considered pre-requisite to becoming self-directed learners). Thirty nursing students then took the survey and rated the items using a 5-point Likert scale, where 5=always, 4=often, 3=sometimes, 2=seldom, and 1=never. However, after 2007, there are numbers of researchers had studied further on SRSSDL and developed and revised

SRSSDL for example Cadorin and colleagues developed a revised SRSSDL that consisted of 40 items instead of the original 60 items proposed by Williamson. In the recent years during 2017-2021, in PubMed and ResearchGate websites shows there are 25 research reference the Williamson's (Williamson, 2007, p. 66) SRSSDL tools in their research, however, most of researches studied on factor analysis and some are content validity. Furthermore, there are no paper found on the content validity of SRSSDL to apply it with employee in workplace. There is room for this paper to study further on this issue.

3.3. Content Validities:

Validity, which is defined as the ability of an instrument to measure the properties of the construct under study, is a vital factor in selecting or applying an instrument. It is determined as its three common forms including content, construct, and criterion-related validity (Lynn, 1986, p 382). Since content validity is a prerequisite for other validity, it should receive the highest priority during instrument development (Zamanzadeh, et.al., 2015, p. 165). This type of validity addresses the degree to which items of an instrument sufficiently represents the content domain especially the domain that related to behavior, attitude, competencies which do not have the exact unit of measurement. Besides, the content validity is a must require to ensure the applicable for each type of target group. For an instrument, there are 3 approaches in content validity stage which are by literature review, by representative of the relevant population and by content expert (Gray, Grove, & Sutherland, 2017, p. 586). For this study, as there is no literature related to the content validity of SRSSDL to apply with employee in the workplace, the author decided to approach expert content in this primary stage. Approaching with the opinion from representative of the relevant population will be decide in the next step after the revised version of SRSSDL from this study is concluded. And as this study aims to revisit the SRSSDL original 60 items whether to content response to the domain of the instrument and applicable to employees in the workplace, not develop the whole new instrument tools, Item-Objective Congruence (IOC) of Povinelli and Hambleton in 1977 is fit for this study (Turner & Carlson, 2003, p. 163-171).

4. Research Methodology

Target group : 5 Experts in various fields, #1 expert is the professor in Measurement and Assessment tools, #2 expert is the professor in Learning and Education field, #3 expert is the professor in Business Administration field, #4 expert is the HR professional practitioner in people capabilities transformation and learning development and #5 expert is the HR professional practitioner in competencies and career development

Measurement design:

1) The content validity form with 60 items has been sent to the 5 experts by mail and some clarification is needed from time to time from experts

2) The Item-Objective Congruence (IOC) was used to evaluate the items of the questionnaire based on the score range from -1 to +1

In each items the experts are asked to determine the content validity score

the score + 1= if the experts is sure that this item really measure the expected attribute

the score 0 = if the expert is not sure that item does measure or does not measure the expected attribute.

the score -1= if the expert is not agree that this item really measure the expected attribute.

3) The experts independently send the form to the researchers with score in all item and recommendation in some items selected by experts

Analysis design:

The Item-Objective Congruence (IOC) was used to evaluate the items of the questionnaire based on the score range from -1 to +1.

Congruent = + 1 Questionable = 0 Incongruent = -1

$$IOC = \frac{\sum R}{N}$$

R is the rating (+1,0,-1) of item

N is the number of experts

The items that had scores lower than 0.5 were revised. On the other hand, the items that had scores higher than or equal to 0.5 were reserved. (Tuntavanitch & Jindasri, 2018, p. 3)

5. Results

This research divides the results into five board areas of SDL which are, awareness, learning strategies, learning activities, evaluation, and interpersonal skills, as followed.

5.1. Awareness: relating to learners' understanding of the factors contributing to becoming self-directed learners. The scale of IOC in term of learning strategies as shown in Table 1

Table 1. The Scale of IOC in term of Awareness.

	Item	Expert					Sum	IOC	Interpretation
		1	2	3	4	5			
1	Identify my own learning need	1	1	1	1	0	4	0.8	reserved
2	I am able to select the best method for my own learning	0	1	1	1	1	4	0.8	reserved
3	I consider my managers as facilitators of learning rather than providing information only	0	1	1	1	1	4	0.8	reserved
4	I keep up to date on different learning resources available	1	1	1	1	1	5	1.0	reserved
5	I am responsible for my own learning	1	1	1	1	1	5	1.0	reserved
6	I am responsible for identifying my areas of deficit	1	1	0	1	1	4	0.8	reserved
7	I am able to maintain self-motivation	1	1	1	1	1	5	1.0	reserved
8	I am able to plan and set my learning goals	1	1	1	1	0	4	0.8	reserved
9	I have a break during long periods of work	-1	1	-1	-1	1	-1	-0.2	revised
10	I need to keep my learning routine separate from my other	1	1	-1	-1	1	1	0.2	revised
11	I relate my experience with new information	1	1	1	1	0	4	0.8	reserved

	Item	Expert					Sum	IOC	Interpretation
		1	2	3	4	5			
12	I feel that I am learning despite not being instructed by my manager or anybody else	1	1	1	1	1	5	1.0	reserved

According to Table 1, there are 10 items had IOC >0.5 which were recommend to be reserved and 2 items had IOC <0.5 which were recommended to be revised.

5.2. Learning strategies: explaining the various strategies self-directed learners should adopt in order to become self-directed in their learning processes. The scale of IOC in term of learning strategies as shown in Table 2.

Table 2. The scale of IOC in term of learning strategies.

	Item	Expert					Sum	IOC	Interpretation
		1	2	3	4	5			
1	I participate in group discussion	1	1	0	1	0	3	0.6	reserved
2	I find peer coaching effective	1	1	1	1	1	5	1.0	reserved
3	I find “role play” is a useful method for complex learning	1	1	-1	1	1	3	0.6	reserved
4	I find interacting learning sessions more effective than just listening to lectures	1	1	-1	1	1	3	0.6	reserved
5	I find simulation in learning useful	1	1	1	1	1	5	1.0	reserved
6	I find learning from case studies useful	1	1	1	1	1	5	1.0	reserved
7	My inner drive directs me towards further development and improvement in my learning	0	1	-1	1	1	2	0.4	revised
8	I regard problems as challenges	1	1	-1	1	1	3	0.6	reserved
9	I arrange my self-learning routine in such a way that it helps develop a permanent learning culture in my life	1	1	1	1	1	5	1.0	reserved
10	I find concept mapping is an effective method of learning	1	1	1	1	1	5	1.0	reserved
11	I find new interactive learning tools enhance my learning process	1	1	1	1	1	5	1.0	reserved
12	I am able to design my own learning strategy	1	1	1	1	-1	3	0.6	reserved

According to Table 2, there are 11 items had IOC >0.5 which were recommend to be reserved and 1 item had IOC <0.5 which were recommended to be revised.

5.3. Learning activities: specifying the requisite learning activities learners should actively engage to become self-directed in their learning processes. The scale of IOC in term of learning activities as shown in Table 3.

Table 3. The scale of IOC in term of learning activities.

	Item	Expert					Sum	IOC	Interpretation
		1	2	3	4	5			
1	I rehearse and revise new information that I have learnt	1	1	1	0	1	4	0.8	reserved
2	I identify the important points when reading a chapter all an article	1	1	-1	1	1	3	0.6	reserved
3	I use concept mappings/ outlining as useful method of comprehending a wide range of information	1	1	0	1	1	4	0.8	reserved
4	I am able to use information technology effectively	1	1	0	1	1	4	0.8	reserved
5	My concentration intensifies and I become more attentive when I read a complex study content	0	1	1	0	1	3	0.6	reserved
6	I keep at notated note or a summary of all my ideas, reflections and new learning	1	1	1	1	1	5	1.0	reserved
7	I enjoy exploring information beyond the prescribed course objectives	1	1	1	1	1	5	1.0	reserved
8	I am able to relate knowledge with practice	1	1	1	1	1	5	1.0	reserved
9	I raise relevant questions in trainings	1	1	1	1	1	5	1.0	reserved
10	I am able to analyse and critically effect on new ideas, information or any learning experiences	1	1	1	1	1	5	1.0	reserved
11	I keep an open mind to others' point of view	0	1	1	1	1	4	0.8	reserved
12	I prefer to take any break in between any learning tasks	0	0	-1	0	1	0	0.0	revised

According to Table 3, there are 11 items had IOC >0.5 which were recommend to be reserved and 1 item had IOC <0.5 which were recommended to be revised.

5.4. Evaluation: revealing learners' specific attributes in order to help monitor their learning activities. The scale of IOC in term of evaluation as shown in Table 4.

Table 4. The scale of IOC in term of evaluation.

	Item	Expert					Sum	IOC	Interpretation
		1	2	3	4	5			
1	I self-assess before I get feedback from my manager or an expert of the company	1	1	1	1	1	5	1.0	reserved
2	I identify the areas for further development in whatever I have accomplished	1	1	1	1	1	5	1.0	reserved
3	I am able to monitor my learning progress	1	1	1	1	1	5	1.0	reserved
4	I am able to identify my area of strength and weakness	1	1	1	1	1	5	1.0	reserved
5	I appreciate when my work can be peer reviewed	1	1	1	1	1	5	1.0	reserved
6	I find both success and failure inspire me to further learning	1	1	1	1	1	5	1.0	reserved
7	I value criticisms as the basics of bringing improvement to my learning	1	1	1	1	1	5	1.0	reserved
8	I monitor whether I accomplished my learning goals	1	1	1	1	1	5	1.0	reserved
9	I check my portfolio to review my progress	1	1	1	1	1	5	1.0	reserved
10	I review and reflect on my learning activities	1	1	1	1	1	5	1.0	reserved
11	I find new learning challenging	0	1	-1	-1	1	0	0.0	revised
12	I'm inspired by others success	0	1	-1	-1	1	0	0.0	revised

According to Table 4, there are 10 items had IOC >0.5 which were recommend to be reserved and 2 items had IOC <0.5 which were recommended to be revised.

5.5. Interpersonal skills: relating to learners' skills in interpersonal relationships, which are prerequisite to their becoming self-directed learners. The scale of IOC in term of interpersonal skills as shown in Table 5.

Table 5. The scale of IOC in term of interpersonal skills.

	Item	Expert					Sum	IOC	Interpretation
		1	2	3	4	5			
1	I intend to learn more about other cultures and languages I am frequently exposed to	1	1	1	1	1	5	1.0	reserved
2	I am able to identify my role within that group	1	1	1	1	1	5	1.0	reserved
3	My interaction with others helps me to develop the insight to plan for further learning	1	1	1	1	1	5	1.0	reserved

	Item	Expert					Sum	IOC	Interpretation
		1	2	3	4	5			
4	I make use of any opportunities I come across	1	1	-1	0	-1	0	0.0	revised
5	I need to share information with others	1	1	1	1	1	5	1.0	reserved
6	I maintain good interpersonal relationships with other	1	1	1	1	1	5	1.0	reserved
7	I find easy to work in collaboration with other	1	1	1	1	1	5	1.0	reserved
8	I am successful in communicating verbally	1	1	1	1	1	5	1.0	reserved
9	I identified the need for interdisciplinary links for maintaining social harmony	1	1	1	1	1	5	1.0	reserved
10	I am able to exploit my ideas effectively in writing	1	1	1	1	1	5	1.0	reserved
11	I am able to express my views freely	1	1	0	1	1	4	0.8	reserved
12	I find it challenging to pursue learning in a culturally diverse milieu	1	1	1	1	1	5	1.0	reserved

According to Table 5, there are 11 items had IOC >0.5 which were recommend to be reserved and 1 items had IOC <0.5 which were recommended to be revised.

Limitations and directions for future research

In developing a measurement there are three types of validity for instant content validity, construct, and criterion-related validity are considered. However, in this study only the evident for content validity is achieved. Evidence for other validity factors can be gained in future research.

6. Discussion and Conclusion

6.1. Discussion : The aim of this study is to validate the content in self- rating scale of self-directed learning (SRSSDL) whether it can apply with employee in workplace context. There are 5 board areas that the experts explored and considerate. From the expert points of views, here are the summarization and discussion:

Domain 1: Awareness , the experts who scored 0 and -1, in item #9 “*I have a break during long periods of work*” questioned that how taking a break during long working hours relate with the awareness of learning and in the item #10 “*I need to keep my learning routine separate from my other*” experts questioned that in working context the learning can happened all the time especially during the working hour, employee with self-directedness should engage their learning and work together. Theses 2 items then need to be revised.

Domain 2: Learning strategy: the experts had question on item #7 “*my inner drive directs me towards further development and improvement in my learning*” that should this item belong to

part 1 instead as “the inner inside” is more related in awareness part more than strategy. Experts confirmed that this item is good and advise to remain it but in the different main factor item.

Domain 3: Learning activities, the experts had question on item #12 “*I prefer to take any break in between any learning tasks*” and requested to be revised as this does not reflect the purpose of this factor to measure the learner engagement

Domain 4: Evaluation, the experts had questions on item #11 “*I find new learning challenging*” and #12 “*I’m inspired by others success*”, they cannot be convinced that how these 2 questions related to the evaluation purpose, questing that should them be in the awareness for item #11 and learning strategy for #12 if these questions are need to be remained

Domain 5: Interpersonal skills, expert questioned item #4 “*I make use of any opportunities I come across*” as the question is short and experts cannot find the relation between taking opportunities and interpersonal skills to build the relationship to support their learning, then the revised of this item is suggested.

From experts’ suggestion, the author revised 7 items to be more applicable with employee in workplace context and removed 2 items that irrelevant to the domain objectives. The final revised 58 items are listed below;

Awareness :

1. Identify my own learning need
2. I am able to select the best method for my own learning
3. I consider my managers as facilitators of learning rather than providing information only
4. I keep up to date on different learning resources available
5. I am responsible for my own learning
6. I am responsible for identifying my areas of deficit
7. I am able to maintain self-motivation
8. I am able to plan and set my learning goals
9. I have learnt from my daily work
10. I keep my learning routine engage with my daily work
11. I relate my experience with new information
12. I feel that I am learning despite not being instructed by my manager or anybody else

Learning strategies :

1. I participate in group discussion
2. I find peer coaching effective
3. I find “project assignment” is a useful method for complex learning
4. I find interacting learning sessions more effective than just listening to lectures in training or seminar
5. I find simulation in learning useful
6. I find learning from case studies useful
7. I find that keep being self-motivated drive me for further development and improvement in my learning



8. I regard problems as challenges
9. I arrange my self-learning routine in such a way that it helps develop a permanent learning culture in my life
10. I find concept mapping is an effective method of learning
11. I find new interactive learning tools enhance my learning process
12. I am able to design my own learning strategy

Learning activities :

1. I rehearse and revise new information that I have learnt
2. I identify the important points when reading a chapter all an article
3. I use concept mappings/ outlining as useful method of comprehending a wide range of information
4. I am able to use information technology effectively
5. My concentration intensifies and I become more attentive when I read a complex study content
6. I keep at notated note or a summary of all my ideas, reflections, and new learning
7. I enjoy exploring information beyond the prescribed course objectives
8. I am able to relate knowledge with practice
9. I raise relevant questions in trainings
10. I am able to analyse and critically effect on new ideas, information or any learning experiences
11. I keep an open mind to others' point of view
12. I well schedule my learning plan

Evaluation :

1. I self-assess before I get feedback from my manager or an expert of the company
2. I identify the areas for further development in whatever I have accomplished
3. I am able to monitor my learning progress
4. I am able to identify my area of strength and weakness
5. I appreciate when my work can be peer reviewed
6. I find both success and failure inspire me to further learning
7. I value criticisms as the basics of bringing improvement to my learning
8. I monitor whether I accomplished my learning goals
9. I check my portfolio to review my progress
10. I review and reflect on my learning activities
11. I am revisited what make me be inspire for learning and developing myself

Interpersonal skills :

1. I intend to learn more about other cultures and languages I am frequently exposed to
2. I am able to identify my role within that group
3. My interaction with others helps me to develop the insight to plan for further learning
4. I need to share information with others
5. I maintain good interpersonal relationships with other

6. I find easy to work in collaboration with other
7. I am successful in communicating verbally
8. I identified the need for interdisciplinary links for maintaining social harmony
9. I am able to exploit my ideas effectively in writing
10. I am able to express my views freely
11. I find it challenging to pursue learning in a culturally diverse milieu

6.2. Conclusion : Self-directed learning is beneficial for both individuals and organization. Having experienced and completed an efficient SDL measurement tool and receiving their own result, employee will develop a better understanding of their current skills, attribute, and behaviors in their learning approach and attempt. When they become aware of these, they may develop that their own precise strategies and behaviour to become more self- directed in their learning. Theses may help them catch up with the new skills faster and effectively adapt to the change of job requirement and environment during and after COVID-19 pandemic. With the efficient measurement tool, organization will have a better understanding of employees in their self-directed learning level and efforts. The organization can then also offer development programmes that incorporate an assessment result of each employee more efficiently and effectively. SRSSDL can be the high potential effective instrument to measure self-directedness of employee in the workplace context after receiving the point of views from experts. However, before the 58 revised items version will apply with employee, try out with some sample group of employee in workplace can play an important role on giving feedback in content validity process to explore whether they understand the questions in the same way of the purpose of each item. Another challenge is language, to apply the final validated SRSSDL with employee in workplace, translation into local language that tailored to the target group is also significant and need to be considered.

7. References

- Bartlett, J. E. I. K., Joe W. (1999). Development of a Self-Directed Learning Instrument for Use in Work Environments. *Journal of Vocational Education Research*, 24(4), 185-208.
- Baruch, Y. (2006). Career development in organizations and beyond: Balancing traditional and contemporary viewpoints. *Human Resource Management Review*, 16(2), 125-138.
- Blackwood, C. C. (1994). Applying Self-Directed Learning Principles in the Technical Training of a High-Risk Industry. *New Directions for Adult and Continuing Education*, 64, 47-54.
- Brockett, R. G., & Hiemstra, R. (1991). *Self-direction in adult learning : perspectives on theory, research, and practice*. London ; New York: Routledge.
- Brookfield, S. (1986). *Understanding and facilitating adult learning : a comprehensive analysis of principles and effective practices*. Milton Keynes: Open University Press.
- Cadorin, L., Suter, N., Dante, A., Williamson, S. N., Devetti, A., & Palese, A. (2012). Self-directed learning competence assessment within different healthcare professionals and amongst students in Italy. *Nurse Educ Pract*, 12(3), 153-158.
- Cárdenas, C., Ruíz, M., & Fortoul, T. (2015). Autorregulación en estudiantes de medicina: traducción, adaptación y aplicación de un instrumento para medirla. *Investigación en Educación Médica*, 4, 3-9.
- Cho, M.-A. (2006). A Study on the Effect of Reading Instruction on the Creative Ability and the Self-Directed Learning Ability. [A Study on the Effect of Reading Instruction on

- the Creative Ability and the Self-Directed Learning Ability]. *Journal of the Korean Society for Library and Information Science*, 40(3), 53-71.
- Confessore, S., & Kops, W. (1998). Self-directed learning and the learning organisation: examining the connection between the individual and the learning environment. In (Vol. 9, pp. pp.365-375). San Francisco: Jossey-Bass.
- Ellinger, A. D. (2004). The Concept of Self-Directed Learning and Its Implications for Human Resource Development. *Advances in Developing Human Resources*, 6(2), 158-177.
- Fisher, M., King, J., & Tague, G. (2001). Development of a self-directed learning readiness scale for nursing education. *Nurse Educ Today*, 21(7), 516-525.
- Garrison, D. R. (1997). Self-directed learning: Toward a comprehensive model. *Adult Education Quarterly*, 48(1), 18-33. doi:10.1177/074171369704800103
- Gray, J., Grove, S. K., & Sutherland, S. (2017). *Burns and Grove's the practice of nursing research : appraisal, synthesis, and generation of evidence*: Missouri.
- Guglielmino, L. M. (1977). *Development of the self-directed learning readiness scale*: University of Georgia.
- Guglielmino, L. M. (1997). Reliability and validity of the self-directed learning readiness scale and the learning preference assessment. *HB Long & Asso., Expanding horizons in self-directed learning*, 209-222.
- Guglielmino, L. M. (2008). Why Self-Directed Learning. *International Journal of Self-Directed Learning* 5(1), 1-14.
- Hendry, G. D., & Ginns, P. (2009). Readiness for self-directed learning: validation of a new scale with medical students. *Med Teach*, 31(10), 918-920.
- Hiemstra, R., & Brockett, R. G. (1994). *Overcoming Resistance to Self-direction in Adult Learning*: Jossey-Bass.
- Hiemstra, R., & Brockett, R. G. (2012). *Reframing the Meaning of Self-Directed Learning: An Updated Model*. Paper presented at the the 54th Annual Adult Education Research Conference, Saratoga Spring.
- Houston, A., & McNamara, J. (1999). *Models of adaptive behaviour*. Cambridge, UK ; New York, N.Y.: Cambridge University Press.
- Kai, P. (2009). Modeling spaces for self-directed learning at university courses. *Journal of Educational Technology & Society*, 12(3), 23-43. Retrieved from <http://www.jstor.org/stable/jeductechsoci.12.3.23>
- Knowles, M. S. (1975). *Self-directed learning : a guide for learners and teachers*. Chicago: Association Press.
- Long, H. B., & Agyekum, S. K. (1984). Teacher ratings in the validation of Guglielmino's self-directed learning readiness scale. *Higher Education*, 13(6), 709-715.
- Loyens, S., Magda, J., & Rikers, R. (2008). Self-Directed Learning in Problem-Based Learning and its Relationships with Self-Regulated Learning. *Educational Psychology Review*, 20, 411-427.
- Lynn, M. R. (1986). Determination and quantification of content validity. *Nurs Res*, 35(6), 382-385.
- Katy, M. (2022). COVID-19: Briefing note #88, January 19, 2022. *COVID-19: Implications for business*. Retrieved from <https://www.mckinsey.com/business-functions/risk-and-resilience/our-insights/covid-19-implications-for-business>
- Merriam, S. B., & Caffarella, R. S. (1991). *Learning in adulthood : a comprehensive guide*. San Francisco: Jossey-Bass.

- Tough, A. M. (1979). *The Adult's Learning Projects: A Fresh Approach to Theory and Practice in Adult Learning*: Ontario Institute for Studies in Education.
- Tuntavanitch, P., & Jindasri, P. (2018). The Real Meaning of IOC. *Journal of Educational Management, Mahasarakham university*, 24(2), 3-12.
- Turner, R., & Carlson, L. (2003). Indexes of Item-Objective Congruence for Multidimensional Items. *International Journal of Testing*, 3, 163-171.
- Williams, B., & Brown, T. (2013). A confirmatory factor analysis of the Self-Directed Learning Readiness Scale. *Nurs Health Sci*, 15(4), 430-436.
- Williamson, S. N. (2007). Development of a self-rating scale of self-directed learning. *Nurse Res*, 14(2), 66-83.
- Zamanzadeh, V., Ghahramanian, A., Rassouli, M., Abbaszadeh, A., Alavi-Majd, H., & Nikanfar, A. R. (2015). Design and Implementation Content Validity Study: Development of an instrument for measuring Patient-Centered Communication. *J Caring Sci*, 4(2), 165-178.

SCIENCE, TECHNOLOGY AND BCG ECONOMY

Development of Mycelium Sheet from Oyster Mushroom, *Pleurotus* SP.

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Abstract

Alternative materials derived from mushroom mycelium have gained increasing attention to replace others like leather, wood pulps and plastic because mushrooms, as environmental friendly and biodegradable matter, can grow rapidly and can be cultured in a controlled environment. This study aimed to develop mycelium sheets from a commercially available mushroom, *Pleurotus* sp. or oyster mushroom, a well-known food source of protein and minerals. The oyster mushrooms were purchased from a local market in Muang district, Khon Kaen province, and were isolated and cultured in malt extract broth (MEB) for 30 days to form a mycelium sheet on top of the growth medium. After that, the obtained oyster mycelium sheet (OMS) was dried before testing material properties. According to the scanning electron microscope images, the sheet surface was covered with a biofilm. In the water absorption test, the weight increased by $58.33 \pm 6.94\%$ after being exposed to 80-85% humidity for 48 hours. The water contact angle with distilled water was 131.4 ± 26.9 degrees, and the OMS had a tensile strength of 1.57 ± 1.03 Mpa. The hardness value was 17.1 ± 5.5 HV. The peaks in the infrared spectrum of OMS showed the presence of vibrational bonds from proteins, polysaccharides, and lipids. The biodegradability test revealed that the sheet weight decreased by 93%, 93%, and 97%, when being buried in soil, soaked in water, and placed on top of the soil surface for 7 days, respectively. The findings of this study showed the OMS was environmentally friendly for the future alternative material.

Keywords: Mycelium; Sheet; Mushrooms; Mushroom based material; Oyster mushroom.

1.Introduction

Plastics play an important role in various industries and also a part of daily consumption in different products, but their long period of degradation results in long-term

problems to the environment including marine life, soil, ecosystem, and natural resources (Derraik, 2002, pp. 842-852; Wilcox et al., 2018, pp. 1-9). For instance, face masks with plastic fibers have become a part of people's regulatory materials. The number of single-use masks is rapidly raising concerns, and masks found on streets and water sources are harmful to the

environment and living creatures (Fadare & Okoffo, 2020, pp. 1-4). One of the solutions is to replace the synthetic plastic with natural fibers or bioplastics that are more environmentally friendly.

Due to advances in materials science, innovative bio-based materials have been developed as alternatives to non-biodegradable plastics (Ariga et al., 2012, pp. 1-9). Mushroom mycelium is one of the interesting renewable fiber materials that has been applied in different industries (Camere & Karana, 2017, p. 106) such as bio-composite materials for architecture and construction (Girometta et al., 2019, pp. 1-17), and green packaging (Holt et al., 2012, pp. 431-439). Moreover, fibers from mushrooms are also modified for other purposes such as meat replacements (Kauffman, 2019), nutrient accumulation medium (Li et al., 2019, pp. 1-13), mycelium paper from *Pleurotus ostreatus* (Appels et al. 2018, pp. 1-7), wastewater treatment (Mir-Tutusa et al., 2019), furniture, textiles (Ecovative Design LLC, 2020), leather craft (MycoWorks, 2021), a composite material to reduce heat (Jones et al., 2018, pp. 1-7), footwear products (Silverman et al., 2020, pp. 119-131), activated carbons for supercapacitor applications (Hao et al., 2018, pp. 1-7) and carbon anodes for Li-ion batteries (Campbell et al., 2015, pp. 1-8). These applications show the potential of the mushroom mycelia as an interesting alternative material.

Oyster mushroom (*Pleurotus* sp.) is a local mushroom that is commercially cultured and available in local markets. Therefore, due to the versatility of the mushroom and fast-growing ability in controlled condition, it was the interest of this project to create the 2-dimensional material from this mushroom so called oyster mycelium sheet (OMS) and to test its properties to determine the material potential.

2. Research Objectives

1. To make the mycelium sheet from Oyster mushroom (*Pleurotus* sp.) under controlled conditions.
2. To test material properties of the mycelium sheet (morphology, flexibility, hardness, structural properties, water uptake, water protection, and biodegradability).

3. Literature Review

Mushrooms are macrofungi with fruiting bodies or basidiocarps that are dominant in fungi of the class Basidiomycetes (Miles & Chang, 1997, p. 3). The spores can be branched as many as possible to increase the number of hyphae tips in mycelium for growth benefit (Harris, 2019, p. 35-39). In this study, the mushroom *Pleurotus* sp. was chosen (Basidiomycota). Also known as an oyster mushroom, *Pleurotus* is the second most cultivated edible mushroom (Sánchez, 2010, pp. 205-211) and is distributed on every continent except Antarctica. Oyster mushrooms are rich in primary and secondary metabolites and physiologically important chemical constituents. For example, vitamin C, vitamin B12, riboflavin, thiamin, oleic acid, and linolenic acid help in lowering cholesterol levels, and blood sugar, have antioxidant and anti-cancer properties, and can strengthen the immune system. The *Pleurotus* is classified as a medicinal mushroom and is used in cosmetics and for treatment of diabetes, arteriosclerosis, and cancer (Piska et al., 2017, pp. 151-158). Apart from its nutritional and medicinal values,

the mushroom is also used as the natural fibers reinforced with synthetic polymers carbon-based and polysaccharide-based nanofibers. Nano cellulose fibers isolated from plant fibers were used in the early days. After that, nano-chitin fibers were extracted from crustaceans shells and fungi (Nawawi et al., 2020, pp. 30-47). Novel biobased materials from mushroom mycelia are now becoming more favorable as sustainable alternatives in various applications. According to Cerimi et al. (2019, pp. 1-10), a large number of mushrooms have been used to produce 27 biomaterials, i.e., 12 species of Agaricales, 9 species of Polyporales, 1 species of Russulales, and various ascomycete mushrooms. Some of the studies on the innovations from mushrooms have been summarized in Table 1.

Table 1. Innovations from some mushroom species

Mushroom	Innovation	References
<i>Schizophyllum commune</i>	Mycelial films	Appels et al. 2018, pp. 1-7
<i>Agaricus bisporus</i>	Mycelial films	Nawawi et al. 2019, pp. 30–55
<i>Agaricus bisporus</i>	Chitin nanopaper	
<i>Pleurotus ostreatus</i>	Mycelium paper	Appels et al. 2019, pp. 64–71
<i>Trametes multicolor</i>		
<i>Agaricus bisporus</i>	Chitin-glucan nanopaper	Nawawi et al. 2019, pp. 30–55
<i>Ganoderma lucidum</i>	Footwear	Silverman et al. 2020, pp. 119-131
<i>Pleurotus florida</i>		
<i>Pleurotus citrinopileatus</i>		
<i>Pleurotus eryngii</i>		
<i>Pleurotus pulmonarius</i>	Paper	Mazur, 2015, p. 68
<i>Pleurotus ostreatus</i>		
<i>Phellinus ellipsoideus</i>	Leather	Bustillos et al. 2020, p. 3145–3156
<i>Ganoderma lucidum</i>	Sheet	Haneef et al. 2017, p. 41292
<i>Pleurotus ostreatus</i>		

Oyster mushroom (*Pleurotus* sp.) is a commercially available mushroom that can be cultured under controlled conditions. Types of culture media are therefore influential to the mushroom growth. Malt Extract (ME) medium in both agar and broth form as one of the media for fungal culture consists of the water-soluble portion of malted barley containing simple sugars as the basic nutrients for fungi and mushrooms. Maurya et al. (2019, p. 88-92) studied six different culture media for mycelial growth of *Pleurotus ostreatus* and found that it could grow well in Potato Dextrose Agar (PDA) and ME agar (MEA), 8.960 and 8.820 mm in 7 days. Also, Ibekwe et al. (2008, p. 350) cultured oyster mushroom (*P. ostreatus*) mycelia on ME medium with different initial pH values. The results suggested that the mycelial growth in ME Broth (MEB) with pH 6.5 produced the highest mycelium yield. Thus, this condition for the oyster mushroom was applied to the culture environment in this study to obtain the mycelium sheets from *P. ostreatus*.

4. Research Methodology

4.1 Mushroom isolation and culture

Fresh *P. ostreatus* mushrooms were purchased from a local market in Muang district, Khon Kaen. The inner parts of the mushroom were aseptically placed on Potato Dextrose Agar (PDA) and incubated for 7 days to derive the pure mushroom mycelia. Then, the pure oyster plugs were transferred to the autoclaved liquid culture medium Malt Extract Broth (MEB) containing malt extract (20 g), peptone (10 g) and glucose (20 g) in 1000 mL distilled water. The mycelium plugs were incubated in Erlenmeyer flasks (150 mL) containing the liquid media (50 mL) in a stationary condition to let the mycelia grow on the surface of the MEB at room temperature. The flasks were not exposed to direct sunlight for 30 days.

4.2 Production of mycelium sheets

After 30 days, the oyster mycelium sheets (OMS) were removed from the flask, rinsed with clean water and then placed in a hot air oven at 60 °C for 3-6 hours to dry the sheet and inhibit further mushroom growth. The dried OMS were collected and kept in sealed bags containing silica beads for materials properties testing (Mazur, 2015, p. 5).

4.3 Properties tests

The OMS were tested for their properties to determine the potential of the materials, which were morphology, flexibility test, hardness test, structural properties, water uptake, water protection and biodegradability.

4.3.1 Morphology

Morphological features of the OMS were captured and visualized under a scanning electron microscopy (SEM) S-3000N. Small pieces (1 mm × 1 mm) were fixed on a copper plate and coated with gold by Emitech sputter coater K500X before the visualization.

4.3.2 Flexibility test

The flexibility test was performed using a dual column universal testing machine (Lloyd Instruments LR30K). The samples were cut into a rectangular shape (4 mm × 25 mm) and subsequently attached to the clamps of the machine. The deformed rate was set at 2 mm/min until failure. The ultimate tensile strength (UTS) and test-load value (max-min) were calculated using NEXYGEN™ PLUS Materials Testing Software. This experiment was done with 5 replicates.

4.3.3 Hardness test

The OMS were fixed on wooden cubes before testing with microhardness tester Future-Tech FM-800 machine (Vickers hardness). The force was set at 50 gf/15 sec and FT-ARS software version 1.15.13 (Future-Tech Corporation, Japan) was used to calculate the surface hardness values (HV). This test was conducted in 5 replicates.

4.3.4. Structural properties

The samples were analyzed for functional groups and bonds by attenuated total reflection-Fourier transform infrared spectra (ATR-FTIR) using FT-IR Spectrometer Bruker Optik GmbH Tensor 27 in the range of 4000-400 cm⁻¹ (Ketkaew et al., 2018, p. 312; Ounkaew et al., 2018, p. 3).

4.3.5 Water uptake

Three pieces of dried OMS were weighed and placed inside a moist chamber (relative humidity 85-90%). The weight of the OMS was measured after 60, 120, 180, 240 min, and 24 and 48 hr. The mean and SD of the three pieces was calculated from the water absorption increase from the initial dry weight (Ketkaew et al., 2018, p. 312; Ounkaew et al., 2018, p. 3).

4.3.6 Water protection

The water protection was assessed by measuring the water contact angle with a contact angle (CA) goniometer. The OMS was flattened using 2 pieces of cover glasses. Then, a 5 μ L water droplet was deposited onto the white surface of the OMS and the side view images of the water drops on the sample surface were captured at room temperature. The CA was automatically calculated using Optical Contact Angle 15EC dataphysics-instruments, and the average contact angle with standard deviations of five spots is reported (Giridhar et al., 2017, p. 173-193).

4.3.7. Biodegradability

The OMS (0.1 g) was put inside a teabag and placed in 3 different conditions for 21 days: 1) left on the soil surface, 2) buried inside at the center of the soil and sand mixture (1:1) at 85-90% relative humidity, and 3) under water. The conditions 1 and 2 were set inside transparent boxes with pores to remove the excess water and to provide air flow, and the soil was watered every 3 days to maintain the moisture. For condition 3, the teabags with OMS were immersed in bottles containing 150 mL water collected from a natural reservoir. The teabags from all conditions were gently rinsed with water and dried in a hot air oven at 60 °C for 3 hr. and weighed every 7 days (Ibrahim et al., 2014, p.13; Ounkaew et al., 2018, p. 3). Each test was carried out in triplicate.

5. Results

5.1 Production of mycelium sheets

After 30 days of incubation, the oyster mushroom mycelia fully grew on the MEB surface as shown in Fig. 1A. The fresh mycelia sheet in the flask was densely woven with a filamentous structure. Once the sheets were dried, they still stayed in the circular shape and the texture of the OMS was soft like sponge and frail. The top side of the dried OMS was white, and the bottom side attached to the media was brown (Figs. B and C).

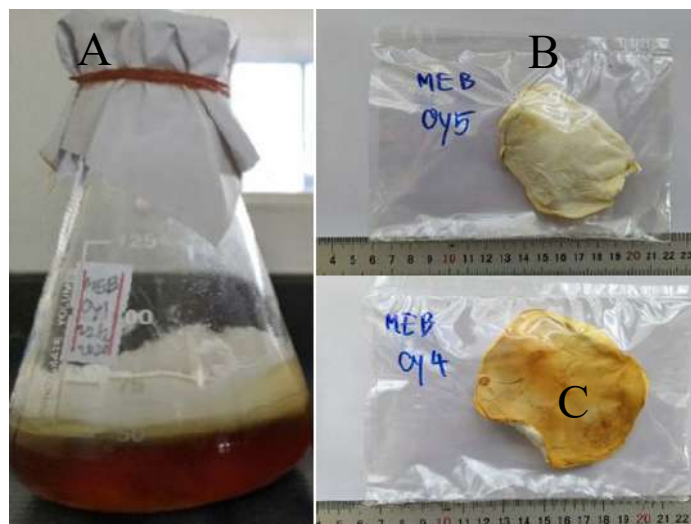


Figure 1. Oyster mushroom mycelium at 30 days in malt extract broth (A), dried oyster mycelium sheet with white (B) and brown colors (C).

5.2 Properties tests

5.2.1 Morphology

The SEM images show the morphological features of the OMS as interweaving structures of the mushroom mycelium (Fig. 2). As a result, this crosslinking provided pores in between the mycelia (Figs. B and C). Parts of the OMS surface were covered with a thin biofilm (Fig. B).

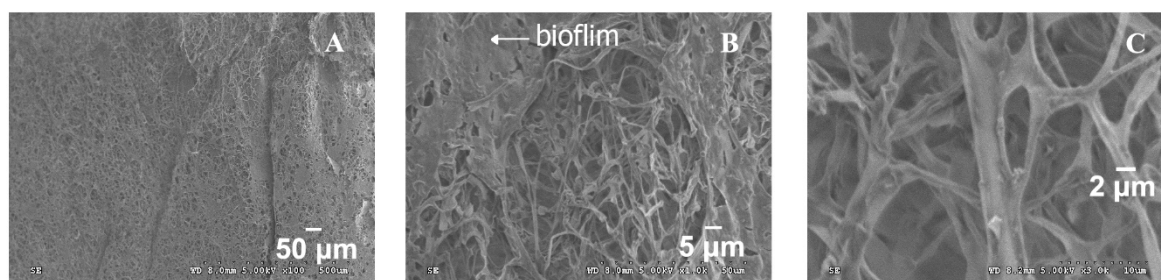


Figure 2. Scanning electron micrographs of the oyster mycelium sheet. The sheet is porous and formed by the tightly interweaving structure of the mycelia sheet (A-C) and covered with the biofilm (B).

5.2.2 Hardness and flexibility tests

The hardness test was to measure the hardness of the material surface. The result of the hardness test with the force applied on OMS at 50 gf/15 sec. Due to the force, it gave an inverted pyramid-like structure on the surface of the OMS (Fig. 3). A clear pyramid shape refers to a high material hardness. However, the OMS performance on this test yielded only the unclear shape meaning that this material was very soft. Quantitatively, the average hardness value of the OMS was 17.1 ± 5.5 HV. To determine the flexibility of the OMS, the ultimate tensile strength obtained from the calculation was 1.57 ± 1.03 Mpa (Table 2). This value suggested that the OMS had very low flexibility because of its soft and brittle texture.

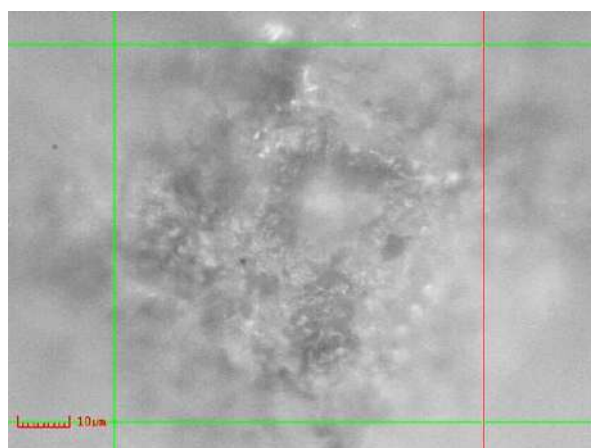


Fig. 3. The shape of the inverted pyramid visualized by the micro hardness tester on the oyster mycelium sheet

Table 2. Hardness values and ultimate tensile strength values of Oyster mycelium sheet in Malt Extract Broth

Sheet	Hardness (HV)	Ultimate tensile strength (Mpa)
OMS	17.1±5.5	1.57±1.03

5.2.3 Structural interaction

The functional groups found in the OMS based on the spectra obtained from FTIR spectroscopy were OH, CH, CO, and amide I groups (Fig. 4). According to Khan et al., (2019), the peaks at 3200 cm⁻¹ are ascribed to OH and CH groups. At 2900, 1600, 1000 cm⁻¹, they are the spectral ranges of CH, amides and CO respectively. These are the main functional groups of proteins, polysaccharides and lipids.

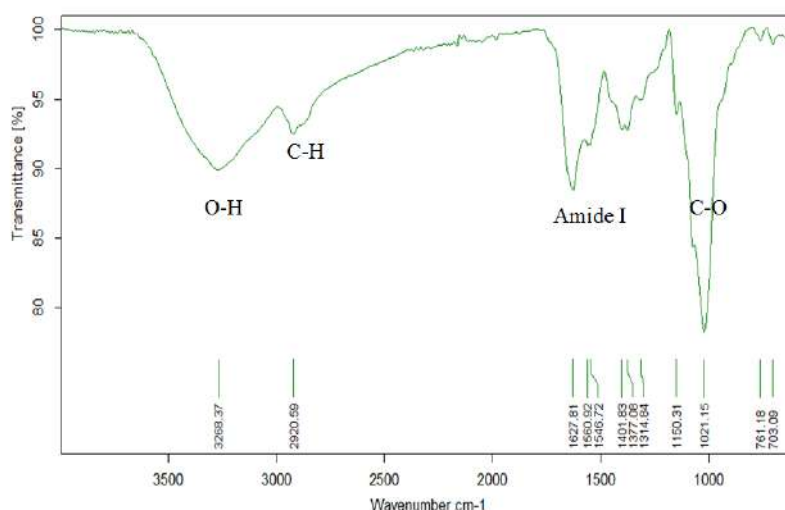


Figure 4. Functional groups determined from the oyster mycelium sheet using Fourier transform infrared spectroscopy

5.2.4 Water uptake

The water absorption of OMS increased with time (Fig. 5). Within the first 60 min of exposure, the weight rapidly increased and became steady in the next 3 hours. At 24 and 48 hr. of exposure, the OMS weight was found to increase again. However, the experiment could not be proceeded for longer than 48 hours due to the microbial degradation on the material.

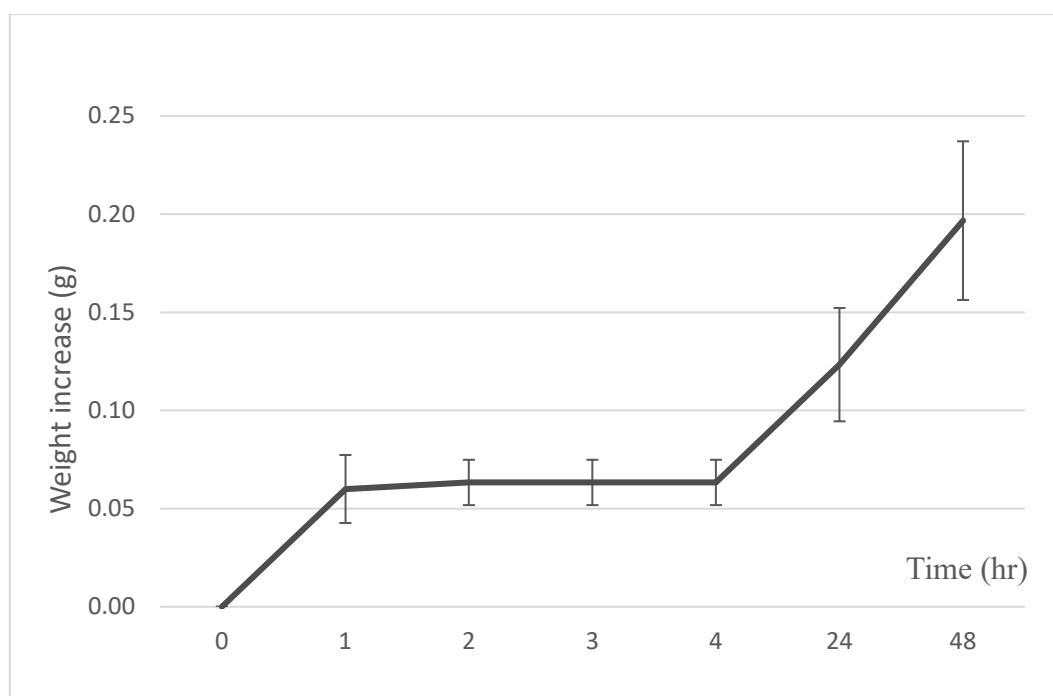


Figure 5. Water uptake of the oyster mycelium sheet for 48 hr.

5.2.5 Water protection

The water protection ability is determined based on the water contact angle. The contact angle of the water droplet on the OMS was $131.4 \pm 26.9^\circ$ (Fig. 6). This high-water contact angle implies that the OMS surface is hydrophobic and can provide protection against water.

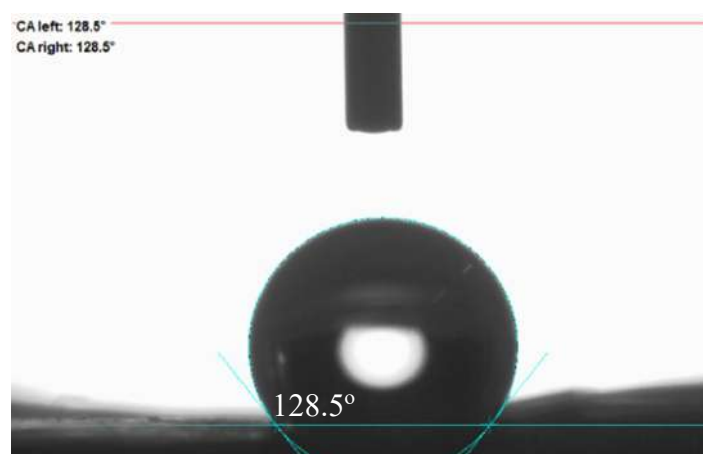


Fig.6. The water contact angle of the oyster mycelium sheet at 128.5°

5.2.6 Biodegradability

After 7 days of OMS buried in the soil mixture (BS) and soaking in water (SW), the weight of the material decreased more than 93% but the weight of the OMS placed on top of the soil surface (SS) disappeared more than 97% based on the initial dry weight. On day 14, the weight loss of the OMS was 97% for SW condition and 100% for BS and SS settings. The OMS were completely degraded after 21 days in each condition (Fig.7).

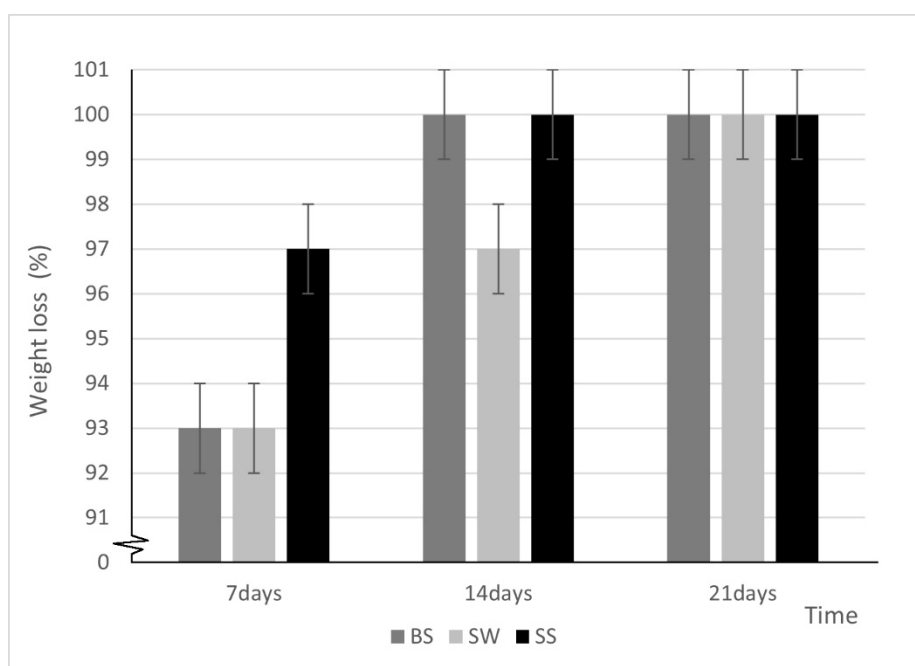


Fig.7. Biodegradability measured by the weight loss (%) of the oyster mycelium sheet in 3 different conditions; being buried in the soil (BS), soaked in water (SW) and placed on soil surface (SS) for 7, 14 and 21 days.

6. Discussion and Conclusion

The texture of the OMS was morphologically comparable to commercial paper but its toughness was inferior because the OMS sheet was composed of the filamentous structure of the mycelia. After drying, the mushroom mycelia became very fragile. The electron microscopic images revealed that the OMS was porous and partially coated with a biofilm. The porosity is a result of the mycelial crosslinking and can explain the good water absorbency, since the weight rapidly increased in the first hour of moisture exposure. This finding was similar to the study by Appels et al. (2019, p. 64–71). They created mycelium composites from the oyster mushroom (*P. ostreatus*) with rapeseed straw. Their composites were able to absorb a higher amount of water in the first 2 hr. and the water sorption was stable after 12 hr. This shows that the OMS was potentially able to absorb the moisture.

The hydrophobic performance of the OMS was determined from the water contact angle, where a higher value implies a better waterproof ability. The OMS revealed a relatively high-water contact angle of $131.4 \pm 26.9^\circ$. This may be due to the biofilm on the surface of the OMS protecting the water droplets. In contrast, Nawawi et al. (2020, pp. 6492-6495) produced paper from blue swimming crab shells, *Agaricus bisporus* and polypores mushrooms. The paper from these components gave relatively low water contact angles of 65.6° , 24.2° and 54.5° , respectively. The higher contact angle of the OMS implies the good potential to prevent against water attack onto the material surface.

The hardness and flexibility of the OMS were very low (17.1 ± 5.5 HV for the surface hardness and 1.57 ± 1.03 MPa for the flexibility) because of its soft and fragile texture. In other studies, the polymer composites obtained from kenaf fibers by Abdullahi et al. (2018) showed the hardness value at 64.5-83 HRL based on Rockwell hardness test (more than 600 HV) which is

higher than the OMS in this study. Meanwhile, the hardness value of the orange peel polymer composite (a combination of resin and orange peel) reported by Ojha et al. (2012, pp. 190-194) was 17.89-20.72 HV, which is similar to that of the OMS. In another study, Appels et al. (2018, pp. 1-7) used *Schizophyllum commune* to make the mycelium-based composites. The resulting tensile strength was 5.1-9.6 MPa, which was around 4 times higher than the OMS. In addition, Nawawi et al. (2020, pp. 190-194) report the tensile strengths for the *A. bisporus*, crab shell and polypore mushroom of respectively 204.4, 65-204 and 65.3Mpa, which were also higher than the OMS. As a result, the OMS should be modified to improve its hardness and flexibility.

The functional groups of the natural fiber in the OMS were also determined. Based on the FTIR spectra, it could be interpreted that the OMS contained OH, CH, CO, and amide I groups. Similar results were reported by Appels et al. (2018, pp. 1-7), the mycelium film from *S. commune*, and the mycelium leather from *Phellinus ellipsoideus* (Bustillos et al., 2020, pp. 3145-3156), who found OH, CH, CO, and amide I group because the materials were composed of natural polymers (chitin from shrimp shell and mushroom mycelia), meaning that these materials could be biodegraded. In this study it was demonstrated that OMS could be naturally decomposed in a very short time (1-3 weeks). This is in congruence with Ounkaew et al. (2018, pp. 8-9), who developed the polyvinyl alcohol/starch film for biopackaging and this film was able to be degraded naturally by 65.28–86.64% in 30 days.

In consequences of the material testing, the OMS needs to be modified with other materials in order to enhance the mechanical strength. For instance, the materials could be co-cultured with other mushrooms giving the greater stiffness to the texture or coated with other polymers (e.g., resins) to enhance the flexibility. However, this OMS was made purely from the mushroom mycelia that assured the environmental friendliness. This study provides the first light to achieve the practical alternative material from mushroom mycelia.

7. Acknowledgements

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8. References

- Abdullahi, T., Harun, Z., Othman, M. H. D., Aminu, N., Gabriel, O., Aminu, T., Ibrahim, S. A., & Kamarudin, N. H. (2018). West African kenaf (*Hibiscus Cannabinus* L.) natural fiber composite for application in automotive industry. *Malaysian Journal of Fundamental and Applied Sciences*, 14(4), 397–402. <https://doi.org/10.11113/mjfas.v14n4.1212>
- Appels, F. V. W., Camere, S., Montalti, M., Karana, E., Jansen, K. M. B., Dijksterhuis, J., Krijgheld, P., & Wösten, H. A. B. (2019). Fabrication factors influencing mechanical, moisture- and water-related properties of mycelium-based composites. *Materials & Design*, 161, 64–71. <https://doi.org/10.1016/j.matdes.2018.11.027>
- Appels, F. V. W., Dijksterhuis, J., Lukasiewicz, C. E., Jansen, K. M. B., Wösten, H. A. B., & Krijgheld, P. (2018). Hydrophobin gene deletion and environmental growth conditions impact mechanical properties of mycelium by affecting the density of the material. *Scientific Reports*, 8(1), 4703. <https://doi.org/10.1038/s41598-018-23171-2>

- Ariga, K., Ji, Q., Hill, J. P., Bando, Y., & Aono, M. (2012). Forming nanomaterials as layered functional structures toward materials nanoarchitectonics. *NPG Asia Materials*, 4(5), e17. <https://doi.org/10.1038/am.2012.30>
- Bustillos, J., Loganathan, A., Agrawal, R., Gonzalez, B. A., Perez, M. G., Ramaswamy, S., Boesl, B., & Agarwal, A. (2020). Uncovering the Mechanical, Thermal, and Chemical Characteristics of Biodegradable Mushroom Leather with Intrinsic Antifungal and Antibacterial Properties. *ACS Applied Bio Materials*, 3(5), 3145–3156. <https://doi.org/10.1021/acsabm.0c00164>
- Camere, S., & Karana, E. (2017). *Growing materials for product design*. International Conference on Experiential Knowledge and Emerging Materials, Delft, The Netherlands. (pp. 101-115).
- Campbell, B., Ionescu, R., Favors, Z., Ozkan, C. S., & Ozkan, M. (2015). Bio-Derived, Binderless, Hierarchically Porous Carbon Anodes for Li-ion Batteries. *Scientific Reports*, 5(1), 14575. <https://doi.org/10.1038/srep14575>
- Cerimi, K., Akkaya, K. C., Pohl, C., Schmidt, B., & Neubauer, P. (2019). Fungi as source for new bio-based materials: A patent review. *Fungal Biology and Biotechnology*, 6(1). <https://doi.org/10.1186/s40694-019-0080-y>
- Derraik, J. G. (2002). The pollution of the marine environment by plastic debris: A review. *Marine Pollution Bulletin*, 44(9), 842–852.
- Ecovative Design LLC. (2020). *Feast of the Future*. Ecovative Design. Retrieved from <https://ecovativedesign.com/news> (07, 20, 2021).
- Fadare, O. O., & Okoffo, E. D. (2020). Covid-19 face masks: A potential source of microplastic fibers in the environment. *Science of The Total Environment*, 737, 140279. <https://doi.org/10.1016/j.scitotenv.2020.140279>
- Giridhar, G., Manepalli, R. K. N. R., & Apparao, G. (2017). Chapter 8—Contact Angle Measurement Techniques for Nanomaterials. In S. Thomas, R. Thomas, A. K. Zachariah, & R. K. Mishra (Eds.), *Thermal and Rheological Measurement Techniques for Nanomaterials Characterization* (pp. 173–195). <https://doi.org/10.1016/B978-0-323-46139-9.00008-6>
- Girometta, C., Picco, A. M., Baiguera, R. M., Dondi, D., Babbini, S., Cartabia, M., Pellegrini, M., & Savino, E. (2019). Physico-Mechanical and Thermodynamic Properties of Mycelium-Based Biocomposites: A Review. *Sustainability*, 11(1), 281. <https://doi.org/10.3390/su11010281>
- Haneef, M., Ceseracciu, L., Canale, C., Bayer, I. S., Heredia-Guerrero, J. A., & Athanassiou, A. (2017). Advanced Materials From Fungal Mycelium: Fabrication and Tuning of Physical Properties. *Scientific Reports*, 7(1), 41292. <https://doi.org/10.1038/srep41292>
- Hao, J., Huang, Y., He, C., Xu, W., Yuan, L., Shu, D., Song, X., & Meng, T. (2018). Bio-templated fabrication of three-dimensional network activated carbons derived from mycelium pellets for supercapacitor applications. *Scientific Reports*, 8(1), 562. <https://doi.org/10.1038/s41598-017-18895-6>
- Harris, S. D. (2019). Hyphal branching in filamentous fungi. *Developmental Biology*, 451(1), 35–39. <https://doi.org/10.1016/j.ydbio.2019.02.012>
- Holt, G., McIntyre, G., Flagg, D., Bayer, E., Wanjura, J., & Pelletier, M. (2012). Fungal mycelium and cotton plant materials in the manufacture of biodegradable molded packaging material: Evaluation study of select blends of cotton byproducts. *Journal of Biobased Materials and Bioenergy*, 6(4), 431–439.

- Ibekwe, V. I., Azubuikwe, P. I., Ezeji, E. U., & Chinakwe, E. C. (2008). Effect of nutrient sources and environmental factors on the cultivation and yield of oystermushroom (*Pleurotus ostreatus*). *Pakistan Journal of Nutrition*, 7–349.
- Ibrahim, H., Farag, M., Megahed, H., & Mehanny, S. (2014). Characteristics of starch-based biodegradable composites reinforced with date palm and flax fibers. *Carbohydrate Polymers*, 101, 11–19. <https://doi.org/10.1016/j.carbpol.2013.08.051>
- Jones, M., Bhat, T., Kandare, E., Thomas, A., Joseph, P., Dekiwadia, C., Yuen, R., John, S., Ma, J., & Wang, C.-H. (2018). Thermal Degradation and Fire Properties of Fungal Mycelium and Mycelium—Biomass Composite Materials. *Scientific Reports*, 8(1), 17583. <https://doi.org/10.1038/s41598-018-36032-9>
- Kauffman, J. (2019). *There’s a New Source for Meat Substitutes: Fungi*. Retrieved from <https://www.wsj.com/articles/theres-a-new-source-for-meat-substitutes-fungi-11570647109> (07, 20, 2021).
- Ketkaew, S., Kasemsiri, P., Hiziroglu, S., Mongkolthanaruk, W., Wannasutta, R., Pongsa, U., & Chindaprasirt, P. (2018). Effect of Oregano Essential Oil Content on Properties of Green Biocomposites Based on Cassava Starch and Sugarcane Bagasse for Bioactive Packaging. *Journal of Polymers and the Environment*, 26(1), 311–318. <https://doi.org/10.1007/s10924-017-0957-x>
- Khan, A., Jahangir, M., Idrees, M., Jan, I., Samin, G., Zahid, A., Fozia, Ishaq, M., Peng, W., Lixin, L., Ming, F., & Fangjie, Y. (2019). Modulation of Agronomic and Nutritional Response of *Pleurotus eryngii* strains by Utilizing Glycine betaine enriched Cotton waste. *Journal of the Science of Food and Agriculture*, 99(15), 6911–6921. <https://doi.org/10.1002/jsfa.9977>
- Li, X., Yan, L., Li, Q., Tan, H., Zhou, J., Miao, R., Ye, L., Peng, W., Zhang, X., & Tan, W. (2019). Transcriptional profiling of *Auricularia cornea* in selenium accumulation. *Scientific Reports*, 9(1), 1–13.
- Maurya, A. K., Vinny John, D K Srivastava, & Pant, H. (2019). *Effect Of Media And Substrates For Spawn Production Of Dhingri Mushroom (Pleurotus ostreatus)*. *Journal of Natural Resource and Development*, 14(2), 88–92. <https://doi.org/10.13140/RG.2.2.21808.79362>
- Mazur, R. (2015). *Mechanical properties of sheets comprised of mycelium: A paper engineering perspective*. (Individual study). State University of New York College of Environmental Science and Forestry, New York.
- Miles, P. G., & Chang, S. (1997). *Mushroom Biology: Concise Basics and Current Developments*. Singapore: World Scientific.
- Mir-Tutusaus, J. A., Parladé, E., Villagrasa, M., Barceló, D., Rodríguez-Mozaz, S., Martínez-Alonso, M., Gaju, N., Sarrà, M., & Caminal, G. (2019). Long-term continuous treatment of non-sterile real hospital wastewater by *Trametes versicolor*. *Journal of Biological Engineering*, 13(1), 1–13.
- MycoWorks. (2021). *MycoWorks*. MycoWorks. Retrieved from <https://www.mycoworks.com/news> (07, 20, 2021).
- Nawawi, W. M. F. B. W., Jones, M., Murphy, R. J., Lee, K.-Y., Kontturi, E., & Bismarck, A. (2020). Nanomaterials Derived from Fungal Sources—Is It the New Hype? *Biomacromolecules*, 21(1), 30–55. <https://doi.org/10.1021/acs.biomac.9b01141>
- Nawawi, W. M. F. W., Jones, M. P., Kontturi, E., Mautner, A., & Bismarck, A. (2020). Plastic to elastic: Fungi-derived composite nanopapers with tunable tensile properties. *Composites Science and Technology*, 198, 108327. <https://doi.org/10.1016/j.compscitech.2020.108327>

- Ojha, S., Raghavendra, G., & Acharya, S. K. (2012). Fabrication and Study of Mechanical Properties of Orange Peel Reinforced Polymer Composite. *Caspian Journal of Applied Sciences Research*, 1(13), 190–194.
- Ounkaew, A., Kasemsiri, P., Kamwilaisak, K., Saengprachatanarug, K., Mongkolthanaruk, W., Souvanh, M., Pongsa, U., & Chindaprasirt, P. (2018). Polyvinyl Alcohol (PVA)/Starch Bioactive Packaging Film Enriched with Antioxidants from Spent Coffee Ground and Citric Acid. *Journal of Polymers and the Environment*, 26(9), 3762–3772. <https://doi.org/10.1007/s10924-018-1254-z>
- Piska, K., Sułkowska-Ziaja, K., & Muszyńska, B. (2017). Edible mushroom *Pleurotus ostreatus* (oyster mushroom)—Its dietary significance and biological activity. *Acta Scientiarum Polonorum - Hortorum Cultus*, 16(1), 151–161.
- Sánchez, C. (2010). Cultivation of *Pleurotus ostreatus* and other edible mushrooms. *Applied Microbiology and Biotechnology*, 85(5), 1321–1337. <https://doi.org/10.1007/s00253-009-2343-7>
- Silverman, J., Cao, H., & Cobb, K. (2020). Development of Mushroom Mycelium Composites for Footwear Products. *Clothing and Textiles Research Journal*, 38(2), 119–133. <https://doi.org/10.1177/0887302X19890006>
- Wilcox, C., Puckridge, M., Schuyler, Q. A., Townsend, K., & Hardesty, B. D. (2018). A quantitative analysis linking sea turtle mortality and plastic debris ingestion. *Scientific Reports*, 8(1), 12536. <https://doi.org/10.1038/s41598-018-30038-z>

Forecasting Diesel Consumption in Thailand Using Decomposition with SARIMAX-ANN Hybrid Model

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Abstract:

The main aim of this research was to study and compare five models of forecasting time series, namely 1) Artificial Neural Network model (ANN), 2) Seasonal Autoregressive Integrated Moving Average model (SARIMA), 3) Seasonal Autoregressive Integrated Moving Average with Exogenous Variable model (SARIMAX), 4) decomposition with SARIMAX model (DEC-SARIMAX) and 5) decomposition with SARIMAX model and ANN (DEC-SARIMAX-ANN). The source of time series data comes from the Energy Policy and Planning Office, Ministry of Energy of Thailand, was the monthly data from January of 2000 to December of 2021. The Mean Absolute Percentage Error (MAPE) and the Reduce Error Rate (RER) were used as the comparative criteria. The results showed that the decomposition with SARIMAX model and ANN (DEC-SARIMAX-ANN) was the most suitable model for forecasting the data of diesel consumption in Thailand. The decomposition with SARIMAX model and ANN had the lowest MAPE of 0.6511% and 0.4888% for 12 months and 24 months lead time forecasting, respectively, the highest RER of 86.1624% and 95.0217% for 12 months and 24 months lead time forecasting, respectively and the highest R-Squared of 99.8750%. We conclude that the hybrid model is an effective way to improve more accurate forecasting than a single forecasting method. The predicted diesel consumption in 2021 and 2022 were 22,353.25 million litres and 22,261.71 million litres, respectively. The diesel consumption in 2021 was predicted to increase 16.3874% from 2011 and in 2022 the diesel consumption was predicted to increase 15.9108% from 2011.

Keywords: Diesel Consumption; Decomposition; SARIMA; SARIMAX; ANN

1. Introduction

Forecasting diesel consumption is an important input in projecting trends in diesel demand and economic analysis of future renewable energy consumption in Thailand. These forecasting, projections, and economic analyses help the Thailand Ministry of Energy and diesel producers develop both medium-term and long-term plans. These plans need to be flexible, given the uncertainties of future consumption of diesel. Many countries have already been heavily consuming diesel in the past few years for transport and electricity generation. For example, based on reports from the U.S. Energy Information Administration, diesel consumption in the

U.S. grew from 326 million gallons in 2009 to 878 million gallons in 2011. The growth rate in 2011 was 69.3% compare to 2009. For diesel consumption in Thailand, the average growth rate of 3.21% per years is shown in Figure 1.

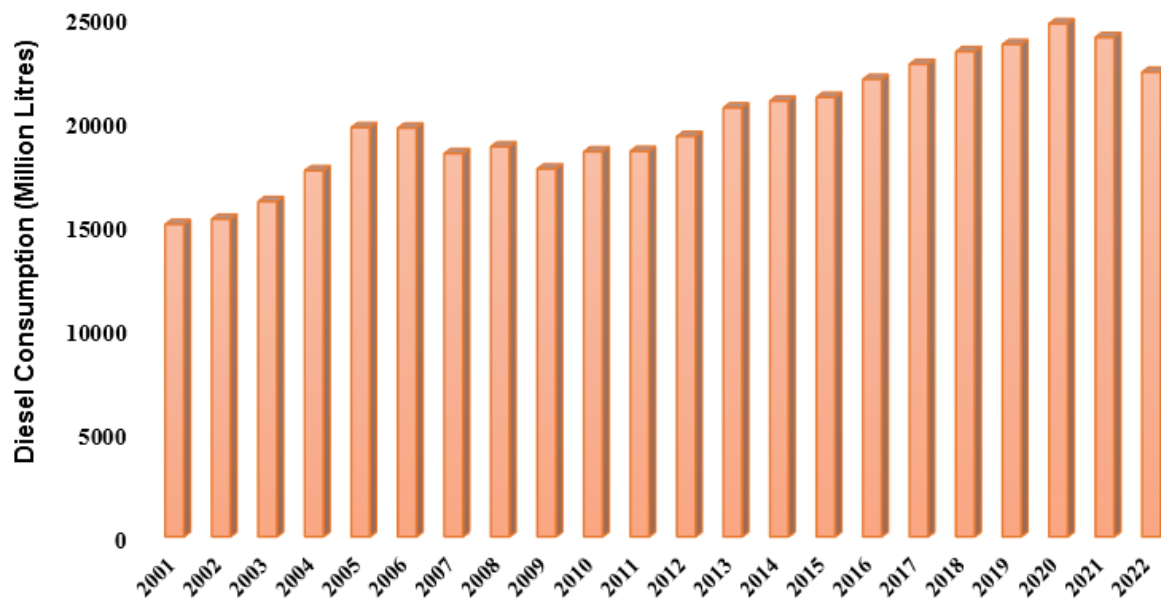


Figure 1: Diesel consumption in Thailand (Million Litres), 2000 – 2021.

In Thailand, even if the fuel consumption is increasing rapidly and the country has been affected by the high volatility of crude oil prices (due to surges in oil demand, particularly in Southeast Asia, and the political instability of major oil supply regions), consumption of diesel blends of 3% to 4% has increased. Therefore, Thailand Ministry of Energy and diesel producers use product demand forecasts for tactical planning such as production planning, and for inventory strategic planning to produce the diesel in Thailand.

In this paper, we present the performance of a hybrid models for time series using decomposition method with SARIMAX model and ANN model. The main aim of this paper is to determine the relative predictive capabilities of the decomposition method with SARIMAX-ANN models (DEC-SARIMAX-ANN). On the other hand, this paper aims to conclude which sequence of decomposition method with SARIMA and ANN is better for constructing series hybrid models for time series forecasting of the diesel consumption in Thailand. The rest of this paper is organized as follows: In the following Sections 4 explains the research methodology such as data preparation and model evaluation criteria, which use to experiment in this research. Results for comparing the forecasting techniques from real dataset are illustrated in Sections 5. The final section provides the conclusion and future research.

2. Research Objectives

1. To study and compare five models of forecasting time series, namely 1) Artificial Neural Network model (ANN), 2) Seasonal Autoregressive Integrated Moving Average model (SARIMA), 3) Seasonal Autoregressive Integrated Moving Average with Exogenous Variable

model (SARIMAX) , 4) decomposition with SARIMAX model (DEC-SARIMAX) and 5) decomposition with SARIMAX model and ANN (DEC-SARIMAX-ANN)

2. To study the factors affecting diesel consumption in Thailand.

3. To select the best and the most efficient model for diesel consumption forecasts in 2021-2022.

3. Literature Review

Researchers have paid significant attention to studies on the demand for fuel transportation, which commonly used the time series analysis approach (Houri and Baratimalayeri, 2008). A variety of energy demand forecasting methods have been applied over the years. Studies on the forecasting method revealed that no one best method exists for all conditions (Ghalekhondabi et al., 2017). The most common models in the energy-related demand forecasting area are time series models, regression-based formulations, and artificial neural network (ANN) (Kuster et al., 2017). Time series forecasting is a forecasting method in which past data for the variable are analyzed to generate a model (Zhang, 2003). The method is widely used to predict energy needs. A linear regression model also had been used in gasoline consumption forecasting (Sapnken et al., 2018) as well as ANN (Lai et al., 2014).

ARIMA models are widely used in time series data analysis (Suganthi and Samuel, 2012). However, Holt–Winters, an extension of exponential smoothing, is also broadly used to predict energy consumption and remains a reliable approach (Kays et al., 2018). Jiang et al. (2020) applied the enhanced Holt–Winters exponential smoothing to predict electricity consumption in China and concluded that this method generated accurate results with few sample data points. In contrast, (Ediger and Akar, 2007) used ARIMA and seasonal ARIMA (SARIMA) to forecast energy demand in Turkey. The neural network or ANN is another forecasting method that is based on the machine learning approach and can accommodate nonlinearity and linearity models. This methodology predicts the causal effect of variables (Chattopadhyay et al., 2019). Many forecasting studies used the neural network (NN) method because it generates accurate prediction results (Ryu et al., 2017). Although the NN has many advantages relative to the multiple regression method, it has limitations. Some of these limitations are that the model parameters cannot be identified, meaning that the functional relationship between variables is unrevealed (Detienne et al., 2003). Moreover, to obtain the minimum error, trial and error must be exercised many times (Ayyoub and Riaz, 2017).

4. Research Methodology

4.1 Data Preparation

In this paper, we have real monthly data sets, which are used to demonstrate the effectiveness of proposed methods such the diesel consumption in Thailand (Ministry of Energy, 2022) from January 2000 to December 2021 shows a seasonal pattern and fluctuations, giving a total of 264 observations.

Variables in this study

Y_t is diesel consumption in Thailand at time t . (Million litres)

$X_{1,t}$ is the production of diesel in Thailand at time t . (Barrels per month)

$X_{2,t}$ is the production of crude oil at time t . (Barrels per month)

$X_{3,t}$ is the production of liquefied petroleum gas at time t . (Million litres)

$X_{4,t}$ is sales of liquefied petroleum gas in Thailand at time t . (Million litres)

$X_{5,t}$ is diesel price in Thailand at time t . (Baht per litres)

$X_{6,t}$ is world crude oil price at time t . (U.S. dollars per barrel)

$X_{7,t}$ is consumer price index at time t . (Percent)

$X_{8,t}$ is monthly irregular index at time t . (Percent)

4.2 Model Construction

To assess the forecasting performance of different models, the dataset is divided into two samples of training and testing. The first part was the forecasting time series data in previous time from January 2000 to December 2019 for 240 months. This data set was used to construct model and select the suitable models in each forecasting models. As the second was the lead forecasting data from January 2020 to December 2021 for 24 months which separated into 2 types such that one year lead time forecasting (12 months) and two years lead time forecasting (24 months).

4.3 Time Series Model

4.3.1 Decomposition Method

An important goal in time series analysis is the decomposition of a series into a set of non-observables components that can be associated with different types of temporal variations such as trend, seasonal, cycle, and irregular. The most common forms are known as additive and multiplicative decompositions, which are expressed in equation (1) and (2), respectively.

$$Y_t = (T_t + S_t + C_t + I_t) + \varepsilon_t \quad (1)$$

$$Y_t = (T_t \times S_t \times C_t \times I_t) + \varepsilon_t \quad (2)$$

where, Y_t is the observation at time t .
 T_t is the trend component at time t .
 S_t is the seasonal component at time t .
 C_t is the cycle component at time t .
 I_t is the irregular component at time t .
 ε_t is the random error of the model at time t .

4.3.2 Seasonal Autoregressive Integrated Moving Average (SARIMA) Model

Seasonal Autoregressive Integrated Moving Average (SARIMA) Model is an extension of ARIMA that explicitly supports univariate time series data with a seasonal component. It adds three new hyperparameters to specify the autoregression (AR), differencing (I) and moving average (MA) for the seasonal component of the series, as well as an additional parameter for the period of the seasonality.

SARIMAX(p,d,q)(P,D,Q) $_s$ model:

$$Y_t = \beta_0 + \sum_{i=1}^k \beta_i X_{i,t} + \frac{\theta_q(B)\Theta_Q(B^S)}{\phi_p(B)\Phi_P(B^S)(1-B)^d(1-B^S)^D} \varepsilon_t \quad (7)$$

4.3.4 Artificial Neural Network (ANN)

Artificial Neural Network is computing algorithms that can solve complex problems, that consist of artificial neurons or nodes, which are information processing units arranged in layers and interconnected by synaptic weights (connections). Neurons can filter and transmit information in a supervised fashion in order to build a predictive model that classifies data stored in memory. ANN model is a three-layered network of interconnected nodes: the input layer, the hidden layer, and the output layer. The nodes between input and output layers can form one or more hidden layers. Every neuron in one layer has a link to every other neuron in the next layer, but neurons belonging to the same layer have no connections between them (see Figure 2).

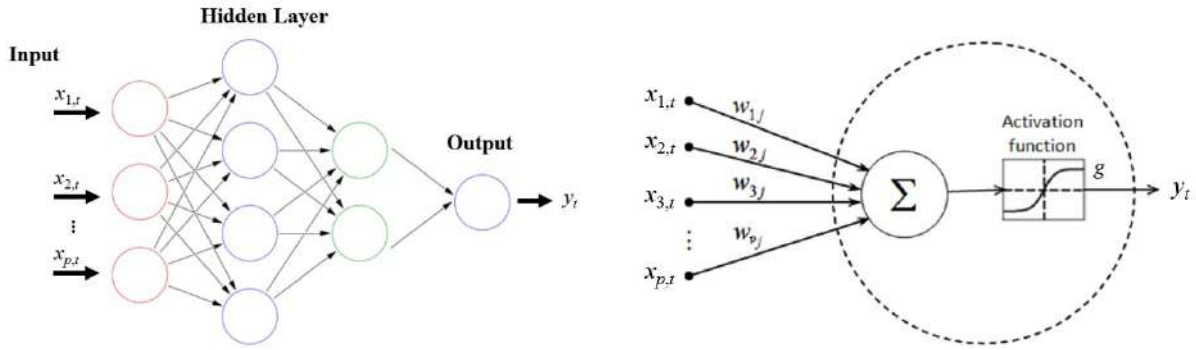


Figure 2: Architecture of artificial neural network and active node.

Input layer phase: The input layer receives information from the outside world, the hidden layer performs the information processing and the output layer produces the class label or predicts continuous values. For the time series problems, an ANN is fitted with past lagged value of actual data ($Y_{t-1}, Y_{t-2}, Y_{t-3}, \dots, Y_{t-p}$) as an input vector. Therefore, the input layer is composed of p nodes that are connected to the hidden layer.

Hidden layer phase: The hidden layer is an interface between input and output layers. The ANN model which are designed in this paper has two hidden layers with q nodes. In this step, one of the important tasks is determining the type of activation function $g(y)$ which is identifying the relationship between input and output layer (see Figure 2). Artificial neural networks support a wide range of activation functions such as linear, quadratic, tanh, and logistic. In this research, the tanh function is used as the hidden layer activation function that is shown in equation (8).

$$g(Y) = \frac{e^Y - e^{-Y}}{e^Y + e^{-Y}} \quad (8)$$

Output layer phase: In this step, by selecting an activation transfer function and the appropriate number of nodes, the output of the artificial neural network is used to predict the

future values of the time series. In this paper, the output layer designed by an artificial neural network contains one node because the one-step-ahead forecasting is considered. Also, the linear function as a non-linear activation function is introduced for the output layer. The formula of the relationship between the input and output layer is shown in equation (9).

$$Y_t = g_2 \left(w_0 + \sum_{j=1}^q w_j \cdot g_1 \left(w_{0,j} + \sum_{i=1}^p w_{i,j} \cdot X_{i,t} \right) \right) + \varepsilon_t \quad (9)$$

where, Y_t is the observation at time t .

$X_{i,t}$ is the input (i^{th} factor) at time t .

p is the number of the input vector in input layer; $i = 1, 2, \dots, p$.

q is the number of neurons in hidden layer; $j = 1, 2, \dots, q$.

g_1, g_2 are activate function.

$w_0, w_{0,j}$ are the initial weight and the initial weight in j^{th} hidden layer.

$w_j, w_{i,j}$ are the weight in j^{th} hidden layer and is the connection weight i^{th} node in j^{th} hidden layer.

ε_t is the random error at time t .

4.3.5 Proposed Method

We proposed the new hybrid methodologies combining linear model such as decomposition method with SARIMAX model and nonlinear model such as artificial neural network. This method includes three steps as follows (see Figure 3). It must be the first noted that, in the Zhang's hybrid model is the additive model shown in equation (10).

$$Y_t = L_t + N_t + \varepsilon_t \quad (10)$$

where, Y_t is the observation at time t , L_t denotes the linear component at time t and N_t denotes the non-linear component at time t , and ε_t is the random error at time t and t is a unit of time ($t = 1, 2, \dots, n$). These two components have to be estimated from the data. The first step, linear component is estimated by the decomposition with SARIMAX model. The decomposition with SARIMAX starts by decomposing in time series data into four parts such that irregular (I), trend-cycle (TC), trend-cycle-irregular (TCI) and seasonality (S) components by using multiplicative decomposition. SARIMAX is applied to the trend-cycle-irregular part to find model that the best describes it. After that, SARIMAX trend-cycle-irregular is then combined with seasonal index to make series of forecast values. Let e_t denote the residual of the DEC-SARIMAX model at time t :

$$e_t = Y_t - \hat{L}_t \quad (11)$$

The second step, an artificial neural network is used to model the residuals from the decomposition with SARIMAX. For p input nodes, the ANN model for the residuals will be:

$$MAPE \% = \frac{1}{n} \sum_{t=1}^n \left| \frac{Y_t - \hat{Y}_t}{Y_t} \right| \times 100$$

(17)

4.4.2 Reduce Error Rate (RER)

RER is a measure of reduce errors for proposed model when compares with original model as a ratio. RER is defined by the formula:

$$RER \% = \left(1 - \frac{MAPE_{Proposed}}{MAPE_{SARIMA}} \right) \times 100$$

(18)

If the RER equals 100% then forecasting by proposed method is the highest accuracy to the SARIMA method. Otherwise, If the RER equals 0% then accuracy of proposed method is not different from SARIMA method.

4.4.3 Coefficient of Determination (R^2)

R^2 is a statistic that will give some information about the goodness of fit of a model. R^2 is defined by the formula:

$$R^2 \% = \left(1 - \frac{\sum_{t=1}^n (Y_t - \hat{Y}_t)^2}{\sum_{t=1}^n (Y_t - \bar{Y})^2} \right) \times 100$$

(19)

If the R^2 equals 100% then the proposed method is well-fitting model. Otherwise, If the R^2 equals 0% then the proposed method is poorly fitting model.

5. Results

The results for diesel consumption dataset shows a seasonal pattern (see Table 1) which has a change in seasonal fluctuations (see Figure 4), giving a total of 264 observations. We are using ANN, SARIMA, SARIMAX, decomposition with SARIMAX model (DEC-SARIMAX) and the hybrid model between decomposition with SARIMAX model and ANN (DEC-SARIMAX-ANN) for 12 months and 24 months lead time forecasting and compare the models using MAPE and R^2 . The results are shown in Table 8. We have conducted experiments on RStudio and SPSS package.

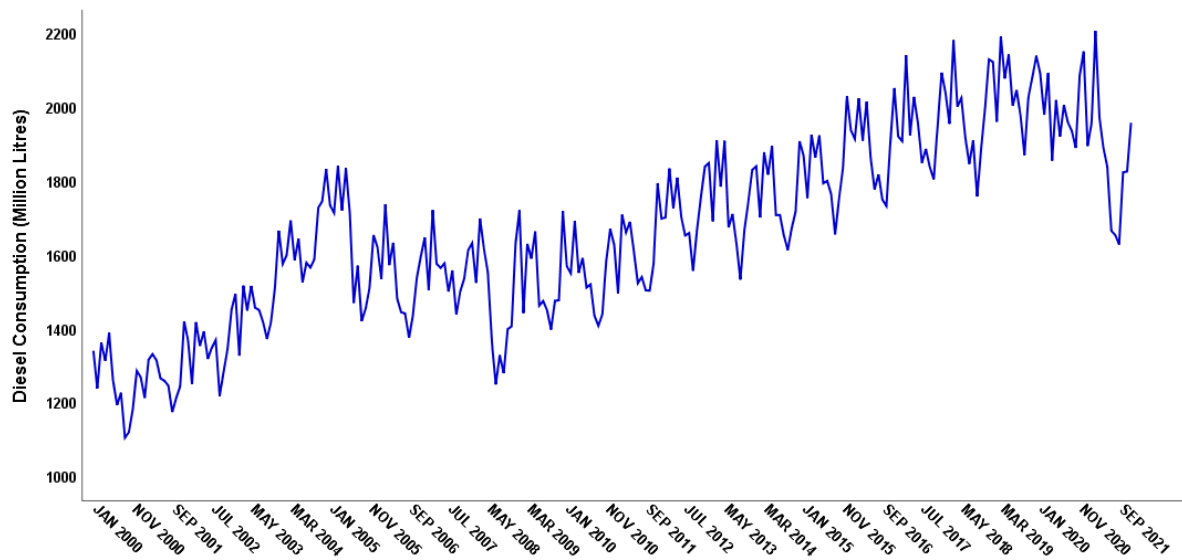


Figure 4: The time plots of the monthly diesel consumption in Thailand.

Table 1: Seasonal Index of diesel consumption in Thailand dataset.

Months	JAN	FEB	MAR	APR	MAY	JUN
Seasonal Index (S%)	104.08	98.65	108.91	102.37	105.05	98.10
Months	JUL	AUG	SEP	OCT	NOV	DEC
Seasonal Index (S%)	96.04	95.68	90.73	94.55	98.94	106.90

5.1 Artificial Neural Network (ANN)

Time series to be forecasted with artificial neural network which, set up training model 74.0% and testing model 26.0%. This structure has 12 inputs as $Y_{t-1}, Y_{t-2}, \dots, Y_{t-12}$, 2 hidden layers, each layers has 100 nodes respectively. Therefore we have the best structure in nonlinear part is ANN(12×100×100×1) as shown in equation (20) and (21).

$$Y_t = g_3 \left(\sum_{k=1}^{100} w_{k,j} \cdot g_2 \left(\sum_{i=1}^{100} w_{k,i} \cdot g_1 \left(\sum_{j=1}^{12} w_{j,i} \cdot Y_{t-j} + b_j \right) + b_i \right) + b_k \right) + \varepsilon_t \quad (20)$$

The forecasting equation of ANN(12×100×100×1) is

$$\hat{Y}_t = g_3 \left(\sum_{k=1}^{100} w_{k,j} \cdot g_2 \left(\sum_{i=1}^{100} w_{k,i} \cdot g_1 \left(\sum_{j=1}^{12} w_{j,i} \cdot Y_{t-j} + b_j \right) + b_i \right) + b_k \right) \quad (21)$$

5.2 SARIMA Model

In Figure 4, the series of observation shows non-stationary property then taking the first order difference ($d=1$ and $D=1$) of Y_t as shown Figure 5. which has Autocorrelation Function (ACF) at lag 35, 45 and 53, respectively. For Partial Autocorrelation Function (PACF) at lag 23, 45 and 53, respectively.

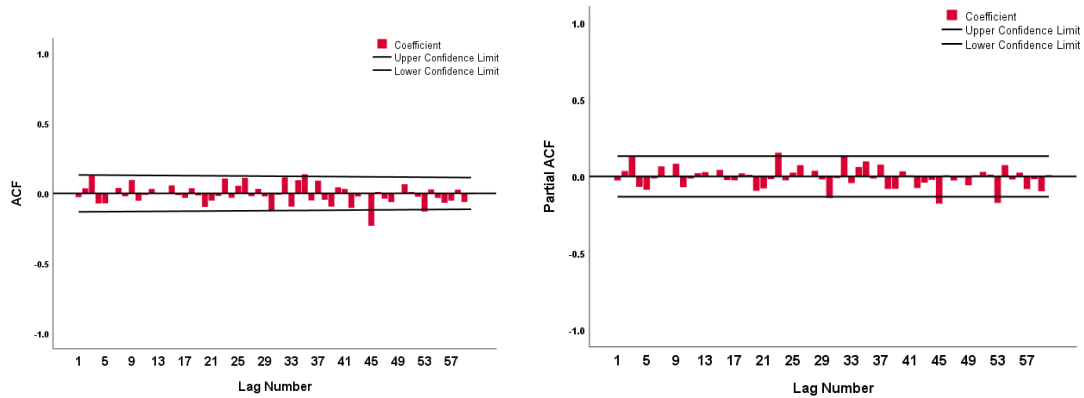


Figure 5: ACF and PACF of Y_t where $d = 1$ and $D = 1$.

Therefore, the optimal model is SARIMA(0,1,(1,45))(0,1,1)₁₂. The model is suitable because the residuals of SARIMA model have no autocorrelation ($Q = 62.4720$, $p\text{-value} = 0.3885$).

SARIMA(0,1,(1,45))(0,1,1)₁₂

$$Y'_t = (1 - \theta_1 B - \theta_{45} B^{45})(1 - \Theta_1 B^{12})\varepsilon_t \quad (22)$$

$$\text{where, } Y'_t = (1 - B)(1 - B^{12})Y_t$$

$$Y'_t = -\theta_1 \varepsilon_{t-1} - \theta_{45} \varepsilon_{t-45} - \Theta_1 \varepsilon_{t-12} - \theta_1 \Theta_1 \varepsilon_{t-13} - \theta_{45} \Theta_1 \varepsilon_{t-57} + \varepsilon_t$$

(23)

The forecasting equation of SARIMA(0,1,(1,45))(0,1,1)₁₂ is

$$\hat{Y}'_t = -\hat{\theta}_1 e_{t-1} - \hat{\theta}_{45} e_{t-45} - \hat{\Theta}_1 e_{t-12} + \hat{\theta}_1 \hat{\Theta}_1 e_{t-13} + \hat{\theta}_{45} \hat{\Theta}_1 e_{t-57} \quad (24)$$

In equation (24), we calculate the coefficient of parameter by using least square method as shown in Table 2.

Table 2: Parameters Estimate of SARIMA(0,1,(1,45))(0,1,1)₁₂.

Process	Parameters Estimate	Coefficients	Standard Error	t	p-value
MA1	$\hat{\theta}_1$	0.5129	0.0563	9.1137	0.0000
MA47	$\hat{\theta}_{47}$	0.1803	0.0585	3.0822	0.0023
SMA1	$\hat{\Theta}_1$	0.9207	0.0814	11.3035	0.0000

Therefore, we get

$$\hat{Y}'_t = -0.5129 e_{t-1} - 0.1803 e_{t-45} - 0.9207 e_{t-12} + 0.4722 e_{t-13} + 0.1660 e_{t-57}$$

(25)

5.3 SARIMAX Model

Time series to be forecasted with SARIMAX model. There must be finding a correlation between Y_t and their exogenous variables. We have selected variables using stepwise method in linear regression. Therefore, We get Y_t that construct in linear regression by the exogenous variables such as $X_{3,t}$ is the production of liquefied petroleum gas (p-value = 0.0000, VIF = 0.1265), $X_{4,t}$ is sales of liquefied petroleum gas in Thailand (p-value = 0.0297, VIF = 0.0757), $X_{5,t}$ is diesel price in Thailand (p-value = 0.0000, VIF = 0.3085), $X_{7,t}$ is consumer price index (p-value = 0.0001, VIF = 0.0841) and $X_{8,t}$ is monthly irregular index (p-value = 0.0000, VIF = 0.9896) as shown in equation (26) with $R^2 = 78.70\%$.

$$Y_t = \beta_0 + \beta_3 X_{3,t} + \beta_4 X_{4,t} + \beta_5 X_{5,t} + \beta_7 X_{7,t} + \beta_8 X_{8,t} + \omega_t \quad (26)$$

The forecasting equation is

$$\hat{Y}_t = \hat{\beta}_0 + \hat{\beta}_3 X_{3,t} + \hat{\beta}_4 X_{4,t} + \hat{\beta}_5 X_{5,t} + \hat{\beta}_7 X_{7,t} + \hat{\beta}_8 X_{8,t} \quad (27)$$

In equation (27), we calculate the coefficient of parameter by using least square method as shown in Table 3.

Table 3: Parameters Estimate of SARIMAX with $X_{3,t}$, $X_{4,t}$, $X_{5,t}$, $X_{7,t}$ and $X_{8,t}$.

Variables	Parameters Estimate	Coefficients	Standard Error	<i>t</i>	p-value
Constant	$\hat{\beta}_0$	-1666.8310	0.4621	-3.9595	0.0001
$X_{3,t}$	$\hat{\beta}_3$	0.1623	0.2399	5.4477	0.0000
$X_{4,t}$	$\hat{\beta}_4$	0.3682	-0.3105	2.1876	0.0297
$X_{5,t}$	$\hat{\beta}_5$	-11.2674	0.4025	-5.7163	0.0000
$X_{7,t}$	$\hat{\beta}_7$	8.6023	0.1351	3.8686	0.0001
$X_{8,t}$	$\hat{\beta}_8$	18.2703	0.4621	4.4552	0.0000

Therefore, we get

$$\hat{Y}_t = -1666.8310 + 0.1623 X_{3,t} + 0.3682 X_{4,t} - 11.2674 X_{5,t} + 8.6023 X_{7,t} + 18.2703 X_{8,t} \quad (28)$$

Calculate the forecast value Y_t and the residuals of multiple linear regression as follow

$$\omega_t = Y_t - \hat{Y}_t \quad (29)$$

Table 4: Parameters Estimate of SARIMAX((1,2,4),1,(1,11,30))(1,1,(2))₁₂ with $X_{5,t}$, $X_{8,t}$.

Variables	Parameters Estimate	Coefficients	Standard Error	<i>t</i>	p-value
$X_{5,t}$	$\hat{\beta}_5$	-1.6101	0.7543	-2.1344	0.0339
$X_{8,t}$	$\hat{\beta}_8$	17.0376	0.2205	77.2563	0.0000
AR1	$\hat{\phi}_1$	0.3603	0.0664	5.4249	0.0000
AR2	$\hat{\phi}_2$	0.2188	0.0695	3.1471	0.0019
AR4	$\hat{\phi}_4$	-0.1841	0.0634	-2.9055	0.0040
MA1	$\hat{\theta}_1$	0.1863	0.0680	2.7408	0.0066
MA11	$\hat{\theta}_{11}$	0.1367	0.0678	2.0152	0.0451
MA30	$\hat{\theta}_{30}$	0.2022	0.0698	2.8964	0.0042
SAR1	$\hat{\Phi}_1$	-0.5132	0.0698	-7.3478	0.0000
SMA2	$\hat{\Theta}_2$	0.2541	0.0826	3.0759	0.0024

Therefore, we get

$$\begin{aligned} \hat{Y}_t = & -1.61011X_{5,t} + 17.0376X_{8,t} + 0.3603\hat{\omega}'_{t-1} + 0.2188\hat{\omega}'_{t-2} - 0.1841\hat{\omega}'_{t-4} - 0.5132\hat{\omega}'_{t-12} \\ & + 0.1849\hat{\omega}'_{t-13} + 0.1123\hat{\omega}'_{t-14} - 0.0945\hat{\omega}'_{t-16} - 0.1863e_{t-1} - 0.1367e_{t-11} - 0.2022e_{t-30} \\ & - 0.2541e_{t-24} + 0.0473e_{t-25} + 0.0347e_{t-35} + 0.0514e_{t-54} \end{aligned} \quad (35)$$

5.4 Decomposition with SARIMAX Model (DEC-SARIMAX)

Time series to be forecasted with DECSARIMAX model. There must be finding a correlation between T_t and their exogenous variables. We have selected the variables using stepwise method in linear regression. Therefore, We get T_t that construct in linear regression by the exogenous variables such as $X_{3,t}$ is the production of liquefied petroleum gas (p-value = 0.0000, VIF = 0.2455), $X_{4,t}$ is sales of liquefied petroleum gas in Thailand (p-value = 0.0297, VIF = 0.2121), $X_{5,t}$ is diesel price in Thailand (p-value = 0.0000, VIF = 0.7081), $X_{7,t}$ is consumer price index (p-value = 0.0000, VIF = 0.0841) and $X_{8,t}$ is monthly irregular index (p-value = 0.0000, VIF = 0.9988) as shown in equation (36) with $R^2 = 83.17\%$.

$$T_{t,SARIMAX} = \beta_0 + \beta_3X_{3,t} + \beta_4X_{4,t} + \beta_5X_{5,t} + \beta_7X_{7,t} + \beta_8X_{8,t} + \omega_t \quad (36)$$

The forecasting equation is

$$\hat{T}_{t,SARIMAX} = \hat{\beta}_0 + \hat{\beta}_3X_{3,t} + \hat{\beta}_4X_{4,t} + \hat{\beta}_5X_{5,t} + \hat{\beta}_7X_{7,t} + \hat{\beta}_8X_{8,t} \quad (37)$$

In equation (37), we calculate the coefficient of parameter by using least square method as shown in Table 5.

Table 5: Parameters Estimate of SARIMAX with $X_{3,t}$, $X_{4,t}$, $X_{5,t}$, $X_{7,t}$ and $X_{8,t}$.

Variables	Parameters Estimate	Coefficients	Standard Error	t	p-value
Constant	$\hat{\beta}_0$	-1432.1288	316.5199	-4.5246	0.0000
$X_{3,t}$	$\hat{\beta}_3$	0.2207	0.0379	5.8252	0.0000
$X_{4,t}$	$\hat{\beta}_4$	1.0918	0.0836	13.0533	0.0000
$X_{5,t}$	$\hat{\beta}_5$	-1.0177	0.1296	-7.8546	0.0000
$X_{7,t}$	$\hat{\beta}_7$	19.9949	3.1419	6.3639	0.0000
$X_{8,t}$	$\hat{\beta}_8$	-1432.1288	316.5199	-4.5246	0.0000

Therefore, we get

$$\hat{T}_{t,SARIMAX} = -1432.1288 + 0.2207X_{3,t} + 1.0918X_{4,t} - 1.0177X_{5,t} + 19.9949X_{7,t} - 1432.1288X_{8,t} \quad (38)$$

Calculate the forecast value $T_{t,SARIMAX}$ and the residuals of multiple linear regression as follow

$$\omega_t = T_{t,SARIMAX} - \hat{T}_{t,SARIMAX} \quad (39)$$

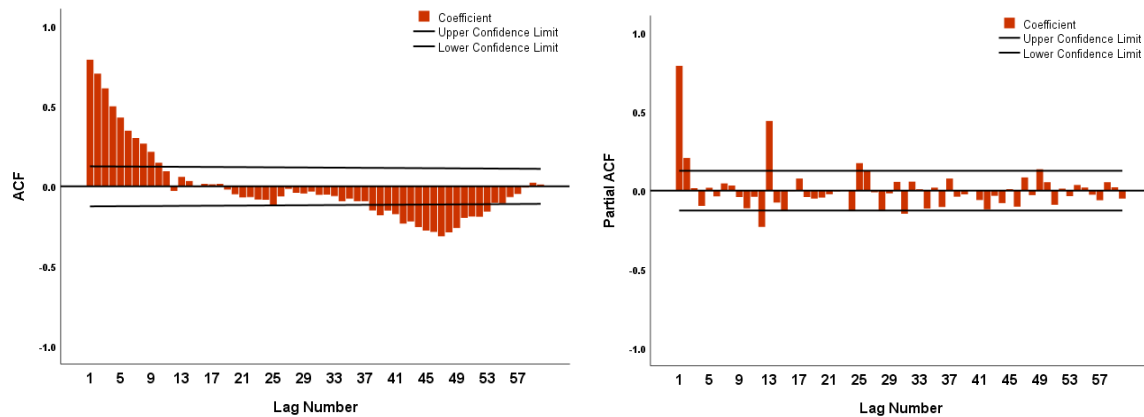


Figure 7: ACF and PACF of ω_t where $D = 1$.

Following equation (39), we calculate the Autocorrelation Function (ACF) and the Partial Autocorrelation Function (PACF) as shown in Figure 7. The series of residual ω_t show that the Partial Autocorrelation Function at lag 1, 2, 12, 13, 25 and 31, respectively. Therefore, the optimal model is SARIMAX(2,0,(2,4,16))(2,1,0)₁₂ with $X_{8,t}$. The model is suitable because the residuals of SARIMAX model have no autocorrelation ($Q = 38.6352$, $p\text{-value} = 0.8420$).

SARIMAX (2,0,(2,4,16))(2,1,0)₁₂ with $X_{8,t}$

$$\hat{Y}_{t,SARIMAX} = [\hat{\beta}_8 X_{8,t} + \hat{\phi}_1 \hat{\omega}'_{t-1} + \hat{\phi}_2 \hat{\omega}'_{t-2} + \hat{\phi}_1 \hat{\omega}'_{t-12} + \hat{\phi}_2 \hat{\omega}'_{t-24} - \hat{\phi}_1 \hat{\phi}_1 \hat{\omega}'_{t-13} - \hat{\phi}_1 \hat{\phi}_2 \hat{\omega}'_{t-25} - \hat{\phi}_2 \hat{\phi}_1 \hat{\omega}'_{t-14} - \hat{\phi}_2 \hat{\phi}_2 \hat{\omega}'_{t-26} - \hat{\theta}_2 e_{t-2} - \hat{\theta}_4 e_{t-4} - \hat{\theta}_{16} e_{t-16}] \times \hat{S}_t \quad (47)$$

5.5 Decomposition with SARIMAX Model and ANN (DEC-SARIMAX-ANN)

Time series to be forecasted with the hybrid model between decomposition with SARIMAX model and ANN (DEC-SARIMAX-ANN) was separate in two part such as the first part is using the forecast value from DEC-SARIMAX model in a linear component part and the second part, using the residuals from DEC-SARIMAX model and capture it by artificial neural network as nonlinear component part.

5.5.1 Linear component part: DEC-SARIMAX(2,0,(2,4,16))(2,1,0)₁₂ with $X_{8,t}$.

$$\hat{L}_t = [\hat{\beta}_8 X_{8,t} + \hat{\phi}_1 \hat{\omega}'_{t-1} + \hat{\phi}_2 \hat{\omega}'_{t-2} + \hat{\phi}_1 \hat{\omega}'_{t-12} + \hat{\phi}_2 \hat{\omega}'_{t-24} - \hat{\phi}_1 \hat{\phi}_1 \hat{\omega}'_{t-13} - \hat{\phi}_1 \hat{\phi}_2 \hat{\omega}'_{t-25} - \hat{\phi}_2 \hat{\phi}_1 \hat{\omega}'_{t-14} - \hat{\phi}_2 \hat{\phi}_2 \hat{\omega}'_{t-26} - \hat{\theta}_2 e_{t-2} - \hat{\theta}_4 e_{t-4} - \hat{\theta}_{16} e_{t-16}] \times \hat{S}_t \quad (48)$$

5.5.2 Nonlinear component part: using artificial neural network which, set up training model 70.7% and testing model 29.3%. This structure has 12 inputs as $e_{t-1}, e_{t-2}, \dots, e_{t-12}$, 2 hidden layers, each layers has 100 nodes respectively. Therefore we have the best structure in nonlinear part is ANN(12×100×100×1) as shown in equation (49) and (50).

$$N_t = g_3 \left(\sum_{k=1}^{100} w_{k,j} \cdot g_2 \left(\sum_{i=1}^{100} w_{k,i} \cdot g_1 \left(\sum_{j=1}^{12} w_{j,i} \cdot e_{t-j} + b_j \right) + b_i \right) + b_k \right) + \varepsilon_t \quad (49)$$

The forecasting equation of ANN(12×100×100×1) is

$$\hat{N}_t = g_3 \left(\sum_{k=1}^{100} w_{k,j} \cdot g_2 \left(\sum_{i=1}^{100} w_{k,i} \cdot g_1 \left(\sum_{j=1}^{12} w_{j,i} \cdot e_{t-j} + b_j \right) + b_i \right) + b_k \right) \quad (50)$$

Therefore, we get the hybrid model between decomposition with SARIMAX model and ANN (DEC-SARIMAX-ANN) as shown in equation (52).

$$\hat{Y}_t = \hat{L}_t + \hat{N}_t \quad (51)$$

$$\hat{Y}_t = [\text{DEC-SARIMAX}(2,0,(2,4,16))(2,1,0)_{12} \text{ with } X_{8,t}] + \text{ANN}(12 \times 100 \times 100 \times 1) \quad (52)$$

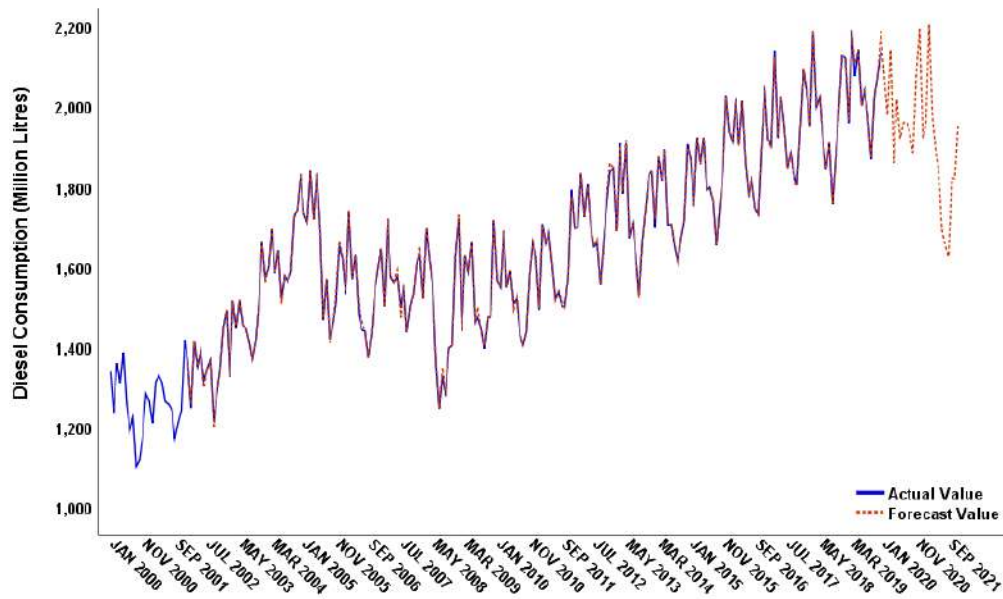


Figure 8: The time plots of actual value (blue line) and forecast value (red line) for diesel consumption dataset using the hybrid model between the decomposition with SARIMAX model and ANN (DEC-SARIMAX-ANN).

Figure 9 shows the efficiency performance of the absolute percentage error plot for 24 months leads time forecasting of five models. The absolute percentage error of the hybrid model between decomposition with SARIMAX model and ANN (DEC-SARIMAX-ANN) is closed to zero, which implies that (DEC-SARIMAX-ANN) perform well when this model has been compared with single models.

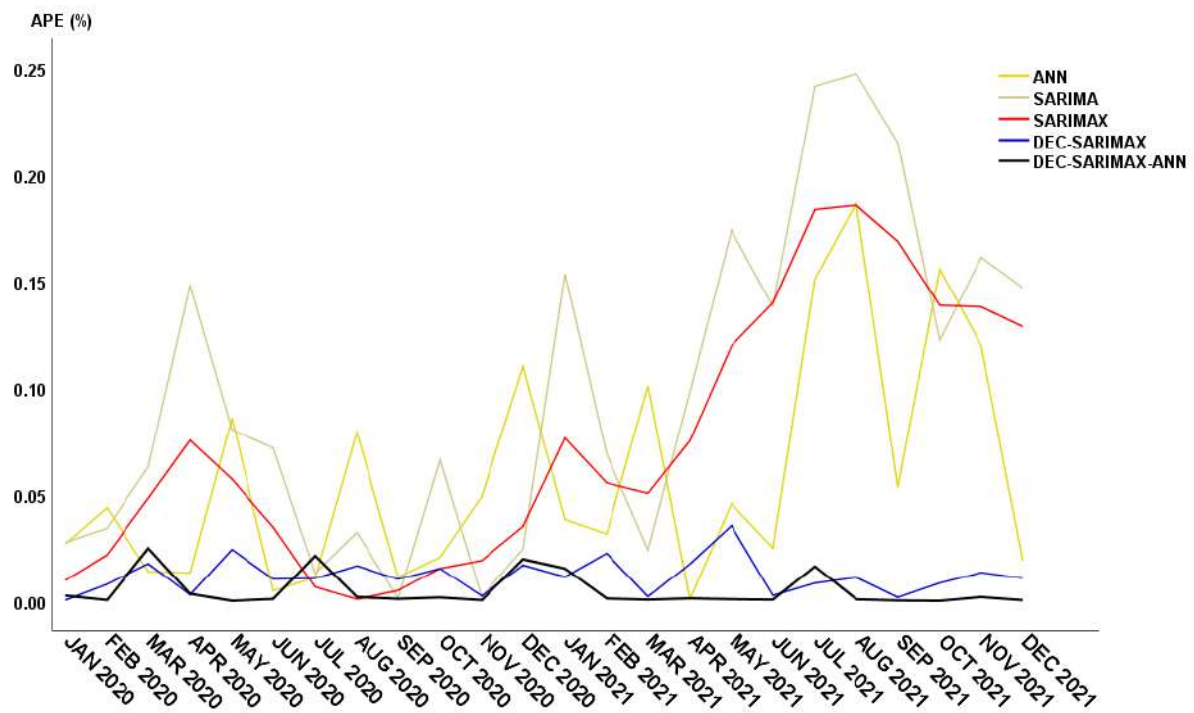


Figure 9: The absolute percentage error plot for 24 months lead time forecasting of five models for diesel consumption dataset.

Table 7 show that the overall detail of residual analysis for diagnostic checking of model such as checking normal distribution by Kolmogorov–Smirnov test, checking independent of error by Ljung – Box test, zero mean of error by t-test and constant variance by Levene’s test.

Table 7: Residual analysis of five models.

Models	Assumption of Random Error			
	Normality (Kolmogorov - Smirnov Test)	Independent of Error (Ljung-Box Test)	Zero Mean (t-Test)	Constant Variance (Levene Test)
1. ANN	$Z_{KS} = 2.2566$ p-value = 0.0000	$Q = 89.9958$ p-value = 0.0073	$t = 1.4583$ p-value = 0.1461	$W = 0.7257$ p-value = 0.7132
2. SARIMA	$Z_{KS} = 0.5790$ p-value = 0.8908	$Q = 62.4720$ p-value = 0.3885	$t = 0.6323$ p-value = 0.5278	$W = 1.2937$ p-value = 0.2294
3. SARIMAX	$Z_{KS} = 0.6591$ p-value = 0.7777	$Q = 41.0398$ p-value = 0.9709	$t = 0.2261$ p-value = 0.8213	$W = 1.4162$ p-value = 0.1670
4. DEC- SARIMAX	$Z_{KS} = 0.7223$ p-value = 0.6739	$Q = 38.6352$ p-value = 0.8420	$t = 1.3834$ p-value = 0.1679	$W = 1.0048$ p-value = 0.4431
5. DEC- SARIMAX- ANN	$Z_{KS} = 0.8344$ p-value = 0.4040	$Q = 36.4405$ p-value = 0.9930	$t = 1.2643$ p-value = 0.1849	$W = 1.3548$ p-value = 0.3256

Tables 8 show MAPE of five time series forecasting methods for 12 months and 24 months lead time forecasting, respectively. It found that the hybrid model between decomposition method with SARIMAX model and ANN (DEC-SARIMAX-ANN) has the lowest MAPE for diesel consumption dataset of 0.2772%, 0.6511%, 0.4888% for training model, 12 months and 24 months lead time forecasting, respectively and the highest R^2 of 99.8750%. The best forecasting model has been checked by using residual analysis. We conclude that the random errors are normally distributed, no autocorrelated, zero mean and constant variance (see Table 7).

Table 8: MAPE and R^2 of five models.

Evaluation Criteria	ANN	SARIMA	SARIMAX	DEC-SARIMAX	DEC-SARIMA-ANN
1. MAPE (%) Training	3.1254	2.5624	0.7026	0.6960	0.2772*
2. MAPE (%) 12 months	3.9167	4.7053	2.7442	1.1321	0.6511*
3. MAPE (%) 24 months	5.8284	9.8186	7.4599	1.1731	0.4888*
4. R^2 (%)	87.5727	94.7194	99.5736	99.6130	99.8750**

Note that: ‘*’ is the lowest MAPE and ‘**’ is the highest R^2 .

Table 9 shows reduce error rates and the average reduce error rates of diesel consumption dataset. Each model was compared with SARIMA model in 12 months and 24 months lead time forecasting. It found that the hybrid model between decomposition method with SARIMAX model and ANN (DEC-SARIMAX-ANN) has RER of 86.1624%, 95.0217% and average RER of 86.2980%, respectively (see Figure 10). Moreover, the DEC-SARIMAX-ANN model for 12 months and 24 months lead time forecasting is more accurate than another model of time series forecasting method.

6. Discussion

This research differs from other previous studies, as this DEC-SARIMAX-ANN model has a higher effectiveness and better long-term forecasting, while producing fewer discrepancies in prediction. Based on the many relevant studies reviewed, most existing models were only made available for forecasting capability ranging from long-term forecasting. Additionally, there have also been some studies that have attempted to forecast for six years but not 20 years. (Mu et al., 2002) used improved grey model for the 2011–2020 prediction. (Zeng et al., 2017) developed a homologous grey prediction model for 2018–2024 forecasting. Furthermore, (Jiang et al., 2018) used MGM model, ARIMA model, MGM–ARIMA model, and BP model for the forecasting period of 2017–2030. (Ediger and Akar, 2007) deployed ARIMA model and SARIMA model for 2005–2020 forecasting. (Ekonomou, 2010) applied ANN model for 2005–2008, 2010, 2012, and 2015 prediction. However, reviewing various studies found that long-term forecasting has become a popular topic most researchers have chosen to study, and various methodologies have been implemented. In this study, we selected the most appropriate model for long-term forecasting. The DEC-SARIMAX-ANN model functioned better and was more efficient, with fewer errors, when compared to other models. With the output of the model, it is very useful and fits in Thailand’s policy-making and planning. Furthermore, it can become the best guideline for any interested researchers to further develop and explore.

Therefore, from this study, the DEC-SARIMAX-ANN model is suitable for forecasting the diesel consumption in the long-term (2000–2021). In addition, this model differs from any existing models used on the prediction within Thailand since the model’s prediction result can support the Ministry of Energy’s policy-making at a higher efficiency. Since the DEC-SARIMAX-ANN model is developed, only true influential variables over the diesel consumption in Thailand. The results of this research are useful to the Ministry of Energy to use the forecast values as a guideline for planning the production and import of diesel fuel to meet the demand for domestic energy and to reduce the risk of domestic oil shortages.

7. Conclusion and Future Research

7.1 Conclusion

Time series forecasting is one of the very demanding subjects over the last few decades, since can be applied for financial, economics, engineering and scientific modeling. The standard statistical technique from the literature, review namely decomposition method and Box-Jenkins’s method are well known for many researchers. The aim of this research is preferred new method, namely the hybrid model between decomposition with SARIMAX models and ANN (DEC-SARIMAX-ANN) with application to the monthly of diesel consumption dataset in Thailand. The proposed methods are compared to ANN, SARIMA, SARIMAX, the decomposition with SARIMAX (DEC-SARIMAX) models. The performance evaluation results indicated that the hybrid model between decomposition with SARIMAX models and ANN (DEC-SARIMAX-ANN) was the most suitable model for forecasting the data of diesel consumption in Thailand. The decomposition with SARIMAX model and ANN had the lowest MAPE of 0.6511% and 0.4888% for 12 months and 24 months lead time forecasting, respectively, the highest RER of 86.1624% and 95.0217% for 12 months and 24 months lead time forecasting, respectively and the highest R-Squared of 99.8750%. We conclude that the hybrid model is an effective way to improve more accurate forecasting than a single forecasting method. The predicted diesel consumption in 2021 and 2022 were 22,353.25 million litres and

22,261.71 million litres, respectively. The diesel consumption in 2021 was predicted to increase 16.3874% from 2011 and in 2022 the diesel consumption was predicted to increase 15.9108% from 2011.

7.2 Future Research

We can try to use trend component (T_t) in Exponential Smoothing method, Holt-Winters method or using the variety of Neural Network such as Long Short-Term Memory (LSTM) by applying this technique to some other problems and big data sets with various numbers of features.

8. Acknowledgments

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9. References

- Ayyoub, M., Riaz, A. (2017). The artificial neural network method: A practical guide for business research. *Journal of Business Strategies*, 11(1), 113-132.
- Chattopadhyay, A., Manupriya, P., Sarkar, A., Balasubramanian, V.N. (2019). Neural network attributions: A causal perspective. In: *Proceedings of the 36th International Conference on Machine Learning, ICML 2019*, 1660-1676.
- Detienne, K.B., Detienne, D.H., Joshi, S.A. (2003). Neural networks as statistical tools for business researchers. *Organizational Research Methods*, 6(2), 236-265.
- Ediger, V.Ş., Akar, S. (2007). ARIMA forecasting of primary energy demand by fuel in Turkey. *Energy Policy*, 35(3), 1701-1708.
- Ekonomou, L. (2010). Greek long-term energy consumption prediction using artificial neural networks. *Energy Policy*, 35(1), 512–517.
- Ghalekhondabi, I., Ardjmand, E., Young, W. A., & Weckman, G. R. (2017). Water demand forecasting: review of soft computing methods. *Environmental monitoring and assessment*, 189(7), 1-13.
- Jafari, H. H., & Baratimalayeri, A. (2008). The crisis of gasoline consumption in the Iran's transportation sector. *Energy Policy*, 36(7), 2536-2543.
- Jiang, F., Yang, X., Li, S. (2018). Comparison of forecasting India's energy demand using an MGM, ARIMA model, MGM-ARIMA model, and BP neural network model. *Sustainability*, 10(1), 22-25.
- Kays, H.M.E., Karim, A.N.M., Daud, M.R.C., Varela, M.L.R., Putnik, G.D., Machado, J.M. (2018). A collaborative multiplicative Holt-Winters forecasting approach with dynamic fuzzy-level component. *Applied Sciences*, 8(4), 530.
- Kuster, C., Rezgui, Y., Mourshed, M. (2017). Electrical load forecasting models: A critical systematic review. *Sustainable Cities and Society*, 35(1), 257-270.
- Lai, S.L., Liu, M., Kuo, K., Chang, R. (2014). Energy consumption forecasting in Hong Kong using ARIMA and Artificial neural networks models. *Applied Mechanics and Materials*, 672(1), 2085-2097.
- Ministry of Energy. (2022). *Diesel consumption in Thailand*. Retrieved from <http://www.eppo.go.th/index.php/en/en-energystatistics/petroleum-statistic>.

- (January, 8, 2022).
- Mu, H., Dong, X., Wang, W., Ning, Y., Zhou, W. (2002). Improved gray forecast models for China’s energy consumption and CO₂ emission. *Journal of Desert Research*, 22(1), 142–149.
- Ryu, S., Noh, J., Kim, H. (2017). Deep neural network based demand side short term load forecasting. *Energies*, 10(1), 1-21.
- Sapnken, E.F., Tamba, J.G., Essiane, S.N., Koffi, F.D., Njomo, D. (2018). Modeling and forecasting gasoline consumption in Cameroon using linear regression models. *International Journal of Energy Economics and Policy*, 8(2), 111-120.
- Suganthi, L., Samuel, A.A. (2012). Energy models for demand forecasting-a review. *Renewable and Sustainable Energy Reviews*, 16(2), 1223-1240.
- Zeng, B., Zhou, M., Zhang, (2017). Forecasting the energy consumption of China’s manufacturing using a homologous grey prediction model. *Sustainability*, 9(1), 1975.
- Zhang, G.P. (2003). Time series forecasting using hybrid ARIMA and neural network model. *Neurocomputing*, 50(1), 485-483.

The Isolation and Quantitative Determination of Protocatechuic Acid from *Sechium Edule* (Jacq) Swartz.

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Abstract

The phytochemical investigation of *Sechium edule* (Jacq) Swartz. fruits extract led to the isolation of protocatechuic acid. The structure of this compound was determined based on spectroscopic data especially ¹H and ¹³C NMR data. Furthermore, the method validation for qualification of protocatechuic acid was performed by using RP-HPLC. The chromatographic separation was achieved with a Hypersil gold C18 column (4.6 x 250 mm, 5 μm). The mobile phase consisting of ACN and 0.05% acetic acid was flowed with 1.0 mL/min and detected at 280 nm. The resulting of calibration curve showed a good linearity with R² = 0.9990. LOD and LOQ values were 0.45 and 1.36 μg/mL, respectively while the accuracy and precision also examined. This developed method was applied to determine protocatechuic acid in *Sechium edule* (Jacq) Swartz. extract and the result were calculated to contain 0.19 % w/w of protocatechuic acid.

Keywords: *Sechium edule* (Jacq) Swartz, Protocatechuic acid, HPLC, Method validation

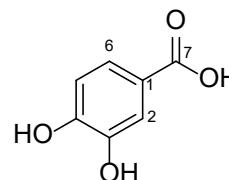
1. Introduction

Chayote is the common name of *Sechium edule* (Jacq.) Swart and it is classified as a Cucurbitaceae family. This plant was distributed in the North and Northeast of Thailand and has been used for treatment of renal disease, obesity and arteriosclerosis (Díaz-de-Cerio et al., 2019). Chayote has produced the various groups of secondary metabolites including fatty acid derivatives (Ragasa et al., 2014), flavonoids (Ordoñez et al., 2009, Wu et al., 2014 and Díaz-de-Cerio et al., 2019) and organic acids (Trejo-Moreno et al., 2018). Furthermore, these compounds exhibited pharmaceutical activities such as anti-endothelial dysfunction activity (Trejo-Moreno et al., 2018) and lipid accumulation inhibition (Wu et al., 2014). Protocatechuic acid (PCA) is a phenolic compound which has chemically name as 3,4-dihydroxybenzoic acid. This compound is found in many edible plants such as brown rice and onion (Kakkar et al., 2014). Moreover, PCA exhibited pharmaceutical activities including antibacterial, antioxidant,

anticancer, antidiabetic and antiviral activities (Kakkar et al., 2014). Herein, we reported the isolation and structural elucidation of PCA and method validation for quantitative determination of PCA in *S. edule* extract was also determined.



(A)



(B)

Figure 1. *S. edule* fruits (A) and structure of protocatechuic acid (B)

2. Research Objectives

The aims of this work were to isolation the protocatechuic acid (PCA) from *S. edule* extract and method validation of PCA in extract.

3. Literature Review

The plant *S. edule* or chayote has been reported for phytochemical constituents in literatures. The major compounds were flavonoids, and the other groups were consisted of phenolic compounds and fatty acids (Siciliano et al., 2004, Ragasa et al., 2014, Wu et al., 2014, Trejo-Moreno et al., 2018 and Díaz-de-Cerio et al., 2019). Moreover, *S. edule* was rich in nutrition including protein, amino acids, vitamins and minerals (Vieira et al., 2019). Ploypetchaya et al., (2021) reported that the dried mixture of chayote and kohlrabi extract were developed using encapsulation technology in order to use as the functional food ingredients. The previous study exhibited a suitable encapsulated condition for the extract and investigated the morphology, physicochemical and antioxidant activity. Furthermore, the encapsulating materials can protect an active ingredient from drying condition such as high temperature, pH and lights. From this information, the encapsulated powder of extract can be applied for functional food products due to its efficiency in pharmaceutical activity and the rich of nutrients.

Protocatechuic acid is phenolic compound which contain 2 hydroxy and carboxylic functional groups. This compound is reported in various plants such as star anise (*Illicium verum*), melisa (*Melissa officinalis* L.) and medical rosemary (*Rosmarinus officinalis* L.) (Kakkar et al., 2014). PCA was extract using acid-base extraction according to the hydroxy group can change to ion form in different pH and transfer to aquas phase. Furthermore, PCA was studied in various types of solvent such as toluene, octanol and petroleum ether (Anthony et al., 2020).

4. Research Methodology

4.1 General experimental procedures

The UV–vis absorption spectrum was measured in MeOH with a Hitachi U-2900 spectrophotometer. The NMR spectra were recorded on 500 MHz Bruker NMR spectrophotometer. Chemical shifts were recorded in parts per million (δ) in methanol- d_4 (δ_H 3.31 and δ_C 49.0 ppm) with TMS as an internal reference. Thin-layer chromatography (TLC) was performed on silica gel 60 GF254 (Merck). Column chromatography (CC) was carried out on Sephadex LH-20 with MeOH or silica gel (Merck) type 100 (62–400 μ m). Solvents for extraction and chromatography were distilled prior to use. The acetonitrile was purchased in HPLC grade from RCI Lab Scan, Thailand while acetic acid was obtained from Merck, Germany. The protocatechuic acid as standard compound was purchased from Sigma, Switzerland. The ultrasonic bath was Bandelin Sonorex, Banoelin.

4.2 Plant Materials

The fruits of *S. edule* were collected from Petchabun, Thailand in November 2020. The taxonomy of this plant was identified and has been deposited at Bangkok Herbarium, Bangkok, Thailand (specimen no. Wiriaporn 01)

4.3 Extraction and Isolation

The fresh fruits of *S. edule* (2.0 kg) was cut to small pieces and dried in the oven at 50°C for 2 days. The dry fruits (150.0 g) were extract with 70% EtOH (500 mL) for 3 times at room temperature and solvent was removed under reduced pressure to obtain the ethanol extract (60.17 g) as dark brown gum. The crude extract was further dissolved in acetone and then afforded acetone fraction (1.10 g) as brown viscous. The acetone part was isolated by CC over sephadex LH-20 with MeOH to obtain 4 subfractions (A-D). Subfraction C (16.0 mg) was further purified by FCC over silica gel by elution with 10% MeOH/CH₂Cl₂ to furnish compound **1** (10.2 mg) as a brown solid.

Protocatechuic acid (**1**): brown solid; UV (MeOH) $\lambda_{\max}$ (log ϵ) 294 (3.4), 259 (3.8), 218 (4.2) and 205 (4.2) nm; ¹H NMR (500 MHz, methanol- d_4) δ_H 7.44 (1H, d, J = 2.0 Hz, H-2), 7.42 (1H, dd, J = 8.0, 2.0 Hz, H-6), 6.80 (1H, d, J = 8.0 Hz, H-5); ¹³C NMR (125 MHz, methanol- d_4) 170.3 (C=O), 151.5 (C-4), 146.0 (C-3), 123.9 (C-5), 123.1 (C-1), 117.8 (C-2), 115.8 (C-6).

4.4 Method validation

4.4.1 HPLC method condition

The RP-HPLC was performed on Water 600 controller, equipped with a Water 486 detector, USA using Hypersil gold RP18 column (4.6 x 250 mm, 5 μ m), injection loop 10 μ L, flow rate 1 mL/min and detection wavelength at 280 nm with ACN and 0.5% acetic acid as mobile phases. The gradient-elution program was as follows: 0-2 min, 85% B; 2-25 min, 80% B; 25-28 min, 80% B; 28-35 min, 0% B and 35-40%, 100% B.

4.4.2 Preparation of standard Stock Solution

Accurately weighed 2 mg of standard protocatechuic acid then transferred to a 5 mL volumetric flask and dissolved in MeOH 2 mL. The stock solution was sonicated for 5 minutes and adjusted with MeOH to 5 mL to obtain concentration 400 μ g/mL of stock solution.

4.4.3 Calibration curve

The calibration curves were built by plotting the peak area with concentration of each standard solution. The protocatechuic acid standard solutions were prepared as concentration 0.625, 1.25, 2.5, 5 and 10 µg/mL from stock solution into volumetric flask and adjusted with MeOH. The linear regression equations were calculated by $y = ax \pm b$, where x and y are the concentrations and the peak areas of each concentration, respectively. The linearity was established according to the least squares treatment (R^2). The analysis of standard PCA concentration was measured in triplicate.

4.4.4 Limit of detection (LOD) and quantification (LOQ)

The limit of detection (LOD) was determined as the lowest concentration of sample, and the limit of detection quantification (LOQ) was measured the lowest concentration of compounds. The values of LOD and LOQ were calculated from the calibration curve using the formula as $LOD = 3.3SD$ or $3.3\delta/S$ while $LOQ = 10SD$ or $10\delta/S$.

4.4.5 Accuracy

The accuracy of the method was evaluated by a recovery study. It was conducted by adding a measured amount of standard PCA solutions. All samples were analyzed in triplicate and recovery were calculated. The equation used to analyze the recovery percentage was $(\text{detected amount} - \text{original amount}) / \text{spiked amount} \times 100$.

4.4.6 Precision

The precision studies were determined six times of the samples which injected as the same condition as the standard PCA. The precisions were expressed as relative standard deviations (RSD, %).

4.5 Sample Analysis Using Established Method

Accurately weighed 50 mg of 70% EtOH extract of *S. edule* a then transferred to a 25 mL volumetric flask and dissolved in MeOH 10 mL. The sample solution was sonicated for 15 minutes and adjusted with MeOH to 25 mL.

5. Results

5.1 Isolation of acetone fraction of *S. edule*

The acetone extract was isolated by column chromatography to obtain compound **1** as a brown solid. The compound **1** was elucidated using ^1H and ^{13}C NMR spectroscopy (Figure 1). The NMR spectra exhibited resonances in ^1H NMR at δ_{H} 7.44 (1H, d, $J = 2.0$ Hz), 7.42 (1H, dd, $J = 8.0, 2.0$ Hz) and 6.80 (1H, d, $J = 8.0$ Hz) while ^{13}C NMR found 7 carbon signals; 170.3, 151.5, 146.0, 123.9, 123.1, 117.8 and 115.8 ppm.

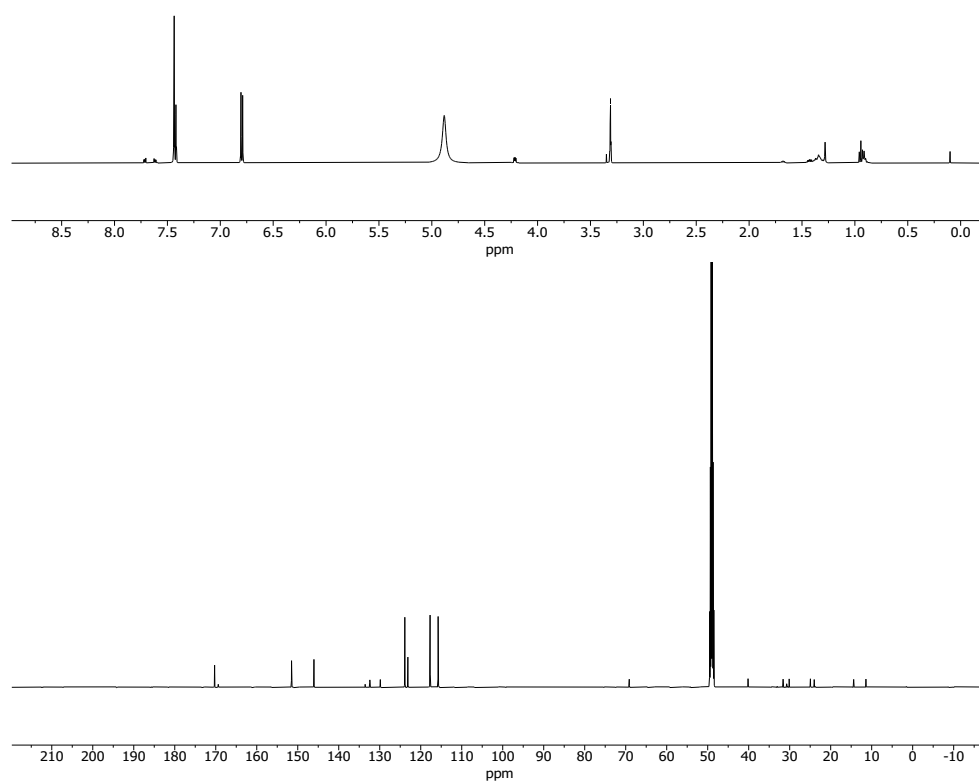


Figure 2. ^1H (500 MHz) and ^{13}C (125 MHz) spectra of protocatechuic acid in methanol- d_4

5.2 Method validation

5.2.1 Calibration curve, LOD and LOQ

The calibration curve for standard PCA presented a good correlation coefficient ($R^2 = 0.9990$) with the formula $y = 49610x - 14376$ in the scope of concentration between 0.625-10 $\mu\text{g/mL}$ (Figure 2). The LOD and LOQ values were calculated by equation then results showed that the LOD and LOQ were 0.45 and 1.36 $\mu\text{g/mL}$, respectively.

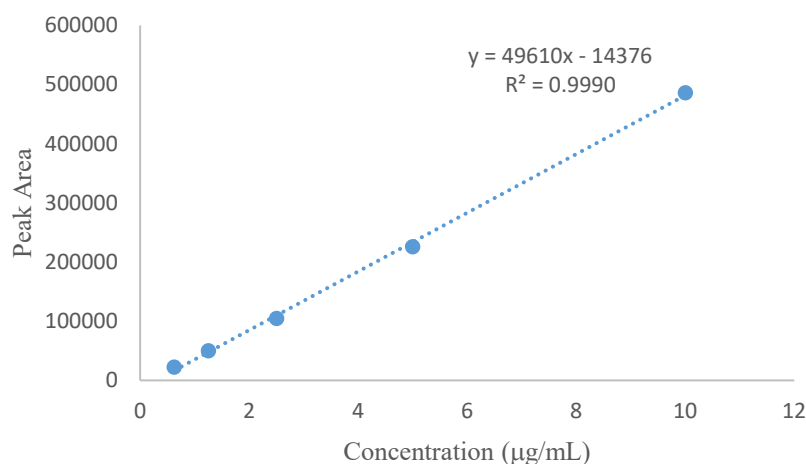


Figure 3. Calibration curve of standard protocatechuic acid in the range 0.625-10 µg/mL

5.2.2 Accuracy and precision

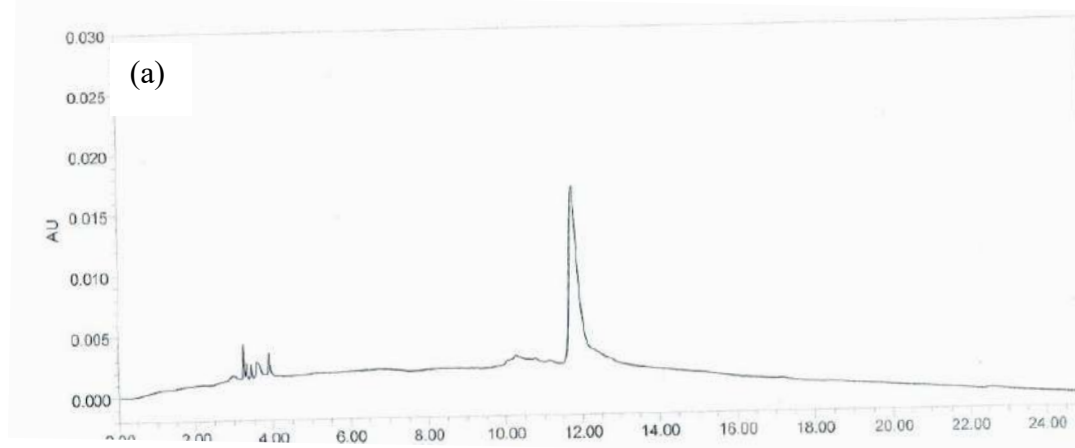
The accuracy test was determined using spike of three different concentrations of standard PCA in samples. The results displayed percent recovery values between 91.521-107.176 %.

Table 1. The results of accuracy and precision of method validation

Sample	%Recovery	%RSD
<i>S. edule</i> extract	-	1.562
<i>S. edule</i> extract + PCA 1 ppm	95.743	1.802
<i>S. edule</i> extract + PCA 2 ppm	91.521	1.321
<i>S. edule</i> extract + PCA 3 ppm	107.176	0.914

5.3 Analysis of *S. edule* extract

The crude extract of *S. edule* was determined for PCA content with the optimized condition and validated method. The calculation of average peak area compared with the calibration curve of standard PCA was performed. HPLC chromatogram established peak of PCA at 11.8 min when compared with standard PCA and contained PCA showed 3.831 µg/mL or 0.19 %w/w in sample (Figure 3).



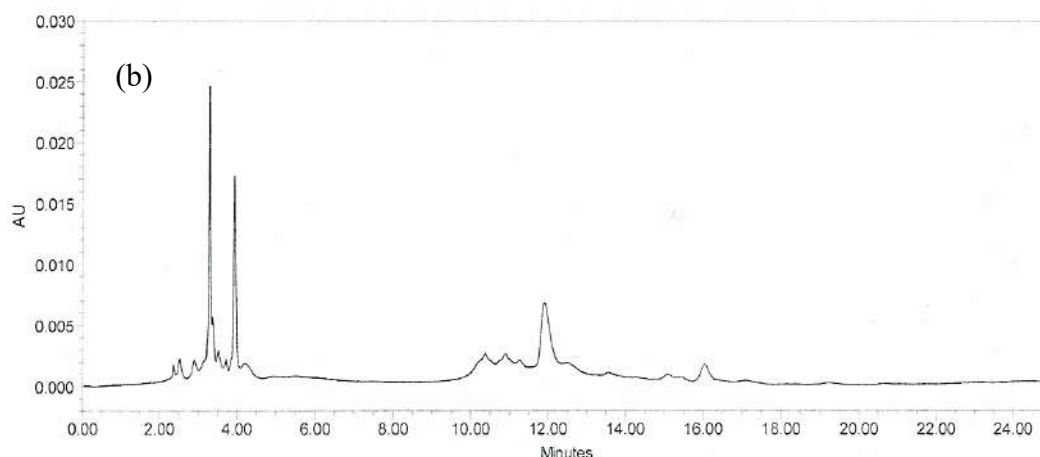


Figure 4. HPLC chromatograms of standard PCA (a) and 70% EtOH extract of *S. edule* (b)

6. Discussion and Conclusion

The phytochemical investigation of acetone fraction of *S. edule* extract led to the isolation of a pure compound. This compound was characterized using spectroscopic techniques. The UV spectrum showed the maximum absorption bands at 294, 259, 218 and 205 nm which corresponded to benzene and carbonyl chromophores. The ^1H NMR data showed a set of 1,2,4-trisubstituent aromatic ring at δ_{H} 7.44 (1H, d, $J = 2.0$ Hz), 7.42 (1H, dd, $J = 8.0, 2.0$ Hz) and 6.80 (1H, d, $J = 8.0$ Hz). Furthermore, ^{13}C NMR spectrum exhibited one carbonyl (δ_{C} 170.3), three quaternary (δ_{C} 151.5, 146.0 and 123.1) and three aromatic methine carbons (δ_{C} 123.9, 117.8 and 115.8). The comparison of this data with literature, compound **1** was protocatechuic acid (Nguyen et al., 2013).

To determine PCA in extract, the method development to measure PCA in extract was studied. The method validation of PCA was determined by chromatographic condition using Hypersil gold RP18 column (4.6 x 250 mm, 5 μm), injection volume 10 μL , flow rate 1 mL/min at 280 nm. Acetonitrile and 0.5% acetic acid were used as mobile phase. This condition exhibited good calibration curve in the range 0.625–10 $\mu\text{g/mL}$ with R^2 value at 0.9990. The calculation of LOD and LOQ values were at 0.45 and 1.36 $\mu\text{g/mL}$, respectively. The accuracy of spike sample with standard PCA gave the recovery values and %RSD in the range of 91.5–107.2% and 0.91–1.80%, respectively. The accuracy is acceptable values of ICH guideline 2005 that require %recovery between 90–115%. Moreover, the precision of *S. edule* extract displayed %RSD at 1.56%. The determination of PCA in 70% EtOH extract found PCA content with 3.831 $\mu\text{g/mL}$ which corresponded to 0.19% w/w. The amount of PCA in extract was higher than LOQ of this method thus the result is acceptable.

In conclusion, the investigation of acetone fraction of *S. edule* extract resulting in the isolation and characterization of protocatechuic acid using spectroscopic techniques. The method development for determination of PCA in *S. edule* extract and method validation showed the calibration curve in the range of 0.625–10 $\mu\text{g/mL}$ with $R^2 = 0.9990$. LOD and LOQ were 0.45 and 1.36 $\mu\text{g/mL}$. The accuracy and precision results illustrated %recovery and %RSD between 91.5–107.2% and 0.91–1.80%, respectively. The extract contained PCA 0.19% w/w

8. References

- Anthony, F.M., & Wasewar K. (2020) Reactive extraction: a promising approach to separate protocatechuic acid. *Environmental Science and Pollution Research*, 27, 27345-27357.
- Díaz-de-Cerio E., Verardo V., Fernández-Gutiérrez, A., & Gómez-Caravaca M. (2019) New insight into phenolic composition of chayote (*Sechium edule* (Jacq.) Sw). *Food Chemistry*, 295, 514-519.
- ICH harmonized tripartite guideline validation of analytical procedures text and methodology: Q2(R1); 2005
- Nguyen, D.-M.-C., Se, D.-J., Kim, K.-Y., Park, R.-D., Kim, D.-H., Han, Y.-S., Kim, T.-H., & Jung, W.-J. (2013) Nematicidal activity of 3,4-dihydroxybenzoic acid purified from *Terminalia nigrovenulosa* bark against *Meloidogyne incognita*. *Microbial Pathogenesis*, 59-60, 52-59.
- Ordoñez, A. A. L., Ordoñez, R. M., Zampini, I. C., & Isla, M. I. (2009) Design and quality control of a pharmaceutical formulation containing natural products with antibacterial, antifungal and antioxidant properties. *International Journal of Pharmacology*, 378, 51-58.
- Ploypetchara, T., Sorndech, W., Auranwiwat, C., Sumsakul, W., Pinthong, M., Kansuwan, A., Butseekhot, S., & Siricoon, S. (2021) Impact of Encapsulation Wall Materials and Drying Method on Physicochemical Properties and Digestibility of Encapsulated Chayote (*Sechium edule* (Jacq.) Swartz) and Kohlrabi (*Brassica oleracea* var gongylodes L.) Extracts. *Food Science and Engineering*, 3, 1-11.
- Ragasa, C. Y., Biona, K., & Shen, C. C. (2014) Chemical constituents of *Sechium edule* (Jacq.) Swartz. *Der Pharma Chemica*, 6, 251-255.
- Sahil, K. & Souravh B. (2014) A Review on Protocatechuic Acid and its pharmacological potential. *International Scholarly Research Notices*, 2014, 9 pages.
- Siciliano, T., Tommasi, N. D., Morelli, I. & Braca, A. (2004) Study of flavonoids of *Sechium edule* (Jacq) Swartz (Cucurbitaceae) different edible organs by liquid chromatography photodiode array mass spectrometry. *Journal of Agricultural and Food Chemistry*, 52, 6510-6515.
- Trejo-Moreno, C., Castro-Martínez, G., Méndez-Martínez, M., Jiménez-Ferrer, J. E., Pedraza-Chaverri, J., Arrellín, G., Zamilpa, A., Medina-Campos, O. N., Lombardo-Earl, G., Barrita-Cruz, G. J., Hernández, B., Ramírez, C. C., Santana, M. A., Fragoso, G., & Rosas, G. (2018) Acetone fraction from *Sechium edule* (Jacq.) S.w. edible roots exhibits antiendothelial dysfunction activity. *Journal of ethnopharmacology*, 220, 75-86.
- Wu, C. H., Ou, T. T., Chang, C. H., Chang, X. Z., Yang, M. Y., & Wang, C. J. (2014) The Polyphenol Extract from *Sechium edule* shoots inhibits lipogenesis and stimulates lipolysis via activation of AMPK Signals in HepG2 Cells. *Journal of Agricultural and Food Chemistry*, 62, 750-759.

Consumer Acceptance and Physical Property of Esan Hot Pot Sauce

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Abstract

The thickness of the Esan hot pot sauce is quality control and plays an important role in consumer acceptance. This study aimed to evaluate the sensory quality, consumer acceptance, and viscosity property of Esan hot pot sauce. Thirty consumers were asked to taste the three different formulas of Esan hot pot sauces with four levels of guar gum at 0%, 0.5%, 1.0%, and 1.5%. Results found that increasing guar gum level affected the viscosity property (448 – 5,501 Cp.). In addition, adding 1 % of guar gum showed the highest score of thickness liking ($p < 0.05$) and consumer acceptance at 7.93 ± 1.01 and 100%, respectively, compared with the control sample at 6.46 ± 1.52 (without guar gum). Overall liking for all samples was not significant ($p > 0.05$). Therefore, 1% guar gum is appropriate to add into the Esan hot pot sauce, which promoted consumer acceptance and might influence future purchase decisions.

Keywords: consumer acceptance, viscosity, Esanhot pot sauce, and guar gum

1. Introduction

Esan, E-san, or Isan is a specific Thai named Northeastern Thailand. Esan hot pot is a Thai traditional soup with the completely perfect taste of hot and spicy, salty, sweet, and Thai herbs in which is famous among Esan people. Even though the soup and sauce are similar, the sauce is much thicker, viscose, and more intensive in test and texture. The uniqueness of Esan hot pot is not only the soup and sauce, moreover, but the added vegetables have its distinct smell inclusive of saw leaf coriander, basil, betel leaf, cabbage, and water spinach. The study has conducted with one of Esan hot pot restaurants in Khon Kaen province, Thailand which started operation in the mid-year of 2021, the main products are Esan hot pot and spice Esan hot pot sauce. There are several ingredients, including full of Thai herbs, spices, vegetables, and sliced meat, and serving with spice Esan hot pot sauce, as shown in Figure 1.

Spice Esan hot pot sauce with the addition of different ingredients might affect sensory and physical qualities of the product such as taste, aroma, and texture, especially thickening of the product. Roasted rice powder is one of the ingredients to increase the viscosity and homogenous of the product as well. However, the addition of that one at an inappropriate level influences the change of taste and viscosity of the product. In the food industry, guar gum is one of the cheapest thickening agents or hydrocolloids and it has not influenced health hazards. Guar gum was added into food products which can improve the textural quality and the

suspension of other ingredients or emulsions which increases the stability of the product. According to the United States, Food and Drug Administration (FDA) suggests that the concentration of guar gum is not to exceed 2% is recommended in food application (Tripathy & Das, 2013). Interestingly, this Esan hot pot sauce consumer trend rose in popularity. However, the added ingredients and spices are varying depending on cookers and restaurants' preference style and formula, consequent to the divergence in taste. These cause the hardness of assessing the preference test of sauce. On the other hand, the viscosity of sauce is more visible to measure and more constant compared to its taste. Hence, the researchers see the opportunity to explore the effect of viscosity on consumers' preferences and acceptance.

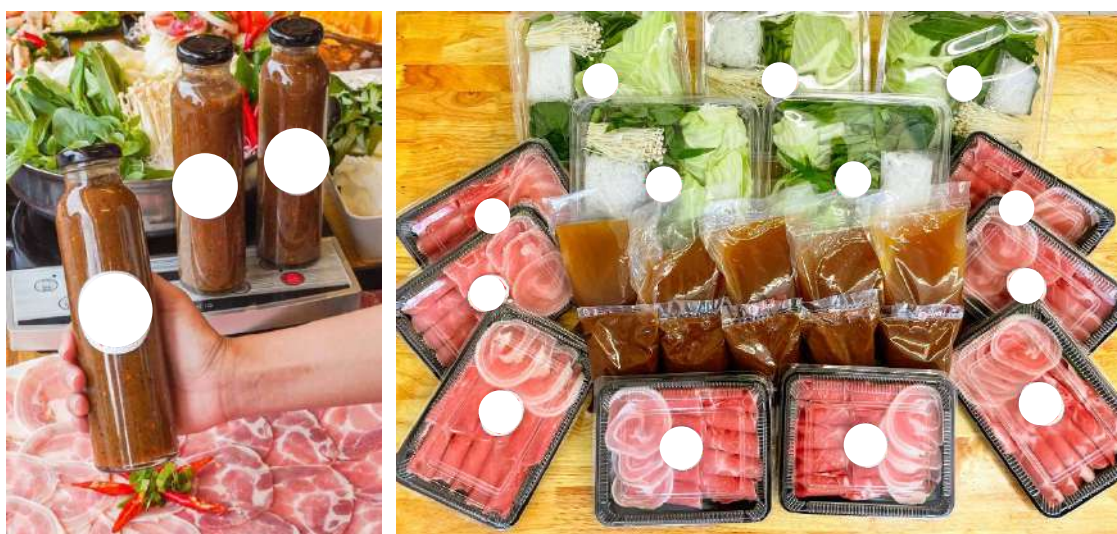


Figure 1: Esan hot pot sauce by one of Esan hot pot restaurants in Khon Kaen, Thailand.

2. Research Objectives

The objective of the current study aims (i) to evaluate the sensory quality, consumer acceptance, and viscosity property of Esan hotpot sauce with the different levels of thickening agent (guar gum) and (ii) to suggest the restaurants that offer a similar product based on the finding.

3. Literature Review

Hydrocolloids as a thickening in food can improve the textural properties, quality attributes, and shelf-life (Saha & Bhattacharya, 2010). Food thickeners are used to apply in many types of food products such as thicken sauces, soups, and puddings without altering their taste. In addition, they are used in non-food products such as paints, ink, and cosmetics. (Glassburn & Deem, 1998; Mudgil et al., 2014). Table 1 was presented the application of thickening agents in various food systems. The viscosity rate of thickening agents does not remain constant but changes with conditions like temperature, pH, solute, the concentration of the food system.

Guar gum powder was produced by processing guar plant seed (*Cyanaposis tetragonolobus L.*) (Krstonošić et al., 2021). It has advantages and is used for several applications in the various food industries for its incredibly beneficial properties such as textural improvement and water

holding capacity of processed meat products, it performed prevention of fat migration during storage and kept the water in the system of restructuring meat product.

In addition, guar gum powder also increases the creaming stability and rheology property of emulsion prepared by egg yolk (Ercelebi & Ibanoglu, 2010) and low-fat yogurt comparable with full-fat yogurt (Brennan & Tudorica, 2008). Then, it can be encapsulated for food flavor (Mudgil et al., 2014). In the quality of soft tofu stew sauce, the addition of guar gum results in a significant increase in the rheological behaviors and as a key factor of overall acceptability (Im et al., 2015). Some researchers were used to prevent ice crystal growth and control texture during freezing (Gupta & Variyar, 2018).

Table 1: Application of thickening agents in food.

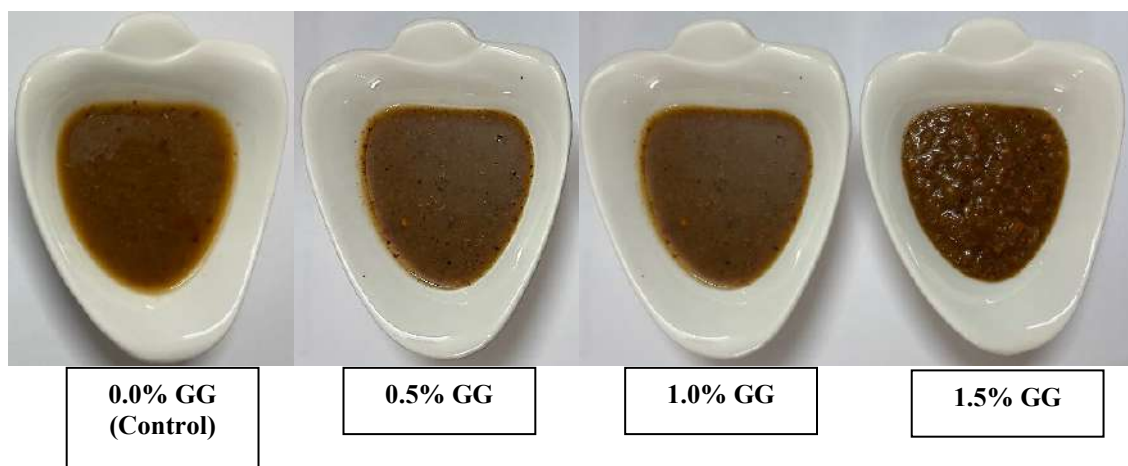
Hydrocolloids as thickening agents	Application in food products
Xanthan	Soups and gravies, ketchups, instant beverages, desserts, toppings, and fillings
Carboxymethyl cellulose (CMC)	Salad dressings, gravies, fruit pie fillings, ketchup
Methyl Cellulose (MC) and Hydroxypropyl Methyl Cellulose (HPMC)	Salad dressings, cake batters, beverages, whipped toppings
Galactomannans (Guar gum, Locust bean gum, and tara gum)	Dairy products including ice cream, ketchup, fruit juices, pudding powder, cake batter

Source: (Saha & Bhattacharya, 2010).

4. Research Methodology

4.1 Product (the sauce)

Esan hot pot sauce was supported by one of Esan hot pot restaurants, Khon Kaen Province, Thailand. Four formulas with the different levels of a thickening agent (guar gum, GG) were tested in this study as the following: 0% (without GG), 0.5%, 1.0%, and 1.5% respectively, other ingredients were used the same level for all formulas (there was not shown the ratio of ingredient of chili powder, roasted rice powder, sugar, and thai herb). The percentages of guar gum were applied as required by preliminary testing and FDA recommendation (not to exceed 2%) (Tripathy & Das, 2013). All samples were produced and kept in the refrigerator at 4 to 10 degrees Celsius until tasting (approximately 2 days). In addition, figure 2 was exhibiting the level of GG added in the sauce reflecting on its thickness and viscosity.



4.2 Participation

The thirty volunteers (n =30) aged between 19 to 45 years old from Khon Kaen University were asked to test their preference toward the four formulas of additional guar gum. The screen questions regarding consumer behavior and experience with Esan hot pot soup and sauce were applied, [Question; Have you ever eaten Esan hot pot sauce before? (Yes and No) and How often do you eat Esan hot pot sauce? (2-6 times per week, once per week, few times per month, once per month, and less than one per month)]

4.3 Procedure

The four sauce formulas were poured into a 50 milliliters clear plastic bowl and covered with 3-digit random numbers. After that, they were asked to rate the thickness liking and overall liking using the 9-point hedonic scale (1= extremely dislike, 5= neither like nor dislike, and 9= extremely like) in which was routinely adopted in food science study for 60 years (Wichchukit & O'Mahony, 2015). Acceptance test was evaluated using 2-point scale (1 = Accept and 2 = Reject). The piece of white bread and water were used as their palate's cleaner. All evaluations were conducted in isolated sensory booths under normal white lighting. (Sukkwai et al., 2018)

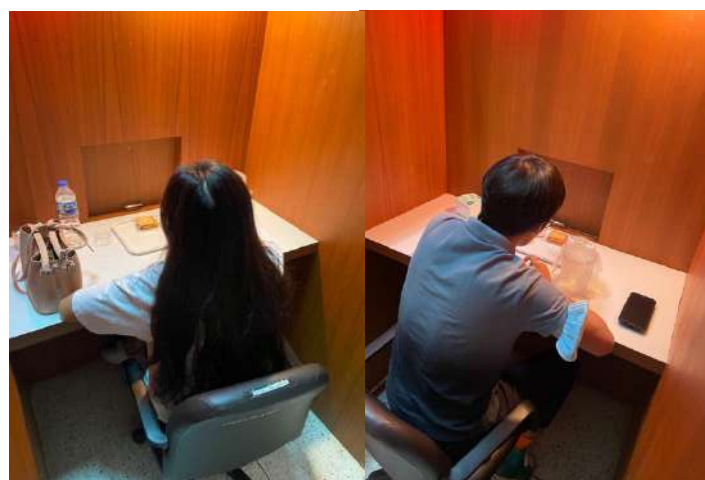


Figure 3: Consumers were evaluating the sample in the booth.

4.4 Measurement of viscosity

The apparent viscosity of Esan hot pot sauce was investigated by using Brookfield viscometer (DV-III, Brookfield-RVT) using Spindle No. 1, 5 rpm at 30°C. The viscosity of the sample was expressed in the centipoises unit (cP) (Singh et al., 2014).

4.5 Data analysis

The significance of differences among the four Esan hot pot sauce formulas in terms of viscosity and sensory liking was determined at $P \leq 0.05$ by using an analysis of variance (Scheffe, 1999), followed by Duncan’s multiple range tests (Tallarida & Murray, 1987). Analysis was performed using the SPSS statistical package version 28 by Khon Kaen University license (SPSS 28.0 for Windows, SPSS, Inc., Chicago, IL).

5. Results

5.1 Demographic information and consumer behaviour.

The demographic information was a cover of gender, age and consumer behaviour for 30 consumers. As seen in Table 2, the result shows 16 females (53.33%) and 14 males (46.67%). There were 3 age ranges between 16 - 25, 26 - 35, and 36 - 45 years old with 12 participants (40.00%), 8 participants (26.67%), and 10 participants (33.33%), respectively. Consumer behavior questions were asked to screen the participants before testing the sample, it was found that 100% of participants used to have Esan hot pot sauce before and there were more 56.67% of participants have eaten Esan hot pot sauce for once per week.

Table 2 Demographic information

Demographic information	participants	%
<i>Gender</i>		
Male	14	46.67
Female	16	53.33
<i>Age</i>		
16 - 25 Years old	12	40.00
26 - 35 Years old	8	26.67
36 - 45 Years old	10	33.33
<i>Consumer behaviour</i>		
<u>Q: Have you ever eaten Esan hot pot sauce before?</u>		
Yes	30	100
No	0	0
<u>Q: How often do you eat Esan hot pot sauce?</u>		
2-6 times per week	5	16.67
Once per week	12	40.00
Few times per month	7	23.33
Once per month	3	10.00
Less than one per month	3	10.00

* There were thirty volunteers ($n=30$) in this study, it was calculated and presented into the percentage.

5.2 Sensory liking and viscosity properties of Esan hot pot sauce

Thirty consumers have evaluated Esan hot pot sauce with four different levels of guar gum at 0%, 0.5%, 1.0%, and 1.5%. The thickness liking and overall liking were utilized to determine the sensory quality of the product. The result found that four formulas of Esan hot pot sauce showed a significant difference ($p < 0.05$) on thickness liking, as seen in Table 2. The increasing of guar gum at 1.0% and 1.5% can increase the thickness liking for 7.93 ± 1.01 and 7.50 ± 1.16 , respectively, compared with the control sample without guar gum and 0.5% of guar gum for 6.46 ± 1.52 and 6.70 ± 1.08 , respectively. In addition, the overall liking results (7.06 to 7.46 score) were not significantly different from the levels of guar gum.

The viscosity property of Esan hot pot sauce was investigated using a Brookfield viscometer and reported in the cP unit. All Esan hot pot sauces presented a significant difference ($p < 0.05$) on viscosity property. The highest value of viscosity was 5,501 cP at 1.5% GG and the lowest value was 448 cP without guar gum.

Table 2: Sensory liking and viscosity properties of Esan hot pot sauce.

The levels of additional GG to the sauce	Sensory liking ¹		Viscosity ² (cP)
	Thickness liking	Overall liking ^{ns}	
0% GG (Control)	6.46 ± 1.52^b	7.06 ± 1.36	448.00 ± 15.39^d
0.5% GG	6.70 ± 1.08^b	7.10 ± 1.51	842.67 ± 42.85^c
1.0% GG	7.93 ± 1.01^a	7.46 ± 1.07	$2,529.00 \pm 47.32^b$
1.5% GG	7.50 ± 1.16^a	7.13 ± 1.27	$5,501.00 \pm 32.51^a$

¹ Mean $\pm$ SD from 30 volunteer participants.

² Indicating a significant difference by Duncan's multiple range test ($p < 0.05$).

^{ns} No difference significance.

5.3 Consumer acceptance of Esan hot pot sauce

Sensory evaluation plays an attention role to predict consumer acceptance of Esan hot pot sauce. This case study was used 2 points scale to evaluate consumer acceptance (accept or reject product). As seen in Figure 3, the consumer acceptance of Esan hot pot sauce with different levels of guar gum is at 0%, 0.5%, 1.0%, and 1.5%. Results found that the additional 1.0% of guar gum was showed the highest frequency of consumer acceptance of the product at 100%. In contrast, adding 1.5% and 0.5% of guar gum were the frequency of accepted product (90% and 86.67% of accepted product, respectively) lower than 1.0% of guar gum added.

However, the control sample (without guar gum) was presented the highest percentage of rejected products for 43.33% which was a similar trend of the thickness liking and overall liking that showed the lowest score of consumers liking for 6.46 ± 1.52 and 7.06 ± 1.36 , respectively.

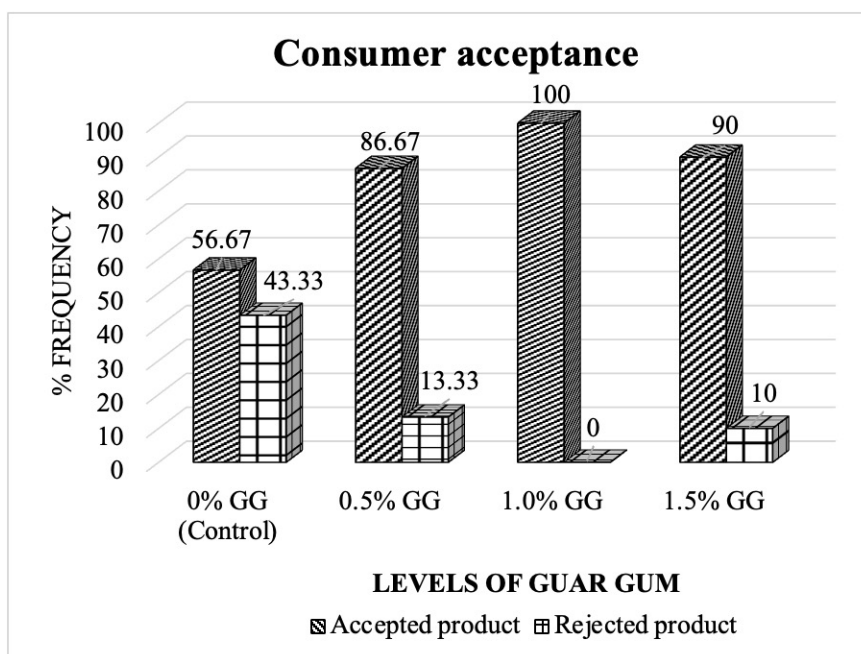


Figure 4 Consumer acceptance of Esan hot pot sauce

6. Discussion and Conclusion

This study focused on the evaluation of the impact of the thickening agent for Esan hot pot sauce on sensory liking, consumer acceptance, and physical property. The addition of guar gum could improve the textural quality of Esan hot pot sauce. It was similar results of (Tripathy & Das, 2013), who mentioned that the concentration of guar gum is enhanced the degree of inter-molecular chain interaction enhanced causing an increase in viscosity. As presented in Table 2 the viscosity result of Esan hot pot sauce is at 0%, 0.5%, 1.0%, and 1.5% of guar gum from 448 to 5,501 Cp. (Sahin & Ozdemir, 2004) reported that the addition of the different hydrocolloids such as locust bean gum, tragacanth gum, guar gum, xanthan gum, and carboxymethyl cellulose (CMC) have an impact on the physical properties of ketchup products.

Consumer acceptance was determined through preference tests by the target consumers to assess the thickness liking and overall liking of Esan hot pot sauce product. It was found that 1% of guar gum added to the product was most liked and accepted by consumers **which all** participants used to have Esan hot pot sauce before and they were age between 16 - 45 years old. However, the concentration of guar gum in the case at 0 - 1.5% not only influenced the overall liking of Esan hot pot sauce. (Moskowitz & Krieger, 1993) and (Li et al., 2015) suggested that although the appearance of the product on consumer acceptance may be different, it may not be a critical driver of liking. (Im et al., 2015) reported that various levels of guar gum (0.0, 0.1, 0.2, 0.4, and 0.5%) affected sensory attributes and viscosity property of the stew sauces. Fifty-one consumers preferred the stew sauce at 0.1% of guar gum.

In summary, the different concentrations of thickening agents demonstrated as sensory drivers of liking and disliking factors and consumer acceptance. In this study, Esan hot pot sauce at 1% guar gum was performed the highest score of sensory liking and consumer acceptance.

7. Research Implications

The research could be implied into two aspects. First, the implications for the restaurants that serve a kind of food with sauce e.g., shabu-shabu, sukiyaki, barbecue, and grilled restaurant. This kind of restaurant is increasingly widely popular in Thailand. The restaurant might adapt its sauce viscosity to be not too much loose or thick in accordance with consumers’ preferences. The suggested level of guar gum is 1% and 1.5% added because these levels are the two most satisfied consumers’ preferences. Despite these two levels being recommended, the concern is that the Esan hot pot sauce has added the roasted rice in a certain amount, and it makes the sauce thicker as the basis. The right amount of guar gum powder is varying in different kinds of sauce and ingredients.

On the other hand, the implications for the food industry especially in sauce production. The sauce production like sukiyaki, shabu-shabu, barbecue, as well as Esan hot pot sauce has much better to add a certain amount of guar gum instead of 0% added because the 0% produces the highest rejection rate at 44.33% of participants. The right additional amount might be further examined and tested by the producers because of the variation of ingredients and spices.

Research limitations

The current study has focused on the overview of the Esan hot pot sauce thickening aspect. There are several limitations found in this present study. A limited number of thirty participants would not represent the generalizability in which could not be implied to the whole region and industry. There are missing some aspects to assess consumer preference and acceptance of Esan hot pot sauce, for instance, sauce color level and the taste expectation are unidentified. In addition, comparative evidence of the similar type of sauce that existed in the market has not been discussed. Therefore, the researchers would suggest that future research further empirically and deeply study with a bigger sample, border aspects, and more comparative.

8. References

- Brennan, C. S., & Tudorica, C. M. (2008). Carbohydrate-based fat replacers in the modification of the rheological, textural and sensory quality of yoghurt: Comparative study of the utilisation of barley beta-glucan, guar gum and inulin. *International Journal of Food Science and Technology*, 43(5), 824–833.
<https://doi.org/10.1111/j.1365-2621.2007.01522.x>
- Ercelebi, E. A., & Ibanoglu, E. (2010). Stability and rheological properties of egg yolk granule stabilized emulsions with pectin and guar gum. *International Journal of Food Properties*, 13(3), 618–630. <https://doi.org/10.1080/10942910902716984>
- Glassburn, D. L., & Deem, J. F. (1998). Thickener viscosity in dysphagia management: Variability among speech-language pathologists. *Dysphagia*, 13(4), 218–222.
<https://doi.org/10.1007/PL00009575>

- Gupta, S., & Variyar, P. S. (2018). Guar gum: A versatile polymer for the food industry. In A. M. Grumezescu & A. M. B. T.-B. for F. D. Holban (Eds.), *Biopolymers for Food Design* (pp. 383–407). Elsevier. <https://doi.org/10.1016/B978-0-12-811449-0.00012-8>
- Im, P., Han, J.-H., Kim, Y.-C., Lee, B., Kim, M.-Y., Chang, Y., Yu, S., & Lee, Y. (2015). Effects of guar gum on quality of soft tofu stew sauce. *Journal of the Korean Society of Food Science and Nutrition*, 44(3), 442–448. <https://doi.org/10.3746/jkfn.2015.44.3.442>
- Krstonošić, V., Jovičić-Bata, J., Maravić, N., Nikolić, I., & Dokić, L. (2021). Rheology, structure, and sensory perception of hydrocolloids. In C. M. B. T.-F. S. and F. Galanakis (Ed.), *Food Structure and Functionality* (pp. 23–47). Elsevier. <https://doi.org/10.1016/B978-0-12-821453-4.00005-3>
- Li, X. E., Jervis, S. M., & Drake, M. A. (2015). Examining extrinsic factors that influence product acceptance: A review. *Journal of Food Science*, 80(5), R901–R909. <https://doi.org/10.1111/1750-3841.12852>
- Moskowitz, H., & Krieger, B. (1993). What sensory characteristics drive product quality? An assessment of individual differences. *Journal of Sensory Studies*, 8(4), 271–282. <https://doi.org/10.1111/j.1745-459X.1993.tb00219.x>
- Mudgil, D., Barak, S., & Khatkar, B. S. (2014). Guar gum: Processing, properties and food applications—A Review. *Journal of Food Science and Technology*, 51(3), 409–418. <https://doi.org/10.1007/s13197-011-0522-x>
- Saha, D., & Bhattacharya, S. (2010). Hydrocolloids as thickening and gelling agents in food: A critical review. *Journal of Food Science and Technology*, 47(6), 587–597. <https://doi.org/10.1007/s13197-010-0162-6>
- Sahin, H., & Ozdemir, F. (2004). Effect of some hydrocolloids on the rheological properties of different formulated ketchups. *Food Hydrocolloids*, 18(6), 1015–1022. <https://doi.org/10.1016/j.foodhyd.2004.04.006>
- Scheffe, H. (1999). *The analysis of variance* (Vol. 72). John Wiley & Sons.
- Singh, R., Brar, S. P. K., & Thind, S. S. (2014). Effects of different packaging conditions and storage temperatures on the physico-chemical properties of barbecue sauce. *International Journal of Food and Fermentation Technology*, 4(2), 129. <https://doi.org/10.5958/2277-9396.2014.00015.4>
- Sukkwai, S., Kijroongrojana, K., Chonpracha, P., Pujols, K. D., Alonso-Marengo, J. R., Ardoin, R., & Prinyawiwatukul, W. (2018). Effects of colorant concentration and ‘natural colour’ or ‘sodium content’ claim on saltiness perception, consumer liking and emotion, and purchase intent of dipping sauces. *International Journal of Food Science & Technology*, 53(5), 1246–1254. <https://doi.org/10.1111/ijfs.13704>
- Tallarida, R. J., & Murray, R. B. (1987). Duncan Multiple Range Test. In *Manual of Pharmacologic Calculations* (pp. 125–127). Springer New York. https://doi.org/10.1007/978-1-4612-4974-0_38
- Tripathy, S., & Das, M. K. (2013). Guar gum: Present status and applications. *Journal of Pharmaceutical and Scientific Innovation*, 4(4), 24–28. <https://doi.org/10.7897/2277-4572.02447>
- Wichchukit, S., & O’Mahony, M. (2015). The 9-point hedonic scale and hedonic ranking in food science: Some reappraisals and alternatives. *Journal of the Science of Food and Agriculture*, 95(11), 2167–2178. <https://doi.org/10.1002/jsfa.6993>

HOLISTIC HEALTH AND WELLNESS MANAGEMENT

Relationship between Environmental Factors Influencing the Detection of Total Coliforms Bacteria in Drinking Water in Sealed Containers, Southern Thailand by Multiple Logistic Regression.

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Abstract

The safety of drinking water is essential to human life. However, previously, the numbers of bacterial quality of drinking water in sealed container was beneath designated safety standards. Although drinking water quality in Thailand is controlled according to the Notification of the Ministry of the Public Health No. 61 (BE. 2524) entitled Drinking water in sealed containers. Therefore, this study applied statistics to determine the relationship between the environmental factors, the growth and proliferation of bacteria. The analyzed annual reports of water quality (high total coliforms bacteria sample) by the Department of Medical Science laboratories were obtained, parallelly the reported annual air temperature was collected via National Statistical Office during fiscal year 2015 – 2020. The bacterial water quality indicator, here expressed by the high total coliforms bacteria (TCB) sample in drinking water in sealed container, was applied to multiple logistic regression by setting the level of confidence 95% ($p < 0.05$). The result showed that year of production and each laboratory have been significantly difference. This may be caused by different climate conditions, especially temperature, which is an important factor influencing the growth of bacteria. Moreover, the growth of the city, transportation process and location for keep might affect the water quality and further influence drinking water quality. However, process of manufacture does not ensure the pass of product testing, further study from production to distribution processes of sealed-container drinking water should be done.

Keywords: total coliform bacteria, drinking water, southern Thailand, multiple logistic regression

1. Introduction

Water is essential for human required in life (Usuwanthim *et al*, 2010, 50-56). Which is a basic facility giving everyone access to clean, safe, and affordable water. It is the United Nations (UN) declared the Sustainable Development Goals 6 or SDG 6 with the aim clean water and sanitary for all by 2030 around the world (Alshomali & Gulseven, 2020, 1-3). Human need

average for clean water in residence about 100 liters/person/day (Office of the Health Promotion Fund., 2012). Water quality is important factors affecting health safety of consumer and the suitability for utilization in various aspects (Bajarczuk *et al*, 2018, 10102-10114). Clean water is to be use for drinking, cooking, and simple hygiene (Khalifa & Bidisee, 2018, 17-20). Presently, around the world required use water increase 1 percent/year and expect the human would like to use increase about 20 – 30 times of consumption within 2090 (Singhanart, 2020). During 2010 – 2017, Demand of drinking water was increase from 61 to 71 percent (Poulin *et al*, 2020, 13566-13578). Natural resource of water was appropriated for manufacture water supply was surface water, such as, rain, creeks, rive, lakes and can used another there but bring to improve water quality before (Thongboran & Srisuwan, 2018, Khalifa & Bidaisee, 2018, 17-20, Stanaszek-Tomal, 2020, 1-9). In 2005 – 2014, Bureau of water quality management analyze surface water can showed more deteriorating water quality by main caused discharge of sewage from community sources and leaching of agricultural residues. Regarding water quality by region, Southern Thailand have been the best than another region. Overall was on fair to good criteria (Bureau of water Quality Management, 2014). Consider, provinces each found that, Phuket was the most degraded, Phang-nga was faired, Krabi Trang and Ranong were good in standard (Regional Environment Office 15, 2019). Chumphon was fair to good, Nakhon Si Thammarat is degraded to faired, Surat Thani and Phatthalung were degraded to good (Regional Environment Office 14, 2021). The continuous development of tourism, agriculture and industry cause water pollution and water quality were more deteriorate (Islam *et al*, 2017, 319-332). Water quality assessment can be defined as the evaluation of the biological, chemical, and physical (Bajarczuk *et al*, 2018, 10102-10114, Jufri, 2020, 12-17). Bacterial indicators of water quality, total coliforms bacteria (TCB) can be easy to analyze more than the other because pathogens have short life cycle, low quantity and difficult for analyze (Seo *et al*, 2019, 1-16). They live intestinal gut and can be detected in digestive system of warm-blood animals including human, if detected in water resource it indicates excretion feces contamination (Nuangjui & Chanphiwat, 2021, 11-16, Seo *et al*, 2019, 1-16). In addition, TCB can cause serious illness such as gastroenteritis and diarrhea, these contaminations can indication with pathogens with cause diseases in the human such as cholera, dysentery, typhoid fever from infection *Vibrio cholerae*, *Shigella dysenteries* and *Salmonella typhimurium* (Kudsong *et al*, 2010, 102-106, Nimrat *et al*, 2021, 102-113, Takal & Quaye-Ballard, 2018, 1-11). The quality standard TCB per 100 milliliter must less than 2.2 in drinking water in sealed container (Notification of Public Health No. 61, 1981) and product samples must analyze at least once per year.

From the data previous, in 2010 found cause TCB contamination in the base-basin of the Nan River exceeds the specified standard, it was illness from incidents in water in Thailand, which make must be vigilant and notified of inappropriateness for consumption (Kudsong *et al*, 2010, 102-106). Later in 2015, There was a study showed have been TCB does not pass specified standard from consumption behavior in the river of the people in Bang Look Sua Sub-District community, Ongkharak District, Nakhon Nayok Province, while testing relationship statistic significant between occurrence of diarrhea and skin disease (Phakham *et al*, 2016, 17-23). At the same time, 1,330 staffs and students detected 55 people were diarrhea epidemic at military school from Prachuap Khiri Khan Province because of drinking water contaminated *Escherichia coli* (Komol *et al*, 2018, 124-135). For overseas situation, between 2010 – 2017 the population was about 2.2 million people have been diarrhea due to drinking water contamination with microorganism and 500,000 deaths in Republic of Uganda and Bangladesh (Poulin *et al*, 2020, 13566-13578). The drinking water quality each area found that

was difference and had increase deterioration. In this study applied statistical analysis to determine the relationship between the environmental factors and the not pass the standard of microorganism. The bacterial water quality indicator, here expressed by the high TCB sample in sealed-container drinking water, was applied to multiple logistic regression model, and predict the likelihood (Aungsakaw & Jhan-o-phat, 2016).

2. Research Objectives

This study aimed to determine the relationship between environmental factors and the high TCB sample in drinking water in sealed containers Southern Thailand.

3. Research Methodology

3.1 The annual reported high TCB sample in drinking water in sealed container was collected from the Department of Medical Science laboratory in Southern Thailand. Data consisted of four laboratories based on Regional Medical Science Center (RMSC) setting; Surat Thani=RMSC 11 (responding for Surat Thani, Nakorn Sri Thammarat, Chumphon, and Ranong Provinces); Phuket = RMSC 11/1 (responding for Phuket, Phang Nga and Krabi Provinces); Songkhla = RMSC 12 (responding for Songkhla, Pattani, Yala, and Narathiwat Provinces) and Trang = RMSC 12/1 (responding for Trang, Satun and Pattalung Provinces). Then, the reported TCB were further normalized by the number of the total samples. Moreover, the annual air temperature data was collected from National Statistical Office (NSO) between fiscal year 2015 and 2020. The air temperature was averaged based on the regional laboratory responsibility. In Figure 1.

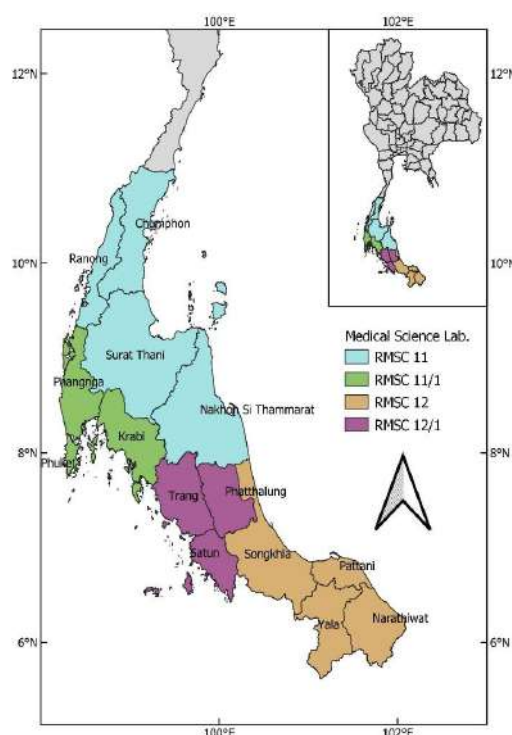


Figure 1 Four Regional Medical Science Center laboratories in Southern Thailand; blue: RMSC 11 (Surat Thani Laboratory), green: RMSC 11/1 (Phuket Laboratory), purple: RMSC 12/1 (Trang Laboratory), and brown: RMSC12 (Songkhla Laboratory).

3.2 To determine the relationship of air temperature factors and high TCB samples in sealed-container drinking water, collected data was analyzed with the multiple logistic regression model with the ‘stats’ package in R 4.1.1 (Lim, 2021, Raksakiattisak, 2018). The number of the high TCB sample was used as a dependent variable, and environmental factors (year of production, air temperature, and RMSC laboratory) are predictive variables.

3.3 A multiple logistic regression model is in the follow form the odds or the logit (y), $\text{logit}(y) = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3$ when y is number of high TCB sample, x_1 is year of production, x_2 is air temperature, x_3 is RMSC laboratory. Test probabilistic ratio (Likelihood ratio) by Analysis of variance (ANOVA) test for $p = 0.95$ were used to determine the significance of differences in the examined parameters between the study area of the year. Then, the no significant variables were eliminated. Finally, the computed model was rechecked the suitability of the model with the ROC curve (Lim, 2021).

4. Results

Table 1 presents the collecting quality report about total sample of drinking water, high TCB sample all Regional Medical Sciences Center laboratory (RMSC 11 = Surat Thani = SRT, RMSC 11/1 = Phuket = PKT, RMSC 12 = Songkhla = SKL, RMSC 12/1 = Trang = TRG) and average air temperature from National Statistical Office (NSO) between 2015 - 2020. The water samples from 4 laboratories were total 10,665 samples (consist of 3,932 samples in RMSC 11, 1,070 samples in RMSC 11/1, 2,856 samples in RMSC 12, 2,807 samples in RMSC 12/1), high TCB sample was 1,795 samples (consist of 922 samples in RMSC 11, 241 samples in RMSC 11/1, 314 samples in RMSC 12, 318 samples in RMSC 12/1) and average air temperature range from 27.48 to 27.83°C (consist of 27.48°C in RMSC 11, 27.86°C in RMSC 11/1, 27.70°C in RMSC 12 and 27.83°C in RMSC 12/1).

Table 1 Quality report on drinking water and air temperature form RMSC laboratory and NSO

Year	Number of samples								Mean of air Temp (°C)			
	RMSC 11		RMSC 11/1		RMSC 12		RMSC 12/1		RMSC 11	RMSC 11/1	RMSC 12	RMSC 12/1
	Total	High TBC	Total	High TBC	Total	High TBC	Total	High TBC				
2015	880	298	222	34	532	23	464	52	27.45	27.83	28.03	27.83
2016	906	164	166	28	707	159	465	52	27.70	27.97	28.15	28.30
2017	615	115	143	42	555	53	422	42	27.25	27.53	27.28	27.57
2018	580	130	256	42	372	32	799	73	27.28	27.73	27.38	27.63
2019	530	137	172	48	343	11	290	39	27.63	28.10	27.83	27.90
2020	421	78	111	47	347	36	367	60	27.60	27.97	27.50	27.77
Total	3,932	922	1,070	241	2,856	314	2,807	318	27.48	27.86	27.70	27.83

Table 2 presents the results of analysis multiple logistic regression revealed that the relationship between year of production (x_1) and air temperature (x_2). The p-values were ranged from 7.52×10^{-8} to 0.049 ($p < 0.05$). A logistic regression model was created to predict the likelihood of high TCB sample separate each laboratory showed that

- (1) $\text{logit}(y)_{\text{RMSC 11}} = 262.06 - 0.10x_1$
- (2) $\text{logit}(y)_{\text{RMSC 11/1}} = -659.65 + 0.26x_1$
- (3) $\text{logit}(y)_{\text{RMSC 12}} = 913.97 - 0.35x_1 - 0.56x_2$
- (4) $\text{logit}(y)_{\text{RMSC 12/1}} = -202.12 + 0.07x_1 + 0.56x_2$

Analysis of variance (ANOVA) showed that environmental factors in year of production, air temperature and the high TCB sample of drinking water in sealed containers at Southern Thailand, there were statistically significant differences between each laboratory.

Table 2 The result of statistic test classified by each laboratory.

RMSC 11	Estimate Std.	Error	z value	Pr (> z)
(Intercept)	262.06	64.39	4.07	4.71 x 10 ⁻⁵ ***
Year (x ₁)	-0.10	0.02	-4.12	3.77 x 10 ⁻⁵ ***
Temp (x ₂)	-0.23	0.21	-1.07	0.284
RMSC 11/1	Estimate Std.	Error	z value	Pr (> z)
(Intercept)	-659.65	141.59	-4.66	3.18 x 10 ⁻⁶ ***
Year (x ₁)	0.26	0.06	4.54	5.64 x 10 ⁻⁶ ***
Temp (x ₂)	-0.43	0.37	-1.14	0.254
RMSC 12	Estimate Std.	Error	z value	Pr (> z)
(Intercept)	913.62	169.86	5.38	7.42 x 10 ⁻⁸ ***
Year (x ₁)	-0.35	0.06	-5.38	7.52 x 10 ⁻⁸ ***
Temp (x ₂)	-0.56	0.11	-4.93	8.25 x 10 ⁻⁷ ***
RMSC 12/1	Estimate Std.	Error	z value	Pr (> z)
(Intercept)	-202.12	94.21	-2.14	0.032 *
Year (x ₁)	0.07	0.04	1.97	0.049 *
Temp (x ₂)	0.56	0.27	2.07	0.039 *

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table 3 presents overall the relationship between year of production (x₁), air temperature (x₂) and RMSC laboratory (x₃) were differences in the detection number of analyze high TCB sample in sealed containers drinking water Southern Thailand. A multiple logistic regression model showed that

logit (y) = -2.03 - 0.27x₁₍₂₅₆₀₎ - 0.32x₁₍₂₅₆₁₎ + 0.03x₂ - 0.87x_{3(RMSC 12)} - 0.81x_{3(RMSC 12/1)}
 Year of production, RMSC laboratory were significant differences. The p-values were ranged from < 2 x 10⁻¹⁶ to 0.03 (p < 0.05) and air temperature was not significant differences (p > 0.05) in high TCB sample between year of production and RMSC laboratory.

Table 3 The statistic result and multiple logistic regression model Southern Thailand.

	Estimate Std.	Error	z value	Pr (> z)
(Intercept)	-2.03	6.97	-0.29	0.771
Year (x ₁) ₂₅₅₉	-0.06	0.10	-0.63	0.529
Year (x ₁) ₂₅₆₀	-0.27	0.12	-2.21	0.027 *
Year (x ₁) ₂₅₆₁	-0.32	0.11	-3.00	0.003 **
Year (x ₁) ₂₅₆₂	-0.12	0.09	-1.31	0.190
Year (x ₁) ₂₅₆₃	-0.03	0.09	-0.29	0.772
Temp (x ₂)	0.03	0.25	0.13	0.893
Lab(x ₃) _{RMSC 12}	-0.87	0.09	-8.76	< 2 x 10 ⁻¹⁶ ***
Lab (x ₃) _{RMSC 11}	0.04	0.13	0.34	0.730
Lab (x ₃) _{RMSC 12/1}	-0.81	0.09	-8.56	< 2 x 10 ⁻¹⁶ ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table 4 presents the suitability examining of the environmental factor variables present or absence in the multiple logistic regression models by statistics chi-square (χ^2 - test). The result showed all environmental factors are p-value < 0.05. Which can conclusion the year of production, air temperature and RMSC laboratory must have into the model.

Table 4 Testing the suitability of variables in logistic regression equation by χ^2 - test

Factor	Df	Deviance	Resid.	Df Resid.	Dev	Pr (>Chi)
NULL				23	557.51	
Year (x ₁)	5	33.51	18	524.00	2.98 x 10 ⁻⁶	***
Temp (x ₂)	1	95.92	17	428.08	2.2 x 10 ⁻¹⁶	***
Lab (x ₃)	3	173.19	14	254.89	2.2 x 10 ⁻¹⁶	***

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Based on figure 2, the equation can predict the probability the detection of TCB sample by $p(y) = e^{\text{logit}(y)} / 1 + e^{\text{logit}(y)}$, when $p(y) < 0.5$ is the low TCB sample and $p(y) \geq 0.5$ is the high TCB sample. After that perform an evaluation of the model’s performance by recheck the harmony with the ROC curve which considers sensitivity and specificity area under the curve along with comparing result and true value from observation, the ROC curve = 0.63. It shows that the model’s poor alignment with the actual data has a chance of predicting the result incorrectly.

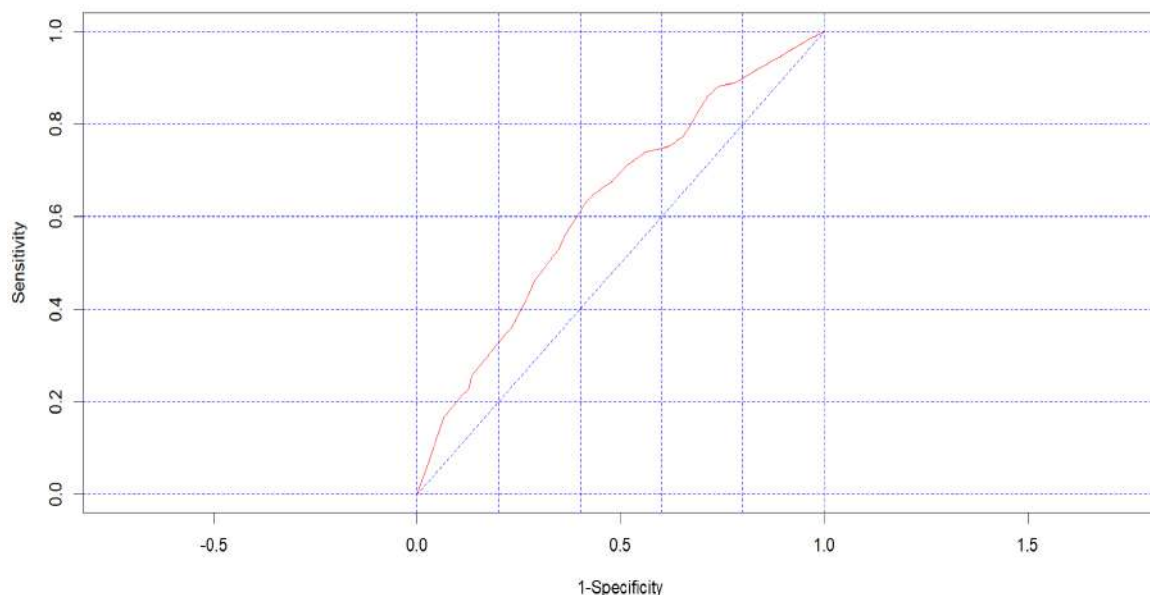


Figure 2 The testing harmony of the model with ROC curve.

Table 5 presents the suitability testing process of the generated model was concluded, the likelihood of high TCB sample in drinking water in sealed container have relationship with year of production, air temperature and RMSC laboratory. Their showed that, which comparing the number of high TCB sample in 2015 with 2017 and 2018, they dropped out 0.76 and 0.73 times higher respectively. And comparing the testing sites with each laboratory with RMSC 11/1, it was found that the high TCB sample of the RMSC 12, and RMSC 12/1 were 0.42 and 0.44 times respectively.

Table 5 The evaluated result from models created with multiple logistic regression.

	Crude OR (95%CI)	Adj. OR (95%CI)	P (Wald's test)	P (LR-test)
Year: ref. = 2015				< 0.001
2016	0.91 (0.78, 1.06)	0.94 (0.77, 1.15)	0.529	
2017	0.71 (0.59, 0.84)	0.76 (0.6, 0.97)	0.027	
2018	0.67 (0.56, 0.79)	0.73 (0.59, 0.9)	0.030	
2019	0.89 (0.74, 1.06)	0.88 (0.73, 1.06)	0.190	
2020	0.9 (0.75, 1.07)	0.97 (0.81, 1.17)	0.772	
Temp	0.72 (0.6, 0.86)	1.03 (0.63, 1.69)	0.893	< 0.001
Lab: ref. = RMSC 11/1				< 0.001
RMSC 12	0.42 (0.35, 0.521)	0.42 (0.34, 0.51)	< 0.001	
RMSC 12/1	0.44 (0.37, 0.53)	0.44 (0.37, 0.54)	< 0.001	
RMSC 11	1.05 (0.9, 1.24)	1.04 (0.81, 1.34)	0.773	

5. Discussion and Conclusion

The aim of this study was investigated detection high TCB sample in drinking water in sealed containers under the 3 environmental factors, (1) year of production (2) air temperature and (3) RMSC laboratory. We found that all environmental factors have been relationship statistic significant ($p_{(x1)}$, $p_{(x2)}$ and $p_{(x3)} < 0.05$). The relationship separates each laboratory, the result show that, year of production in RMSC 11 and RMSC 11/1 have been relationship statistic significant ($p_{(x1)}$ (RMSC 11) and $p_{(x1)}$ (RMSC 11/1) < 0.05) and air temperature are not statistic significant ($p_{(x2)}$ (RMSC 11) > 0.05 and $p_{(x2)}$ (RMSC 11/1) > 0.05). At the same time, RMSC 12 and RMSC 12/1 are statistic significant ($p_{(x1)}$ (RMSC 12), $p_{(x2)}$ (RMSC 12) < 0.05 and $p_{(x1)}$ (RMSC 12/1), $p_{(x2)}$ (RMSC 12/1) < 0.05).

Because of difference year and location of production are influencing to climate change, such as, temperature which influence to growth and survival of all bacteria (Hou *et al*, 2017, 1-12, Islam *et al*, 2017, 319-332). The air temperature each location has been difference, while was suitable for growth of bacteria between 20 – 50 degrees Celsius (Bintsis, 2017, 529-563). The detection high TCB in water does not pose a direct risk of waterborne diseases, but their indicates contamination and the possible presence of waterborne pathogens which risk of waterborne disease outbreaks to the consumer (Bojarczuk *et al*, 2018, 10102-10114, Islam *et al*, 2017, 319-332). In addition, location for keep and transportation process cause of modified temperature effected to water quality (Colt & Fornshell, 2014, 1-6).

Therefore, logistic regression model high TCB sample and impact of environmental variables on southern Thailand is challenging. TCB standards for drinking water are designed to guarantee limited disease risks (less than 2.2/100 milliliters). If more than standard it indicated a public health problem. The conclusion in this study environmental factors about year of production, air temperature and RMSC laboratory in Southern Thailand, we have found that high TCB sample with increased air temperature in drinking water in sealed containers and anticipate the pathogens similarly to indicator bacteria, which health risk will increase with air temperature and each laboratory. Wherewith all laboratories effected by difference factors the suitability of model for predict probability high TCB sample with calculation under the ROC curve less than 0.8, it is indicating poor harmony of the subject and not suitable for use (Lim. 2021). This may be due to an under-processing factor, too little study year of production (2015

– 2020), or incomplete consideration of environmental factors, this causes the resulting subject to have low harmony. So that, to optimize the model, the duration of the study about year of production should be increase and add another environmental factor relevant to make the model more efficient and suitable for predict water quality. However, there are many environmental factors, which were not included in this study. Many factors possibly effect TCB in water e.g., precipitation (Islam *et al*, 2017, 319-332, Seo *et al*, 2019, 1-16), season (Bojarczuk *et al*, 2018, 10102-10114). In the future all parameters must be included.

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7. References

- Alshomali, I. S., and Gulseven, O. (2020). A Note on SDG 6 – Clean Water and Sanitation for All. *ResearchGate*. DOI: 10.13140/RG.2.2.16461.38881
- Aungsakaw, Y., and Jhan-o-phat, W. (2016). *Logistic Regression Models in Medical*. Retrieved from URL <http://sc2.kku.ac.th/stat/statweb/images/Eventpic/60/Seminar/0112.pdf> (October, 21, 2021)
- Bintsis, T. (2017). Foodborne pathogens. *AIMS Microbiology*, 3(3), 529-563.
- Bureau of water Quality Management. 2014. Annual Report Bureau of water Quality Management 2014. <https://www.pcd.go.th/publication/3910/> (November 18, 2021)
- Colt, J., and Fornshell, G. (2014). *Water quality in tilapia transport, from farm to retail*. Retrieved from URL <https://www.globalseafood.org/advocate/water-quality-in-tilapia-transport/?headlessPrint=AAAAPIA9c8r7gs82oWZBA> (February, 15, 2022)
- Hou, D., Huang, Z., Zeng, S., Liu, J., Wei, D., Deng, X., Weng, S., He, Z., and He, J. (2017). Environmental Factors Shape Water Microbial Community Structure and Function in Shrimp Cultural Enclosure Ecosystems. *Frontiers in Microbiology*, 8, 1-12.
- Islam, M. M. M., Hofstra, N., and Islam, M. A. (2017). The Impact of Environmental Variables on Faecal Indicator Bacteria in the Betna River Basin, Bangladesh. *Environmental process*, 4, 319-332.
- Jantira, K., Chutima, C., and Tiwaporn, K. (2015). Outbreak Investigation of *Escherichia coli* Diarrhea among Military Academy School Students in Prachaup Kiri Khan. *Journal of Bamrasnaradura Infectious Diseases Institute*, 12(3), 124-135.
- Jufri, R. F. (2020). The Effect of Environmental Factors on Microbial Growth. *Journal La Lifesci*, 1(1), 12-17.
- Khalifa, M., and Bidaisee, S. (2018). The Importance of Clean Water. *Scholar Journal of Applied Sciences and Research*, 1(7), 17-20.
- Kudsong, P., Nhungspreug, N., and Anurak, B. (2010). Total Coli Form Bacteria and Water Quality in Western Nan Sub-River Basin. *International Network for Water and Ecosystem in Paddy Fields*, 1, 102-106.
- Lim, A. (2021). *Data Manipulation, Graphics and Statistical Analysis Using R*. Songkhla: IQ media.

- Nuangjui, M., and Chanphiwat, P. (2021). Bacteria” Indicator of biological water quality of Rayong river in Eastern special Economic Area. *Journal of Environment*, 25(2), 11-6.
- Notification of Department of Health. (2020). *Criteria for drinking water quality*. Retrieved from URL <https://foodsafety.anamai.moph.go.th/th/water-quality/204437> (November, 26, 2021)
- Notification of National Environment. (1994). *Set water quality standards in surface water resource*. The Royal Gazette 111 part 16 Ngor.
- Notification of Public Health No. 61. (1981). *Drinking water in sealed containers*. The Government Gazette special 98 Ror Jor. 52 chapter 157.
- Notification of Public Health No 78. (1984). *Ice*. The Government Gazette special 101 Ror Jor. 9 chapter 23.
- Office of the Health Promotion Fund. (2012). Water is essential **let’s take a closer look at what is useful water**. Retrieved from URL https://www.thaihealth.or.th/Content/water_benefits.html (November, 16, 2021)
- Phakham, S., Wilachai, W., Silprasit, W., and Thummajitsakul, S. (2016). A study of waterborne diseases classified to water consumption behaviors in Moo 7 community, Bangluksua sub-district, Ongkharak district, Nakhonnayok province. *Journal of Health Science Research*, 9(2), 17-23.
- Poulin, C., Peletz, R., Ercumen, A., Pickering, A. J., Marshall, K., Boehm, A. B., Khush, R., and Delaire, C. (2020). What Environmental Factors Influence the Concentration of Fecal Indicator Bacteria in Groundwater? Insights from Explanatory Modeling in Uganda and Bangladesh. *Environmental Sciences and Technology*, 54, 13566-13578.
- Puttrawutichai, S., Kwanyuen, B., Kongjun, T., Ishii, A., and Satoh, M. (2017). Relationship between El Niño-Southern Oscillation and Seasonal Rainfall in Thailand’s Northern and Central Regions. *Journal of Science and Technology*, 6(1), 48-61.
- Raksakiattisak, S. (2018). *Knowledge discovery with Data Analytics with R and Weka*. Retrieved from URL http://science.swu.ac.th/Portals/22/PR_SCI/2018/03/180314_doc/3.0DataAnalysisWithR_andWeka_Mar2018.pdf (November, 18, 2021)
- Regional Environment Office 14. (2021). *Water quality monitoring report in the Southern region Gulf of Thailand 2020*. Retrieved from URL <http://www.mnre.go.th/reo14/th/information/more/311> (November, 18, 2021)
- Regional Environment Office 15. (2019). *Environmental situation report in the Southwest Coast 2019 Phuket Phang-nga Krabi Trang and Ranong Provinces*. Retrieved from URL <http://www.oic.go.th/FILEWEB/CABINFOCENTER66/DRAWER040/GENERAL/DATA0000/00000545.PDF> (November, 18, 2021)
- Seo, M., Lee, H., and Kim, Y. (2019). Relationship between Coliform Bacteria and Water Quality Factors at Weir Stations in the Nakdong River, South Korea. *Water journal*, 11(1171), 1-16.
- Singhanart, W. (2020). *Water quality management 2020. Department of Health Service Support*. Retrieved from URL <http://49.231.15.21/deptw2/upload/files/bsmeF256308251322418090.pdf> (November, 16, 2021)
- Stanaszek-Tomal, E. (2020). Environmental Factors Causing the Development of Microorganisms on the Surfaces of National Cultural Monuments Made of Mineral Building Materials-Review. *Coatings*, 10(1203), 1-19.

- Subuntith, N., Apinya, J., Verapong, V. (2021). Physical, Chemical and Microbiological Quality of Opaque-Plastic Bottled Drinking Water Distributed in Chon Buri Province, Thailand. *Journal of Applied Research on Science and Technology*, 20(2), 102-113.
- Raksakiattisak, S. (2018). *Knowledge discovery with Data Analytics with R and Weka*. Retrieved from URL http://science.swu.ac.th/Portals/22/PR_SCI/2018/03/180314_doc/3.0DataAnalysisWithR_andWeka_Mar2018.pdf (November, 18, 2021)
- Takal, J. K., and Quaye-Ballard, J. A. (2018). Bacteriological contamination of groundwater in relation to septic tanks location in Ashanti Region, Ghana. *Cogent Environmental Science*, 4(1556197), 1-11.
- Thongboran, N., and Srisuwan, A. (2018). *Water resource problem conservation of resources and the environment in the profession*. Retrieved from URL <https://sites.google.com/site/wichakarxnuraks/payha-thraphyagr-na> (November, 26, 2021)
- Usuwanthim, K., Othaganont, P., Timyam, W., Salaibhom, N., and t Intu, A. (2010). The Examination of contaminated bacterial in Water Sources of Muang and Around Naresuan University, Phitsanulok Province. *Naresuan University Journal* 18(2), 50-56.

INTERNATIONAL STUDIES

An Analysis of Female Protagonist (Josephine) in the Novel of Little Women

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Abstract

This research analyzed the female protagonist (Josephine) in the *Little Women* novel by Louisa May Alcott (1880) which aimed to analyze development of the female protagonist (Josephine) and to analyze gender inequality by using liberal feminism in the novel. This research is based on liberal feminism theory. This research applied a descriptive qualitative method in collecting data from the novel which were dialogues and the narrative samples derived directly from text in the *Little Women* novel. The researchers found that Jo has development of herself in characteristics, lateral thought, as well as actions and behaviors. Moreover, gender inequality is discovered in the novel through the female protagonist (Josephine), which represents less opportunities in choosing careers. The researchers concluded that Jo has improved in all three aspects in terms of controlling her anger, trying to be a writer, and a great sacrifice for the family. Although she lives in an era where men have more freedom than women, she proves that she has the potentiality that is not different from men in the society. Gender inequality cannot keep her from giving up on her dreams.

Keyword: Little Women, Female Protagonist, Liberal Feminism, Josephine, Gender inequality

1. Introduction

Little Woman based on true story of the writer, Louisa May Alcott, reflects gender inequality in society. The writer wants to inspire the girls in this period that they should not be afraid to fight for their dreams and be strong. They have to stop seeing themselves as a fragile thing that cannot live in a world where men are trying to control. The writer in this novel represents herself as Jo. Jo's personalities in the story reflect as a different girl in the 19th century, especially, her lateral thought patterns which means individual ability to think differently from others in order to solve a problem. For example, Jo does not want to marry because she has a passion to be a writer. This is the interesting point of this study. Furthermore, Alcott's story

had been translated into at least 50 languages. Today sales continue, after having found a home among Americans’ 100 most favorite books in 2014, and being ranked among Time’s top 100 young adult books of all time two years later (George, 2018). Therefore, we chose the main female in *Little Women*, Josephine, to analyze how lateral thought she has in her life.

Little Women is a classic nineteenth-century novel written by American novelist Louisa May Alcott that talk about the story of four March sisters which consist of Meg, Jo, Beth, and Amy. Meg is the oldest sister who is responsible and kind. She has a small weakness for luxury and leisure, but the greater part of her is gentle, loving, and morally vigorous. Jo is a tomboy and the second-oldest sister who wants to be a writer. She hates romance in her real life, and wants nothing more than to hold her family together. Beth, the third daughter who is very quiet and very virtuous. She adores music and plays the piano very well. Amy is the youngest girl who is an artist and adores visual beauty. She is given to pouting and fits of temper (Sparknotes, n.d.). They were raised by their mothers and taught by their fathers, but during that time their father was away because he had to fight in the American Civil War. However, they still take care of each other and live happily. Each of them has different characteristics, interests and dreams, especially Jo who is ambitious, brave person. She is unlike ordinary girls and she has to struggle many problems to follow her dream in Victorian period.

The Victorian Era (1837-1901) was the period when the British Empire and the United Kingdom were the most prosperous. This was the culmination of the Industrial Revolution, the prosperity of the economy, and the capitalist civilization. People in society are expected to adhere ethical criteria strictly, but Victorian ethics is full of contradictions, especially sex issue. In Victorian period, the women began to call for their rights in the society because they do not want to get advantage off that related to literature in this period. There are more women authors who express their ideas to support women that they should be themselves and can do anything they want. The example of a famous female author is Charlotte Bronte who wrote *Jane Eyre* (Trauma, 2020).

The hypocrite of Victorian society is clearly reflected in the oppression of women. It believed that women in the society are only two types. The first one is reserved women. They have to be good wives and mothers for husbands and children. It’s the important duties that they have to do in their life. They are seen as sexual objects of the men and have no freedom in life. The second type is dissolute women like prostitute. They are not accepted in society and they are disgusting because sex is sinful if they are not marriage yet. Lust of woman is wrong thing, but lust of men is usual that they can have free sex without shame. Therefore, the oppression of women leads to gender inequality because patriarchy involved in this period (Trauma, 2020). According to dictionary.com (n.d.), patriarchy is a social system empowered by men through social standards and traditions that favor men and withhold opportunity from women. In short, men are the power in a society and is the person who determines the values in society. As a result, women were deprived of certain rights causing inequality in society (Christ, 2016). The female protagonist in *Little Women*, Josephine, she wants to be an author, yet the women in this period are not supported or accepted by society as men. As a talented woman in this era, it was very difficult to show her talent because the society obstruct the right of women to express their opinions in public spaces.

Therefore, Jo's dream forces her to fight with the struggles that come to her life. This also makes us think about the status of women who are inferior to men through the story that takes place in society through the characters of the four sisters in the novel, *Little Women*.

The novel also shows the gender inequality associated with the liberal feminism of Jo March's character in *Little Women*. Jo is an independent and tomboy character. Her personality showing external action in the novel, in which she succeeded in facing the stereotype of women by proving that she can live well without marrying a millionaire. She proves it by being a woman writer and being involved in the public sphere. Her ambitions without being excluded from sexism shows that women should be equal as men in both the private and public spheres.

Liberal feminism is a particular approach to achieving gender equality between men and women that focuses on an individual's ability to change discriminatory actions against women. Liberal feminism aims for individuals to use their own strengths and the democratic process to assist women and men become more equal in the law, society, and workplace. In addition, liberal feminism emphasizes the importance of freedom and holds the state responsible for individual freedom (Serva, 2021).

Little Women is a novel which has all ages of readers. It is a true story that the author, Louisa May Alcott, represents herself as Josephine in the novel, but it is only a part of her life like characteristics and struggles. Jo is a committed, ambitious and courageous woman who struggles hard in order to be a writer in the patriarchy society. For this reason, the author sees the character's efforts in fighting for her own dreams. Therefore, the researchers want to analyze the development of the female protagonist in this novel as a guideline for the life of women of all ages that deserves the right to have a dream or choose a path for themselves, just like men.

2. Research Objectives

The objectives of this study are to analyze development of the female protagonist (Josephine) and to analyze gender inequality by using liberal feminism in the novel.

3. Literature Review

3.1 Struggle of Women

The first related study is a journal article written by Heni Rahayu titled *An Analysis of Woman Struggle in Louisa May Alcott's Novel Little Women*. This study talks about the discovery of woman struggle contained in the novel and also the struggle of the main character in realizing her dream. Rahayu conducts the problem formulation, consisting of woman struggle and portrayed Josephine March struggle to get her dream in *Little Women* by Louisa May Alcott. The similarities of the researchers' study and Rahayu's study is having the same qualitative method in collecting and analyzing data. Meanwhile, the difference between the researchers' study and Rahayu's study is that the researchers analyze female protagonist (Josephine) develop herself and gender inequality exist in the novel by using liberal feminism, but Rahayu investigates how is woman struggle portrayed in *Little Women* by Louisa May Alcott (Rahayu, 2018).

Furthermore, according to Swari (2018) in *Daughter Sacrifice While Living Without Father in Louisa May Alcott's Little Women Novel (1868): A Feminist Approach*, the researcher analyzes this study about sacrifice analysis and feminist analysis based on the novel which related to feminist approach consists of women's role, women's participant, women's position and women's right. This study is qualitative research. The researcher conducts the data source with primary data and secondary data sources. The primary source is *Little Women* novel (1868) by Louisa May Alcott. The secondary source is internet, article, and books. This result of this

study finds daughter's sacrifice for living, while the figure of father is absence in home. Daughters make sacrifice to work hard and make anything to be fortunes even if their life was hard and struggle for their family. This study finds feminist theory in this novel which reflects through main female characters. In women's role of *Little Women* novel, it is about the gender roles as Meg is always and tried to be ladylike in her society. Jo is also tried to be the real woman even it is hard for her. Jo is a tomboy and always puts the position as a man while there is no father but she is kindness and hard worker woman. *Little Women* also explains that the women's roles are to work and make fortunes to their family and change their poverty to be sufficiency life. Jo is the female character that wants to be a different woman from the normal society. The similarity of the researcher's study and the Swari's study is the same qualitative method by using feminism to involve with analyzing. The differences of them are the researchers focus on the development of the female protagonist (Josephine) and Swari points out the daughter's sacrifice while living without father through female characters in *Little Woman*.

3.2 Types of Feminism

The previous study is Desmawati (2018), writes *Analysis of Feminism in the novel Little Women by Louisa May Alcott*. Desmawati's study aims to examine types of feminism and how four sisters reflect feminism in *Little Women* novel. Besides, Desmawati's research presents that women and men should have equal opportunities. Feminism is a women's movement that reveals gender equality in society. Desmawati uses a qualitative method and got the data from *Little Women* novel as this research does. As a result, it finds that there are four types of feminism in *Little Women*. Furthermore, the four sisters' characters are reflected in four classifications of feminism. Those are liberal feminism, marxist feminism, existentialist feminism, and radical feminism.

3.3 Characters

Septiana (2020) wrote *Liberal Feminism Depicted by Jo March as the Main Character in Greta Gerwig's Movie Script Little Women*. The researcher study about explore Jo March's character related to the values of liberal feminism. The researcher uses a feminist approach to analyze that is character and characterization theories, theories of liberal feminism, and a cinematic point of view. In conducting the study, the researcher uses library research. The primary data is the film script of *Little Women* written and directed by Greta Gerwig. Secondary data consists of books, e-book, essays, journals, thesis, and articles. The researcher found that Jo March's character is portrayed as three characteristics. There are independent, caring, and tomboy. In addition, she is successfully depicting liberal feminism by facing the gender stereotype. She rejects the stereotype in society by proving that she can live without marrying a rich man. She also shows her ambition and intelligence without being interrupted by women's limitations based on sexism and patriarchy. The similarities of the researchers' study and Septiana's study is having the same methodology in collecting and analyzing data, use a feminist approach to analyze Jo March as the main character in theories of liberal feminism. Meanwhile, the difference between the researchers' study and Septiana's study is that the researchers have the primary data in *Little Women* novel wrote by Louisa May Alcott, but Septiana uses the primary data in the film script of *Little Women* written and directed by Greta Gerwig to explore Jo March's character related to the values of liberal feminism.

3.4 Self-Development

Ratprutthikul (2011) wrote *Parenting Style and Moral Development of Female Main Characters in Louisa May Alcott's Little Women*. The researcher study about the mother's parenting style of Marmee that influences moral development of her four daughters. The objective of this study consists of two issues. The first one is to study mother's parenting style that influences the behavior of female main characters in *Little Women*. The another one is to examine moral development of the female main characters. Ratprutthikul's study uses qualitative method. The mother's parenting style was examined by using Baumrind's theory of child raising, while the girls' conduct was examined using the concept of true women in nineteenth-century American culture and Kohlberg's theory of moral growth. This study focuses on the mother's parenting style of Marmee that influences moral development of her four daughters—Meg, Jo, Beth, and Amy. The researcher examines Marmee's parenting style and how it influences moral development of the four sisters. The study shows that Marmee has the quality of refined woman. She is virtuous, submissive, and domestic. She believes in God. This study shows that the female main characters develop their moral development in a way that meets social expectations of the nineteenth century America. The study also shows that with mother's love and care, the young girls learn how to deal with misconduct and how to behave appropriately. The similarities of the researchers' study and Ratprutthikul's study is having the same qualitative method in collecting data. Meanwhile, the difference between the researchers' study and Ratprutthikul's study is that the researchers use liberal theory in analyzing data, but Ratprutthikul uses psychology theories in analyzing data. Moreover, the researchers analyze female protagonist (Josephine) develop herself and gender inequality, but Ratprutthikul studies about study mother's parenting style that influences the behavior of female main characters in *Little Women*.

4. Research Methodology

In this research uses a qualitative descriptive method to find out how the development of the female protagonist is and to use liberal feminism approach to analyze gender inequality in *Little Women*. There are two kinds of the sources that researchers need in this study. The primary source is from the *Little Women* novel written by Louisa May Alcott. The secondary sources are from some books, journals, and internet sources that support this research. This study uses both textual and theory analysis in order to analyze the statement of problems.

5. Results

5.1 Development of Female Protagonist (Josephine)

The female protagonist (Josephine) in *Little Women* is an unfeminine girl. Her personalities make her completely different from other girls in the society because she always speaks frankly, and she has a leadership in herself. In the nineteenth century, getting married and being a part of their husband's interest and business are considered as a main role of women this century. They have to train about housewife skills such as weaving, cooking, washing, and cleaning unless they come from a wealthy family. Typically, women are also not allowed to be educated or gain knowledge outside of the home because a man is the greatest. The beauty standard is very important for them because they want to have good looking to impress men in society such as putting the hair up or wearing a corset. (Appell, 2012). Jo gradually grows many ways of her life that her mom, Mrs. March, teaches her in the right ways. Mrs. March teaches their children to be themselves happily. Her children do not need to follow the role of woman

in society. They can do whatever they want for their life. Every time her children have problems in life, she always uses her experiences of her life to advise them for best solution. Jo's development is seen to characterization, lateral thoughts and actions, and behaviors.

5.1.1 Development of Jo's Characteristics

Jo's characteristics have been changed in three aspects, temper, ambition and sacrifice. As you can see from the situation below.

5.1.1.1 Temper

The female protagonist, Josephine March, has the changing of her emotion. Jo is usually cheerful, and she enjoys her life. She is beloved of the people around her. There is a situation that makes Jo gets mad, and she cannot control herself. After Jo gets the lesson from her temper, she can deal with her emotion to become a better person.

Normally, Jo is a positive person because she is optimistic. She is cheerful, and she always enjoys her life that makes her get along well with everyone. Writing play's script is her talent. She often brings her story to act with her sisters. She is very happy when she spends time with them. Writing a play's script is what Jo loves the most. She spends her time writing since she was a child. Living with writing is the happiness of her life as if it is a part of her life. It is her passion that is driven by the writing in her manuscript. It is the thing that combines her love and care. The turning point which makes Jo changes her emotions and feelings is her sister. Her youngest sister, Amy, burns the manuscript that Jo loves and cherishes the most in her life. Jo is furious with her sister because the manuscript is burned as though Jo's heart is burned as well. The blazing fire of burning symbolizes heat and destruction. If it burns anywhere, it will devour everything. Her manuscript is destroyed as if her soul is also obliterated. Furthermore, the words of Amy who is a self-willed person make Jo's temper intensify that are compared as increasing firewood into the fire. Therefore, Jo expresses her temper to her sister directly.

“Yes, I did! I told you I'd make you pay for being so cross yesterday, and I have, so—”

“Amy got no further, for Jo's hot temper mastered her, and she shook Amy till her teeth chattered in her head; crying, in a passion of grief and anger.”

“You wicked, wicked girl! I never can write it again, and I'll never forgive you as long as I live.”

(Alcott, 1880, p. 81).

Jo loses herself because of Amy's terrible actions. As a result, Jo's personality changes a lot from her original. Jo cannot control her ideas and actions when she has a strong temper in her mind. Originally, Jo is a very positive person, and she only thinks about good things with everyone, especially with her family. Jo becomes a negative person that she is ready to destroy someone she gets mad. She lets negative feelings in her mind dominate her as if the devil in her mind is ready to come out all the time, and she does not know how to stop it. Her temper causes her to be very cold towards Amy that she wants to make her dangerous deadly. Although Amy is a family member, Jo cannot control herself to do the wrong thing with her.

“Jo heard, but Amy was just struggling to her feet, and did not catch a word.

Jo glanced over her shoulder, and the little demon she was harboring said in her ear: ‘No matter whether she heard or not, let her take care of herself.’

(Alcott, 1880, p. 84).

Hurting of her sister makes Jo realize about terrifying effects of her temper. She is taught a good lesson by her mother, Mrs. March, that makes her become a better person. Motherhood is a powerful energy. When the mother sees the children have a problem, she always helps them and gives good advice for a solution. No matter how bad the children are, the mother is ready to be beside them. The great encouragement of Jo's mother helps her to handle the negative part of her life. Jo can control herself well when she gets mad. The better changing of her temper is seen obviously with Fred who is Laurie's friend. Fred cheats the game that Jo pays attention to play, and Jo hates the injustice. Jo tries to control her bad temper consciously to not express to him. She can control her temper, and she feels peace of mind because she already knows how to deal with it.

“Jo opened her lips to say something rude, but checked herself in time, colored up to her forehead, and stood a minute, hammering down a wicket with all her might, while Fred hit the stake, and declared himself out with much exultation.”

(Alcott, 1880, pp. 136-137).

5.1.1.2 Ambition

Based on the novel of *Little Women*, Jo is ambitious. The ambitions of girls in this era are very rare because social values dictate that women's roles are limited to take care only for children and family matters. As can be seen, women have no right to express themselves or have a public space, so the girls in this period do not possess this type of characteristic. Meg, Jo's elder sister, does everything that is proper with the role of women in the society. She wants to get married and has her own family to complete her life. She is a perfect housewife that is clearly different from Jo. She does not have ambition to create her own way as same as Jo. Jo loves freedom and wants to be a woman who can take care of herself and make money from her dream job. Jo is an ambitious girl from a young age. Jo has lots of dreams and determination to become a writer. Jo's ambitions are big beyond the boundaries of women of this era.

In society, Jo becomes a very rebellious woman. She aspires to be a writer by breaking free from the social constraints. She has always developed her own writing. As a result, she is praised by the people around her. Receiving compliments from family members gives her more confidence in her writing.

"I don't see how you can write and act such splendid things, Jo. You're a regular Shakespeare!" exclaimed Beth, who firmly believed that her sisters were gifted with wonderful genius in all things.

"Not quite," replied Jo modestly. "I do think 'The Witch's Curse, an Operatic Tragedy,' is rather a nice thing; but I'd like to try Macbeth, if we only had a trap-door for Banquo. I always wanted to do the killing part. 'Is that a dagger that I see before me?'" muttered Jo, rolling her eyes and clutching at the air, as she had seen a famous tragedian do."

(Alcott, 1880, p. 7).

Jo always loves writing the play's script and enjoys acting with her siblings. The story she writes is praised by her siblings for being a writer as brilliant as Shakespeare. Jo wants to improve her skills by writing more diverse stories. Jo has a personal preference that can see

clearly since she was young that is drama script and acting. The work of Jo has shown that Jo is capable of doing it well and received good feedback from those around her. Jo is confident in her writing and thinks she can improve her skills and go further. That is the starting point that makes Jo wants to use what she likes to become a career in the future. Jo always tries to develop her skill by writing various stories. Jo is always passionate about writing because she enjoys it.

Jo's determination and effort with self-confidence in her writing give her the courage to decide to present publicly. Jo wishes to prove herself that she has the potential to be a writer. Nevertheless, she faces many obstacles of social values and the hardships of her family. Jo's ambition drives her to never give up on pursuing her dreams, so she proves it by submitting a book of her own to a publisher.

“Well, I've left two stories with a newspaperman, and he's to give his answer next week,” whispered Jo, in her confidant's ear.”
(Alcott, 1880, p. 165).

Women's writings are not widely accepted by publishers in this era. However, Jo's hard work and self-belief enable her to achieve her goals. Jo's success demonstrates that women in this era have no less potential and talent as men.

“And when I went to get my answer, the man said he liked them both, but didn't pay beginners, only let them print in his paper, and noticed the stories. It was good practice, he said, and when the beginners improved, anyone would pay. So I let him have the two stories, and today this was sent to me, and Laurie caught me with it and insisted on seeing it, so I let him.”
(Alcott, 1880, p. 170).

5.1.1.3 Sacrifice

Initially, Jo's childhood makes Jo has selfishness in deep. She only sacrifices for her family because she does not understand how sacrifice to others is necessary. Fortunately, Mrs. March's motherhood nurtures Jo. Afterward, the cultivation of Jo's mother influences and makes her literally realize the meaning and value of making sacrifices for others.

Sacrifice is crucial to the March family, no matter how great or tiny it is. Nevertheless, Jo's childhood makes her not realize of sacrifice. She has a bit of selfishness inside. She does not willing to share anything else with other people unless her family because family is what Jo loves and bonds with. From the story, Christmas is a great celebration for everyone. Mrs. March tells Jo to sacrifice for the food or anything to the poor, but Jo does not quite agree with it. Jo thinks that her family is not rich enough to share with others, and the entire family should be celebrated in front of each other on this day. Luckily, Jo's selfishness is slowly disciplined and dispersed by her mother. Mrs. March's motherhood is always as calm and warm as a safe zone for her children. Mrs. March teaches Jo to learn to be selfless by providing food to the poor on Christmas day. The teaching of sacrifice repeatedly from Mrs. March makes Jo realize that there is someone more suffered than her. Jo gets a sense of complacency every time she donates to someone else. These things have been ingrained in Jo since childhood, but she does not realize the word "sacrifice." Jo always does it all the time, but she still thinks that it is primarily because her mother tells her to do.

"Merry Christmas, little daughters! I'm glad you began at once, and hope you will keep on. But I want to say one word before we sit down. Not far away from here lies a poor woman with a little newborn baby. Six children are huddled into one bed to keep from freezing, for they have no fire. There is nothing to eat over there, and the oldest boy came to tell me they were suffering hunger and cold. My girls, will you give them your breakfast as a Christmas present?"
(Alcott, 1880, pp. 15-16).

Jo's sacrifice is emphasized again when her family is hit by a financial crisis, Jo is forced to consider all options in order to provide for her family. She does not like when her family borrows money from others, so she decides to sell her hair for money. Hair is a vital feature of a woman's body that she should cherish and adore. Jo's deep feminine instinct makes her have a bond with her hair, despite being as strong as a guy. She is upset and cries because she sells her hair. Apparently, she prioritizes her family more than anything else. Absorbing the habits that have been fostered since childhood as well as being implanted of goodness from mother, Jo does it automatically. She does not believe that sacrifice is a duty she must do, but rather that it is something she should do. This allows the entire family to recognize how meaningful of Jo's sacrifice is.

"No, it's mine honestly. I didn't beg, borrow, or steal it. I earned it, and I don't think you'll blame me, for I only sold what was my own."
"Your hair! Your beautiful hair!" "Oh, Jo, how could you? Your one beauty."
"My dear girl, there was no need of this." "She doesn't look like my Jo any more, but I love her dearly for it!"
(Alcott, 1880, p. 177).

5.1.2 Jo's Lateral Thoughts

Jo's mindset has different from the other siblings in her family which showing courage and leadership through her action. She has desires and ambitions to earn money in order to support her own family. In this era, normal women have to get married in order to earn money and have a good life while Jo has different thought. She wants to earn money by herself without depending upon anyone. Jo observes that masculinity can be inherent in both women and men. Her absence of father leaves her struggling and trying to be the head of the family as her father. Consequently, Jo's lateral thoughts demonstrate her masculinity as follow.

5.1.2.1 Showing masculinity from Jo's thoughts

Jo does not want to identify herself as a woman. She also does not want to show femininity to others since childhood. Jo is comfortable to introduce herself as Jo. "Jo" is a name that represents both a woman and a man. She does not like to introduce herself with her real name, Josephine, because it represents the name of the woman, but Jo prefers to introduce herself as Jo instead. She thinks that if it is the name of Josephine, that is a sign of femininity which Jo does not want that at all because Jo does not want to show the humility of women. The fact that Jo introduced herself as Jo because she wants to show her strength like a man.

"Nicely, thank you, Mr. Laurence. But I am not Miss March, I'm only Jo,"
returned the young lady."

"I hate my name, too, so sentimental! I wish everyone would say Jo instead of Josephine"

(Alcott, 1880, p. 30).

Jo also has the idea of raising her family so that she can have a comfortable life. Jo is aware of the position of the family. Jo notices that it is very difficult for her older sister that she wants a new dress or beautiful things, but she only wears old clothes. It is at this incident that Meg complains about her financial problems that prevent her from living a glamorous life like everyone else. The only thing she can do is just dream of living a comfortable life. Seeing Meg talking about her dream makes Jo feels uncomfortable. Jo is diligent, patient, responsible, and has leadership. Besides, Jo is a person who cares about the people around her and always supports family members. Therefore, Jo tells her sister that she will be pledging to her sister that she will make money and make her sister live the life that she wants.

"You're a blighted being, and decidedly cross today because you can't sit in the lap of luxury all the time. Poor dear, just wait till I make my fortune, and you shall revel in carriages and ice cream and high-heeled slippers, and posies, and red-headed boys to dance with."

(Alcott, 1880, p. 38).

5.1.3 Jo's Actions and Behaviors

Jo is quite different from the women of this era because she has a very masculine approach. Her speech is as erudite and straight as a man's talk. There is a very masculine slang and gesture that can be seen in the dialogue below.

"Jo does use such slang words!" observed Amy, with a reproving look at the long figure stretched on the rug. Jo immediately sat up, put her hands in her pockets, and began to whistle.

"Don't, Jo; it's so boyish!"

"That's why I do it."

"I detest rude, unladylike girls!"

"I hate affected, niminy-piminy chits!"

(Alcott, 1880, p. 3).

From this conversation it is shown that the behavior that Jo exhibits clearly conveyed her masculinity. The first is the use of slang in conversation, which at that time is only used by most men because it is a rather rude word. Jo's use of slang is inappropriate and should not be used because it is an act of a man. In addition, putting her hands in his pockets and whistles is one of the cool and comforting things that man do. They put one or both of their thick hands into their pocket and begin to whistle following to his mood. The fact that Joe does the same gesture is an extremely inappropriate gesture for a woman because it reduces her femininity. Apart from the above, her dress is different from other women of this era which happens when she is getting dressed for going to Camp Laurence, Mac, eldest sister, asks Jo that "Oh, Jo, you are not going to wear that awful hat? It's too absurd! You shall not make a guy of yourself (Alcott, 1880, p.134)." Jo replies that

"I just will, though, for it's capital—so shady, light, and big. It will make fun; and I don't mind being a guy if I'm comfortable." With that Jo marched straight away, and the rest followed—a bright little band of sisters, all

looking their best, in summer suits, with happy faces under the jaunty hat-brims.

(Alcott, 1880, p. 134).

As you can see from Jo's statements above, they show that dressing should not separate between men and women. All genders should be equal and free to dress. It should not be attached to whether dressed in pants is called a man or dressed in a skirt is called a woman. People should not judge people by their dress. As long as it does not hurt others and you are satisfied with the outfit you are wearing.

Moreover, her manly manner is something that Jo has since she was a child. She likes to dress in such a way that she feels comfortable which she does not use fancy accessories like the women in this era. Using slang and whistling is something she often does. In addition, her absence of father makes her greater leadership and responsibility for his family. These things make her more masculine which it is seen when Jo goes to celebrate a New Year's Eve. Jo tells her sister, Meg, to wink to her if she notices something wrong with herself, but Meg says that winking is not a lady manner. Meg says: "No, winking isn't ladylike. I'll lift my eyebrows if anything is wrong, and nod if you are all right (Alcott, 1880, p. 28)."

As the dialogue above shows that Jo's expression is not acceptable for the general etiquette of women of this era who has to be neat and polite, but Jo's wink-eyed expression is an act that men do. The acting that Jo does, she wants to show all those things are not only a man can do but women as well. This is the main point that Jo wants to destroy the boundaries between men and women by asserting that women can behave as same as men.

5.2 Gender Inequality

Inequality is outstanding and evident in the novel of *Little Women*, there is less opportunities in choosing careers, which can be divided into two sub-topics: freedom in choosing the life Jo wants and incapable of joining the army.

5.2.1 Less Opportunities in Choosing Careers

Women in the 19th century do not have much of an opportunity or right to choose a career. Therefore, the female protagonist, Josephine, in *Little Women* attempts to follow her dreams because she is limited in her career choices. There are divided into sub-topics as follows: freedom in choosing the life Jo wants and incapable of joining the army.

5.2.1.1 Freedom in Choosing the Life Jo Wants

The unequal freedom in choosing the life of women and men is obviously existed in the era. Jo has a conversation with Laurie about her dreams for what she wants to be in the future. Laurie is a man who wants to be a famous musician abroad and he can be yourself fully without any limitations in life. This is something that can be done easily and practically because Laurie has money and freedom in life. Additionally, Laurie becomes Jo's inspiration to be successful in the writing career as Laurie achieves his profession as a famous musician. However, in this society, women are not as free as men to have the right to dream of living their own lives. Jo has dreams of becoming a writer but struggles on her own, and helps her family as Jo's family is poor. In which at that time the writing career is a man's occupation. Society considers that it is inappropriate for women to come into this profession. The role of women in society is that when they grow up, they have to go out and marry men in order to have money for famous and well-known in society which Jo does not want. Jo wants to stand up for herself to live her own

life and make herself famous from her ways. The dreams of Jo and Laurie are indicative of gender inequality which are evident in freedom of life. Men are more independent than women to choose their own way of life.

“I’d have a stable full of Arabian steeds, rooms piled with books, and I’d write out of a magic inkstand, so that my works should be as famous as Laurie’s music. I want to do something splendid before I go into my castle—something heroic, or wonderful—that won’t be forgotten after I’m dead. I don’t know what, but I’m on the watch for it, and mean to astonish you all, some day. I think I shall write books, and get rich and famous; that would suit me, so that is my favorite dream.”

(Alcott, 1880, p. 156).

5.2.1.2 Incapable of Joining the Army

In the century 19th, it is an era in the midst of war. Strong and courage man represent leadership. Besides, being a breadwinner of the family, another important duty for men is to go to war to serve the country. Women, on the other hand, are seen as the weaker gender, and they are inappropriate to act as a man. In fact, the main duty of women in society in this era is to be a housewife. She has to take care of the house and her children. The female character, Jo clearly does not want to be a woman in the role that society defines her to be. As a result, she does not want to be like an ideal women in this era.

“Don’t I wish I could go as a drummer, a *vivan*—what’s its name? or a nurse, so I could be near him and help him,” exclaimed Jo, with a groan.”

(Alcott, 1880, p. 8).

According to Jo statement above, she truly demonstrates her desire, and it clearly shows that Jo has high masculinity. She looks at her father as a role model. Jo wishes to be as strong as her father. Apart from having her father as a role model, being woman prevents her from being a soldier. Although Jo has potentiality and enough self-confidence to be able to be a soldier. Nevertheless, she is unable to choose the path of life that she wants.

6. Discussion and Conclusion

This is an era in which gender inequality is very visible in society. Men are given more prominence and privileges in society than women, especially in terms of social chances. Women at the period were unable to be themselves or pick their ways of life. The majority of women's lives are spent as housewives. Jo, on the other hand, is very masculine. She has an idea that is not typical of a normal woman, but she cannot avoid being feminine because of her gender. As a result, she must contend with the societal standards of the day by attempting to think and act on an equal footing with males. In the end, she was able to accomplish the success that she had hoped for.

6.1 Development of Female Protagonist (Josephine)

Josephine March, the female protagonist, in *Little Women* obviously changes herself to be a better person. At first, she cannot control her temper that it affects the people around her terribly. Jo cannot handle with her problem well. Jo can control herself later because she knows the ways to deal with the negative idea in her mind properly. She is always active to be a writer.

She practices herself to write her story to improve her skill of writing. She never gives up on her goal. Her ambition increases continually to follow her dream. Finally, her work is accepted, and she can be a writer. Jo develops better self-sacrifice from a girl who only cares about her own things. She becomes a person who sees the common good rather than herself refined by her mother. Jo sacrifices what she loves in exchange for money to help and solve financial problem of family. Jo's lateral thought shows that Jo has the masculinity obviously through her ways of living. She always tries to hide her feminine personality in her life because she does not want to be a girl as same as others. Jo expresses her feeling directly that she is different from other girls in the society. She wants to do everything as men. Jo's actions and behaviors show how she wants to be a man clearly in any aspects such as speaking, acting as well as behaving. She does not care how other people think and look at her. The important thing that she does care is comfort and happiness about what she does.

6.2 Gender Inequality

Gender inequality is the main problem that Jo faces throughout the story. It has one main point that the researchers discover as the main issue about less opportunity in choosing careers which is divided into two sections: freedom in choosing the life Jo wants and incapable of joining the army. The unequal freedom in choosing the life of women and men is obviously existed in this era. Jo has a dream of becoming a writer, but the writer is a man's occupation in this era. Society considers that it is inappropriate for women to get this career. The role of women in society of Vitoria era is when they grow up, they have to go out and marry men in order to have money to be famous and well-known in society which Jo does not want. In the incapable of joining the army, she has a firm determination that she wants to join the army. Jo wants to show everyone that she has the strength and potentiality as same as men. Jo wants to be a part of the army, but her feminine sexuality obstructs her from doing what she wants at that time.

7. References

- Appell, F. (2012). Victorian ideals: the influence of society's ideals on Victorian relationships. *McKendree University Online Journal of Undergraduate Research*. <https://www.mckendree.edu/academics/scholars/issue18/appell.htm>
- Christ, P.)2016.(A new definition of patriarchy: Control of women's sexuality, private property, and war. *Sage journals*. <https://doi.org/10.1177/0966735015627949>
- Desmawati, E. (2018). Analysis of Feminism in the Novel of Little Women by Louisa May Alcott. *Journal of Language and Literature*, 6(2), 91-96. <http://dx.doi.org/10.35760/jll.2018.v6i2>
- George, A. (2018). *Why 'Little Women' endures 150 years later*. Retrieved from <https://www.smithsonianmag.com/mithsonian-institution/why-little-women-endures-150-years-later-180970303/?fbclid=IwAR15Se n1Z3AiwW9sPwQ4OazD10qR4eDHZ81bemdl1nwHRJTr3tbjXpUpph4> (September, 18, 2018).
- Little Women*. (n.d.(. Sparknotes .Retrieved from <https://www.sparknotes.com/lit/littlewomen/characters/>



Patriarchy. n.d.(. Dictionary.com. Retrieved from
<https://www.dictionary.com/browse/patriarchy>

Rahayu, H. (2018). *An Analysis of Woman Struggle in Louisa May Alcott's Novel Little Women*. Department of English Faculty of Cultural Studied University of Sumatera Utara Medan.

Ratprutthikul, U. (2011). *Parenting Style and Moral Development of Female Main Characters in Louisa May Alcott's Little Women*. Srinakkharinwirot University.

Septiana, M. (2020). *Liberal Feminism Depicted by Jo March as the Main Character in Greta Gerwig's Movies Script Little Women*. Department of English Letters Faculty of Letters Universitas Sanata Dharma Yogyakarta

Serva, C.)2021.(*Liberal feminism: Definition & theory*. Retrieved from
<https://study.com/academy/lesson/liberal-feminism-definition-theory-quiz.html?fbclid=IwAR3lDaM7Fipbyh8xMKe8UaWVdqqPRhenlpRo3XeSHO5LDQiVueI8gqBnr8>

Swari, R. (2018). Daughter Sacrifice While Living without Father in Louisa May Alcott's Little Women Novel (1868): A Feminist Approach. *Department of English Education School of Teacher Training and Education Universitas Muhammadiyah Surakarta*

Trauma, M. (2020). *Victorian Era (1837-1901): Society and morals*. Retrieved from
<https://thefamilyintheai.wordpress.com/2020/08/01/victorian-age/> (01,08,2020)

A Comparative Study of Dehumanization in the Novel and the Film of *The Giver*

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Abstract

This study aims to explore the presentation of dehumanization portrayed in novel and film of *The Giver* and to evaluate the comparison of the presentation of dehumanization in both media through the Theory of Adaptation by Linda Hutcheon. In the study, the researchers use the novel entitled *The Giver* by Lois Lowry and the movie in the same entitled which is directed by Phillip Noyce. This study is a qualitative analysis method. The data of this study are collected from words, phrases, sentences, narrations, and dialogues in each chapter of the novel and film that shows dehumanization in the story. *The Giver* is the story about dystopian society. Citizens live in a concept of sameness that government uses to control them which means there is no difference.

The researchers discover eight aspects of the dehumanization portrayed in the novel: elimination of emotion, reproduction, surveillance, elimination of perception, elimination of knowledge and information, punishment, social rules and release while the dehumanization portrayed in the film is only seven aspects without punishment. From evaluating the comparison, there is the different unique style of both media because the author and the director uses different techniques to present dehumanization. In the novel, the author uses the descriptive approach to intensely emphasize the details which allows the readers to deeply create their own picture through the imagination. However, even there are the elimination of some original details, the director adds more various film techniques through the obvious expression of the characters.

Keywords: Dehumanization, Comparative study, *The Giver*, Dystopian literature

1. Introduction

After the First World War ended, there are many traces according to the beginning of science and reason and there are great effects on society, especially on human being in many aspects. There are two terms which are used to define the society at that time to nowadays. Firstly, in 1516 Thomas More coined the term ‘Utopia’ which means the ideal society or a good place

(Claeys, 2010). Moreover, in the book of Kateb also identified that “Utopian fiction mainly depicts an ideal, imaginary society with a perfect socio-economic and political system.” (Gerhard ,2012). On the other hand, John Stuart Mill, English philosopher, also coin an antonym which is “Dystopia” in 1868 and it means “bad place” (Gerhard, 2012). Furthermore, it is the illusion of a perfect society through oppressive societal control by the corporation through the bureaucrat, technology, societal norm, or totalitarianism system (Johnston, 2020).

Dystopian fiction increasingly grew out in the sixteenth century according to the writers' beliefs and concerns that it will be worse if people do not oppose the power and greed of the totalitarian system from the authority who will use many tools to organize human behavior through censorship, indoctrination, and modern technology; for example, spread propaganda and manufacture advance military weapons to intimidate citizens. Therefore, the easiest way that writers can do to increase awareness about this issue is to indicate the related environment and social justice from their writing styles. Moreover, there are many awarded fictions in dystopian style which are good sample to emphasize this topic such as *We* written by Yevgeny Zamyatin criticizes Soviet social. In addition, it has powerfully influenced other writers, especially George Orwell to write the novel entitled 1984 which is one of the best-known dystopian novels of all time from the Pan Macmillan website (2021). The plot of 1984 is similar to the plot of *We*.

Dystopian society has great effect on people as the example from the characters in many novels who are unable to be aware of the dehumanization process because of using modern technology to control human behavior. Then they will become enslaved. Dehumanization takes place in modern society more than in the traditional community (Wardani, 2010). People in society were enslaved to technology and became selfish by unawareness of others and their surroundings; moreover, it will cause ignoring the norms and mores. Furthermore, it is difficult to believe that there are no problems in a perfect and peaceful society. However, there will be people who have conflict about the concept of the dystopian community as the protagonist on the provided sample novel.

The researchers decided to study the dehumanization from *The Giver* because dystopian fiction can help people understand and appreciate the value of human rights. Importantly, it can challenge readers to see the reality of current society and politics, and it may lead to the action of change. Furthermore, *The Giver* by Lois Lowry is guaranteed as one of the best books of all time from the Time website (Carlisle, 2021), especially the standing out of plot story because of no evil or sinister characters and the easiness of intensive access to the content. Besides, the complex storyline and interesting characters can hold the attention of the readers to follow. Finally, *The Giver* is adapted into a movie version directed by Phillip Noyce. It first released on August 11, 2014, at Ziegfeld Theater with 97 minutes running time lengths.

The story begins when Jonas and other Elevens become Twelves in December. They are forced to work in occupations chosen by the committee of elders. Jonas becomes *The Giver*, where he is the only person who will have all the memories of the past that were erased from the community. He realizes that this community had taken away true happiness. He began to

question the peace in his society. Eventually, he sought to find the natural course of human life by leaving this dystopian community (Carlisle, 2021).

So, the researchers decided to study the presentations of this issue in both the novel by Lois Lowry and film directed by Phillip Noyce to a better realization of the dystopia's effects on society. According to the dehumanization that takes place in *The Giver*, it is similar to the real situation of many countries. So, the researchers decided to study the presentations of this issue in both the novel by Lois Lowry and film directed by Phillip Noyce to a better realization of the dystopia's effects in the society.

2. Research Objectives

1. To explore the presentation of dehumanization in novel of *The Giver*.
2. To examine the presentation of dehumanization in film of *The Giver*.
3. To evaluate the comparison of the presentation of the dehumanization in novel and film of *The Giver*.

3. Literature Review

3.1 Previous study

The Giver is one of the dystopian novels due to the presence of dehumanization which obviously found in the study of Marina (2018) by focusing on narrations and dialogs through the characteristics in the novel. Even though people have to live in the environment by following the strict rules and being controlled and oppressive to reach the government expectation, there is the main protagonist character of a story who has the special power to see and think differently to deal with the dystopian society. Furthermore, it displayed the state overcontrolled the citizens' bodies and minds as if they were imprisoned (Gerhard, 2012). The citizens were brainwashed to follow social duties in order to potentially serve, sacrifice, and produce the well-being for the state. Moreover, there were four forms of discipline exercised by the government: routine, reproduction, social function, and surveillance.

Furthermore, the real-life and social situation study of Lois Lowry by Mallyta and Pujiati (2018) indicated that the sameness concept represented in the dystopian novel was the cause of violence which was used to eliminate the differences in the community so that the citizens will obediently live equally without awareness, and the leaders do not care even though it dehumanizes people. In addition, there are effects from four negative aspects of dehumanization which consist of the limitation of freedom and choice, loss of individuality, elimination of emotions and feelings, and, especially loss of memories from the study of Hanson (2009). This study revealed that people in *The Giver* novel are treated as the objects due to no individual memories and the right to respond to their human beings' desire, and the government has created the rules including the punishments for wrongdoers which can cause death.

3.2 The Novel and the Author's Biography

3.2.1 Dystopian Literature

Dystopian literature is a form of fiction where imaginary communities or societies are dehumanizing and terrifying. The word “Dystopian” is the opposite of utopian which means a place of perfection. Adam found that the root of the word dystopia comes from Ancient Greek, where dys- means "bad" and -topia means "place". So, “Bad place” is a term used to describe

the word dystopia. Dystopia is a community of the future with dehumanization. In dystopian literature, society is often oppressed by totalitarian governments. There are various government laws such as regulating reproduction, living under surveillance and control system. It causes people to lose their rights and freedoms.

3.2.2 Plot and Structure

The setting of *The Giver* (1993) is a dystopian society which is the future world. People live in sameness which is a concept that government uses to control the community. There are no pains, no emotions and feelings, no memories and no choices in this community. There are both major characters and minor characters in this novel. Firstly, the major characters are Jonas and the Giver. Jonas is intelligent and very thoughtful of his everyday life. He begins to see something different from the others. He is assigned as The Receiver of Memories. The Giver is patient and wise. He conveys his memories and helps Jonas. Next, the minor characters are father, mother, Lily, Gabriel, Asher, Fiona, Chief Elder, Larissa, Rosemary. The point of view of the novel is third person limited perspective. The narrator tells the story from Jonas's perspective. The readers learn about the events of the story and the various aspects hidden in a dystopian society with Jonas. The theme in *The Giver* is “Individuality and freedom of choices are important in human life.” Throughout *The Giver*, this community shows a lack of freedom and choices as everything is controlled by the government. After Jonas receives memories from the Giver, he realizes that freedom and choices have been eliminated. He thinks it is unfair to the citizens. There are three important conflicts in the novel. Firstly, person against person, Jonas had conflict with his father when his father told him that Gabriel was going to be released, especially when his father killed one of the weaker twins. Next, person against self, Jonas felt a little guilty after he had not taken the pills which was used to stop stirrings, but he knew he could not go back to the world of no feelings that he had lived in so long. Lastly, person against society, Jonas was against his community after he received the memories because he thought it was unfair that his friends and others had no choices, freedom, etc.

3.2.3 The Author's Biography: Lois Lowry

Lois Lowry was born on March 20, 1937. She is an American writer who writes many books for children and young adults. Her first serious drama novel is *A Summer to Die* (1977), which is based on her own experience of losing her sister. It was published in 1977. After that, she writes her novel as a series of humorous books named *Anastasia Krupnik* (1979) which continues to release over forty novels. Because of her greatest communication to the readers, she has won two prestigious Newbery awards for *Number the Stars* (1989) and for *The Giver* (2014); moreover, she also has won numerous awards as well.

The Giver (1993) was inspired by her father's loss of memory. It was Lowry's pride being a successful writer because she won two prizes: the Newbery Medal and the William Allen White Award. *The Giver* is written by Lowry's interesting style that is narrated in basic and uncomplicated tone. Besides, she portrayed everyday life of citizens in Jonas's community in such vivid and realistic detail. Besides, *The Giver* was sold more than 12 million copies, and it also empowered many schools and families to learn the morals from the plot. However, it was not only in a novel version but also adapted into a film directed by Philip Noyce in 2014 as well as a play, a musical, and an opera (Ulaby, 2014).

3.3 The Film and the Director's Biography

3.3.1 Film Techniques

1. Lightning and color

There are three film techniques in *The Giver* film. Firstly, lightning techniques are often found in the film. The director uses source light such as windows, lamps, and street lights. Secondly, contrast range technique often is used at the beginning of the film. The director uses a low key, especially in the Giver's room. Thirdly, color temperature is an important technique to present the colorless in the community. The director uses cold colors like black-and-white color or greyscale to give a sense of coldness as an insipid mood. Moreover, there are warm colors like red and orange in the sunset scene in the film. It provides a sense of warmth. Lastly, Color palette is used as grayscale color for almost the entire film to present colorless in the community. It shows a lifeless mood and reflects the theme of sameness. The shot gradually had more colors after Jonas receives memories, especially red color. The shot changes from a black-and-white color palette to a dark earth tone palette, and the color is brighter after memories are brought back to the community.

2. Editing

The director uses montage techniques editing when the Giver transmitted his memories to Jonas. The director uses this technique to show plenty of memories in the past which are deleted from the community such as war, celebration, ritual, ceremony, religion, and so on. Using this technique can generate more information for the audiences in a limited time.

3. Mise-en-scène

Mise-en-scene is necessary in film because it can amplify the thought of characters, make fantasy more alive, and also enrich the director's creativity through the scene. In film relation, André Bazin, a French theorist and critic, stated the definition of the mise-en-scène as “an important aesthetic revolution that choreographs movement within the scene rather than through editing.” Eventually, this term refers to the contents in the frame: lighting, production design, performers, composition, and costumes (Kumar, 2021).

4. Soundtrack

The soundtrack is dialogue, music, sound effect, and all the other sounds playing in a film. There are three genres of the soundtrack which are commonly found in film: music, sound effect, and voice. The style and tempo of the soundtrack which is played as background music is important because it informs the audience to the film's theme (Rose, 2020). Moreover, it aids viewers to comprehend the plot more clearly. Thus, filmmakers establish distinct musical signatures or themes for various personalities, circumstances, and locations.

5. Use of the Camera

Shots refer to how much audience see the object size in a frame whereas shot angles refer placement where the camera is located, and it often used to affect the narrative and mood in a frame. There are eight basic types of shots in film which have various purpose for presentation: establishing shot (ES), extreme wide shot (EWS) or extreme long-shot (ELS), long-shot (LS), full shot (FS), medium shot (MS), medium close-up shot (MCU), close-up shot (CU), and extreme close-up shot (ECU). Therefore, all of shots and angles have different purpose which are reflect the characters' feeling to impact the audience.

3.3.2 The Director's Biography: Phillip Noyce

The birthplace of Philip Noyce is Griffith, New South Wales, Australia. He was born in 1950. He started making a short film entitled *Better to Reign in Hell* (1969) at the age of 18 and became the manager of the Sydney Filmmakers Co-op. He released his first movie

entitled *Backroads* (1977). After the film debuted, he released *Newsfront* (1978) that was a huge success. In addition, Noyce Also attracted the attention of the Hollywood studio for *Dead Calm* (1989) which made him direct *Blind Fury* (1989). In 1994, he directed *Clear and Present Danger* (1994). It grossed \$216 million, and another successful movie was *Salt* (2010). It grossed nearly \$300 million. In addition, he made films adaptations like *The Quiet American* (2002), *Rabbit-Proof Fence* (2002), and *The Giver* (2014). All of which have received numerous awards. *The Giver* (2014) grossed \$67 million and achieved a People's Choice Award nomination for “Favorite Dramatic Movie”. It is also worth noting that many of Noyce's films are based on novels. It proves that he dots on literature and truly achieves success on the big screen.

4. Research Methodology

This is a qualitative data analysis study. The researchers use textual analysis according to the deep reading of the novel by Lois Lowry and thoroughly watch an adapted film with the same title directed by Phillip Noyce. The researchers read and watch both medias several times by using the Theory of Adaptation by Linda Hacheon with SiobphanO' Flynn to understand the dehumanization in the story. The researchers used the relevant critical approaches and the crucial presentation techniques for literary devices and film techniques of both media to explore the dehumanization and compare the effectiveness and the data related.

5. Results

The Presentation of Dehumanization in the Novel and the Film and the Comparison between Both Media

According to this study, the researchers discover eight aspects of dehumanization portrayed in the novel which are elimination of emotion, reproduction, surveillance, elimination of perception, elimination of knowledge and information, punishment, social rules and release while the presentation of dehumanization portrayed in the film is only seven aspects because without the punishment.

5.1 Elimination of Emotion

In the novel, elimination of emotion is part of human beings because both of them reflect the personal thought, especially to make the decisions, and it can lead to the relation to others. All of those are not what the community wants because it will cause disorder and problems to the society. Therefore, there are the controlling process which leads to the dehumanization. Jonas's community have two rituals about feelings which are feelings and dreams telling. They also have the process to stop people from having sexual desire by taking the pill.

In the film, elimination of emotion in the community is the strictest rule; nobody has feelings although they are human beings. The government prevents their population's feelings by morning medication and sharing feelings during having dinner because the community believes that emotion can cause dangerous results to the community which can lead to the difference as the most unwanted of this community. The most obvious scene is when Jonas's father kills a twin baby, who is weaker than the other one, with a cold-blood facial expression. The population does not have even their own opinions which are based on feelings to express and make decisions by themselves since all of them depend on the government.

In the film is more effective than in the novel. Even though the author puts into details and comparative the natural human feelings as the disease which need to eradicate immediately, but, in the film, the director adds intensive details through the cold-blooded expression of actors, especially Jonas' parents because having no feelings of people in the community is the cruelest.

5.2 Reproduction

In the novel, population expansion is the nature of humans for surviving, especially the maternity of women. However, this community dehumanizes women by giving them the assignment as the Birthmother. They create this process to control childbirth and reduce the risk of acquiring unqualified children. They never saw their own child because the child will be sent to Nurturing center immediately. In fact, it is the mother's right to raise or protect their child, but this community is not even let the motherhood see their child's face so that they will not have a deep relationship with their children. It has a serious effect on maternity because it is maternal deprivation. Moreover, there is a devalued woman as fewer honors for Birthmother.

In the film, reproduction is one of the fundamental ways that the government uses to control their citizens of having birth by giving assignments to some selected twelve-year-old girls to become the Birthmother. Actually, people should be uncomfortable with this atrocious action, but it is very common to citizens because of the propaganda of the state as if it is a proud career. Giving birth is actually an individual right whether they want to have a baby or not, conversely, it is set as rule for Jonas's community for the one who is chosen for the sake of the community. So, they are willing to do it for increasing the effective children.

In the novel is more effective than in the film because some information in the film is eliminated, and in the novel, the audience can clearly see of the cruelty of the community to the citizens due to the author intensively mentioned this issue since the first process of selection the Birthmother which is seen a disrespectful career from the point of view of other people in the community.

5.3 Surveillance

In the novel, surveillance is the best way to monitor both the behavior and the strange feelings of people for the state's stability by getting rid of it immediately. There are two ways in this community for surveillance system: watching carefully from the committee and using the technology as speaker talks. The community has process of giving the job assignment because all of children will be useful for the community in the future. The committee chooses the right assignment for all child by always observing and watching their interest activities, it means they have no privacy in their life. The community also uses the technology to control the behavior. The main technology are speakers and cameras. These devices are everywhere even in the house to ensure that every conversation can be heard, and every action of citizens can be seen.

In the film, surveillance in community of *The Giver* is the most obvious method of the community that uses to organize and structure society. The community takes the information of citizens' movements and activities which are recorded by technology, and it finally benefits to the community. Citizens are noticed their actions and speeches through video recording by the advanced technology called speaker. It will warn wrongdoers apparently through the

speaker which is assumed that the wrongdoers are always caught by the camera inside the speaker. Besides, they are also observed to be given assignment, especially for the twelve-year-old children.

There is no media which is more effective than another because they use the speaker for announcements or warnings, and there is a difference in effective techniques in each media. Memories are used as one of the most important themes to demonstrate the dehumanization in the novel while the director adds new information in the film as using the virtual effects to make the audience feel excited about the survival of the characters.

5.4 Elimination of Perception

In the novel, perception builds characters which lead to the individual identity, and they are the enemy of the community because it can result to the independence which can lead to destroy the rules that the government has created. So, all citizens are eliminated perception to avoid making any errors, mainly in vision aspect for the maximum benefit to society. According to the concept of sameness, citizens in this community cannot see the color because the government wants to prevent those results of the difference. They also control climate to make more advantages to the society.

In the film, citizens are not allowed to perceive; the population in the community has no right to perceive colorful color which obviously seen from the black and white tone of the film. One of the scenes is that although the apple which is red, nobody sees and knows that it is red except Jonas and the giver who are only allowed to see colorful things in the community. The cruelest of this community is that the basic right to perceive color is forbidden for the innocent population.

There is no media which is more effective than another because a large number of details in each episode of the novel can emphasize the serious impacts of dehumanization through the selfishness of the community by hiding the truth to make the benefit to the community. Moreover, the visual effects portrayed in the film are also productive because there are more details of history scenes that are similar to the real experience which can attract the attention of the audiences through emphasizing the character's loss of humanity.

5.5 Elimination of Knowledge and Information

In the novel, every home in this community has only one book which is about the rules of the community because education will lead people to gain more knowledge, and it could lead to rebel if people realize what the government does not want them to know. Using language in this community is very important because the deep meaning of words will create more relationship which are unwanted. Memories are also eliminated in this community because it makes people know the sense of right and wrong, and it will interrupt the controlling process of the community which is made for the obedient citizens through the sameness.

In the film, Jonas's community is really strict with the language because they want to prevent every relationship, so they create the precise language that only uses in their society. They are not allowed to express words which may impact feeling even though they do not know the meaning of those words due to the state's elimination of language. Precise language is what citizens in the community must be aware and careful. They are lack of language perception

which humans basically need to be educated; they are not permitted to speak abruptly whether they are with family, friends, or in the public.

There is no media which is more effective than another because it mentions in many scenes in the novel to point up the readers to clearly see the importance of language’s limitation by the government who believes that it will lead to the destruction of the community’s benefits and can become the rebellion. In the film, the director puts more intensive details to inform the audiences about the greatness of the boundary by providing the city planning’s picture where is solitary from other places so that their citizens cannot know any information outside.

5.6 Punishment

In the novel, punishment is used in this community to control and increase obedience, especially for the children because they will not do mistakes after being punished for their actions. It is easier to cultivate since they were young because they have to make benefit to society without rebellion when they grow up. Therefore, the citizens who break community rules will be punished no matter how old they are.

In the film, there is no information at this point.

In the novel is more effective than in the film because all of the original information is eliminated in the film. It is one of the outstanding presentation techniques with full of details of dehumanization according to clear information which can make the audiences clearly see the effects of this issue through the characters.

5.7 Social Rules

In the novel, social rules are the regulations on people who live under the government must follow which can ensure their safety through obedience. There are many rules; for instant, people have to accept the apology to convince the harmony and make people feel sympathetic to each other. Citizens are not allowed to move food out of a particular area. It is the dependence process which ensures that no one can be able to live alone. Therefore, it indirectly forces people to learn to be with others, and becoming coexistence will bring to increase the benefits to the community. There is also a rule that prohibits locking the door to limit the freedom so that the committee can approach everyone at any time. Moreover, there is a rule to limit the number of children in each family unit, and citizens need to submit an application for matching spouse which will be approved by the Committee. All citizens will get job assignment from the government for the sake of community.

In the film, there are the same rules that appear in both novel and film. Firstly, the committee of elders observes children to choose an occupation for them secretly. Another one is releasing which is the same killing conditions including, weak babies, retired elderly, and rule-breakers. There are additional rules in the movie that are not specified in the novel. Firstly, it is forbidden to name a newborn until the age of one year old. Secondly, twelve years-old children have to wear the assign clothing. Thirdly, no one is not allowed to go outside after curfews. Fourthly, people are not allowed to lie. On the other hand, some rules exist in the novel but not in the movie. Firstly, people are not allowed to take food out of the premises. Secondly, citizens must not lock the door. Thirdly, family members are limited. Lastly, people must accept any apology. It can be seen that the rules in fiction are more profound.

There is no media which is more effective than another because the intensive details in the novel can raise awareness about the lack of humanity of the government and convince the readers to understand the discomfort feelings of humans who are brainwashed and eliminated freedom of choice by staying in the rules all the time. In the film, the director pays much attention to many small points, especially from the opening scene to interpret the audiences to see that the process of cultivating and brainwashing.

5.8 Release

In the novel, the word ‘release’ refers to dehumanizing people by taking life away from them even no one deserves to be killed, especially without their requests. This is the process of choosing qualified people who can make benefit to the community. So, there will be the elimination of ineffective people as in the case of a weak newborn child as one of an imperfect twin and old people or the case of people who are disobedient and destroy society.

In the film, release is the word that is used when citizens are injected to death, but people understand that they leave from the community to another place. People who are released in Jonas’s community are unhealthy children, elderly people, and rebellion. Killing people is the most dehumanization that appears in *The Giver* film. People are killed without any guilt. They are simply killed for not having enough quality by society's standards.

In the film is more productive than in the novel due to the expression of no feeling from Jonas’s father, especially when he kills a child as if he is not a living thing. Furthermore, this scene is the cruelest dehumanization because it can make the audiences deeply touch the feelings which make them more sympathize with those being killed people.

6. Discussion and Conclusion According to the result of this study, the researchers

6.1 Discussion

Even though this is a comparative study, the researchers realize that there is not only a better or weaker of each media is because we discover that there are no media that is more effective than the other to present the dehumanization aspects. In fact, we found that each media has its own special techniques and style from the author and the director for the same purpose which is to convince people to be aware of the effects of a dystopian society which is similar to the real situation of the world in nowadays. Even it is not exactly conformed to the hypothesis of this research, it still can indicate that there are different techniques in each media that are intentionally created to be able to deeply touch the audiences’ feelings in order to increase awareness. So, it can be concluded that both media are successful. In addition, this comparative study is worth it because, finally, the researchers have discovered the beauty of art in different media. In the novel, Lowry uses the narrator as an approach methodology to elaborate the intensive details throughout the story which can attract the reader's emotions and feelings along with the expression of the characters. Moreover, it can make the audiences immerse in each scene through mental processes of imagination. In the film, although there is also the elimination of the original information, Noyce still keeps the principal ideas from the original source and adds some outstanding presentation techniques as a new content. For example, he uses the visual effects as advanced technology and film techniques such as the soundtrack, lighting, and color in the film. Moreover, he pays more attention to the power of the Chief Elder to cruelty control every part of citizens’ lives, and the solitary of this community to increase the feelings of hopelessness, but at the same time, more excitement after the rebel.

Therefore, it can be able to lead the audience to sympathize about the dehumanization from the government to citizens as productive as in the novel.

This study conducts about dehumanization portrayed in the novel and the film of *The Giver*. It is useful for humans to comprehend and aware more of the cruelty of dehumanization that oppresses humans, no matter they are willing or not. It is not only the way humans are controlled by the government, but it is the loss of the human rights that they must basically receive.

6.2 Conclusion

6.2.1 Dehumanization as Presented in the Novel and the Film

The government has eliminated diversity and difference from this community in order to reduce any conflict and keep citizens live together peacefully. The citizens are controlled in every aspect of their daily life. They are also limited their freedoms and choices because of the sameness concept of the community. The government has made the peaceful community, and the citizens live equally by controlling. On the other hand, the control leads to dehumanization of citizens. The researchers discover that the presentation of dehumanization portrayed in *The Giver* novel are divided into eight aspects. There are elimination of emotion, reproduction, surveillance, elimination of perception, elimination of knowledge and information, punishment, social rules, and release.

In contrast, there are seven methods of dehumanization portrayed in the film which are elimination of emotion, reproduction, surveillance, elimination of perception, elimination of language, social rules, and release. The rules in *The Giver* film use to prevent people from indicating their identity, and people cannot express their different ideas from the community's aspect. The rules deprive people of independence and liberty. Citizens cannot have any decision. They cannot keep their secrets or hide their feelings. The authority knows every aspect of citizens' lives which makes people do not have privacy and safety. The authority also transgresses the right to live and liberty of citizens. Jonas, who is one of the citizens who has feelings in the society, realizes how cruelty of the dehumanization in the society because he acknowledges that there are no freedoms, no rights, and no choices. Finally, he figures out by leaving everything in the community and escaping to another community.

The novel and the film of *The Giver* have the same concept that the writer and the director focus on which is dehumanization in the dystopian society. The writer provides language to touch readers' imagination by deeply depicting, especially Jonas's feelings. Meanwhile, the director presents realistic scenes by film techniques to reveal dehumanization. All of the eight aspects of the novel and the seven aspects of the film are both effective in different ways. The readers use their different imaginations while they are reading the novel, on the other hand, the viewers watch the movie through the color tone, the characters' expressions, etc. The authors compare the dehumanization from both media to show the readers about what each rule is created for because some rules in the community may violate human rights, and also the scenes that appear in the film or in the novel may have different forms of dehumanization. Therefore, the readers and the viewers can be aware of the importance of human rights which might happen in their life unconsciously.

6.2.2 Outstanding Presentation Techniques in the Novel and the Film

The Giver is told in third person limited narrative point of view. The narrator tells the story from Jonas's perspective through his thoughts and feelings. The readers know the truth

hidden in Jonas's community, including the dehumanization and also the clues in hopes of getting all the answers along with him. It is effective because the readers have to follow every chapter to hit all the points, and it reinforces the pathetic human life without freedom and choice. Moreover, the descriptive method of the author as a third person point of view can create the real innocence of the citizens through their behavior, and leads to the shock feeling for the readers as well. In addition, according to the readers do not easily see the expression of emotion and feeling of the characters as in the film, but from the text instead, so the author can make more awareness of dehumanization in the dystopian society through the readers' imagination.

The outstanding technique presented in *The Giver* film is the color technique. The director uses color to tell the story through Jonas. The perspective of the scene changes according to Jonas's vision. When Jonas has not been transmitted about color yet, he saw his community in black and white which the audiences see the scenes in black and white as well. However, when he is transmitted with a sense of color, the scenes changed from black and white to colorful. In addition, when Jonas is in the scenes, the scenes are colorful, whereas without Jonas the color reverts to black and white as usual. Furthermore, the director conveys viewers by visual effects technique to describe advanced technology in the film for more realistic; for example, the surveillance scenes which uses drone, plane, and CCTV room has also existed in the community. This technique imparts the cruelty of dehumanization in the community that citizens do not have their own privacy even they are home or public because they are catching up by the community. In addition, the assignment ceremony scene also uses visual effects to show the power of the Chief Elder by the huge size of a picture. The viewers completely recall who has the power in the community to assign fate for citizens.

6.2.3 Evaluative Comparison of the Novel and the Film

Both in the novel and the film, there are no media that is more effective than the other because the principal ideas are kept. The main content of both media focuses on the controlling process of sameness by the dehumanization of the citizens in a dystopian society. Even there is the elimination of some original information and adding more new techniques in the film, however, the dehumanization as presented in the novel is also effective due to the descriptive approach. Therefore, the researchers are unable to certainly evaluate the conclusion which media is better because both media are efficient which can increase not the same aspects of the viewers' comprehension.

6.3 Suggestion

According to the discovery of this study, the researchers expect that the study will be productive for further research, especially English literature research about dehumanization that occurs in a dystopian society or any related topics. The researchers also hope that the study could be a reference for further research by applying other theories.

8. References

- Adams, J. J. “*Dystopian Fiction: An Introduction*”. Retrieved from <https://www.tor.com/2011/04/11/dystopian-fiction-an-introduction/> (October, 2, 2021)

- Bedore, P. (2021). *Defining Dystopia: Development and Difference from Utopia*. Retrived from <https://www.thegreatcoursesdaily.com/defining-dystopia-development-and-difference-from-utopia/> (2021, September 25)
- Carlisle, M. (2021). *The 100 Best Ya Books of All Time: The Giver by Lois Lowry*. Retrieved from https://time.com/collection/100-best-ya-books/6084683/thegiver/?fbclid=IwAR1eLLj5K6TgT3hns8OxbmxPwvjWsGUixigfjxDLJa_B6aW-SkfCAgEkFA (2021, September 12)
- Claeys, G. (2010). *The Cambridge Companion to Utopian Literature* (Cambridge Companions to Literature): Cambridge University press. (Online). Available: <https://www.pdfdrive.com/the-cambridge-companion-to-utopian-literature-cambridge-companions-to-literature-e162098371.html> (2021, September 10)
- Contis, E. (2019). *Types of Shots in a Film: The First Tools to Building a Shot List*. Retrieved from <https://www.careersinfilm.com/types-of-shots-in-film/> (October, 7, 2021)
- Gerhard, J. (2012). *Control and Resistance in The Dystopian Novel: A Comparative Analysis* [Degree Master of Arts, California State University, Chico] (Online). Available: https://scholarworks.calstate.edu/downloads/4b29b648d?fbclid=IwAR0x2kZPuV8aFuvliQ_czss0meo-jqRvk3ZvdGrazz9y2tb_0W-mYBakwWA (2021, September 12)
- Johnston, B. (2020). *Dystopian Literature Worksheet*. Retrieved from <https://app.wizer.me/preview/H6XEFE> (2021, September 10)
- Kumar, A. (2021). *What Is Mise-en-scène? 7 Films That Are Perfect Illustrations*. Retrieved from <https://flickside.com/what-is-a-mise-en-scene-movie-examples/> (October, 10, 2021)
- Lowne, C. (2020). *Nineteen Eighty-four novel by Orwell*. Retrieved from <https://www.britannica.com/topic/Nineteen-Eighty-four> (2021, September 10)
- Mallyta, R, H, A. and Pujiati, H. (2012). *Violence Beyond the utopian Society in Lowry's the Giver*, Volume 2 (No.1) Page Range 90-103 (Online). Available: <https://jurnal.uns.ac.id/hsb/article/view/16430/16652> (2021, September 12)
- Marina, J. (2018). *Dystopian Characteristics in The Giver Novel by Lois Lowry* (Master of Arts). State University of Jakarta, Indonesia. (Online). Available: <http://repository.unj.ac.id/1248/1/SKRIPSI%20OK%20JUWITA.pdf?fbclid=IwAR3s1ikfGDD9XMqNLmPElywL4oc9rzHisllg6-gdh22bDyZ2nFdsL0vejYI> (2021, September 11)



- Peranginangin, D, R, K. (2019). *An Analysis of Totalitarianism and Its Impact Found in Yevgeny Zamyyatin's We* (online). Available: <http://repositori.usu.ac.id/bitstream/handle/123456789/14769/140705122.pdf?sequence=1&isAllowed=y> (2021, September 15)
- Rose, R. (2020). *The Importance of Soundtrack in Cinema*. Retrieved from <https://www.undergroundpress.co.za/features/op-ed/the-importance-soundtrack-in-cinema> (October, 1, 2021)
- Ulaby, N. (2014). *Lois Lowry Says 'The Giver' Was Inspired by Her Father's Memory Loss*. Retrieved from <https://www.npr.org/2014/08/16/340170478/lois-lowry-says-giver-was-inspired-by-her-fathers-memory-loss> (October, 2, 2021)

An Analysis of Feminist Perspectives Reflected in the Film of The Color Purple

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Abstract

Female oppression happens everywhere, especially in the family; it is the unavoidable problem for women. Many artists realize it, so they make the issue more aware through their works. *The Color Purple* (1985), a movie directed by Spielberg, expresses female oppression as well. It clearly covers the issues of women's oppression, inequality, and sexual abuse. The researchers are interested in studying women's oppression which is focused on a radical feminist perspective. Therefore, this movie is used as a source to conduct the study. This study aimed to analyze the radical feminist issues that Celie, an African-American teenager, must overcome and the methods she uses to overcome men's authority. To fulfill the objectives, radical feminist theory is applied as an approach theory. A movie file and movie script are collected as the primary data, and all the gathered information is analyzed based on the research objectives. According to the researcher's analysis, the oppression of African-American females from patriarchy was studied through Celie. She is physically and psychologically oppressed by black people in her society; especially, black male members of her family because of her natural gender. Furthermore, Celie has tried to overcome the patriarchy to perceive her independence by gaining inspiration from other female characters and resisting the authority for herself. At the end, she could overcome male superiority and become visible and strong enough to stand on her own. Finally, further researchers are expected to conduct studies about feminism or patriarchy in novels or films that portray the same issues.

Keywords: radical feminism; female oppression; patriarchy

1. Introduction

African people were forced into slavery in the American colonies since the 16th centuries. A Portuguese slave ship named the São João Bautista traveled across the Atlantic Ocean, and almost half of them had died (Elliott, & Hughes, 2019). At present, the suffering of black people still happens, and it should be undeniable as they are human beings like others such as George Floyd who was killed by white police. However, the worst belongs to women as they can only do the lowest-paid jobs compared to black men or white women (Frye, 2019). Additionally, they are oppressed doubly. They have suffered from both types of prejudice: racism and sexism from racial discrimination by the white society and sexual repression by black males in their

community. They must fight against white patriarchy, white women's racism, and black men's sexism within their own race (Chapagain, 2020). Due to the outstanding oppression of African-American women in America, many artists such as Toni Morrison, Alice Walker, Steven Spielberg², etc. created literary works to represent black women who encountered unavoidable cruel oppression by both white people and black men.

Films are one of literary works that are used to represent oppressive black women. The African-American films' history is a harsh timeline of repression, racism, and struggle contrasted with film scenes of unbounded hope, joy, and artistic spirit (Liversidge, 2003). Nowadays, lots of good films shows the oppression of African-American people. However, *The Color Purple* by Steven Spielberg¹ is the most interesting film in the same field because before it became the film, it was a novel by Alice Walker that received the 1983 Pulitzer Prize for fiction and the National Book Award in 1983 (Wang, 2016). Moreover, “*The Color Purple* is one of the all-time greats of literature, a global bestseller, and has inspired generations of readers” (Hachette Essentials, n.d.). Due to its popularity, it was adapted into a film by Steven Spielberg, Hollywood's best-known director, who is one of the most influential personalities in the history of cinema. Furthermore, he is a white man who barely created drama films, but he created the drama being beneficial to black women (Steven Spielberg, n.d.). Nevertheless, it was adapted into a film because of its outstanding story; it portrayed the strong viewpoint that black men treated black women as if they were not human and violence domestic abuse which is the closed issue to us (*The Color Purple*, n.d.). Additionally, this film was so popular that it won the Classic Cinema Hall of Fame from the Black Movie Awards in 2005 (Black Movie Awards, n.d.). Therefore, these reasons inspire the researchers to choose this film to study instead of others.

In the film, an African-American teenager, Celie, experiences tragedies. She was physically and psychologically oppressed by her stepfather and her husband. She has been oppressed since she was young until she married. However, her life is surrounded by women who have independent minds; thus, she learns from those women to become strong and stand for her rights (Foca, 2019).

2. Research Questions

2.1 What are the radical feminist issues that the main character Celie encounters in the patriarchal society seen through *The Color Purple*?

2.2 How does the main character Celie overcome the radical feminist issues in the patriarchal society seen through *The Color Purple*?

3. Research Objectives

²Steven Spielberg, the director of *The Color Purple*, will be cited when the film is mentioned or described throughout the research.

3.1 To identify radical feminist issues that the main character Celie has to overcome in the patriarchal society seen through *The Color Purple*

3.2 To analyze how the main character Celie overcomes radical feminist issues in the patriarchal society seen through *The Color Purple*

4. Literature Review

4.1 Feminism

Willhite (2021) stated that feminism is the advocacy of and belief in the economic, political, and social equality of the gender expressed especially through organized activity on behalf of women's interests and rights. Feminists believe that men and women are equal, and women deserve the same rights as men. Moreover, Pande (2018) stated the basic definition of Feminism as the lower place of women in society and the prejudice they face due to their gender. Overall, feminism can be referred to as the equality of men and women, which can be classified into four main meanings: the advocacy of women's rights based on the equality of sexes; the theory of the political, economic, and social equality of the sexes; the belief that men and women should have equal rights and opportunities; and the ideology advocating social, political, and all other rights of women equal to men. It is separated into three waves. The first wave was to provide possibilities for women to vote in the context of urban industrialism and liberal and socialist politics (Rampton, 2008). The second wave focused on women's cultural and political inequality, family, sexuality, and work (Phillips, 2004). The third wave tried to redefine femininity while also celebrating variations in race, class, and sexual preference, and it embraced feminism and rejected many stereotypes of the feminine ideal. This movement marked a clear departure from the second wave, and the emergence of intersectionality began to form (Delao, 2021).

Feminism has five main types: Liberal, Radical, Marxist, Cultural, and Eco feminism; radical feminism's ideal obviously parallels with Celie's actions. Radical feminism focuses on the efforts of eliminating patriarchy by transforming the entire role of the society. If it is compared with other branches, for example the liberal feminism, which is focusing on the achieving the power of equality between men and women, especially, the power of women to freely vote for political and legal requirement; the readers can notice the uniqueness of the radical feminism requiring to get rid of the traditional genders' roles, not the equalizing the genders' power (How many types of feminism are there?, n.d.).

4.2 Theoretical Framework

There is only one theory to support this research which is the radical feminist theory by Mary Daly (1990), which believed that the patriarchal system oppresses women. Furthermore, Rosemarie Tong (1989), which focused on the inequality that should not have a new system, and it should be destroyed. Finally, Kelly Weisberg (1996), which mentioned the differences between male and female bodies that are not only the reason why women are oppressed but also mentioned the roles of both gender and sexuality that are also being oppressed. The researchers use this branch of theory because we would like to identify radical feminist issues to fulfill our objectives. Additionally, there is no study about radical feminism analyzed in *The Color Purple* (1985). Therefore, the researchers decide to use radical feminist theory in our study.

4.3 Previous Studies

The researchers studied five related previous studies as follows: The first study is a study of Bowers (2018), he researched the differences between the film and novel titled *The Color Purple* by mentioning the highlight of Spielberg’s work which is the feminist theorist about the forgiveness of feminist perspective. Secondly, Pradipta (2012) conducted a study focusing on the feminist perspective of the movie *The Color Purple*: how the main character, Celie, escaped from the oppression portrayed in the movie. Additionally, a study of Chelsey (2011), she compared the novel and movie *The Color Purple* and the patriarchy issues. Moreover, Franko (2016) conducted a study by using womanist theory and focused on the adapted 1985 film *The Color Purple* by Steven Spielberg. Eventually, Frías (1998) compared the novel and movie named *The Color Purple* focusing on the different portraying the content of lesbianism in those literary works.

Those studies, the researchers found that they are not research on the radical feminist perspective through *The Color Purple* Movie; therefore, the researchers conduct a study on radical feminist issue as a gap of those research. The researchers focus on the behavior of Celie and how she deals with her struggles through her life. Conversely, those previous research compare contents, elements, perspectives of the movie and the novel or just focusing on other feminist perspectives. However, this research identifies radical feminist issues that Celie must overcome and analyzes how she overcomes those radical feminist issues in the patriarchal society.

4.4 Biography of the Director

Steven Spielberg or Steven Allan Spielberg is an American film director and producer. He was born on December 18, 1946, in Cincinnati, Ohio, United States. Spielberg’s films have a wide range of appeal and critical acclaim, ranging from science classic fictions such as *E.T.: The Extra-Terrestrial* (1982) to historical dramas such as *Schindler's List* (1993) (Barson, n.d.). Moreover, he has also worked on film adaptations of books including *The Color Purple* (1985) and *Empire of the Sun* (1987) (Biography.com Editors, 2021). Along with his three Oscar wins, he has received many other honors.

5. Research Methodology

This qualitative research focuses on the analysis of feminist perspectives seen through the movie entitled *The Color Purple*. Additionally, the descriptive qualitative method was used in this research because the researchers would like to ascertain radical feminism phenomena that the female protagonist named Celie has to overcome and how she overcomes. Finally, the data of this research will be only sentence explanations; it will not include any numerical data, percentages, or mathematical techniques.

The movie and the movie’s script of *The Color Purple* (1985) are the major data sources for this study. The researchers watch the movie from movies2watch website and analyze some scenes in the movie that related to the radical feminist issues presented through patriarchy and how Celie overcomes the radical feminist issues that she encounters in the patriarchal society. Additionally, the researchers analyzed this movie by reading script. The screenplay of the

movie was written by Menno Meyjes³. However, the script is not taken from the official screenplay. Instead, it is transcribed by the transcriptDB website. Therefore, the researchers read the movie's script and will analyze the related scenes.

To collect data, the researchers use the following steps. The first step is selecting the movie *The Color Purple* (1985) because of the feminist perspectives that are reflected in the movie. The second step is watching the entire movie to review and perceive the protagonist about how she has been through this movie from the feminist perspective. The next step is searching for the movie's script and reading the movie's script to collect the data. The last step is taking notes about the issues that the researchers would like to learn.

This research is the textual analysis to interpret and criticize Celie on how she lives in the black society that relates to radical feminist criticism. After collecting the data, the researchers read the entire script of the movie to analyze the data in specific. The second step is gathering and reading the related sources. Then the researchers apply radical feminist theory by Mary Daly (1990), Rosemarie Tong (1989), and Kelly Weisberg (1996) to analyze the data focusing on the radical feminist perspective. The third step is analyzing the radical feminist issues that the Celie faces and her ways to overcome those problems. The next step is finding and concluding information based on the analysis that had been done from the information and the final step are making conclusions from the results and discussion.

6. Results

6.1 The Radical Feminism Presented in Patriarchal Society

Radical feminism is an ideology that emphasizes the patriarchal basis of inequality between men and women, especially men's social power over women (what is radical feminism, n.d.). In the film, radical feminism is shown in the way that black females are oppressed in patriarchy. The oppression in the film women must face is categorized into the subtopic entitled female oppression demonstrated in a patriarchal society.

6.1.1 Female Oppression Demonstrated in a Patriarchal Society

The researchers found out several oppressions Celie must overcome. They can be divided into three subtopics: patriarchal dominance, double oppression, and sexual oppression.

6.1.1.1 Patriarchal Dominance

Men do not want women to be equal to them, so they use physical or psychological violence to control women (Taylor, 2020). Many examples of patriarchal dominance are shown in this movie. First, Celie is physically and psychologically oppressed by her stepfather and her husband. Additionally, she is unfairly treated compared to other women around her. For further explanation, they are demonstrated under the following categories.

³Menno Meyies, the scriptwriter of *The Color Purple*, will be cited when the movie script is mentioned or described throughout the research.

a. Physical and Psychological Oppression

Violence from men is another example of patriarchal dominance. Men use violence to show their masculinity. The researchers categorize violence into two types: physical oppression and psychological oppression.

For physical oppression, both Albert and Alphonso physically oppress Celie violently. Albert uses violence to control Celie’s thoughts and opinions. His aggressive actions make Celie obey him and lose her confidence as well as bravery to express any opinions. Although her role as a wife is a member of the family, she does not have the right to show good ideas for the resolution of any problems in her family. In the film, Celie suggests shaving his daughter’s hair due to the toughness. However, Albert refuses and slaps her to prevent her from expressing the idea and to only obey his order (Spielberg, 1985). This shows that Albert uses violent action to make Celie’s be under his control. The dialogue below demonstrates how Albert oppresses Celie.

Celie: I'll have to shave it off.

Albert: No, no, no. It's bad luck to cut a woman's hair.

Celie: This'll take all day.

Albert: Shut up!

Celie: I can't. It hurts her. Ow! Ow! Ow!

Albert: (Albert slaps Celie's face.) Ahh! Don't talk back to

me. You do what I tell you.

(Meyjes, 1985)

Additionally, Albert uses violence to take Celie’s freedom away. Celie cannot have her own time to achieve her errands since she must donate all her time to please Albert. She must promptly fulfill Albert’s requirement. This authority diminishes her right from spending her free time. To read her own letters from her sister in her free time should not be prevented, but Albert aggressively steals it for his pleasure. While Celie is reading the letter from Nettie in the field at 1:54:26, Albert slaps Celie’s face since she does not hear the call for shaving (Spielberg, 1985). Shaving can be one’s self-responsibility, but Albert uses Celie to finish it. Moreover, when one does not hear the call, we can get closer to the one and tell one politely, however, Albert uses violence instead to suppress Celie and take Celie’s spare time for his own business. The dialogue below expresses his cruel action.

Celie: Ah! (Celie is slapped, while reading the letter.)

Albert: What's with you? I was calling you for an hour!

Now get my shave and don't keep me waiting!

(Meyjes, 1985)

Moreover, Celie's right is deprived by not being able to contact Nettie through the letter. Because reading the letter from her sister creates the bond between sisters, Albert prohibits Celie from reading the letters because of the fear of Celie having more authority and disobeying. She will know more about incidents happening in the world and provide her with broader visions and perspectives. Additionally, she might think of rebelling against him one day.

After Celie reads the letters from Nettie, she gains more knowledge because normally Celie only lives at home and does the housework. Nettie writes letters about the different lifestyles of other people from where Celie lives. It helps Celie know the way she is living is not the format; she can live differently from the norm of that society. Therefore, Albert stops Celie by blocking her from connecting with Nettie. In the scene at 31:50, Celie cannot receive the letters from Nettie due to Albert's order (Spielberg, 1985).

Celie: Can I see if a letter come from Nettie?

Albert: Ain't nothing for you, hear? Don't never mess with

that mailbox, you understand? That's my business! I done fixed that mailbox so I can tell if it be messed with. You understand?

(Meyjes, 1985)

For psychological oppression, sharing opinions or expressing feelings are the basic right of humans. However, Celie does not have them due to patriarchal dominance, so this prevention makes her miserable and tolerant. She does not have the right to possess anything except reluctance. Since every order of men must be obeyed without considering her own feelings, the right to reject the order or express the better choices that do not affect her feelings is not hers. For example, she is miserable because she cannot decide to have her child with her; although she would like to keep that infant, she must obey her stepfather's decision to take her infant away. As a mother of her child, she is supposed to have a chance to nurture and see her child's development, but she is not able to do them at all. Motherhood and maternity are the only power black women can own, but Alphonso steals them away. Therefore, this reinforces that Celie is miserable due to patriarchal dominance. According to the scene at 04:40, there are the hands of Alphonso, Celie's stepfather, who takes the baby away, and he intimidates Celie to keep it secret (Spielberg, 1985). The dialogue and statements below illustrate that Celie has no chance to express her sad feeling of losing her child, and the only thing she can do is telling God. This shows her heartbrokenness because of her stepfather's dominance.

Alphonso: Ain't you done yet?

Nettie: A girl!

Celie: No, I want it.

Nettie: Shh.

Celie: Nettie!

Alphonso: You better not tell nobody but God. It'd kill your mama.

(Meyjes, 1985)

Celie: "Dear God, I'm 14 years old. I've always been a good girl. Maybe you can give me a sign. Let me know what's happening to me. One day, my daddy come and say, "You gonna do what your mama wouldn't." Now, I got two children by my daddy. A baby boy called Adam, he took while I was sleeping...and a baby girl called Olivia...that he took right out of my arms. Then my mama died...cussing and screaming...because her heart been breaking. Dear God, he acts like he can't stand me no more" (Meyjes, 1985).

Furthermore, she does not have the right to make her own decision. Although she wants to be with Nettie and does not want to go with Albert, she cannot express her opinions and must go without any other choices. This highlights her stepfather's selfishness. He gives Celie instead of Nettie and does not care about her feelings. Usually, he treats her as an object. In the scene where Albert comes to Celie's house to ask Alphonso for marrying Nettie. Alphonso refuses but carelessly gives Celie instead. He decides without asking Celie's opinion about whether she wants to go with Albert or depart Nettie (Spielberg, 1985). Alphonso's statements below demonstrate how he acts dominantly:

"I can let you have Celie. She oldest and should marry first. She ain't fresh, but I expect you know that. She's spoiled, twice. Celie is ugly but she works hard, and she can learn. And God fixed her. You can do what you like. She won't make you feed or clothe it (Meyjes, 1985)."

Without a doubt, women lack human rights as being women in all directions. They have no right to do anything if men do not allow them to do. Therefore, women do not have the right to feel or think; they can only obey men and do what men order. If women disobey, they will be punished violently.

b. Injustice Treatment

Injustice treatment can make the person who is treated wrongly and unfairly suffer. Especially, if the person does their best but is not being treated right, the person will feel miserable since what he or she has been doing is worthless and meaningless. In the film, Celie is oppressed by both Alphonso and Albert due to the unfair treatment. The injustice treatment devalues Celie's important roles. Oppositely, she does not know the way she is being treated is injustice; therefore, she may not feel much suffering from being treated unfairly. Conversely, she should have been treated better as her roles are not less essential

compared to the opposite people that are provided the better treatment. There are many examples that Celie is treated unfairly.

Firstly, Alphonso treats Nettie better than Celie. Although Celie is also one of his daughters, she is treated differently. Celie is chosen to do every mother's responsibility. After she is pregnant by Alphonso, she does not have a chance to go to school as Nettie does. At 8:15, Albert goes to Alphonso's house then he asks Alphonso to marry Nettie, but Alphonso denies that request. However, Alphonso gives Celie instead (Spielberg, 1985). The dialogue below shows how Alphonso is appreciative Nettie more than Celie.

*Albert: I want to marry your Nettie. I got to have
somebody right now. I got nobody to watch
over my young ones. They's be
fighting and bleeding and throwing
upon the floor while I got a farm to run. I'll take
right good care of your Nettie.*

*Alphonso: I can't let you have Nettie. She too young. But
I tell you what. I can let you have Celie. She the
oldest. She ought to marry first. She ain' fresh, but
I expect you know that She's spoiled, twice. Celie
is ugly but she is ain't no stranger to hard work,
and she can I earn. God done fixed her. You can
do everything that you want to, and she ain't
gonna make you feed it or clothe it. But Nettie,
you flat out can't have. Not now, not never.*

(Meyjes, 1985)

The second instant, Albert rides a horse, while Celie walks. On the way to Albert's house, there are two cattle: A horse and a cow. Celie must walk along the way and carry all her belongings as well as take a walk with the cow instead of riding it. Contrastingly, Albert rides a horse comfortably at 9:40. Even though that horse can carry both Albert and Celie, and the cow can carry the belongings for fairness; Albert still lets Celie walk (Spielberg, 1985). This shows Albert's patriarchy to treat Celie unfairly.

The third one is that Albert treats Celie as an object. When Celie approaches Albert's house, she was thrown a stone at. while her head is bleeding, no one provides care for her. He had sex with her on the same day, and when the next day comes, she must work without resting. This shows that Albert does not care about Celie and means to use Celie as an object to please him (Spielberg, 1985).

The next example is that Celie is treated as a housekeeper. Albert orders Celie to do every house chore. Although Celie is a woman that is supposed to do all the house chores according to the social standard, both Albert and Celie are a couple; they are supposed to help each other with whatever another person is working on. They should be equal and not rely everything on one person so that another person is living

comfortably. Furthermore, women should not only be at home doing housework, but they also should be able to hang out with friends sometimes.

Lastly, Albert treats Shug better than Celie. Although Celie is a wonderful wife, she has been treated as if she is an invisible person. Nevertheless, when Shug comes to visit Albert at the house, Albert takes very good care of Shug although Shug stays there temporarily and never does anything. Hence, this is unfair for Celie as she does her best, but the better treatment goes to Shug.

6.1.1.2 Double Oppression

Double oppression is the issue that black women are oppressed by two types of people (Ibrahim, 2021). In the film, Celie is oppressed doubly not only by other African-American people but also her male family members: her stepfather and husband. One way of oppression is verbal. Speeches are mostly used to mentally hurt other people which make the victims lose their self-identification and could be depressed. The verbal oppression to Celie is cursing, insulting, and criticizing her appearances (Spielberg, 1985). The first verbal oppression comes from Alphonso.

Alphonso: *Celie, you got the ugliest smile this side of Creation.*
(Meyjes, 1985)

Those words make Celie always covers her mouth when she smiles which shows her submissiveness. Moreover, this shows how she loses her self-esteem and self-recognition. While she can keep on showing her smile if she does not care, she refuses. It makes her heartbroken as her father; the one she loves, cares for and expects him to love her back, is the one who comment.

Even black woman insults Celie. For example, Celie is smiling to welcome Shug on their first meet, but Shug says, “*You sure is ugly!*” (Meyjes, 1985). Because of Shug's words, Celie stops smiling, and remembers Shug's words. However, she does not act awkwardly because she is used to the negative comments about her appearance. When one is used to negative words that one must have encountered it many times, it makes one depressed. Celie has heard negative comments since she had been with her stepfather, so she does not surprise when Shug insults her. The following dialogue shows Celie's true feelings about negative words.

Celie: *Yeah, because don't nobody love me.*
Shug: *I love you.*
Celie: *You think I's ugly.*
Shug: *No, I don't.*
Celie: *You ugly. You sure is ugly.*
(Meyjes, 1985)

Moreover, men usually think women are incompetent; especially, black, poor, or not gorgeous woman. The scene where Celie is going to leave Albert's house, he says “*Who you think you is? You can't curse nobody. Look at you!*”

You're black, you're poor, you're ugly, you're a woman! You're nothing!" (Meyjes, 1985). Even though his words cannot affect Celie because she is fulfilled with enough encouragement, the words are obviously cruel and insulting to her (Spielberg, 1985).

Additionally, another way of oppression is isolating the woman from contacts with others, which is a form of oppression that prevents Celie from help and support. Because Celie is without help or support from her relatives, she is just Albert's possession. For example, Albert isolates her from Nettie, which can be seen as an indication of how Albert takes control over his wife's life in patriarchy displayed in the argument below.

Celie: Let her stay. Please let her stay. I'll do anything for you!
Let her stay!
Albert: You ain't never coming back here! Get out of here! No! No! Get off my land! Get off my land! You ain't welcome no more.
 (Meyjes, 1985)

In addition, unfair treatment is another double oppression. The woman is usually frightened and threatened by the destructive relationship she lives in: Albert takes Celie to his plantation, acts as she is a domestic servant, and tolerates by his physical abuse which men do not want women to be equal to them by obeying them without expressing any opinions, so they use violence to control women.

Furthermore, preventing women from experiencing motherhood is an additional way of oppression. It is regarded as painful for women who cannot express their love and nurture their child. Motherhood is the fundamental right of a mother to raise her child. For Celie, motherhood is the only power that she is proud of. Unfortunately, this pride of hers is taken away by her stepfather, showing the cruelty of a man who takes Celie's child from her. This is more depressing since the one who oppresses her is a member of the same family, she takes a part in.

Equally important, Alphonso suppresses her from stealing her right to study. Celie never has a chance to study since it is the rule that women who are pregnant cannot go to school which makes her become illiterate. Obviously, this is beneficial to male characters: her stepfather and her husband. Due to this oppression, Celie is ignorant about herself and her rights. Instead, she becomes passive to the patriarchal actions and does not against others.

6.1.1.3 Sexual Oppression

Sexual oppression is also presented in a patriarchal society. Sexual oppression is the actions of a sexual nature against a person's will, and it is tied to inequality. Sexual oppression and harassment are an issue directed at women as well as the belittling or ignoring of women's thinking (oppression & sexual violence, n.d.).

In the film, Celie is treated as a sexual object and forced to have sexual intercourse with her stepfather. Celie is also exposed to sexual abuse from her

male family members. As she is unpleasant in doing a sexual activity, she is oppressed in a sexual way as if she is the sexual object of both Alphonso and Albert. Both use physical violence and sexual force against Celie which action is so hard and severe. This displays the method of gaining control of males in the form of patriarchy. For instance, at 4:00, where Celie gives birth to two children. However, there is no clear scene about her being raped by her stepfather but her words which are shown in the dialogue below (Spielberg, 1985).

*Alphonso: You gonna do what your mama wouldn't
(Including sexual activity).*

*Celie: Now, I got two children by my daddy.
(Meyjes, 1985)*

Furthermore, Albert treats Celie as an object when having sexual intercourse with her. Albert does not care about Celie's pressure which obviously shows that she is Albert's sexual object. This makes Celie unhappily live in a house where her value is unconsidered without any choices. The dialogue below from Celie shows how Albert does to her. (Spielburg, 1985).

"He don't never ask me how I feel. He never ask me about myself. He just climb on top of me and do his business (Meyjes, 1985)."

During the sexual activity scene with Albert, Celie sees the picture of a woman on the wall. She mentions that the woman may like having sexual activity with Albert. This indirectly shows that she is not pleasant to have sexual intercourse with Albert; otherwise, she would have said the woman in the picture 'must like' it, instead of 'may like' it. Additionally, she mentions 'I don't cry' instead of 'it is fun'. This means she wants to cry, but she does not. However, above all hypotheses, the confirmed one is that she does not enjoy the activity. In the film, she lets Albert use her body for sexual activity. When he is on top of her, he does his business, while her soul is not there doing the activity with her husband. There is only her body lying on the bed, but her mind thinks about something else during the time; she worries about Nettie if the stepfather would hurt her (Spielburg, 1985). This can be seen that her feelings are not cared for; Albert fulfills his lust without considering Celie's worries. If he loves or puts value on her, he will notice the awkwardness during the activity. He will ask whether she is all right or what she is thinking about to help her figure out a solution as other couples do. Thus, it is proved that he does not love his wife but merely uses her to please him.

6.2 The Methods Used by Celie to Overcome the Patriarchy

According to the film, Celie fights with the male authority using these three methods: inspiration from other female characters, having conversations among women, and resistance to patriarchy.

6.2.1 Inspiration from Other Female Characters

Inspiration can give passion to people who are depressed because they do not have a passion left in life to continue living. The passion can make people realize what goal they must achieve. In the film, Celie suffers from patriarchy which makes her lose self-esteem, self-confidence, and self-recognition. However, when she is physically and psychologically inspired by other female characters: Nettie, Sofia, and Shug; she has self-development. She begins to stand for her independence and overcomes the patriarchy. The inspiration from other female characters in the movie is classified into two types: physical inspiration and psychological inspiration.

a. Physical inspiration

Celie is inspired by other people's words and actions. In the film, she lives with Albert painfully. She surrenders her life to Albert. However, after she meets Nettie, Shug, and Sofia; she has self-development to battle patriarchal dominance.

From the scene that Shug comforts and inspires Celie with words and actions to help Celie discover her value. She notices that since she has met Celie, Celie has been a sad girl and very shy and has not been confident in herself; she loses her self-esteem. Therefore, Shug writes the song *Miss Celie's Blues* for Celie, and she sings it among many people (Spielberg, 1985). Shug wants to encourage Celie, and makes Celie exist among others. This is the first time that everyone turns their attention to Celie. It is also the first time that Celie is visible as a woman. Since she realizes someone turns attention to her, it makes her think more about her existence, that she is a woman, and she deserves a better relationship with others. Furthermore, Celie obtains much physical inspiration from Shug when Celie dresses up in Shug's red dress, and she tries to cover her smile with her hand (Spielberg, 1985). This emphasizes that Celie does not dare to show being herself because she has lived in the patriarchal society. This is the result of her being oppressed by male characters since childhood. Alphonso once said that she is ugly and has an ugly smile. However, Shug supports and inspires Celie so that she finally shows her smile and laughs happily for a moment. Additionally, Shug's characteristics: confident, charming, glamorous, independent, sexy, warm or compassionate, make Celie have a good desire to be like her. Therefore, Celie learns about herself and gather the power to fight for her independence and overcome the oppression of males.

b. Psychological Inspiration

In the film, Nettie indirectly inspires Celie by her letters. Reading Nettie's letters; Celie gains essential psychological inspiration from Nettie through the letters that Nettie tried to contact her (Spielberg, 1985). The bond between sisters makes Celie strong and knows the goal of her life. It provides her the purpose of living to receive Nettie's message and finally meet each other. Since Nettie sends Celie letters to explain how she lives and how her life has been developing, this makes Celie know that Nettie as well as her children are alive. Thus, the news inspires her to live with the hope. As a result, she has the power to fight for her freedom and to overcome the dependency in the patriarchal society. Thus, she is strongly encouraged to rebel against Albert who separate them.

Consequently, these inspirations from other female characters make Celie realize the value in herself to stand on her own and want to overcome this patriarchal society.

6.2.2 Celie's Development through the Conversations between Women

The conversation among women is also important for Celie's development. Since Celie has not been educated, she is not taught about being oppressed, and it makes her become passive. Having conversations with independent woman makes Celie aware of her value and rights as a woman. Additionally, it helps widen Celie's world. Being a woman does not always have to be under male superiority because women can independently live and can fight for their justice. Shug, Sofia, and Nettie provide Celie different lessons.

For instance, talking with Shug helps Celie gain encouragement and find herself. Shug encourages Celie to confidently smile. Furthermore, Shug listens and comfort Celie when she vents and unburdens about her life living under male authority. Shug also shows how much she cares for and recommends Celie to leave Albert for her freedom in a family full of men. Further instance, Celie learns from Sofia's speech. Sofia tells Celie how difficult she tries to fight for her freedom in a family full of men. Thus, Celie learns that being attacked by men, especially men in her family is unacceptable. Lastly, the conversations with Nettie that she wats Celie to defend herself and do not be submissive. Nettie teaches Celie to fight for her own self because Celie does not have self-confidence.

Overall, the conversations among women in the movie are meaningful. Those women do not generally talk with Celie, but they represent Celie the rights that belong to all women. Without them, Celie might have had no opportunity to be aware of the fact about lacking education. Therefore, talking to those women is like having outdoor classes that teach her lessons about women's rights. When Celie gains enough knowledge from her 'teachers', she gradually stands for her independence. Without a doubt, the women around Celie possess completely different characteristics from Celie. Moreover, these women fight for the inequality they encounter in life, Celie is influenced in a good way to fight for hers.

6.2.3 Resistance to Patriarchy

Resisting to be submissive is a kind of action that is considered fighting patriarchy. Because patriarchy is all about oppressing women; if women resist the concept, the system of patriarchy is meaningless. For most of the story, Celie is always ignorant, but after she gains confidence, Celie resists patriarchy by standing for her independence. She threatens Albert with a knife for her insistence since Albert insults her in the scene where they have a meal together. At 1:59:09, Shug tells Albert that Celie will go to Memphis with her then the resistance to patriarchy begins. In the movie, it shows the real patriarchal system. Moreover, this scene strongly expresses the way Celie stands up for herself (Spielberg, 1985).

Shug: It's time to move on. Celie is coming with us. Celie is coming to Memphis with us.

Albert: Over my dead body!

Shug: Are you satisfied? That's what you want?

Albert: Now what's wrong with you?

Celie: You a lowdown, dirty dog, that's what's wrong. It's time for me to get away from you and enter creation. Your dead body be just the welcome mat I need.

Albert's father: You can't talk to my boy that way.

Celie: Your boy seems like if he hadn't been your boy, he might have been a halfway decent man.

Albert: Say what?

Celie: You took my sister Nettie away from me. You knew she was the only somebody in the world who loved me. But Nettie and my kids, they are coming home soon. And when we all get together, we're gonna sit around and whoop your ass.

Albert: Nettie and your kids? Woman, you talkin' crazy.

Celie: No, I got children. My children livin' in Africa. Learning different languages. Fresh air, plenty of exercise. And they gonna turn out a heap better than these fools you never tried to raise.

Harpo: Hold on, here!

Celie: No "hold on," Harpo. If you hadn't tried to rule over Sofia, white folks wouldn't have got her.

Harpo: Now, that's a lie!

Celie: A little truth in it. Y'all was rotten kids. You was. You was rotten kids! Made my life here hell. Of course, your daddy ain't nothin' but some dead horseshit.

...

Albert's father: My God, the dead has arisen.

Albert: You won't get a penny of my money. Not one thin dime!

Celie: Did I ever ask you for anything?! Did I ever ask you for anything?! I never asked you for nothing! Not even for your sorry-ass hand in marriage! Nothing. I never asked you for nothing!

Albert: And this house ain't been cleaned good since my first wife died. Nobody's crazy enough to marry you. So, what you gonna do? Hire yourself to farm? Maybe somebody will let you work on their railroad.

Albert's father: Maybe sweep out the caboose. Ha ha!

Celie: Any more letters come?

Albert: Could be. Could be not. Who's to say?

Celie: (Holding a knife to Albert's neck)

Shug: Celie, no!

Celie: I curse you! Until you do right by me. Everything you think about is crumble!

...

Albert: Who you think you is? You can't curse nobody. Look at you! You're black, you're poor, you're ugly, you're a woman! You're nothing at all!

Celie: Until you do right by me, everything you even think about gonna fail!

(Meyjes, 1985)

Those methods influence Celie’s thoughts and change her attitude about herself and the importance of women. From having analyzed this film, Shug, Nettie, and Sofia own completely different personalities from Celie; they are strong and have the determination to stand up for themselves. This is the best fortune in Celie's poor life for being among these powerful women who are supportive and want to see her happiness. Therefore, these three women are significant to Celie as models to discover her value.

7. Discussion and Conclusion

The film demonstrates the physical and psychological oppression of Celie in the black patriarchal society and the methods she used to overcome the oppression. Celie presents struggles and fights to obtain freedom. The factual issue represents in nowadays society, and the researchers consider that this analysis of the issue of women's oppression in a patriarchal society will encourage readers to fight the problems of female oppression and racism in our society. Since literature provides a better understanding of how the world functions today, researchers suggest using literature in social studies. It educates one about the knowledge and attitudes essential to civic competence. Furthermore, the film adaptation by Steven Spielberg is easy to understand, and he portrays female oppression with a broad perspective and sympathy of women as well as highlights the inequality in black women's rights, women's poor perspectives and women's strength in the film although he is a man. The findings of this research help people understand and know how feminism demonstrates through the movie as well as the awareness about how patriarchy has tormented poor women. Most importantly, this study will convince the readers of understanding and empathy for women as human beings, not objects. It will be meaningful to all women; especially, African-American women in terms of the awareness of women’s rights and how to insist for themselves under the inequality of gender. Further scholars are expected to conduct the study of similar types of movies or novels in the same period using other perspectives of feminism or patriarchy.

This study analyzed radical feminism, which aims to analyze radical feminist issues and methods Celie used to overcome the issues through *The Color Purple Movie* and the movie’s script. The oppression of African-American women in a patriarchal society in the film had inspired the researchers to use a radical feminist theory to analyze the issue to find the answers to the research problems. Due to the objectives, the researchers found that Celie is physically and psychologically oppressed by black people in her society; especially, her stepfather and her husband. Furthermore, the researchers found that Celie has tried to overcome the patriarchy by gaining inspiration from other female characters and resisting for herself. Finally, from an invisible and ignorant woman, she becomes a visible and strong woman who stands on her own and overcomes male superiority at the end.

8. References

- Black Movie Awards. (n.d.). IMDb. Retrieved from https://www.imdb.com/event/ev0001401/2005/1/?fbclid=IwAR34qQOaX8AtsamC-xaMkYRJBwLkYYarcR_93OMJGCSi9ML0_jTSYc-1YL0
- Bowers, K. P. (2008). *Misreading justice: The rhetoric of revenge in feminist texts about domestic violence*.
- Chapagain, R. P. (2020). African American Women, Racism and Triple Oppression.

- Interdisciplinary Journal of Management and Social Sciences, 1(1), 113-117
- Chelsey, B. (2010). *The Color Purple*: evaluation of the film adaptation. *ESSAI: Vol. 8*, Article 11. <http://dc.cod.edu/essai/vol8/iss1/11>
- Delao, M. (2021, March 4). A brief look at the four waves of feminism. TheHumanist.Com. Retrieved from <https://thehumanist.com/commentary/a-brief-look-at-the-four-waves-of-feminism/>
- Elliott, M. & Hughes, J. (2019). *A Brief History of Slavery That You Didn't Learn in School*. The New York Times Magazine. <https://www.nytimes.com/interactive/2019/08/19/magazine/history-slavery-smithsonian.html>
- Foca, A. (2019, February 11). The Color Purple. Encyclopedia Britannica. Retrieved from <https://www.britannica.com/topic/The-Color-Purple>
- Franko, C. (2016). *A womanist approach to Spielberg's The Color Purple*. Kadir Has University, Academic Repository. <https://hdl.handle.net/20.500.12469/2126>
- Frias, M. (1998). *The Walker-Spielberg Tandem and Lesbianism in The Color Purple: "Spielberg Don't Like It Dirty"*. BELLS: Barcelona English Language and Literature Studies 9: 49-56.
- Frye, J. (2019, August 22). Racism and sexism combine to shortchange working black women. Center for American Progress. Retrieved from <https://www.americanprogress.org/issues/women/news/2019/08/22/473775/racism-sexism-combine-shortchange-working-black-women/>
- Hachette Essentials. (n.d.). The Color Purple: The classic, Pulitzer Prize-winning novel. Hachette Essentials. Retrieved from <https://www.hachetteessentials.com/the-color-purple>
- Ibrahim, N. A. (2021). The struggle of African-American women against double oppression in Toni Morrison's *The Bluest Eye*. The Faculty of Cultural Sciences Hasanuddin University. Retrieved from http://repository.unhas.ac.id/id/eprint/11434/2/F041171506_skripsi_05-11-2021%20Bab%201-2.pdf
- Oppression & Sexual Violence. (n.d.). Pennsylvania Coalition Against Rape. Retrieved February 8, 2022. Oppression & Sexual Violence | Pennsylvania Coalition Against Rape (PCAR)
- Pande, R. (2018). The history of feminism and doing gender in India. *Revista Estudos Feministas*, 26(3), 1-17. Retrieved from <https://www.scielo.br/pdf/ref/v26n3/1806-9584-ref-26-03e58567pdf?fbclid=IAR3o8gVuJPUAczF4GRAx58>
- Phillips, M. (2004). The ascent of woman: A history of the suffragette movement and the ideas behind it (1st edition). In R. Pande (2018). The history of feminism and doing gender in India. *Revista Estudos Feministas*, 26(3), 1-17. Retrieved from https://www.scielo.br/pdf/ref/v26n3/1806-9584-ref-26-03-e58567pdf?fbclid=IAR3o8gVuJPU-Lm_KOvQEIXQUMj24ZthuBf23_9ypraGAczF4GRAx58
- Pradipta, G. S. (2012). *Escaping From Oppression In Steven Spielberg's The Color Purple Movie*
- Rampton, M. (2008). Four waves of feminism. Pacific University. Retrieved from <https://www.pacificu.edu/magazine/four-waves-feminism>

- Steven Spielberg. (n.d.). IMDb. Retrieved from https://m.imdb.com/name/nm0000229/bio?ref_=m_mn_ov_bio&fbclid=IwAR34qQOaX8Atsamc-xaMkYRJBwLkYYarcR_93OMJGCSi9ML0_jTSYc-lYL0
- Taylor, J. (2020). The real reasons that women are oppressed by patriarchy. Retrieved February 8, 2022 from [The real reasons that women are oppressed by patriarchy – VictimFocus Blog](#)
- The Color Purple. (n.d.). IMDb. Retrieved from <https://m.imdb.com/title/tt0088939/?fbclid=IwAR0GViEF7t3GTz1-b1SjUL25-uwr9JoSQSvZYYS5KD3UzWD1IqdSjAWGuh4>
- The Color Purple (1985) Script. (n.d.). TranscriptDB. Retrieved September 29, 2021, from <https://transcripts.thedealr.net/script.php/the-color-purple-1985-N8V>
- The Color Purple. (n.d.). Movies2watch. Retrieved from <https://movies2watch.tv/watch-movie/watch-the-color-purple-hd-58124.1638988>
- Wang, L. (2016). Gender trouble in The Color Purple. *cscanada*, 13(4), 62-65.
doi:10.3968/896
- What Is Radical Feminism?. (n.d.). ThoughtCo. Retrieved February 8, 2022 from What Is Radical Feminism? (thoughtco.com)
- Willhite, S. (2021, March 4). *View: An advocate for feminism*. Minnesota Women's Press. Retrieved from <https://www.womenspress.com/view-suzann-willhite-an-advocate-for-feminism/>

Determinant of Outward FDI: Case Study Singapore, Malaysia and Thailand

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Abstract

Over the last decade, ASEAN outward FDI is increasing significantly despite being major recipients of FDI, they have developed into an emerging investment source for many countries and there are three leading investors from ASEAN – Singapore, Malaysia, and Thailand. However, the growth of outward FDI from these three countries has received little attention from academics in mainstream research publications. The motivation behind this paper aims to investigate the determinant of outward FDI from Singapore Malaysia, and Thailand to see what is the major factor that influences outward FDI and compare the determinant for each country which is similar or different by employing panel data analysis covering the period 2005–2019. Overall, the results show that the common factor that influences outward FDI is Export and Labor cost and there are specific factors that influence each country such as Market size, Market growth, Technology, and Geographic distance.

Keywords: Outward foreign direct investment; Outward FDI; ASEAN; Panel data

1. Introduction

In the recent decade outward FDI from developing countries increase significantly and it has grown faster than developed countries (Herzer, 2011). Outward FDI is seen to be the agenda of developed countries but due to many reasons such as the change of nature of international business and the climate change, emerging market or developing countries began to have more share of global outward FDI (Lbrahim,2019), their share of the world outward FDI increased significantly from 11.87 percent in 2000 to 35 percent in 2014. Moreover, Asia developing countries became the world's largest investor region in 2014 for the first time about one-third of global outward foreign direct investment. (Lee & Sermcheep, 2017) Focusing on ASEAN, the share of ASEAN in the world outward FDI is increasing hugely in the past two decades. Many countries of ASEAN have become important players in the investment arena. Despite being major recipients of FDI, they have developed into an emerging investment source for many developing countries, especially in the ASEAN region. (Secretariat, 2013) ASEAN countries reached higher levels of growth and income per capita, the factor composition started to shift toward greater capital intensity and higher technology. At this point, local and foreign-owned businesses in these countries started looking for other countries in which to invest — in the hopes of developing manufacturing facilities or gaining access to other countries. As a result, outward FDI from the more developed ASEAN countries has emerged. (Lee & Sermcheep, 2017) The overall outward FDI from ASEAN increased rapidly from US\$8.97

billion in 2000 to US\$56.03 billion in 2019 (UNCTADstat). Among ASEAN countries, there are three leading investors from ASEAN – Singapore, Malaysia, and Thailand. In 2014, Singapore and Malaysia are ranked as the 10th and the 17th respectively of global outward FDI. (Lee & Sermcheep, 2017) Thailand in recent years, Thailand is ranked as the 22nd of global outward FDI in 2017 and has the higher rank which is 18th in 2018 (UNCTAD, 2019). The outward FDI has an important role to contribute economic growth and economic development to home countries. The multinational enterprise can generate a return which return can be in form of financial return (income, profit), intangible capability return (knowledge, skill, technologies upgrade, managerial expertise), and tangible capability return (machinery, capital goods from abroad). These returns that gain from outward FDI can support the economic growth and development of a home country. (Knoerich, 2017) To encourage outward FDI, state policymakers or company managers need to understand which factors that influence these investments. This will ensure that the right policies will be used to increase the outflow of investment from the economy to maintain the country's competitiveness in the world economy. Therefore, this study attempts to examine the determinant of outward FDI from Singapore Malaysia, and Thailand which are the top 3 leading investors of ASEAN to see what is the major factor that influences outward FDI for each country.

2. Research Objectives

The aim of this study is to examine the determinant of outward FDI from top 3 leading investors of ASEAN which is Singapore Malaysia and Thailand and compare the determinant of each country which is similar or different for each other.

3. Literature Review

The theoretical on outward FDI

As Faeth (2009) points out the first theoretical try to explain FDI is based on the Heckscher–Ohlin model of the neoclassical trade theory where FDI is seen as part of international capital trade. The Heckscher–Ohlin model's economic intuition assumes that commodities differ in relative factor intensities and countries differ in relative factor endowments, resulting in international factor price differentials. Thus, a relatively capital-abundant country (home country), would export the capital-intensive good to the host country or move the capital to the host country where returns on capital are higher and returns on labor lower until factor price is equal. Hobson (1914), Jasay (1960), MacDougall (1960), and Kemp (1960) developed the MacDougall–Kemp model assumed full employment, perfect competition, and constant returns to scale, however they only considered one good and two factors of production. Once again, capital flows to countries with higher capital returns. On the other hand, countries could manipulate capital returns and capital flows by placing taxes on globally mobile capital in order to improve their own welfare. Aliber (1970) proposes that capital moves as a result of a difference in capital returns, which is a difference in capital endowments and currency risks. Firms from countries that have harder currencies could borrow money in countries with softer currencies at a lower interest rate than host country firms due to their lower risk structure. As a result, foreign firms could capitalize on the same stream of expected earnings at a higher rate than host country firms, giving them an incentive to invest in the host country.

But authors such as Hymer (1976) and Kindleberger (1969) believe that perfect competition in neoclassical theory could not explain FDI, but market imperfections which linked to the theory of MNEs can be better explained. Hymer (1976) confirms that international investment

involves high costs and risks which are cultural differences, language differences, and some treatment by the governments in host countries. Therefore, to compensate for the drawbacks, firms must have ownership advantages. (Cleeve, 2008; Dunning, 1993) As a concept of ownership advantages, Caves (1971) focused study on product differentiation as FDI has an advantage over export and licensing since a product differentiation is based on information and knowledge. Knickerbocker (1973) studies the relationship between oligopoly rivalry and FDI between firms. He claimed that FDI flows represent strategic rivalry between firms in the international market as a result of the behavior of responding to the entry of competitors in the markets. In other words, the firm often behaves as imitators: they follow the internationalization of their competitors so that they can't gain a strategic advantage. Firm competition would influence their decisions to reduce production costs in order to become more competitive, which led Vernon (1966) to study the product life cycle theory. He found that firms invest directly in abroad as an alternative to export then goods travel along their life cycle curve. In the growth stage, firms invest in developed countries where markets are growing and local production can be absorbed. For the maturity and decline stages, the production move to developing countries since markets become saturated and products are less innovative. (Hill, 2008)

Dunning (1977, 1979) created the eclectic or OLI paradigm from the concept of internalization theory and traditional trade economics and synthesizing the advantages for investing internationally (Faeth, 2009). there are advantages in choosing FDI when there are ownership advantages - O, location advantages – L, and internalization advantages - I. Ownership advantages referred to the MNE manufacturing process, competitive advantage over domestic companies and patents, technical expertise, management skills, and reputation. Location advantages referred to market size, accession to the markets, special tax regimes, low production and transport costs, low risk, and structure of competition. Internalization advantages occurred as a result of the public good nature of ownership advantages and advantage of low transaction costs, minimizing technology piracy, and preserving the firm's reputation by effective management and quality control. (Dunning & Lundan, 2008)

The new trade theory provided a new alternative framework for analyzing FDI and MNE activity by integrating ownership advantage (knowledge) and location advantages (market size and low transaction cost) with technological and country characteristics (factor endowments). (Assunção et al., 2011; Faeth, 2009) This new theory applied an eclectic paradigm to correlate the three variables of OLI (ownership, location, internalization) with technology and a country characteristic in a coherent manner. (Markusen, 2002)

According to institutional theory, when firms have to operate in a new environment, firms' decisions will depend on the institutional forces that influence them (Francis et al., 2009). Government policies and incentives affect the investment decision-making process. Governments can influence a firm's decision to invest in domestic production licensing, or FDI which could be greenfield investment (the construction of new factories or offices) or the acquisition of an existing firm (including joint ventures) and the firm's decision to remain or exit. As a result, the investment decision-making process is much more complicated than simply deciding whether or not to invest. In practice, MNEs and host countries haggle over a variety of issues, including taxation, subsidies, funding arrangements, the use of expatriates, training, local input, export conditions, and capital repatriation. Thus, considering many policies and non-policy determinants and their effects, many areas are still open for theoretical

and empirical research despite the research that has been undertaken since the late 1980s. (Faeth, 2009)

The empirical study on outward FDI

Lee et al. (2017) study determinants of Singapore’s outward FDI. This paper aims to examine determinants of Singapore’s OFDI and compares the determinants of OFDI stock and flow by using a dynamic panel data estimation for the period 1994-2012. The main results show that for OFDI stock. The GDP is significant with a positive sign for total OFDI and retail OFDI. OFDI could be attracted to host countries with low average income and perhaps indicating the lower cost of production in these countries. The corporate tax rate has a negative sign for manufacturing and retail OFDI, it suggests that a higher corporate tax rate in host countries will discourage Singapore’s OFDI to these countries and FTA is found to have a positive effect on OFDI especially for the retail sector. For OFDI flow, the results are slightly different from those. Outward FDI flows show a negative relationship with GDP but a positive relationship with GDP per capita. This implies that outward FDI flows to countries with lower GDP (smaller economies) but higher income(market-seeking). For the FTA, it has a negative impact on manufacturing but a positive impact on retail. This is puzzling and needs further research.

Yean et al. (2017) study outward FDI from Malaysia to top-15 foreign countries. The purpose of this paper is to investigate the pattern of outward FDI from Malaysia, major motivation, and how it affects the country. This study uses panel data of countries over time and uses the Hausman test to choose between a fixed-effects model or a random-effects model, and the fixed effect estimation method is selected. Results in this paper show that relative market size is significantly positive in influencing Malaysia’s OFDI. For the relative natural resource variable, it shows a negative and significant sign. The distance shows a significant and positive sign. The other control variables also show significant and expected signs. their study finds a significant and negative sign between relative corporate tax rates and Malaysia’s OFDI. But the study is unable to ascertain the influence of corruption on OFDI. Relative trade liberalization also has a positive impact on the OFDI of Malaysia. Finally, cultural proximity affects the stock of OFDI positively for similar reasons as explained in the paper. Therefore, it concludes the main findings in this paper show that outward investment from Malaysia is driven mainly by the horizontal, market-seeking type of investment while the literature indicates that its impact on trade is insignificant.

Moreover, Cheewatrakoolpong and Satchachai (2017) study about factors influencing Thailand’s Outward FDI. It analyses the determinants of Thailand’s OFDI in ASEAN-5 and CLMV countries. Fixed-effect panel regression model is applied in this study. For ASEAN-5 GDP per capita seems to be the main factor driving Thailand to invest more in those countries. However, the real effective exchange rate has negative sign which implies that the appreciation of the Thai baht induces more outward FDI. The signs of other factors, such as the host country’s GDP, inflation, TFP, LFP, trade openness, and FDI openness are statistically insignificant. For Thai OFDI in CLMV countries, GDP per capita is the most influential factor determining outward FDI flows of Thailand in CLMV countries. Moreover, FDI openness significantly explains the outward FDI of Thailand to CLMV countries. Finally, economic-related factors of host countries including real effective exchange rate and inflation rate do not significantly determine outward FDI from Thailand to CLMV countries. In conclusion the results of ASEAN-5, we can see that market-seeking is the main explanation of Thailand’s

OFDI to the ASEAN-5 countries, but for CLMV countries the countries’ policies including trade openness and FDI openness are the most important explanatory variables.

4. Research Methodology

Conceptual Framework for estimation model

Market size

Faeth (2009) show market size in an aspect of location advantage significantly affects firms to operate internationally. When markets size increases, more opportunities would exist for foreign investors since, a large market size implies exploitation of economies of scale, efficient utilization of resources and higher potential investment returns therefore, the greater the relative market size of host countries, the larger the amount of outward FDI is expected to be attracted. So, this study uses host country GDP as the proxy for host market size as well and expects a positive relationship between the GDP of the host country and outward FDI.

Market growth

Outward FDI will be associated positively with market growth since a more rapidly growing economy provides higher profit opportunities than a slower-growing or non-growing one. (Lim, 1983) The proxy of market growth is GDP growth rates since it reflects a country's economic growth. This study expects that outward FDI is associated positively with host market growth.

Exchange rate

The appreciation of home currency (depreciate of host currency) will lead firms to invest abroad more and easier because when the exchange rate appreciates, foreign assets become cheaper consequently, lowering the capital requirement for the home country to invest abroad. This will encourage outward FDI. (Buckley et al., 2007) And when the exchange rate appreciates, export less competitive so outward FDI becomes a cheaper mode for serving the international market. (Kohlhagen, 1977; Kueh et al., 2010; Stevens, 1998) So, this study expects that the exchange rate has a positive relationship to outward FDI.

Inflation

Inflation could represent the host country's macroeconomic stability and risks for foreign investors. (Botrić & Škuflić, 2006) Since it is clear that high inflation rate and volatile inflation is a sign of macroeconomic instability. FDI will be attracted to a host country with a stable and predictable inflation rate since it will increase the trust of foreign investors by providing certainty and assisting long-term corporate planning, especially for price-setting and profit expectations. (Buckley et al., 2007) Also, High inflation rates indicate a devaluation of the domestic currency, which will cause foreign investors to halt their investment since more devaluation would reduce the real value of earnings in local currency. Thus, a higher rate of inflation in the host country discourages outward FDI.

Openness to trade

From nine theoretical models of Faeth (2009), the proximity-concentration hypothesis suggests that higher transaction costs resulting from higher trade barriers and higher transportation costs lead to horizontal cross border expansion of production hence, it encourages FDI. In this case, international trade is a substitute for international investment or FDI. Therefore, the relationship between exports and FDI is negative. On the other hand, the

factor proportion hypothesis suggests that when factor endowment differences are large or factor price differences exist then it encourages firms to engage themselves in vertical cross border integration, which results in a complementary relationship between international trade and FDI. Thus, the relationship between exports and FDI is positive in this case. Therefore, outward FDI is associated positively/negatively with home country export to the host country.

Dunning (1998) suggest that imports and FDI could have a substitute relationship if the host country used to import from the home country but now the home country has started producing the same goods in the host country which motivated by lower transportation costs, avoidance of trade barriers, etc. therefore, the relationship between imports and FDI will be negative. On the other hand, the relationship between imports and FDI can be complementary. when the investing country requires certain inputs or factors that are not available in the host country and are imported then more production will increase imports of inputs thus, the relationship between imports and FDI will be positive (Alguacil & Orts, 2002). Thus, OFDI is associated positively/negatively with home country imports from the host country.

Technology

Firms have incentive to invest abroad because they want to exploit or take advantage of technological superiority in the host country. Technology in a broader sense not only including new products, new machines, and new production processes, but also management and marketing skills, so foreign firms may be motivated by the technology level that the host country has (Chen, 1983). Moreover, multinational firms from the emerging market are more likely to invest in developed countries for advanced technologies, they are increasingly involved in acquiring sophisticated technology and manufacturing know-how in a variety of industries (Deng, 2004). Technology can proxy by the rate of patenting in the host country thus, outward FDI is driven by the technology level of the host country.

Natural resource endowment

There are numerous empirical studies also suggested that investors prefer to invest in natural resource-rich countries to exploit local natural resources as inputs to their production processes so, they can reduce the costs for their domestic manufacturing and export industries. (Morck et al., 2008; Zhang & Daly, 2011) Therefore, higher natural resource endowments in the host country increases outward FDI.

Labor cost

The low labor cost country has attracted more investment than high labor cost country since it reduces the cost of production and makes firms earn more profit that prove by Dees (1998) who suggest that foreign investment mostly was attracted to China because China has lower wages than other Asian countries. Yean (2007) also suggest that Malaysian firms tend to invest in other developing countries to take advantage of lower wage costs. Thus, the relationship between host labor costs and OFDI is expected to be negative.

Political stability

Buckley et al (2007) suggest that in countries experiencing high political risk (political instability), market-seeking firms will tend to use servicing modes (exporting or licensing) for directly owned local production, and that resources-seeking firms are discouraged from committing substantial sunk costs in investment (Buckley & Casson, 1981) Therefore, a host country with high political risk is generally associated with low values of FDI inflow

(Chakrabarti, 2001). Moreover, political instability can increase the likelihood that the profits and assets of the investor will be expropriated. And firms will expect lower profits, which will reduce their investments in the targeted countries. (Al-Sadig, 2009; Blonigen, 2005) Thus, the higher political stability of the host country increases outward FDI.

Tax rate

The net return on FDI is affected by the tax system of both the home and the host country, tax policies affect the incentives to engage in foreign investment and the way in which that investment is financed (Lizondo, 1993). Caves (1971); Gordon and Hines Jr (2002) suggest that outward FDI is influenced by corporate and income taxes. The low tax rate country is considered to be more competitive in attracting FDI as it offers a higher net investment return – Tax haven countries are commonly preferred by investors (Aminian et al., 2008). Therefore, if corporate tax rates are higher in the host country, a negative relation with OFDI is expected.

Distance

Dong et al. (2011) suggest that distance can act as a determinant for outward FDI decision since it reflects the transport cost. If the OFDI is horizontal, OFDI tends to replace export because the cost of market access through exports is high so, a longer distance will encourage OFDI, but Barnard (1997) studies finds that transport costs are positively related to OFDI. If the OFDI is vertical, firms will be discouraged by high transportation costs and the impact of distance on OFDI is negative. Thus, geographic distance is associated positively/negatively with outward FDI.

Estimation model

This research focuses on the determinants of outward FDI of Singapore Malaysia and Thailand. There are many noticeable works on exploring determinants of OFDI so, this research includes some variables as explained in the literature. The panel data for this analysis are balanced and consist of 3 countries (Singapore Malaysia and Thailand). Singapore and Thailand for the period of 2005-2019 and Malaysia for the period of 2010-2019. The period and sample size for this study are determined by data availability since some countries in the sample size have no data on outward FDI before 2005 and 2010. Similarly, data on the explanatory variables are also not available for some countries before 2005.

The estimating equation can be stated as follows:

$$OFDI_{ji,t} = \alpha_{ji} + \beta_1 GDP_{ji,t} + \beta_2 GRTH_{ji,t} + \beta_3 ER_{ji,t} + \beta_4 INF_{ji,t} + \beta_5 EX_{ji,t} + \beta_6 IM_{ji,t} + \beta_7 TECH_{ji,t} + \beta_8 RAW_{ji,t} + \beta_9 LCOST_{ji,t} + \beta_{10} PTS_{ji,t} + \beta_{11} TAX_{ji,t} + \beta_{12} DIST_{ji,t} + \mu_{ji,t}$$

Where: OFDI	Outward FDI of home country to host country
GDP	GDP of host country
GRTH	GDP growth of host country
ER	Bilateral exchange rate of host per home country currency
INF	Inflation rate (Consumer Price Index) of host country
EX	Home country's exports to the host country
IM	Home country's imports from the host country
TECH	Patent registrations in host country
RAW	The ratio of ore and metal exports to merchandise exports of host country
LCOST	Host country's labor cost
PST	Host country's political stability rating (higher values indicate greater stability)
TAX	Host country's corporate tax rates
DIST	Geographic distance between host and home country

the subscript i refer to the home economy which is Singapore Malaysia and Thailand, subscript j is host countries which are top 10 destinations of OFDI from home country, subscript t is a year.

The reason for choosing panel data analysis is that it allows for variation in characteristics relating to these countries both cross-sectionally and over time. Moreover, the advantages of using panel data are many as Hsiao (1985), Klevmarken (1989) and Solon (1989) suggest that panel data gives more informative data, more variability, less collinearity among the variables, and more degrees of freedom hence more efficiency. The three types of panel analytic models used are as follows: (1) Pooled regression model, (2) fixed-effect model, and (3) random-effect model and use R-squared, adjusted R-squared, and the Hausman test to determine which model is the appropriate model to be used.

5. Results

Descriptive Statistic

The descriptive statistical analysis divided the study into 3 countries which are Singapore, Malaysia and Thailand as shown in Table1. Outward FDI of Singapore has the highest average outward FDI, followed by Malaysia and Thailand, respectively. For GDP, Malaysia more likely invests in host countries that have large size of GDP than Singapore and Thailand. The mean of GDP growth and Inflation rate for 3 countries are similar to each other. The average amount of exports from Malaysia to host country is higher than others whereas for the average amount of import from host countries to Singapore is the highest. For technology, Malaysia more likely invests in host countries that high patent registrations than Thailand and Singapore.

The average host country's labor cost of Singapore is lowest while Malaysia and Thailand are similar but higher than Singapore. The average host country's corporate tax rates for 3 countries are slightly different. Thailand more likely to invest in country that has high political stability follow by Malaysia and Singapore. Moreover, Thailand more likely to invest in neighbor country follow by Malaysia and Singapore.

In table 2, Pearson Product Moment Correlation checks the degree of direction of correlation between variables that they are not correlated with each other or as we call it a statistical problem (Multicollinearity) because if there is a correlation between the independent variables, the analysis will result in error.

From Table 2, it finds that the correlation coefficient of all independent variables studied is less than 0.80 indicating that the variables are independent of each other or there is no relationship with each other, therefore, it can be concluded that the multicollinearity problem does not occur which can find coefficients for all variables.

Then testing the suitability of the models in 3 types of analysis: Fixed Effect Model, Random Effect Model and Pooled OLS Regression using Hausman Test method (main assumption is Random Effect is more suitable than Fixed Effect) and considering R-squared and Adjusted R-squared in choosing which estimation method to use will give a more efficient estimation result as in Table 3. From Table 3, when tested by Hausman Test method, it was found that Singapore had a Prob value of 0.0000, indicating that Fixed Effect Model was more suitable than Random Effect Model. Thailand had a Prob value of 1.0000 which greater than 0.05 indicates that the Random Effect Model is more suitable than Fixed Effect Model, whereas As for Malaysia, it cannot be used for the Hausman Test because the amount of data used to estimate the Random Effect Model is too small.

Model estimation results

The results of model testing of the 3 models in the analysis were Fixed Effect Model, Random Effect Model and Pooled Regression Model of all 3 countries as shown in Table 4 – 6

For Singapore model estimation results show in Table 4, the Fixed Effect Model was used for estimation. When the Fixed Effect Model was compared with the Pooled Regression Model by considering the R-squared and the Adjusted R-squared values, the Fixed Effect Model was more suitable in this study than the Pooled Regression Model because the values The R-squared and Adjusted R-squared of the Fixed Effect Model were 0.8954 and 0.8732, respectively, which were higher than the R-squared of the Pooled Regression Model, which were 0.7082 and 0.6827, respectively. However, the Durbin-Watson is 0.5925, Therefore, the problem is solved by using GLS method to solve the Autocorrelation problem then using the Fixed Effect Model again, get the coefficients from the estimates as shown in Table 4. When considering the factors affecting Singapore's outward FDI, which are: GDP, GDP growth, exchange rate, inflation rate, import, natural resource, labor cost, political stability and Geographic distance didn't affect outward FDI of Singapore. Whereas, Export, Patent registrations and corporate tax rates affect outward FDI of Singapore. Home country's exports to the host country affecting outward FDI of Singapore in the same direction (positive effect) means that relative trade openness has an influence on Singapore's OFDI; a higher degree of integration of the host country with the world would also allow Singapore enterprises to use this country as an export platform to new international markets. As a result, the host country is more likely to get more investment from Singapore. Patent registrations in host country affecting outward FDI to Singapore in the same direction (positive effect), means that technology plays an important role in Singapore's outward FDI. like many empirical studies recommend that firms incentives invest abroad because they want to exploit, take advantage or absorb technology in the host country. Host country's corporate tax rates affect outward foreign direct investment in Singapore in the same direction (positive effect), means that when Host country's corporate tax rates increase, Singapore outward FDI also increases which is not consistent with expectation.

For Malaysia model estimation results from Table 5, Random Effect Model cannot be tested due to the small amount of data. Therefore, the suitability between the Fixed Effect Model and the Pooled Regression Model was compared by considering the R-squared and the Adjusted R-squared values. It appeared that the Fixed Effect Model was more suitable in this study than the Pooled Regression Model because the R-squared and Adjusted R-squared values of the Fixed Effect Model were 0.8504 and 0.8101, respectively, which were higher than the Pooled Regression Model which is 0.8382 and 0.8159, respectively. There is a problem with the Autocorrelation because of value the Durbin-Watson stat is 0.8951 therefore, the problem is solved by using GLS method to solve the autocorrelation problem then estimate the coefficients by using the Fixed Effect Model again and get the coefficients from the estimates as shown in Table 5. When considering the factors affecting outward FDI of Malaysia found that GDP growth, exchange rate, Inflation rate, exports, imports, patent registrations and political stability had no effect on outward FDI of Malaysia. Whereas, GDP, natural resource, labor cost, corporate tax rate and Geographic distance affect outward FDI of Malaysia. The relationship can be described as follows. GDP of host country affects Malaysia's outward FDI in the same direction (positive effect) which means a larger market has greater potential demand, provides economies of scale, and better potential returns on investment therefore, it attracts Malaysia's OFDI. The ratio of ore and metal exports to merchandise exports of host country affects outward FDI of Malaysia in the opposite direction means that natural resources

have negative relationship to Malaysia's OFDI which is not in accordance with the expectation. Host country's labor cost affects Malaysia's outward FDI in the same direction (positive effect) means that when host country's labor cost increases, outward FDI of Malaysia will increase which is also not in accordance with the expectation might be because Malaysia is not interested in cost advantages but interested in invest in countries that have advance technology and manufacturing method which is usually associated with high wage. As a result, the positive wage estimate for some host countries is consistent with the motive to gain access to innovative technology and managerial know-how through foreign investment. Host country's corporate tax rates affect Malaysia's outward FDI in the same direction means that when host country's corporate tax rates increase, outward FDI of Malaysia will increase which is not in accordance with the expectation. Geographic distance between host and home country affects outward FDI of Malaysia in the opposite direction (negative effect) means that when the geographic distance between host and home country increased, outward FDI of Malaysia would decrease means that Malaysia would likely to invest in neighbor countries.

For Thailand model estimation results from Table 6, since Prob value of The Hausman Test in Table 5.3 found Random Effect Model in the estimation is more appropriate. When the Random Effect Model was compared with the Pooled Regression Model by considering the values of R-squared and Adjusted R-squared, it appeared that both models had the same R-squared and Adjusted R-squared values. Therefore, it will be considered in each factor that in the two models, which one has the greater number of factors affecting outward FDI of Thailand and it appears that the Random Effect Model has 7 Factors affecting outward FDI of Thailand, which are more than the Pooled Regression Model, however, the equation has autocorrelation problems because of value The Durbin-Watson stat was 0.4426 so the GLS solution is use to improved data then estimate the coefficients by using the Fixed Effect Model again and get the coefficients from the estimates as shown in Table 6. When considering factors affecting outward FDI of Thailand found that GDP, exchange rate, inflation rate, imports, patent, Natural resource, corporate tax rates, political stability rating and geographic distance have no effect on outward FDI of Thailand. Whereas, GDP growth, exports and labor cost has a significant impact on Thailand outward FDI. The relationship can be described as follows. GDP growth of host country affects outward FDI of Thailand in the opposite direction means that when GDP growth of host country increases, outward FDI of Thailand will decrease which is not in accordance with the expectation. Home country's exports to the host country affecting outward FDI in Thailand in the same direction (positive effect) means that when home country's exports to the host country increased, outward FDI of Thailand would increase; a higher degree of integration of the host country with the world would also allow Thai firm to use this country as an export platform to new international markets. Host country's labor cost affects outward FDI to Thailand in the same direction (positive effect) means that when host country's labor cost increases, outward FDI of Thailand will increase might be like Malaysia that interested in invest in countries that have advance technology and manufacturing method which is usually associated with high wage.

6. Discussion and Conclusion

This paper examines and compares the determinants of Singapore, Malaysia and Thailand direct investment to host countries suggested by theory and empirical study by employing balanced panel data analysis approach. In summary this paper finds that each country has different determinant of outward FDI. For Singapore, Openness to trade(export), technology

and corporate tax rate have positive impact on Singapore's outward FDI. For Malaysia's outward FDI is attracted to countries with large market size (high GDP), high labor cost and high corporate tax rate but it is discouraged by high geographic distance and rich Natural resource. For Thailand, Openness to trade(export) and labor cost have positive impact on Thailand's outward FDI but market growth (GDP growth) has negative impact on Thailand's outward FDI. Therefore, each country has specific factor that influence outward FDI which is market size, market growth, technology, natural resource and geographic distance. For common factor that influences outward FDI is export, labor cost and tax that two countries are similar to each other.

This study contributes to our understanding of the determinants of Singapore, Malaysia and Thailand's outward FDI, but we should acknowledge that there are still some limitations. First, for market growth, tax rate and natural resource which not consistent with expectation there should be some other the reasons behind this result. second, our independent variables did not consider some other determinant due to data availability. Future work we should add more independent variables such as openness to FDI (FDI inflow), unemployment rate, infrastructure and other government indicator of host countries.

7. References

- Al-Sadig, A. (2009). The effects of corruption on FDI inflows. *Cato J.*, 29, 267.
- Alguacil, M., & Orts, V. (2002). Inward foreign direct investment and imports in Spain. *Documentos de Economia y Finanzas Internacionales*(02/01).
- Aliber, R. Z. (1970). A theory of direct foreign investment. *The international corporation*, 12-36.
- Aminian, N., Fung, K., & Lin, C. C. (2008). Outward FDI from East Asia: The Experiences of Hong Kong and Taiwan. *World Scientific Book Chapters*, 171-208.
- Ariff, M., & Lopez, G. P. (2007). Outward foreign direct investment: the Malaysian experience. International Workshop on Intra-Asian FDI Flows: Magnitude, Trends, Prospects and Policy Implications April,
- Assunção, S., Forte, R., & Teixeira, A. (2011). *Location Determinants of Determinants of FDI: a Literature Review*.
- Blonigen, B. A. (2005). A review of the empirical literature on FDI determinants. *Atlantic economic journal*, 33(4), 383-403.
- Botrić, V., & Škuflić, L. (2006). Main determinants of foreign direct investment in the southeast European countries. *Transition Studies Review*, 13(2), 359-377.
- Buckley, P. J., & Casson, M. (1976). A long-run theory of the multinational enterprise. In *The future of the multinational enterprise* (pp. 32-65). Springer.
- Buckley, P. J., & Casson, M. (1981). The optimal timing of a foreign direct investment. *The Economic Journal*, 91(361), 75-87.
- Buckley, P. J., Clegg, L. J., Cross, A., Liu, X., Voss, H., & Zheng, P. (2010). The determinants of Chinese outward foreign direct investment. In *Foreign direct investment, China and the world economy* (pp. 81-118). Springer.
- Caves, R. E. (1971). International corporations: The industrial economics of foreign investment. *Economica*, 38(149), 1-27.
- Chakrabarti, A. (2001). The determinants of foreign direct investments: Sensitivity analyses of cross-country regressions. *kyklos*, 54(1), 89-114.

- Cheewatrakoolpong, K., & Satchachai, P. (2017). 7. Factors Influencing Thailand's Outward FDI. In *Outward Foreign Direct Investment in ASEAN* (pp. 152-179). ISEAS Publishing.
- Chen, E. K. (1983). *Multinational corporations, technology and employment*. Springer.
- Cleeve, E. (2008). How effective are fiscal incentives to attract FDI to Sub-Saharan Africa? *The Journal of Developing Areas*, 135-153.
- Dees, S. (1998). Foreign direct investment in China: determinants and effects. *Economics of planning*, 31(2), 175-194.
- Deng, P. (2004). Outward investment by Chinese MNCs: Motivations and implications. *Business horizons*, 47(3), 8-16.
- Dong, Y., Li, K.-W., & Zhang, D. (2011). Comparing the Determinants of Outward Investment from China and the United States. *The Chinese Economy*, 44(2), 58-77.
- Dunning, J. H. (1977). Trade, location of economic activity and the MNE: A search for an eclectic approach. In *The international allocation of economic activity* (pp. 395-418). Springer.
- Dunning, J. H. (1979). Explaining changing patterns of international production: in defence of the eclectic theory. *Oxford bulletin of economics and statistics*, 41(4), 269-295.
- Dunning, J. H. (1998). Location and the multinational enterprise: a neglected factor? *Journal of international business studies*, 29(1), 45-66.
- Dunning, J. H., & Lundan, S. M. (2008). *Multinational enterprises and the global economy*. Edward Elgar Publishing.
- Faeth, I. (2009). Determinants of foreign direct investment—a tale of nine theoretical models. *Journal of Economic surveys*, 23(1), 165-196.
- Fung, K., & Garcia-Herrero, A. (2012). Foreign direct investment outflows from China and India. *China Economic Policy Review*, 1(01), 1250003.
- Gordon, R. H., & Hines Jr, J. R. (2002). International taxation. *Handbook of public economics*, 4, 1935-1995.
- Hartman, D. G. (1984). Tax policy and foreign direct investment in the United States. *National tax journal*, 37(4), 475-487.
- Hill, C. (2008). International business: Competing in the global market place. *Strategic Direction*.
- Knoerich, J. (2017). How does outward foreign direct investment contribute to economic development in less advanced home countries? *Oxford Development Studies*, 45(4), 443-459.
- Kohlhagen, S. W. (1977). The effects of exchange-rate adjustments on international investment: Comment. *The effects of exchange rate adjustments*, 194-197.
- Kueh, J. S.-H., Pua, C. H., & Liew, V. K.-S. (2010). Macroeconomic determinants of direct investment abroad of Singapore.
- Lee, C., Lee, C. G., & Yeo, M. (2017). 4. Determinants of Singapore's Outward FDI. In *Outward Foreign Direct Investment in ASEAN* (pp. 79-102). ISEAS Publishing.
- Lee, C., & Sermcheep, S. (2017). *Outward foreign direct investment in ASEAN*. ISEAS Yusof Ishak Institute.
- Lim, D. (1983). Fiscal incentives and direct foreign investment in less developed countries. *The Journal of Development Studies*, 19(2), 207-212.
- Lizondo, J. S. (1993). Foreign direct investment. *Readings in International Business: A Decision Approach*, 85-114.
- Markusen, J. R. (2002). *Multinational firms and the theory of international trade*. MIT press.
- Morck, R., Yeung, B., & Zhao, M. (2008). Perspectives on China's outward foreign direct investment. *Journal of international business studies*, 39(3), 337-350.
- Secretariat, A. (2013). ASEAN Investment Report 2012: The Changing FDI Landscape. *Jakarta: The ASEAN Secretariat*.

- Stevens, G. V. (1998). Exchange rates and foreign direct investment: a note. *Journal of Policy Modeling*, 20(3), 393-401.
- Yean, T. S. (2007). Outward foreign direct investment from Malaysia: an exploratory study. *Südostasien aktuell: journal of current Southeast Asian affairs*, 26(5), 44-72.
- Yean, T. S., Nee, T. Y., & Yi, A. K. J. (2017). 5. Outward Foreign Direct Investment from Malaysia. In *Outward Foreign Direct Investment in ASEAN* (pp. 103-127). ISEAS Publishing.
- Zhang, X., & Daly, K. (2011). The determinants of China's outward foreign direct investment. *Emerging markets review*, 12(4), 389-398.

Appendix

Table 1 Results of descriptive statistical analysis

Country	Variable	Mean	Std. Dev.	Maximum	Minimum
Singapore (Year 2005 – 2019) (n=150)	OFDI_SIN	35,721.58	28,387.76	146,972.30	1,286.50
	GDP	3,319,132.00	5,221,587.00	21,433,226.00	143,534.10
	GRTH	4.05	2.97	14.23	-4.25
	ER	811.47	2,472.49	10,554.94	0.33
	INF	3.16	2.48	13.11	-0.90
	EX	31.28	20.16	74.56	3.79
	IM	22.03	19.38	67.01	3.01
	TECH	93,413.87	245,486.10	1,393,815.00	133.00
	RAW	6.21	8.71	38.22	1.06
	LCOST	22,167.88	18,982.09	55,419.39	621.63
	TAX	14.09	7.19	26.49	0.00
	PST	0.05	0.82	1.34	-1.52
	DIST	6,410.35	4,961.35	15,546.22	315.07
Malaysia (Year 2010 – 2019) (n=100)	OFDI_MA	20,574.13	26,344.73	108,072.20	651.84
	GDP	4,125,611.00	5,626,201.00	21,433,226.00	228,637.70
	GRTH	3.59	2.45	14.53	-1.25
	ER	359.27	971.95	3,625.33	0.17
	INF	2.20	1.61	6.41	-0.90
	EX	15,002.64	9,472.46	34,723.35	2,107.92
	IM	12,878.03	9,673.51	43,456.22	1,566.16
	TECH	160,394.70	28,9326.70	1,393,815.00	133.00
	RAW	5.89	9.42	38.22	0.72
	LCOST	28,675.79	17,602.45	55,419.39	2,338.74
	TAX	12.07	7.75	25.84	0.00
	PST	0.33	0.77	1.62	-1.44
	DIST	5,212.64	4491.56	15,347.93	315.07
Thailand (Year 2005 – 2019) (n=150)	OFDI_THA	3,106.57	3,622.50	15,118.20	0.53
	GDP	3,806,969.00	5,202,879.00	21,433,226.00	57,633.26
	GRTH	3.57	3.37	14.53	-5.69
	ER	59.64	181.39	742.42	0.01
	INF	2.49	2.88	23.12	-1.35

EX	0.38	0.25	1.00	0.08
IM	0.36	0.41	1.62	0.03
TECH	125,864.80	248,862.70	1,393,815.00	133.00
RAW	2.44	1.21	6.82	0.57
LCOST	28,299.55	16,713.73	55,419.39	535.04
TAX	10.53	8.38	26.49	0.00
PST	0.58	0.53	1.62	-0.66
DIST	4,774.65	4,276.97	14,155.00	988.01

Table 5.2 Results of the correlation coefficient analysis

Singapore, (year 2005 – 2019) (n=150)												
Variable	GDP	GRTH	ER	INF	EX	IM	TECH	RAW	LCOST	TAX	PST	DIST
GDP	1.000											

GRTH	-0.055	1.000										
	0.508	-----										
ER	-0.158	0.152	1.000									
	0.053	0.064	-----									
INF	-0.171	0.349	0.342	1.000								
	0.036	0.000	0.000	-----								
EX	0.167	0.370	0.213	0.045	1.000							
	0.041	0.000	0.009	0.583	-----							
IM	0.626	0.326	0.003	-0.078	0.644	1.000						
	0.000	0.000	0.972	0.345	0.000	-----						
TECH	0.655	0.227	-0.124	-0.135	0.425	0.622	1.000					
	0.000	0.005	0.131	0.100	0.000	0.000	-----					
RAW	-0.167	-0.118	0.032	0.030	-0.220	-0.302	-0.186	1.000				
	0.041	0.149	0.696	0.713	0.007	0.000	0.023	-----				
LCOST	0.291	-0.637	-0.343	-0.426	-0.275	-0.264	-0.084	0.304	1.000			
	0.000	0.000	0.000	0.000	0.001	0.001	0.309	0.000	-----			
TAX	-0.171	-0.345	-0.141	-0.207	-0.689	-0.276	-0.214	0.340	0.237	1.000		
	0.037	0.000	0.085	0.011	0.000	0.001	0.009	0.000	0.004	-----		
PST	0.073	-0.484	-0.308	-0.512	-0.060	-0.165	-0.097	0.323	0.740	0.185	1.000	
	0.377	0.000	0.000	0.000	0.467	0.044	0.238	0.000	0.000	0.024	-----	
DIST	0.524	-0.514	-0.349	-0.317	-0.255	-0.134	0.063	-0.033	0.770	0.030	0.658	1.000
	0.000	0.000	0.000	0.000	0.002	0.103	0.444	0.686	0.000	0.719	0.000	-----
Malaysia (year 2010 – 2019) (n=100)												
Variable	GDP	GRTH	ER	INF	EX	IM	TECH	RAW	LCOST	TAX	PST	DIST
GDP	1.000											

GRTH	-0.002	1.000										
	0.984	-----										
ER	-0.206	0.241	1.000									
	0.040	0.016	-----									
INF	-0.154	0.368	0.525	1.000								



	0.125	0.000	0.000	-----									
EX	0.411	0.294	-0.274	-0.191	1.000								
	0.000	0.003	0.006	0.057	-----								
IM	0.481	0.431	-0.144	-0.145	0.785	1.000							
	0.000	0.000	0.153	0.150	0.000	-----							
TECH	0.634	0.301	-0.185	-0.128	0.532	0.783	1.000						
	0.000	0.002	0.066	0.206	0.000	0.000	-----						
RAW	-0.177	-0.137	0.005	0.089	-0.332	-0.359	-0.234	1.000					
	0.078	0.175	0.965	0.376	0.001	0.000	0.019	-----					
LCOST	0.164	-0.479	-0.505	-0.289	0.096	-0.223	-0.264	0.299	1.000				
	0.102	0.000	0.000	0.004	0.344	0.026	0.008	0.003	-----				
TAX	-0.163	-0.035	-0.060	-0.016	-0.419	-0.292	-0.247	0.398	0.029	1.000			
	0.106	0.729	0.555	0.878	0.000	0.003	0.013	0.000	0.778	-----			
PST	-0.036	-0.362	-0.392	-0.290	0.189	-0.093	-0.198	0.261	0.754	-0.126	1.000		
	0.724	0.000	0.000	0.003	0.059	0.358	0.049	0.009	0.000	0.212	-----		
DIST	0.724	-0.366	-0.301	-0.182	-0.152	-0.137	0.156	0.108	0.460	0.252	0.181	1.000	
	0.000	0.000	0.002	0.069	0.131	0.175	0.121	0.285	0.000	0.012	0.072	-----	

Thailand (Year 2005 – 2019) (n=150)

Variable	GDP	GRTH	ER	INF	EX	IM	TECH	RAW	LCOST	TAX	PST	DIST
GDP	1.000											

GRTH	-0.113	1.000										
	0.170	-----										
ER	-0.230	0.271	1.000									
	0.005	0.001	-----									
INF	-0.164	0.290	0.550	1.000								
	0.045	0.000	0.000	-----								
EX	0.743	0.136	-0.162	-0.160	1.000							
	0.000	0.098	0.048	0.050	-----							
IM	0.486	0.115	-0.205	-0.233	0.713	1.000						
	0.000	0.161	0.012	0.004	0.000	-----						
TECH	0.643	0.136	-0.165	-0.130	0.749	0.732	1.000					
	0.000	0.096	0.044	0.112	0.000	0.000	-----					
RAW	0.133	-0.351	-0.432	-0.179	-0.057	-0.186	-0.169	1.000				
	0.104	0.000	0.000	0.028	0.492	0.023	0.039	-----				
LCOST	0.222	-0.597	-0.529	-0.389	-0.066	-0.237	-0.191	0.397	1.000			
	0.006	0.000	0.000	0.000	0.420	0.003	0.019	0.000	-----			
TAX	-0.033	-0.170	-0.416	-0.208	-0.418	-0.326	-0.168	0.179	0.283	1.000		
	0.693	0.038	0.000	0.011	0.000	0.000	0.040	0.029	0.000	-----		
PST	-0.269	-0.441	-0.231	-0.248	-0.283	-0.279	-0.405	0.181	0.675	-0.034	1.000	
	0.001	0.000	0.004	0.002	0.000	0.001	0.000	0.027	0.000	0.680	-----	
DIST	0.744	-0.388	-0.291	-0.205	0.218	0.024	0.160	0.423	0.474	0.275	-0.057	1.000
	0.000	0.000	0.000	0.012	0.007	0.775	0.051	0.000	0.000	0.001	0.486	-----

Table 3 Model suitability test by Hausman Test method

country	Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Singapore	Period random	219.661496	12	0.0000
Malaysia	Period random	-	-	-
Thailand	Period random	0.000000	12	1.0000

Table 4 the model estimation results of Singapore

Variable	before solving Autocorrelation						solving Autocorrelation method
	Pooled Regression Model		Fixed Effect Model		Random Effect Model		Fixed Effect Model
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient
C	10094.050	0.4119	-27909.400	0.0013*	10094.050	0.1949	4743.082
GDP	0.000	0.8499	-0.003	0.0004**	0.000	0.7647	-0.002
GRTH	1198.898	0.0649	2066.940	0.0000**	1198.898	0.0038*	53.882
ER	1.536	0.0247*	0.737	0.0917	1.536	0.0005**	0.979
INF	-1423.640	0.0565	-851.305	0.1061	-1423.640	0.0028*	291.051
EX	642.908	0.0035*	793.130	0.0000**	642.908	0.0000**	508.500
IM	-582.563	0.0317*	-171.684	0.3363	-582.563	0.0008**	-279.564
TECH	0.097	0.0000**	0.087	0.0000**	0.097	0.0000**	0.087
RAW	-249.207	0.3806	635.937	0.0017*	-249.207	0.1662	153.476
LCOST	0.534	0.0963	-0.595	0.0090*	0.534	0.0090*	-0.229
TAX	850.021	0.0495*	1508.241	0.0000**	850.021	0.0021*	935.878
PST	-2103.741	0.6687	-5112.572	0.1116	-2103.741	0.4985	1804.805
DIST	-2.139	0.1069	4.019	0.0001	-2.139	0.0113	0.733
R-squared	0.7082		0.8954		0.7082		0.6814
Adjusted R-squared	0.6827		0.8732		0.6827		0.6115
Durbin-Watson stat	0.2544		0.5925		0.2544		1.8170
F-statistic	27.7168		40.4921		27.7168		9.7524
Prob. (F-statistic)	0.0000		0.0000		0.0000		0.0000

Source: calculated. Note: **, * means statistically significant at 0.01 and 0.05 levels.

Table 5 the model estimation results of Malaysia

Variable	before solving Autocorrelation				solving Autocorrelation method
	Pooled Regression Model		Fixed Effect Model		Fixed Effect Model
	Coefficient	Prob.	Coefficient	Prob.	Coefficient
C	2366.221	0.7664	-4466.299	0.6196	-7721.009
GDP	0.009	0.0000**	0.009	0.0000**	0.006
GRTH	-646.600	0.3272	-765.182	0.3612	284.409
ER	5.584	0.0052*	4.771	0.0290*	5.177
INF	-1626.250	0.0875	-358.569	0.7740	-247.224
EX	0.671	0.2483	0.657	0.2726	0.893
IM	-1.939	0.0066*	-1.453	0.0696	-0.952
TECH	-0.026	0.0255*	-0.033	0.0137*	-0.030
RAW	-1286.045	0.0000**	-1213.281	0.0000**	-1106.219
LCOST	0.780	0.0012*	0.787	0.0015*	0.863
TAX	2746.377	0.0000**	2549.222	0.0000**	1983.682
PST	13638.540	0.0029*	11982.430	0.0115*	6649.742
DIST	-9.666	0.0000**	-8.632	0.0000**	-5.347
R-squared	0.8382		0.8504		0.6510
Adjusted R-squared	0.8159		0.8101		0.5499
Durbin-Watson stat	0.9502		0.8951		1.9126
F-statistic	37.5665		21.1071		6.4357
Prob. (F-statistic)	0.0000		0.0000		0.000

Source: calculated. Note: **, * means statistically significant at 0.01 and 0.05 levels

Table 6 The model estimation results of Thailand

Variable	before solving Autocorrelation						solving A
	Pooled Regression Model		Fixed Effect Model		Random Effect Model		Random
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient
C	-5256.499	0.0016*	-2546.248	0.1100	-5256.499	0.0000**	-626.348
GDP	-0.0003	0.1088	-0.0003	0.0907	-0.0003	0.0364*	-0.0003
GRTH	-0.505	0.9953	107.157	0.2373	-0.505	0.9938	-120.592
ER	5.122	0.0127*	-2.230	0.2176	5.122	0.0012*	1.849
INF	34.315	0.7099	218.950	0.0135*	34.315	0.6263	-20.485
EX	14726.640	0.0000**	11997.840	0.0000**	14726.640	0.0000**	14344.57
IM	1647.413	0.3202	765.765	0.5883	1647.413	0.1937	-641.039
TECH	-0.004	0.0857	-0.004	0.0177*	-0.004	0.0250*	-0.0002
RAW	-615.298	0.0109*	-879.475	0.0000**	-615.298	0.0009*	-272.954
LCOST	0.146	0.0000**	0.053	0.0723	0.146	0.0000**	0.103
TAX	102.153	0.0142*	40.187	0.2244	102.153	0.0014*	45.805
PST	175.868	0.8257	1910.259	0.0049*	175.868	0.7731	550.410
DIST	-0.064	0.6902	0.146	0.2604	-0.064	0.6019	-0.003
R-squared	0.5505		0.7645		0.5505		0.2411
Adjusted R-squared	0.5111		0.7147		0.5111		0.1694
Durbin-Watson stat	0.4426		0.7205		0.4426		2.3418
F-statistic	13.9815		15.3577		13.9815		3.3624
Prob. (F-statistic)	0.0000		0.0000		0.0000		0.0000

Source: calculated. Note: **, * means statistically significant at 0.01 and 0.05 levels

ART MEDIA AND COMMUNICATIONS

Covid-19 A Temporary Pandemic or Permanent Disease A View from Different Perspectives-

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Abstract

Through personal interviews, this paper evaluates popular opinion on the views of the Coronavirus pandemic, which has influenced the world throughout the years 2020 and 2021. This paper finds a significant distrust surrounding the media information flow and young adults' perception of how information is delivered in general. This paper shows a discord of observations between generations and how we choose to attain news globally. Interviews done internationally also bear evidence of a global distrust of government and information shared to the general public. It must be noted that this paper in no way makes any attempts to conclude on the correctness of information but only the perception amongst young adults, it is not the purpose of this paper to make conclusions on the pandemic but to show the likeliness of discord in attaining general information be that from media, social media, or government globally. This paper must highlight the evident issues for the information gathering, which in this area can be concluded as lacking, but this paper is aimed for a general view of the pandemic and not a further indebt research, which will be followed moving forward. This paper suggests further research into the reasons for distrust amongst young adults and how we in the future can prevent “fake” news and the sharing of information that can be considered dangerous for the general public.

Keywords: Pandemic, Coronavirus, Vaccine, Opinion

1. Introduction

General objective

The objective of this limited survey project was twofold, first, to collect personal opinions from a diverse international group of interviewees about various aspects concerning the Coronavirus pandemic, and second, to get a general sentiment about whether people expect the pandemic to be extinguished or to be ongoing. Although this paper does not have the medical scientific expertise to conclude on matters of the spread of the virus, it can be viewed in terms of popular opinion, which is the aim of this paper.

Selection of topic

News about the Coronavirus, which is classified as a category 1 virus outbreak, are currently dominating the mainstream and social media, no other topic is currently subject to more controversial discussion than the Coronavirus. It must also be noted that the outpour of opinionated and none ethically researched information is roaming our everyday, we have become accustomed to a level of acceptance that is not seen before. As a general topic, we must look at the variables that make up the wider population's justification for concluding based on none scientific sources. When selecting the following topic these elements were of immense importance to the authors of this paper (Jardine, 2021).

The current coronavirus was first identified in the Chinese city Wuhan in December 2019 and was subsequently labelled COVID-19 (COroNaVirus Disease – 19). Despite the immediate lockdown of Wuhan and other cities in the Hubei province, the virus spread quickly to other parts of mainland China and eventually, thanks to international travels, throughout the world. Because of its rapid spread and serious implications on health, the WHO declared Covid-19 a pandemic in March 2020 (Higginbotham, Zalikha, Stoker, & Little, 2021).

Currently, more than 233 million people have been infected worldwide and almost 4.8 million lost their life due to Covid-19. To make things worse, the original virus has constantly evolved in new variants with the current “Delta” variant being the most virulent one so far.

Virology scientists developed vaccines in record time, first Pfizer/BioNTech (approved in December 2020), then Moderna (approved in early January 2021) and AstraZeneca (approved in late January 2021), and other drug and biopharmaceutical companies like Johnson & Johnson, Novavax, and Sinopharm to follow suit. Through a worldwide vaccination roll-out to as many as possible people a so-called “herd immunity” shall be achieved for which at least 80% of the population must be vaccinated, a monumental financial and logistical task which is at this stage unclear whether and when it will be accomplished to fully contain and eventually extinguish Covid-19 (Chan, et al., 2021).

In addition, the continuous mutation of COVID19 presents a huge challenge for pharmaceutical companies developing vaccines to maintain the efficacy of the vaccines and to dispel doubts in a large part of the population about the safety of the vaccine. At the same time, governments are forced to continue imposing unpopular preventive measures to contain the spread of the virus, like regular testing, imposing social distancing and wearing masks in public places, quarantine, and temporary lockdowns of places that are regarded as super spreaders (Higginbotham, Zalikha, Stoker, & Little, 2021).

The impact of Covid-19 on people’s lifestyle, the healthcare systems, and the global economy has been devastating, Covid deniers and anti-vaxxers continue to spread false information and distrust, and governments are facing new challenges to counteract the slowing pace of vaccinations, decisive measures and a swift containment of the virus spread is crucial to avoid a collapse of economies and social unrests that will bring further distress around the globe (Joshi, 2021).

The questions we decided to ask were as follows how will the future look like? Will this be a temporary pandemic or become a new permanent disease?

World Health Organisation “WHO”

The WHO was established in April 1948 as the first specialized agency of the United Nations, just three years after the United Nations itself was established. The WHO's mandate includes

advocating for universal health care, monitoring public health risks, coordinating responses to health emergencies, and promoting health and well-being.

Since its inception, the WHO has played a leading role in several public health achievements, most notably the eradication of smallpox, the near-eradication of polio, the development of a vaccine against Ebola, and to combat the spread of other not yet contained infectious diseases like malaria, HIV/AIDS, cholera, measles, and tuberculosis, all of which are classified as unsolved pandemics which can be treated but for which vaccines have not been developed yet. Concerning the latest outbreak of the Coronavirus pandemic, the WHO created an Incident Management Support Team on 1 January 2020, one day after Chinese health authorities notified the organization of the outbreak of an unknown and rapidly spreading disease within China. On 5 January 2020, the WHO notified all member states of the outbreak, and in subsequent days guided all countries on how to respond. And on 13 January 2020, Thailand was the first country to report a Coronavirus case outside of China.

The WHO has defined six phases when a disease outbreak is recorded (WHO, 2021).

- Phase 1 - a virus is seen in animals but has not been shown to infections in humans
- Phase 2 - a known animal virus has caused an infection in humans
- Phase 3 - scattered or isolated incidence of cases or small clusters of the disease occurring in humans; possible cases of human-to-human transmission but not at a level to cause community-level outbreaks
- Phase 4 - human to human transmission at a rate that causes an outbreak in communities
- Phase 5 - the spread of the disease between humans is now evident in more than one country
- Phase 6 - community-level outbreaks are in at least one additional country other than that seen in phase 5.

For each phase, the WHO has outlined specific actions as illustrated in the following chart:

Figure 2: WHO Pandemic phase description (WHO, 2021)

WHO PANDEMIC PHASE DESCRIPTIONS AND MAIN ACTIONS BY PHASE						
PHASE	DESCRIPTION	PLANNING AND COORDINATION	STATUS MONITORING AND ASSESSMENT	COMMUNICATIONS	STRUCTURE FOR PHASE OF OUTBREAK	INITIATION OF HEALTH CARE PROVIDED
PHASE 1	No animal influenza virus circulating among animals have been reported to cause infection in humans.					
PHASE 2	An animal influenza virus circulating in domesticated or wild animals is known to have caused infection in humans and is therefore considered a specific potential pandemic threat.	Develop, exercise, and periodically review national influenza response plans, including contingency and resource plans.	Develop national influenza surveillance systems in collaboration with national health authorities, and other relevant partners.	Complete communications planning and to take communications activities to communities and other relevant partners.	Provide for sufficient laboratory in individuals for self-protection. Plan for use of pharmaceuticals and vaccines.	Prepare the health system to scale up.
PHASE 3	An animal or human-influenza virus has caused sporadic cases or small clusters of disease in people, but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks.					
PHASE 4	Human to human transmission of an animal or human-influenza virus has caused sustained community-level outbreaks in one or more countries in one WHO region.	Develop and coordinate rapid response containment activities in populations with limited contact or mobility (the spread of infection).	Increase surveillance. Monitor containment and response. Share findings with WHO and the international community.	Provide and communicate recommended interventions to prevent and reduce population and individual risk.	Implement rapid pandemic containment operations and other activities, in collaboration with WHO and the international community as necessary.	Activate contingency plans.
PHASE 5	The same identified virus has caused sustained community-level outbreaks in two or more countries in one WHO region.	Provide leadership and coordination to national response to manage the disease and contain its spread.	Actively monitor and assess the evolving pandemic risk to identify and respond to emerging threats.	Continue providing updates to general public and all stakeholders on the state of pandemic and response to mitigate risk.	Implement individual, social, and pharmaceutical measures.	Implement contingency plans for health system at all levels.
PHASE 6	In addition to the criteria defined in Phase 5, the same virus has caused sustained community-level outbreaks in at least one other country in another WHO region.					
POST-PHASE 1 PERIOD	Levels of pandemic influenza in most countries with adequate surveillance have dropped below peak levels.	Plan and coordinate the additional resources and expertise during pandemic future waves.	Continue surveillance to detect subsequent waves.	Regularly update the public and other stakeholders on any changes to the state of the pandemic.	Evaluate the effectiveness of the measures used to address pandemic, protocols, and surge plans.	Reel, without response, review plans, and rebuild system of services.
POST-PHASE 6 PERIOD	Levels of influenza activity have returned to the levels seen for seasonal influenza in most countries with adequate surveillance.	Review lessons learned and share experience with the international community. Reprioritize resources.	Evaluate the pandemic characteristics and situation monitoring and response plans for the next pandemic and other public health emergencies.	History acknowledge contributions of all stakeholders and sectors and communicate the lessons learned from the pandemic and share the lessons learned.	Conduct a thorough evaluation of all elements implemented.	Evaluate the response of the health system to the pandemic and share the lessons learned.

2. Methodology

Information Sourcing

This paper has relied on several related sources and derives its basic information source from already published papers on the topic. To comply with demands for ethical objective sources are carefully selected and evaluated through peer evaluation between authors and supporting information gathered. Secondly, a group of interviewees was questioned to get more direct and original information to strengthen the output of the paper. The interviewees were chosen internationally to make sure there were no considerable variations to the response. The interviewee group was limited and can only supply an indication to opinions throughout the world, and it is important for the authors of this paper to highlight this limitation, and to underline a further expansion of views globally, will have a more signified picture of global trends in the area.

3. Selection of participants/interviewees

Once the basics for conducting the interviews were established, a group of participants needed to be defined and identified for the actual interview. The main objective was to have a mix of nationalities, gender, education, and age to find out whether there are commonalities or differences within or between a particular group.

At the end, a total number of 12 participants were chosen to participate in the survey for the project. While this number is too small to be truly representative, the responses would nonetheless give some indication about opinions in this particular subjects. The 12 participants were chosen to represent a diverse section of the global population i.e. age, nationality, and income were important. As for this reason participants were chosen from Europe, Africa, Oceania, South-East Asia, South America, and North America. They were divided into age groups of two, participants aging between 15 to 35 and participants between 36 to 75. Income for participants ranged from \$5000, - per anno to \$50.000, - per anno.

4. Conducting the survey/interview

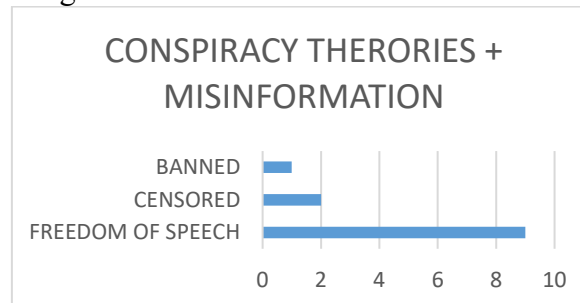
For those participants that are residing overseas and others not feeling comfortable having a meeting in person and to avoid exposure to a potential Covid infection. The survey was predominately conducted by email exchange for which the abovementioned project outline was essential as communication tools.

5. Survey findings

The key findings were twofold: 1. acknowledgment of the overwhelming belief of certain aspects of Covid, like its origin, i.e. the Wuhan Laboratory, and real existence, and 2. division in the society about whether a) Covid news is authentic, b) general preventive measures are effective, and c) vaccinations are safe, independent of nationality, gender, and age (*see figure 2, 3, and 4*).

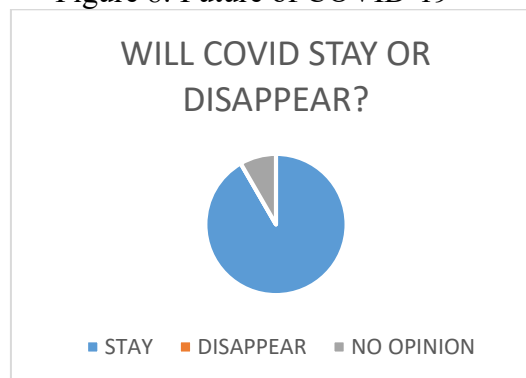
up their educated mind about such news and use common sense to believe or not to believe in certain news.

Figure 7: Belief in information control



Regarding the key question, whether or not the interviewees believe Covid is only temporary or will stay among us permanently. The survey finding was unambiguous as out of 12 participants 11 stated that Covid will stay with us and it is regarded as acceptable as long as people get regularly vaccinated against Covid similar to the yearly flu vaccination or other preventive vaccination against serious diseases like polio or cholera.

Figure 8: Future of COVID-19



6. Conclusion

Not only is the subject itself complicated and because of its scientific nature difficult to comprehend, but also the overwhelming amount of information that can be found on the internet and in the mainstream media about the Coronavirus caused enormous stress during the research phase.

A subsequent challenge was to properly sort and structure the information and to execute the project effectively as the deadline for the project submission was not to be compromised. But the rewards or learning experience in return for the enormous efforts and time spend on this project are undoubtedly notable:

- Professionally researching, assorting, and structuring information
- Preparing clear questions
- Improving and learning new Excel skills
- Communicating with external people in English
- Interacting and discussing with people during an in-person interview in English
- Analyzing survey results, consensuses, and disparities
- Developing a concise and structured project report

In conclusion, a proverb comes to mind that is “no pain, no gain” which summarizes the overall sentiment about this project. The issue with opinion papers like this stems from the foundation of how we perceive peer-review processes and how this practice is not acknowledged in the wider population as it was previously. The impact of social media has taken over for what was previously scientific informed decision making.

7. References

- Chan, C., Sounderajah, V., Daniels, E., Acharya, A., Clarke, J., Yalamanchili, S., . . . Darzi, A. (2021). The Reliability and Quality of YouTube Videos as a Source of Public Health Information Regarding COVID-19 Vaccination: Cross-sectional Study. *JMIR Publications*.
- Higginbotham, D., Zalikha, A., Stoker, S., & Little, B. (2021). *Spartan Medical Research Journal*; 6(2):25963. Retrieved from <https://search.bvsalud.org> : <https://search.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/resource/en/covidwho-1417557>
- Jardine, J. (2021). Retrieved from <https://www.silvercloudhealth.com>: <https://www.silvercloudhealth.com/us/blog/the-challenges-of-covid-19-and-how-to-deal-with-them?fbclid=IwAR3r9jnQstJfj803uWX7p6tz4Q-s6N-vZ69OBp3Co-yMn6yozBMHq3vHtpI>
- Joshi, A. (2021). Quality of Novel Coronavirus Related Health Information over the Internet: An Evaluation Study. *National Center for Biotechnology Information (NCBI)*.
- WHO. (2021). *Global research on coronavirus disease (COVID-19)*. Retrieved from <https://www.who.int>: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/global-research-on-novel-coronavirus-2019-ncov/>

Jargons in Green-Washing Strategy: Effects on Consumers’ Perception in Thailand

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Abstract

Greenwashing is a tactic used by businesses to mislead how environmentally friendly a product is. This tactic is repeatedly applied since climate change and global warming issues have gained rapid awareness. This paper aimed to investigate the possible effects of jargons used in greenwashing marketing strategies on consumer perceptions. Results suggest that consumers tended to consider greenwashed products to be more environmentally friendly than they are. It was also found that 48.9% participants had already heard of the term “greenwashing”. Still, only 27.5% participants had actively searched for the term. After being informed about greenwashing, consumers tended to have a negative outlook on the marketing strategy. The results demonstrate that telling half of the truth is the equivalent of lying within the consumers’ perception. Global warming will continue to impact every aspect of life. Therefore, businesses should be ethical and truthful in implementing environmentally friendly claims.

Keyword: *Greenwashing jargons, consumption behavior, biodegradable, organic, compostable*

1. Introduction

It is no secret that global warming is an ongoing issue that leads to dire consequences. Global warming is a process that has been rapidly accelerated tremendously for the past two centuries by humankind. Greenhouse gases are essential to our survival as it keeps the earth's atmosphere from freezing (Shahzad, 2015). Although greenhouse gases are essential, too much of anything is harmful. The effects of excessive burning of fossil fuels are the reason for the overproduction of greenhouse gases. Humanity has sped up and overdone the process and the result of that is global warming. This phenomenon is nothing new as it has been first suggested by 19th-century scientists. Samuel Pierpoint Langley and Frank Washington Very published their infrared observations in 1890 which was the first observation and calculations of the greenhouse effect (Eddy, 1990). Despite this discovery, climate change has only gained public attention on 23rd June 1988 when Dr. James Hansen, a NASA scientist was on the front page of The New York Times with the headline “*Global Warming Has Begun, Experts Tells Senate*” (Shabecoff, 1988). The consequences of global warming have been continuously reiterated and emphasized. Since the public has been aware of this phenomenon, many companies have used this to their advantage, especially through their products. According to the Cambridge dictionary (n.d.), Greenwashing is designed “to make people believe that your company is

doing more to protect the environment than it really is”. It is when a company conveys false impressions or provides misleading information about how environmentally friendly a product is. Greenwashing claims have become more prominent throughout the years due to the awareness of the severity of global warming. Since consumers have become more aware of the issues that are presented through the use of single-use plastics, greenwashing strategies have become more popular among companies. This is done through various tactics although the present study will focus on the use of jargon as a greenwashing strategy. The current study aims to investigate the role, the possible effects, and the impacts of jargon used as a greenwashing strategy in advertisements on international consumers. Specifically, it aims to explore whether or not: 1) Greenwashing strategies through favourable language cause unintentional bias within audiences, 2) the typical consumers are aware of these greenwashing terms, and lastly, 3) how would consumers' perspectives change after being informed about greenwashing claims.

2. Background Information

Jargon is a terminology associated with a specific field and specialization. Euphemisms are the substitute of words that would have been considered offensive or phrases that would suggest something unpleasant. Jargon and euphemistic rhetoric have been used in advertisements as strategies to convince and persuade consumers. Although it has been an effective strategy, it remains ethically questionable. A dissertation conducted by Zwilling and Marie (2017) examined Lysol and its advertisement from the 1920s to the 1930s. It is stated that the advertisements relied heavily on the reputation and authority of the physicians. Although the purpose of the advertisements was not intended to give the target audience advice on cleanliness or contraception, there were further underlying intentions. According to Dalamu (2018), the usage of euphemisms and jargon has favoured the advertisers' domain and has served the purpose of persuading customers to purchase the product advertised.

According to USDA's organic standard, a product is allowed to be labelled as organic in three ways: 100 percent organic, organic, and made with organic ingredients (Slusher, 2021). A product needs to contain at least 95 percent organic ingredients to be allowed to use the “organic” claim. Meanwhile, only 70 percent of organic ingredients are required in order to apply for the “made with organic ingredients” label. This is considered greenwashing since it can cause misinterpretation from consumers' perspectives. Consumers may assume that the product is 100 percent organic. Furthermore, USDA focuses mainly on agricultural products and has limited authority on cosmetics (Rotman, Gossett, & Goldman, 2020). The cosmetics and personal care products, otherwise, are under the supervision of the FDA. As stated by Riccolo (2021), it was discovered that the FDA had not regulated the term “organic” yet. It was found that it is because the FDA lacks the authority to define the term. The organization oversees the Food, Drug, & Cosmetic Act and the Fair Packaging & Labelling Act, not the regulation of green claims (Slusher, 2021). Therefore, some companies may use this gap to advertise their products as organic. Even though the product has received the approval from USDA, it is still at the risk of containing euphemism. To elaborate, lipstick with only 65 percent organic ingredients can still claim that it includes organic beeswax (Slusher, 2021). This is technically true, although it is easy to misinterpret from the consumer's perspective. This action, despite not violating any USDA regulation, is misleading.

The terms biodegradable and compostable are jargons. Although the word itself has been used as if it was well understood by consumers. According to European Bioplastics, as stated by the European Environment Agency (2021), approximately only 1percent of plastics on the market are considered bio-based, compostable, or biodegradable. This means that the majority of plastics and plastic products are made from fossil fuels. Plastics that are made from fossil fuels increase greenhouse gas emissions; therefore, worsen the environmental issues that are present. Consumers will assume that products with the label “compostable” on it, would be suitable for composting. In theory, biodegradable plastics (BPs) have a high chance of alleviating the current global plastic consumption issue. Despite this possibility, according to Zhu and Wang (2020), the conditions where the biodegradable plastic is disposed of are crucial to whether it will break down or not. There are several unpredictable factors that can affect efficiency and hinder the breakdown of BPs. On the other hand, the majority of products that are labelled as compostable are not suitable for home composting (Browne, 2020). Most of the compostable labelled products are required to be discarded in an industrial composting facility in order to fully decompose. These terms are misleading towards consumer perception and therefore their consumption choices. Greenwashing is a relatively new phenomenon, there are only a few studies that examine the consequences of greenwashing. Exploring the greenwashing phenomenon through a linguistic perspective remains scarce. The key question remains, and the role of the present study is to investigate the relationship between the use of Jargon within consumer perceptions. The present study aims to answer the following research questions: 1) Does Greenwashing through favorable language cause unintentional bias within audiences?; 2) Are the typical consumers aware of these greenwashing terms and jargon? 3) How would consumers' perspectives change after being informed about greenwashing claims?

3. Research Methodology

This study used a descriptive research method through a survey questionnaire. The mode of the survey is online, and participants were able to access the survey through Google Forms. Google Form was the preferred platform due to its accessibility and convenience in collecting many responses simultaneously.

Instrument. The Survey questionnaire used in this study is adapted from Etienne, Chirico, McEntaggart, et al. (2018), Li, Lloyd, Wu, et al. (2020), and González-Díaz, Vilaplana-Aparicio, & Iglesias-García (2020). The previous researches were selected due to the similarities in research aims. Previous research focuses on consumer's perception which correlates with the present study's research objectives. The validated questionnaire was divided into five sections with an overall of twenty-four questions. The first section of the survey began with the exploration of demographic data. The second section covers the data of participants' consumption behaviour. The last three sections were modified to find answers to this paper's aims. The present study investigated the likeliness of an individual to believe in products with eco claims. Images of products that used green-washing jargon in their packaging were used. Participants were then asked to rate how much better for the environment they believe the product to be on a five-point Likert scale. The fourth section examined the familiarity and awareness of the participants with greenwashing and related terms. The terms mentioned were “organic”, “biodegradable”, and “compostable”. Short descriptions were provided about each term, and how the jargons are considered greenwashing. In this section, the respondents were requested to answer two distinct questions. First is whether the respondents have heard or are aware of each term. Second, to specify the number of participants who have looked into the

terms in detail. The last section of the survey observed respondents' perception of greenwashing tactics after being informed about the information. The data were then analyzed through mean frequencies.

Respondents. The online survey was completed by 182 participants in total. The demographic of the respondents were 95 females (52.2%), 85 males (46.7%), and 2 participants (1.1%) who preferred not to answer. 1 response (0.5%) was from a participant who was younger than 17 years old. The majority of responses (76.9%) were from participants ages ranging from 18-24 years old. Following that, there were over 34 responses (18.7%) from 25-34 year olds, 5 responses (2.7%) from 35-44 year olds, 1 response (0.5%) from 45-55 year olds, and lastly, 1 response (0.5%) from a participant over the age of 55. A significant percentage of responses are currently undergoing their bachelor's degree as the survey was distributed through various platforms, including university community pages.

Findings

Jargon is specialized terminology which is associated with a specific field. The terms “biodegradable”, “compostable”, and “organic” are jargon. Consumers tend to assume these terms are more beneficial to the environment than they really are. The claims that are made by companies that a product is compostable and/or biodegradable is highly under-explained. Any claim of compostability should be precise and explicit. It is crucial that consumers are aware of the multitude each “green” labels entail. The present study aims to investigate whether these jargons affect consumption choices if consumers are aware of the meaning of each term, and lastly, does consumer perception change after being informed?

Greenwashing and Its Unintentional Biases

The movement of “anti-plastic” consumption has now evolved into ambiguity in “sustainable” packaging and product claims. According to Browne (2020), the term Biodegradable and Compostable are considered misleading environmental claims. There is a lack of guidelines and clarity for information about these terms. The ambiguity in marketing and using these terms can be considered exploiting the consumers, especially those willing to purchase environmentally friendly products. The survey responses indicate that sustainable green jargon creates bias within consumer perception. Table 1 demonstrates the participants' first impression and opinion on greenwashed products.

Table 1

Percentages of consumers' opinion on products that used green-washing tactics

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
First Product	11.5	18.1	36.8	26.4	7.1
Second Product	2.7	4.4	23.1	36.3	33.5
Third Product	16.5	15.9	31.3	24.2	12.1

Note. The first product was a lotion with the claim to be “All Natural, Hypoallergenic, Organic, Gluten-free”; the second product was a bamboo toothbrush that claims to be “100% biodegradable”; the third product was a “compostable” plastic bag.

Survey results suggest that 26.4 percent (agree) and 7.1 percent (strongly agree) of participants believed a product that claimed to be: All Natural, Hypoallergenic, Organic, and Gluten-free was better for the environment compared to the typical product of the same purpose. The survey also found that 36.3 percent and 33.5 percent of participants agree and strongly agree respectively that a product that claims to be “100% biodegradable” was good for the environment. Meanwhile, 24.2 percent of participants agree that compostable plastic bags were better for the environment. Additionally, 12.1 percent strongly agree that compostable plastic bags were significantly better for the environment.

According to Yuwaniyom (2015), the Cosmetic Act B.E. 2535 (1992) that regulates cosmetics products in Thailand does not control the use of the word “Organic” on cosmetic labels. Each cosmetic company can use the term “Organic”, freely. Riccolo (2021) stated that the green beauty market has undergone exponential growth in the last decade. It is expected to reach \$25.11 billion by 2025 (Bernard and Parker, 2021). With the use of the word “organic” being under regulated, companies are able to use the term without restrictions. This allows cosmetic companies to use the term without having to clarify to the consumers about the true composition of the product. The use of the jargon “Organic” being unmonitored, causes misinterpretation among consumers. Respondents were not aware that there are several unpredictable factors that could hinder the breakdown of BPs (Zhu and Wang, 2020). Companies are using the ambiguity and lack of information available in relation to the jargon to exploit consumers, specifically, those who are inclined to purchase products that claim to be better for the environment.

4. Consumers Awareness of Greenwashing Labels

Jargon is a specialized language. The term that was selected for this study consists of “Organic, Biodegradable, and Compostable”. Most consumers will assume the words are self-explanatory as these words can be broken up into three sections: “bio”, “degrade”, “able” and “compost”, “able”. The definition of the suffix “Able” is able to do or possessing the quality to. As a result, consumers often make assumptions that the plastic will “degrade” by itself after they have thrown the plastic away. Table 2 displays whether respondents were aware of the selected jargon and terminology.

Table 2

Percentages of consumers' awareness on greenwashing labels

	Has heard of the terms	Has searched for the terms
Greenwashing	48.9	27.5
Organic	72	57.7
Biodegradable	59.9	40.7
Compostable	45.6	35.7

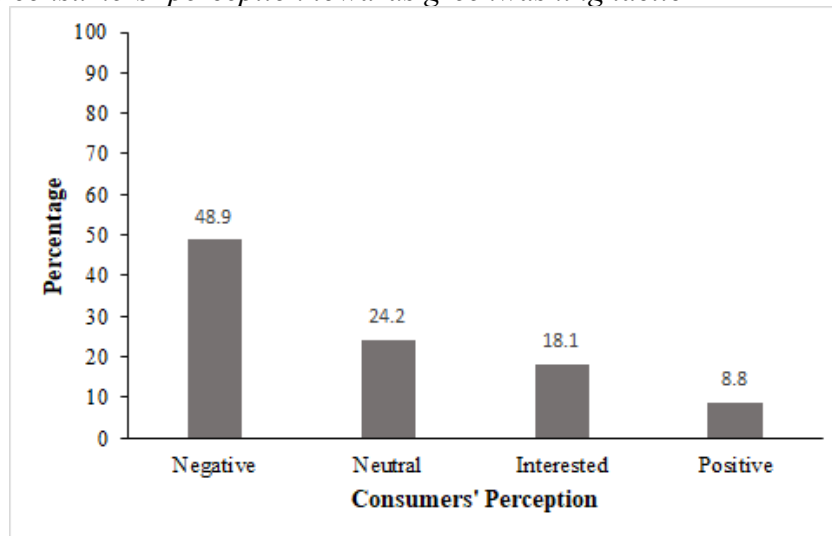
The results suggested that the general audiences are more aware of the “Organic” label than the jargon “Biodegradable” and “Compostable”. The survey results indicated that the term

“Organic” is the only term that more than 72 percent of the respondents are aware of. It is also the only term that 57.7 percent of the respondents have sought out for additional information. 59.9 percent of the respondents knew about the information in regards to the term “Biodegradable”. Moreover, 45.6 percent of the respondents have heard of the information stated in the survey about the term “Compostable”. When the participants were asked if they had looked into each term or not, both numbers decreased to 40.7 percent and 35.7 percent respectively.

The finding of the present study aligns with the study results conducted by Sanz-Navarro (2021). The majority of participants were not aware of greenwashing. The percentage of people who were familiar with greenwashing from the paper mentioned was 35 percent compared to 48.9 percent in the present study. However, up to 91 percent of the respondents in the survey acknowledged greenwashing as a strategy that is widely used for marketing. It could be speculated that the general consumers might have noticed greenwashing tactics but were unaware until they were informed. Results from Schafeld (2019)’s research demonstrated that despite consumers buying products that are considered eco-friendly, it was highly probable that they were unaware of the further details. It was mentioned that 29 percent of respondents tend to purchase organic products, and 52 percent did sometimes. Still, when they were presented with products with three different labels: Bio-Siegel label, fake label, and no label, over 30 percent of the participants preferred fake labels compared to 26 percent who preferred the product without labels. The finding from Schafeld (2019) signified that people were not likely to be knowledgeable about greenwashing. Considering the result from the present research, the survey from Sanz-Navarro (2021), and the paper of Schafeld (2019), despite their basic awareness of green labels, consumers were not conscious enough to avoid being deceived by the greenwashed products. The number of participants who searched for further information was less than those who only have heard of the issues.

Consumers' perspectives after being informed about greenwashing claims

Greenwashing is a successful method in making the product sounds good for the environment and attracting consumers to buy them. One of the reasons for its success is that most people are not aware of this particular issue. Therefore, by creating awareness and providing comprehension of the meaning of each terminology, it should be less likely that people will be misled by these claims. The following results presented in Figure 1 suggest that participants have gained a negative perspective towards the issue after being informed.

Figure 1*Percentage of consumers' perception towards greenwashing tactic*

Over 48.9 percent of the participants had a negative response towards the company after being informed. Meanwhile, 24.2 percent of the participants had a neutral response after learning about greenwashing. The possible reason for this can be investigated through the fact that the majority of respondents do not prioritize the eco-friendliness of a product. 18.1 percent of the respondents were intrigued after learning about each term and wished to be more educated about greenwashing. Participants expressed a desire for more information regarding this particular subject. Lastly, only 8.8 percent of participants believed greenwashing to be a beneficial tactic, although it is expressed that it is from an economic standpoint, rather than an ecological one. It can also be suggested that the consumers who had a positive reaction after being informed see greenwashing as a method of raising awareness. It is implied that greenwashing creates an acknowledgement of plastic pollution issues, which can urge consumers to conduct further personal research.

Consumers tend to have a negative outlook after being informed about greenwashing tactics. Results of the survey correspond with studies that explore similar dimensions. After participants are given information about greenwashing tactics, their perception of “eco-friendly” products changes immensely. Participants within Brouwer (2016) investigation were surprised, and some had strong negative responses and attitudes towards the companies that are utilizing these tactics. Schafeld (2019) observed significant changes in consumer attitudes towards product labelling and the perceived value of the product after informing participants. Forsell and Åkerblom (2020) found that consumers tend to attribute the purpose of greenwashing to factors such as profit. According to the present study responses, it can be concluded that the respondents experienced consistent feelings with participants within Forsell and Åkerblom’s (2020) research. Distrust and disbelief can be observed from the responses. To sum up, consumers who care for the environment will have a negative attitude towards the company after being informed about greenwashing strategies.

5. Discussion

Jargon used on greenwashed labels can cause misconception towards how environmentally friendly the product is. This tactic is usually effective since most consumers are not aware of

the meaning for each term. Nonetheless, the responses also reveal that it is probable that people are willing to change their perspective towards greenwashing after they have gained awareness and received additional information. According to the survey of the present study, 33.5 percent of the participants misunderstood that biodegradable plastics are good for the environment since they strongly agree about this. Meanwhile, an additional 36.3 percent agree that the materials are environmentally friendly. It is highly likely that most respondents do not thoroughly comprehend each label. Apart from the term “Organic”, less than half of participants answered that they have looked for data of other greenwashing terms (40.7 percent for biodegradable and 35.7 percent for compostable). Lastly, it has been demonstrated that almost half of the respondents (48.9 percent) perceive greenwashing negatively after gaining awareness of the issue. Greenwashing terms deceive their consumers. Many are not attentive to the information related to the jargon. Consumers tend to perceive these labels negatively after they have been informed about the specific definition.

The results of the current research are in accordance with several previous studies. In the first research finding, it could be explained that companies can benefit from the ambiguity of the regulations to use greenwashing labels (organic) to accelerate their sales, such as in the beauty industry (Yuwanityom, 2015; Riccolo, 2021). Similarly, this method may be effective due to the lack of comprehension of the general public. Zhu and Wang (2021) stated that many people do not recognize the downside of the term biodegradable plastics. The second point, can be related to the Sanz-Navarro (2021)’s research. Sanz-Navarro (2021) found that 35 percent of participants are familiar with the term “greenwashing” while the percentage is 48.9 percent in the present study. Likewise, the findings from Schafeld (2019) suggested that many consumers were not aware of green labels. Over 30 percent of participants selected fake labels over the real ones and the ones without claims. Furthermore, the participants of Schafeld (2019) and Brouwer (2016)’s research had experienced similar reactions of surprise and perceived greenwashing as manipulative after knowing the facts. According to Forsell and Åkerblom’s (2020), it was described that several consumers thought of greenwashing as a tactic to earn money, not as a solution to climate change.

However, it should be noted that the result might be based on the higher proportion of the people in the age range between 18-24. Therefore, to examine the perception of consumers of other age groups (for instance, adults or older population) or consumers in general with greater comprehension, a study with a more diverse age range should be conducted. Nonetheless, this study is beneficial in understanding the consumers' perception of written labels on a product. It is important, especially for young adults, to be aware of greenwashing since avoiding greenwashed products and spreading this awareness would help humans in sustaining the world that they live in.

6. Conclusion

In conclusion, this study found that the majority of consumers trusted scientific research the most. Compared to private organizations, close friends and family, social media, and government agencies. It is reported that 77 percent of consumers trust scientific research to provide accurate information in regard to honesty with eco-friendly packaging. Nonetheless, the majority of consumers prefer to have the information relayed through social media platforms, as 84.6 percent of participants would prefer the information to be communicated through their social media. Despite the distrust within social media platforms, the information

is preferred to be communicated through the platform mentioned. This suggests that consumers would prefer to receive information through social media that are cited and backed up by scientific data and research. The present study can deduce that the consumers prefer the ease of access to information through social media, although they trust scientific data.

Euphemisms, fluffy language, and dishonesty might create instant reward and short-term profit, but it is not a good or ethical method. After finding out the reality of the situation, the present study found that customers felt cheated and were rather shocked. The results correlated with previous findings. This suggests that the consumer's perception of the company, after being informed about greenwashing, will be tainted. Distrust between the consumer and products will emerge and will cause more harm to the company in the long run. It is recommended for companies to be transparent about the claims rather than using euphemisms or fluffy language (half-lies), as it is the equivalent to blatantly lying to the consumers (De Jong, Huluba & Beldad, 2019).

Nevertheless, the scope is still compromised since the majority of the participants were in the ages of 18-24. Secondly, the current research has investigated and applied a limited amount of literature, especially the previous research specifying the location of the current study. It is recommended for future research to conduct a survey for respondents with a wider age range because the perception of each person can change or exist depending on age and experiences. Global warming is a long-term problem impacting humans and the environment around the world. The present research, as well as the previous studies, amplifies and creates awareness that greenwashing is widely used as a marketing tactic. The tactic which attracts consumers who desire to stop, or slow down climate change. Therefore, greenwashing is a crucial topic to research to decrease the severity of global warming.

7. References

- Bernard, M., & Parker, L. (2021). The Effect of Conscious Consumerism on Purchasing Behaviors: The example of greenwashing in the cosmetics industry. *Jonkoping University International Business School*. Retrieved from <https://www.diva-portal.org/smash/get/diva2:1564552/FULLTEXT01.pdf>
- Brouwer, A. (2016). REVEALING GREENWASHING: A CONSUMERS' PERSPECTIVE. *International Conferences ITS, ICEduTech and STE 2016*, 245-252 Retrieved from <https://files.eric.ed.gov/fulltext/ED571577.pdf>
- Browne, M. (2020). Misleading Environmental Claims Evidence for the Competition Markets Authority. *the Resources and Waste Working Group at Wildlife and Countryside Link*. Retrieved from https://media.mcsuk.org/documents/MCS_Misleading_Environmental_Claims_-_Link_evidence_14.12.2020.pdf
- Cambridge University Press. (n.d.). *Cambridge Advanced Learner's Dictionary & Thesaurus*. Cambridge University Press. Retrieved from <https://dictionary.cambridge.org/dictionary/english/greenwashing>
- Dalamu, T. O. (2018). English Language Development in Nigerian Society: A Derivative of Advertising Communications. *Complutense Journal of English Studies (CJES)*, 26, 263 - 286. <http://dx.doi.org/10.5209/CJES.56940>
- De Jong, M. D. T., Huluba, G., & Beldad, A. D. (2019). Different Shades of Greenwashing: Consumers' Reactions to Environmental Lies, Half-Lies, and Organizations Taking

- Credit for Following Legal Obligations. *Journal of business and technical communication*, 34(1), 38-76. <https://doi.org/10.1177/1050651919874105>
- Eddy, J. A. (1990). Founding the Astrophysical Observatory: The Langley Years. *Journal for the History of Astronomy*, 21(1), 111 - 120.
<https://doi.org/10.1177/002182869002100113>
- Etienne, J., Chirico, S., McEntaggart, K., Papoutsis, S., & Millstone, E. (2018). EU Insights – Consumer perceptions of emerging risks in the food chain. EFSA supporting publication. *EFSA supporting publication*, 15(4). doi:10.2903/sp.efsa.2018.EN-1394
- European Environment Agency. (2021). *Biodegradable and compostable plastics — challenges and opportunities*. EEA Europe. Retrieved from <https://www.eea.europa.eu/publications/biodegradable-and-compostable-plastics/biodegradable-and-compostable-plastics-challenges>
- Forsell, F., & Åkerblom, I. (2020). How do consumers’ perceptions change when greenwashing is revealed?. Retrieved from <https://www.diva-portal.org/smash/get/diva2:1438532/FULLTEXT01.pdf>
- González-Díaz, C. Vilaplana-Aparicio, M. J., Iglesias-García M. (2020). How Is Functional Food Advertising Understood? An Approximation in University Students. *Nutrients*, 12(11), 3312. doi:10.3390/nu12113312
- Li, T. Lloyd, K., Birch, J. Wu, X. Miroso, M., & Liao X. (2020). A quantitative survey of consumer perceptions of smart food packaging in China. *Food Science & Nutrition*, 8(8), 3977-3988. <https://doi.org/10.1002/fsn3.1563>
- Riccolo, A. (2021). The lack of regulation in preventing greenwashing of cosmetics in the US. *Journal of Legislation*, 47(1), 133. Retrieved from <https://scholarship.law.nd.edu/jleg/vol47/iss1/5/>
- Rotman, R. M., Gossett, C. J. & Goldman, H. D. (2020). Greenwashing No More: The Case for Stronger Regulation of Environmental Marketing. *Environmental Marketing. Administrative Law Review*, 72(3), 417-443. Retrieved from <https://scholarship.law.missouri.edu/facpubs/972/>
- Sanz-Navarro, M. (2021). Effects of Greenwashing on Consumer Perception. Retrieved from <https://www.theseus.fi/handle/10024/502326>
- Schafeld, E. S. (2019). How does the awareness of greenwashing influence consumer purchasing decisions of quality-labelled products in the food industry? *Semantic Scholar*. Corpus ID: 199323091 Retrieved from <https://www.semanticscholar.org/paper/How-does-the-awareness-of-greenwashing-influence-of-Schafeld/4399b7ef8fd596af3cf22b9352ff0a151d24ec8d>
- Shabecoff, P. (1988). Global Warming Has Begun, Expert Tells Senate. *The New York Times*, 1. Retrieved from <https://www.nytimes.com/1988/06/24/us/global-warming-has-begun-expert-tells-senate.html>
- Shahzad, U. (2015). Global Warming: Causes, Effects and Solutions. *Durreesamin Journal*, 1(4). Retrieved from https://www.researchgate.net/profile/Umair-Shahzad/publication/316691239_Global_Warming_Causes_Effects_and_Solutions/links/590ca678aca2722d185bff31/Global-Warming-Causes-Effects-and-Solutions.pdf
- Yuwanityom, P. (2018). LEGAL PROBLEM ARISING FROM ORGANIC COSMETIC. *Thammasat Business Law Journal*, 5. Retrieved from <https://so05.tci-thaijo.org/index.php/TBLJ/article/view/112550>
- Zhu, J., & Wang, C. (2020). Biodegradable plastics: Green hope or greenwashing? *Mar Pollut Bull*, 161(Pt B), 111774. National Library of Medicine. doi: 10.1016/j.marpolbul.2020.111774.



Zwilling, K., & Marie, J. (2017). Euphemistic rhetoric in advertising during the Comstock Era: the importance of persona and cultural context in the Lysol case. *Doctoral Dissertation, University of Illinois at Urbana-Champaign*. Retrieved from <http://hdl.handle.net/2142/98329>

How to initiate Thailand Emergency Medical Team verified by WHO; Focus on pharmacists responsibilities.

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Introduction

Thailand Emergency Medical Team (Thailand EMT) became the first in the South-East Asia Region to get World Health Organization (WHO) verification to be a type 1 fixed EMT. In addition, pharmacists are part of their team who service both of the multidisciplinary team as well as patients.

Objective

To describe pharmacists responsibilities in Thailand EMT.



Materials and Methods

This knowledge management was conducted by 3 pharmacists in their team consisting of 3 essential parts:

1. Pre-deployment

- Drawing medications
- Checking quantity & quality
- Recording & Packing

3. Post-deployment

- Reconciling medications
- Checking & Restocking every 6 months

2. Deployment

- Conveying medications
- Using medications comply with SOPs & FEFO

Results

Among 143 migrant workers who were admitted in Wat Krok Krak field hospital from December 30, 2020 to January 6, 2021. The median age was 31.5 years (range 16–54). All patients (100 percent) got a positive SARS-CoV-2 test result. 56 patients (39.2 percent) got prescriptions from doctors and got medication counseling by using Pinto quarantine delivery robot as well as communicated via Android tablets by pharmacists. Furthermore, pharmacists have checked and restocked medications every 6 months to assure medication safety and no expiration and reduce medication waste.



Conclusion

During Covid-19 pandemic, Thailand EMT deployed a field hospital in Wat Krok Krak, Samut Sakhon province, Thailand and suggested others field hospital settings.

Pharmacists can help in various functions to enable the medical team to provide clinical care to their patients under the usually challenging field conditions.

References

1. กรมการแพทย์ กระทรวงสาธารณสุข. (2564). แนวทางการจัดตั้งโรงพยาบาลสนาม (กรณีมีการระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 (Covid-19) ในวงกว้าง).
2. World Health Organization. (2013). Classification and minimum standards for foreign medical teams in sudden onset disasters. Retrieved 28 July, 2021, from <https://extranet.who.int/emt/guidelines-and-publications>

DEVELOPMENT OF TRANSETHOSOMES CONTAINING COFFEE BERRY BY-PRODUCT EXTRACT FOR COSMECEUTICAL APPLICATION

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Introduction

Coffee (*Coffea Arabica* or Arabica) is an economic plant in Northern Thailand. Coffee berry is a fruit of coffee which is a by-product of coffee-making process. However, it has been found to contain caffeine including phenolic compounds that have anti-cellulite, antioxidant, and anti-inflammatory activities. Nowadays, there is a little research regarding the application coffee berry in cosmeceutical products. Therefore, this research is interested in adding value of the by-product in coffee plantation and development of transeosomes containing coffee berry extract for cosmeceutical application.



Methods

Plant material and extraction



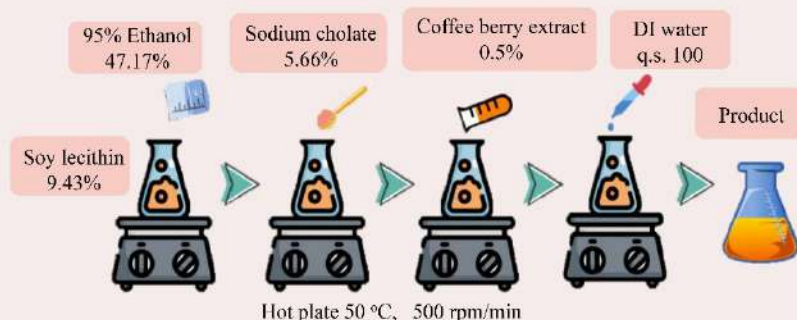
Coffee berries waste

- Coffee berries which were agricultural waste from coffee beans production, were collected from Doi Chang, Chiang Mai, Thailand during winter season.
- They were washed and dried in hot air oven.
- They were extracted by maceration using 95% ethanol and evaporated extracting solvent using a rotary evaporator.
- The extract was evaluated biological activities and chemical markers (caffeine, chlorogenic acid). (Data not shown)



Coffee berries ethanolic extract

Transeosomes containing coffee berry extract



Characterizations

- Physical appearance
- Particle size, polydispersity index (PDI), zeta sizer were measured by Zetasizer

- Percentage entrapment efficiency (%EE)
 - Evaluated by ultrafiltration method (Indirect method) using an Amicon ultra-centrifuge filter
 - Analyzed amount of total extract in the formulation and the unloaded extract by HPLC to calculate %EE



Zetasizer



Amicon ultra-centrifuge filter



HPLC

Stability study

- Accelerated condition : Heating – Cooling 6 cycles (Changing between 4 °C for 48 h and 45 °C for 48 h as 1 cycle)
- 30 °C for 30 days

References

- Ascenso, A., Raposo, S., Batista, C., Cardoso, P., Mendes, T., Praça, E.G., & et al. (2015). Development, characterization, and skin delivery studies of related ultra-deformable vesicles: transosomes, ethosomes, and transeosomes. *International Journal of Nanomedicine*, 10, 5837-5851.
- Squizzato, M., Ferreira, F., Hallan, S.S., Baldissarotto, A., Drechsler, M., Malatesta, M., & et al. (2021). Ethosomes and transeosomes for mangiferin transdermal delivery. *Antioxidants*, 10, 768-786.
- Verma, A., & Mishra, M. (2021). Formulation and characterization of transeosomal-loaded nanoparticles of irbesartan. *International Journal for Pharmaceutical Research Scholars*, 10(1), 28-35.
- Verma, D.D., Verma, S., Blume, G., & Fahr, A. (2003). Particle size of liposomes influences dermal delivery of substances into skin. *International Journal of Pharmaceutics*, 258(1-2), 141-151.

Results and Discussion



Transeosomes containing coffee berry extract was dark brown sticky liquid and coffee berry odor. It had particle size at 158.1 nm. Caffeine was used as standard marker to calculate entrapment efficiency of formulation. The formulation showed high entrapment efficiency (80.10%) after preparation.

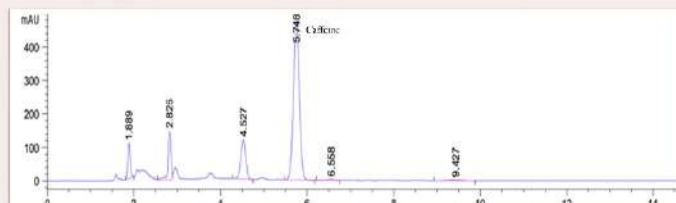


Fig 1 HPLC chromatogram of caffeine in transeosomes containing coffee berry extract

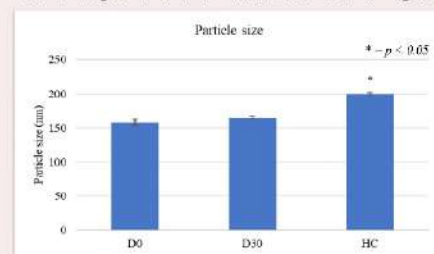


Fig 2 Particle size of transeosomes containing coffee berry extract before and after storage at 30 °C for 30 days (D30) and heating cooling for 6 cycles (HC)



Fig 3 PDI of transeosomes containing coffee berry extract before and after storage at 30 °C for 30 days (D30) and heating cooling for 6 cycles (HC)

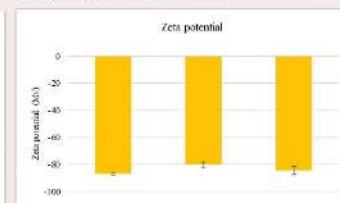


Fig 4 Zeta potential of transeosomes containing coffee berry extract before and after storage at 30 °C for 30 days (D30) and heating cooling for 6 cycles (HC)

Transeosomes containing coffee berry extract did not change in physical appearance (phase separation), PDI and zeta potential after stability study. It revealed significant increase in the particle size after HC that it affected from changing of temperature. However it still remained in a nano-size range. Moreover, the low PDI and high zeta potential more than |30 mV| usually indicates good stability of the system.

Conclusion

The transeosomes containing coffee berry extract was completely prepared using appropriate concentrations of soy lecithin, ethanol, sodium cholate and DI water. It possessed good physical properties and stability. Therefore, this formulation has potential to further study efficacy, safety and develop as cosmeceutical products.

ANTIOXIDANT, ANTI-COLLAGENASE, ANTI-ELASTASE AND CYTOTOXIC ACTIVITIES OF *Tremella fuciformis* EXTRACT FOR COSMECEUTICAL APPLICATIONS

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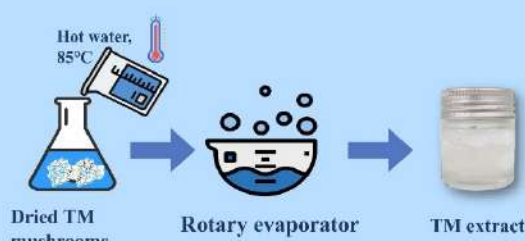
Introduction

Tremella fuciformis (TM) belongs to the Tremellaceae family, commonly named snow mushroom, white brain fungus or white jelly fungus. It has been known as an edible mushroom which contains many active substances, such as protein, polysaccharides, dietary fiber, vitamins and minerals. However, the information on its biological activities related to anti-aging is limited. Therefore, this research was focused on antioxidant, anti-collagenase, anti-elastase, and cytotoxic activities of the TM extract for cosmeceutical applications.



Materials and method

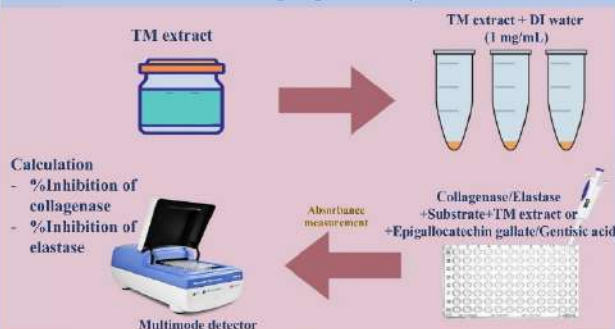
Extraction of TM



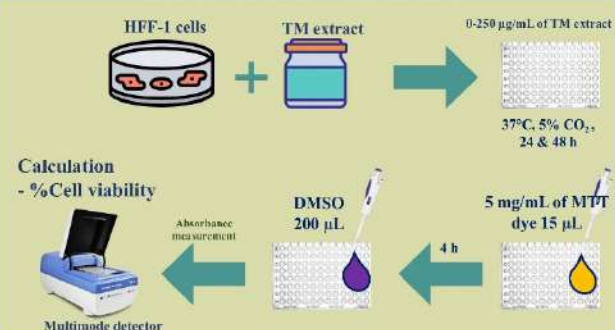
Antioxidant activity



Anti-aging activity



Cytotoxicity in normal cells



References

1. Bin C. Optimization of extraction of *Tremella fuciformis* polysaccharides and its antioxidant and antitumor activities in vitro. Carbohydr Polym 2010; 81: 420-424.
2. Jones A, Pravadali-Cekic S, Dennis G. R., Bashir R., Mahon P. J., & Shalliker, R. A. Ferrie reducing antioxidant potential (FRAP) of antioxidants using reaction flow chromatography. Analytica Chimica Acta 2017; 967: 93-101.
3. Barrantes E, Gumea M. Inhibition of collagenase and metalloproteinases by alons and aloe gel. Life Sci 2003; 72(7): 843-850.

Results & Discussion

Antioxidant activity

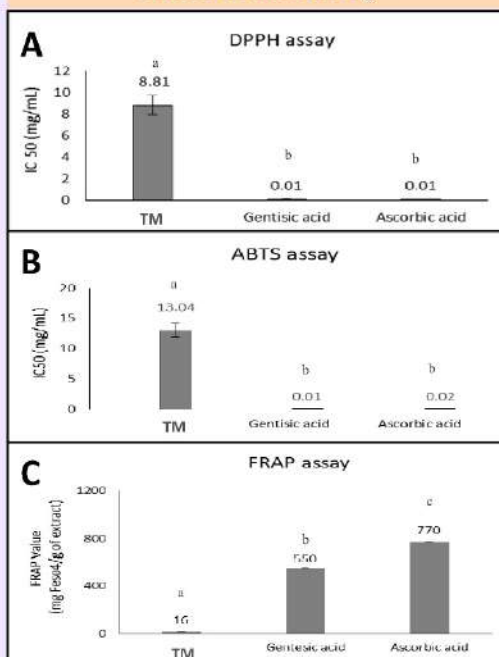


Fig 1. The 50% inhibitory concentration (IC50) of TM extract by DPPH Assay (A), ABTS Assay (B), and FRAP Assay (C). Different superscript letters denote statistically significant differences ($P < 0.05$).

Cytotoxicity in normal cells

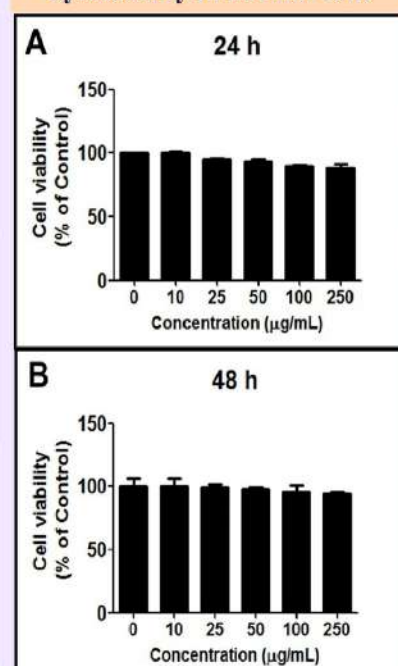


Fig 2. The cell viability of HFF-1 human fibroblasts cells after treatment with TM extract for 24 h (A), 48 h (B).

Anti-aging activity

Table 1. The % inhibition of collagenase and elastase of TM extract compared to standard controls

Sample	% Inhibition	
	Collagenase	Elastase
TM Extract	72.40 ± 7.10 ^a	27.10 ± 0.40 ^a
Gentisic acid	59.48 ± 3.98 ^b	21.98 ± 0.16 ^b
Epigallocatechin gallate	31.05 ± 3.54 ^c	19.16 ± 3.41 ^b

Different superscript letters within a column denote statistically significant differences ($P < 0.05$).

The TM extract was transparent and colorless semi-solid with a unique odor. The yield after water extraction was $52.31 \pm 6.23\%$. The results showed that the TM extract had a good antioxidant activity, but it was significantly less than the standard controls. Interestingly, the TM extract inhibited collagenase and elastase enzymes which had a significant better effect than the standard controls. The reason might be due to the phenolics and flavonoids in the TM extract that could attach to Zn^{2+} ions, resulting in an enzyme malfunction³. Moreover, the TM extract revealed no toxicity toward normal cells (HFF-1) indicating the safety of the extract. In addition, the characterization, formulation development and clinical study will be next parts of the further investigation.

Conclusion

The TM extract possessed the promising antioxidant and anti-aging activities with a safety profile in normal cells. Therefore, this TM extract can be further developed as a new value-added product for cosmeceutical applications.

Acknowledgement : This research was supported under Public and Private Linkage for Commercialize Research Project by Upper Northern Research Administration Network Office of the Ministry of Higher Education, Science, Research and Innovation.

A COMPARATIVE ANALYSIS OF ALLERGEN PROTEINS IN LATEX BETWEEN *HEVEA BRASILIENSIS* CLONES RRIT-251 AND RRIM-600



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Introduction: Natural rubber latex (NRL) from *Hevea brasiliensis* is widely used in rubber product manufacturers. However, proteins in NRL (Hev b 1 – b 15) can induce allergy, raising concern for medical application. Removal of allergen proteins is possible with additional processes and costs. The rubber tree clones that produce low-allergen protein contents can facilitate production and lower the cost of NRL for medical use. The present study compared the allergen protein profiling of two of the most cultivated rubber clones planted in Thailand, i.e., RRIT-251 and RRIM-600.

Materials & Methods :

- C-serum and rubber phase were separated from natural rubber latex derived from rubber two clones planted in Thailand (RRIT-251 and RRIM-600) by centrifugation techniques, **Figure 1**.
- Extracted proteins were tryptically digested and subjected to label-free quantitative mass spectrometry (MS) analysis.
- The database containing *Hevea brasiliensis* known allergen protein sequences (www.allergen.org) was searched with the Mascot search engine.

Results:

- **Figure 2** shows NRL allergen proteins identified in the C-serum and rubber phase of NRL clone RRIM-600 and RRIT-251.
- The label-free quantitative mass spectrometry analysis of allergen proteins in the rubber phase showed that Hev b 1 and Hev b 3, known as NRL major allergen proteins, were significantly higher in clone RRIM-600 than RRIT-251.
- Other NRL allergen proteins were comparable between the two clones.

Discussion & Conclusion:

- The results suggested that *Hevea brasiliensis* clone RRIT-251 is more suitable for low-allergen protein natural latex production purposes compared to RRIM-600.
- However, further comparison with other rubber tree clones is still required.
- This study paves the way to find promising clones for low-allergen protein natural latex production purposes.

References:

- Biochem Cell Biol. 2017 Apr;95(2):232-242.
- Proteome Sci. 2010 Jun 18;8:35.

Acknowledgements:

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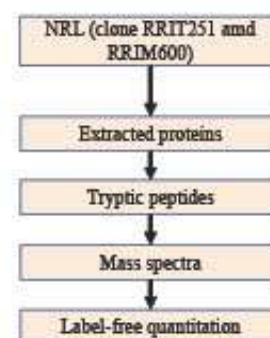


Figure 1 The workflow of this study

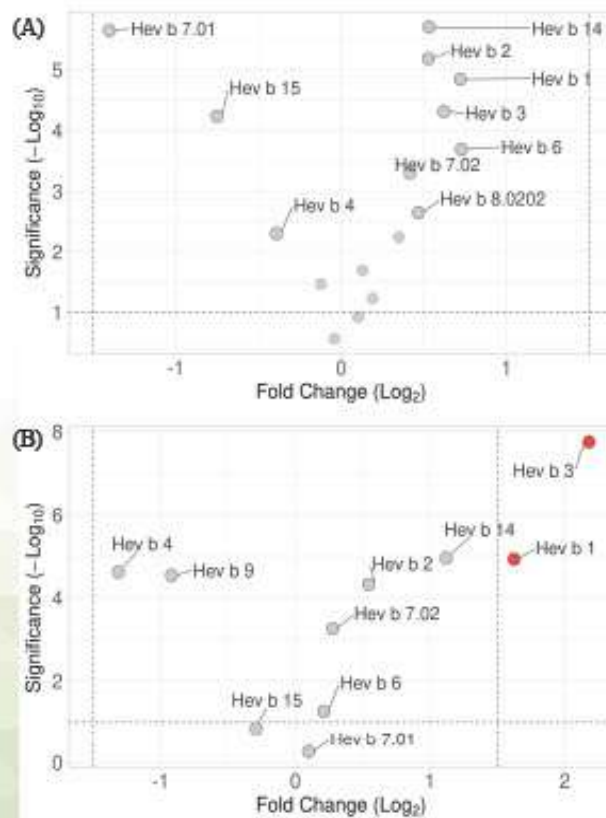


Figure 2 The relative comparison of allergen proteins in (A) C-serum phase and (B) rubber phase between NRL clone RRIM-600 and RRIT-251.

Abstract

This article offers a pedagogical suggestion in using the Barry Levinson's film *Wag the Dog* (1997) to teach about media and politics in civics education. It is appropriate for high school and university students. Movies can help make abstract political concepts more concrete; they raise a number of applicable themes that teachers can explore. When used carefully and properly, they can be effective and useful tools. In this day and age, students have become accustomed to attaining knowledge through mediums such as television and movies. Though books and text are still essential in learning, teachers should take notice of the new visual motivation. Movies are familiar in the everyday lives of students. Will the movie replace the textbook? Never. But the use of film can enhance the learning environment by placing the student in an acquainted ground, the movie theater.

Introduction

The use of movies does have some clear advantages, and students of civics do benefit from the use of film in the civics classroom. For example, it is widely regarded as scientific fact that the human memory retains information in both visual and oral formats, and that a combination of both reasoning capacities aids people in accessing, learning, and remembering information (Champoux, 1999). It is generally recognized that students can retain about 10% - 20% of what they read, but 50% - 60% of what they see and hear. We have to accept the contemporary student's attraction for visual stimulation: they get their information and ideas about the world in a visual fashion through television and the internet and have been socialized through all sorts of visual channels. It is therefore inevitable that the perceptions and information from films enter the classroom whether we like it or not (Lee, 1990). Young individuals in general, and students in particular, appear to have developed an innate ability to deal with visual content. As a result, it makes sense to consider using such information in the classroom to help with civics teaching and learning. For Robert Gregg (1998) movies and films help students learn and enhance their knowledge about politics as they constitute a 'window on the world'. Film presentations in class provide other students with a common reference point that all participants can refer to in order to clarify their discussions, perspectives, and perspectives. After viewing the film, it can serve as a practical case study because everyone in the class will be familiar with it, and it can serve as a 'hook' for a class discussion. (Waalkes, 2003).

Wag the Dog, a film made from a 1993 satirical conspiracy novel *American Hero* written by Larry Beinhart, is the rather ridiculous - and intriguingly believable - story of a president who invents a fictional war to distract the public during a campaign. It is pertinent in a lot of amazing ways. Why does a dog wag its tail? Because a dog is smarter than its tail. If the tail were smarter, the tail would wag the dog. *Wag the Dog* therefore begins with these opening credits, an early indication of a dark socio-political satire that would unfold to criticize the greedy mass media and fickle public opinion, but most importantly, the manipulation of power by political leaders. *Wag the Dog* also ridicules the naivety of society and how people's unthinking absorption of publicity only encourages the media to exploit them on a higher level. It is an interesting movie that explores the relationship of media and politics. In the movie, a spin doctor manufactures a war and creates all kinds of distractions to help his candidate win re-election as President. The major theme of the movie is whether you can trust what you see, and what is actually real. In today's era of 'fake news,' this takes on a whole new level of relevance.

Materials and Methods

After viewing *Wag the Dog*, the students were asked to participate in classroom discussion. A total of 94 students in Active Citizens course participated in the study. *Wag the Dog* is without a doubt a fun and interesting movie, and it will generate plenty of good discussion opportunities. Here are some discussion questions that could be integrated into the lesson on media and politics.

What is the Press Secretary's Job?

Wag the Dog is a great opportunity to examine the rolls of various White House and campaign staff members. One such staff member is the White House press secretary.

How Do You Know What You're Watching Is Real?

One of the other constant questions you ask yourself during this movie is, "Can I trust what I see on TV?"

How Do External Conflicts Affect Internal Politics?

The plot of *Wag the Dog* highlights another timeless idea of political science - that external conflicts united a people. In this case, a war with Albanian terrorists unites the American people to the point that they ignore a pretty big Presidential scandal. Is that really so unbelievable?

Would This Be Possible in the Age of Social Media?

Perhaps the most interesting question is: would this be possible today? If you accept the premise that inventing an entire news story was possible in a previous era where the mainstream media controlled the flow of information, then would access to social media make this easier or harder?

Other questions may include trust in the media and the relationship of foreign policy to politics.

Results

Here are some of the responses from the students:

"Interesting and amazing is the strongest emotion when I watched *Wag the Dog*. I think the characters in this movie, Conrad and Stanley, are clever because they create a very big story about the USA having a war that fools the public and they can resolve any situation."

"The strongest emotion that I felt while watching the film is excited and curious because every scene in the movie makes us want to know what is going to be next."

"This film shows that we shouldn't believe in everything that the government told us. They can do anything for themselves. Election is only a contest to usurpation. The government doesn't treat people with sincerity. The main thing that they mind about is their power to control the country."

"What happens in *Wag the Dog* could be possible in social media in this era would be the rumor of Conrad Brean that occurred in the film could reach the public faster than before. It will quickly become a trend in the public interest and of course, in addition to the information that will reach them quickly"

"I learned that every politics has two sides which mean the things I see might not be what is really there."

"It is definitely possible in this age of social media; some people always believe what the news reports and not think it carefully about what the reality is. If most people believe in something, everyone might conform to the things they see and trust it easily without a doubt."

Discussion and Conclusion

From what students have learned by watching *Wag the Dog*, all of them agree that the film explores the relationship between the media and the political system, and highlights the influence that the media has on shaping public opinion. Moreover, *Wag the Dog* highlights the fact that the media can be a powerful tool in manipulating the public. They have learned from the film that you cannot trust what you see, and what is actually real. In today's era of 'fake news,' this takes on a whole new level of significance. Furthermore, political communication theory can be used to explain the events in *Wag the Dog* and allow students to better understand the dynamic between the media and the political system.

In conclusion, showing a film in class may engage students, but engagement cannot be the only reason for showing movies in the classroom. Teachers must understand that the planning for viewing a film is what makes it an effective learning experience. Visual media can be great for learning, and not just because it's engaging. From a media literacy viewpoint, it's important for students of all ages to learn how to think critically about different types of media. Watching a movie can be an enjoyable way to teach civics, and *Wag the Dog* is an excellent choice for that.

References

- Beinhart, L. (1993). *American Hero*. New York: Patheon Books.
- Champoux, Joseph E. (1999). *Film as a Teaching Resource*. Journal of Management Inquiry 8 (2): 206-217.
- Lee, P. (1990). *Teaching Film and Television as Interpreters of History*, in John E. O'Connor (ed) *Images as Artifact: The Historical Analysis of Film and Television*, pp. 96-107. Malabar: Krieger.
- Levinson, B. (Director). (1997). *Wag the Dog* [Motion Picture].
- Gregg, Robert W. (1998). *International Relations on Film*. London: Lynne Rienner.
- Waalkes, Scott (2003). *Using Film Clips as Cases to Teach the Rise and Decline of the State*. International Studies Perspective 4 (2): 156-174.





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