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About Us

RJCM is an international journal for academics and scholars at the higher education level to communicate and share their viewpoints and academic work with fellow professionals in the areas of creative entrepreneurship and management as practiced in their fields of specializations in social sciences.

RJCM publishes three numbers per volume annually and welcomes contributors to submit their manuscript in January, May, and September of each year. We accept both academic and research papers in social sciences from contributors. The papers are double-blind peer-reviewed in each volume and published online-plus-print thrice a year.

The length of the unformatted manuscript in WORD can be 15-25 pages in length including references. The contents of the manuscript should include (1) a title with the author's name, affiliate, email address and telephone contact, (2) an abstract of 150 words with 3-5 keywords, (3) an introduction, (4) a rationale and background of the study, (5) research objectives, (6) research methodology, (7) data collection procedure, (8) data analysis, (9) results and discussion, (10) research limitation (if any), (11) conclusion, (12) the author's biography of about 50-80 words, (13) acknowledgement(s) (if any), (14) references, and (15) an appendix or appendices (if any).

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Note from Editors of *RJCM* Volume 2 Number 2

Dear *RJCM* Readers,

You are now with our second issue in Year 2 of *RICE Journal of Creative Entrepreneurship and Management* (*RJCM*). This issue contains six articles in the areas of tourism, service quality, decision factors, a model of business organization, an administration model in higher education, followed by current issues on digital learning.

In this issue, we have two papers in the area of tourism regarding service quality and tourists' decision factors: *"Passenger Experiences of Airport Service Quality at Don Mueang International Airport"* (Article 1) and *"The Factors Affecting Thai Tourists' Decision on Visiting Khlong Bang Luang Floating Market, Phasi Charoen, Bangkok*" (Article 5). We have two papers on a business organizational model and a proposed learning administration model in higher education: *"An Innovative Organization Model for Efficient Industrial Business Operations in the Digital Era"* (Article 2) and *"Learning Administration Model of Thai Higher Education in the Digital Age"* (Article 3). Two more papers deal with current issues on virtual learning management and online university courses: *"Learners' Satisfaction with Online Teaching and Learning Management in a Physics Course"* (Article 4), and *"College Degrees versus Free Online Courses"* (Article 6). These articles report interesting findings and new viewpoints in the areas under study.

Our paper contributors are researchers from four universities in Thailand: Kasetsart University, Rajamangala University of Technology Rattanakosin, Rajapruk University, Rangsit University, and one independent scholar from the packaging enterprise.

The editors-in-chief hope that the research findings and new viewpoints discussed in these papers will be interesting to both researchers and practitioners in similar fields of study. The *RJCM* editorial team and the authors would appreciate our readers' comments about these articles, if possible. We always welcome contributions from those who may wish to be part of our *RJCM* network.

Nuttapong Jotikasthira, Ph.D., Editor-in-Chief 1
Ruja Pholsward, Ph.D., Editor-in-Chief 2
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Address from RICE Director

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Dear *RJCM* Readers,

The Covid-19 pandemic has been a cornerstone of a mankind history where things have never been this obscure, uncertain, and insecure, yet revealing. People do not know what is true, what to believe, and how they would have to adapt their worldviews and cope with things in their lives. Pseudoscience, conspiracy theories, fake news, are floated around in our information reception spans. For some, the Covid-19 phenomenon may need to be observed and explained by "reading-between-the-lines" as the social structures have become somewhat opaque and power holders have kind of restraining themselves from revealing the truth.

As such, the pandemic necessitates social theories to be retested empirically whether they still can explain, not to mention to predict, the social world. Undoubtedly, it has affected people from all walks of life, certainly including researchers and academics who have still continued with their work regardless of the limited channels of communication. The articles contributed to *RICE Journal of Creative Entrepreneurship and Management* in this hard time would help fill the voids between academics and communities concerned.

I feel much obliged to all the authors for contributing the betterment of their work to academic communities. Your research in different fields of management and creative entrepreneurship certainly help reexamine the world temporarily blurred with uncertainties at the time of the pandemic.

Always with my best wishes for readers and paper contributors of *RJCM*.

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Passenger Experiences of Airport Service Quality at Don Mueang International Airport

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Abstract

This paper reports Airport Service Quality (ASQ) as a research tool for data management on passengers' perceptions of airport goods and services. The researchers selected Don Mueang International Airport (DMK) that has used the ASQ tool to assess passengers' satisfaction with the airport infrastructure and service management. This quantitative study aimed to identify the airport's strengths and areas for improvement as perceived by 350 voluntary passengers traveling on domestic flights from October to December 2020. The obtained data were analyzed for descriptive statistics, mean, chi-square, t-test, and multi-regression to assess passengers' experiential satisfaction with six aspects: (1) access to the airport, (2) check-in, (3) passport/personal ID control, (4) security, (5) finding your way around the airport, and (6) airport facilities. The results showed the airport environment as the highest in passenger satisfaction, followed by check-in, airport facilities, finding your way, and security. Overall, the participating passengers were satisfied with their airport experiences at Don Mueang, but both economy and first-class travelers did not sense differentiation in the provided services. The findings were expected to shed light on the areas of improvement in airport planning and management to meet demands of airport users for more appealing services.

Keywords: *Don Mueang International Airport, airport service quality, passenger experience, customer satisfaction*

1. Introduction

The airport serves as a hub for people traveling to their destinations and represents the country's aviation service image. Before arriving at their destination, passengers transit through an airport; therefore, its service management is of vital importance. The findings of a recent study conducted by the Airports Council International (ACI) point to air travelers having their choice of flying to and from various airports on the basis of differentiated services provided by competing airports (Pabedinskaitė & Akstinaitėa, 2013). Airport management comprises not only the areas within the airport, but also its human resources, environment surrounding the airport, access to the airport, interior decoration, services, restaurants, baggage service, mobile charging, and other airport amenities/ facilities, such as ATMs, waiting areas, and restrooms. It has been widely recognized that airports accelerate tourism growth and a country's national and international trade relations, and that they are no

longer viewed as service just for those who can afford air travel. In March 2019, the topic sparked a fresh controversy on Twitter, in a series of threads involving the International Civil Aviation Organization (ICAO). With several users questioning the claim that aviation drives sustainable growth given the huge carbon footprint of flying, the ICAO responded that international flight lifts communities out of poverty (Berti, 2019).

Airport Service Quality (ASQ) has become the world's leading airport passenger service and benchmarking program. ACI's Airport Service Quality (ASQ) as the world-renowned and globally established global benchmarking methodology measures passenger satisfaction while passing through an airport. The ASQ provides research tools and management information to help airports better understand their passengers' perspectives and what they want from their products and services (ACI, 2019). To meet the ASQ standard, the airport must execute excellent management in all areas. As a result, airport administration has to cope with the ASQ standard, and not many airports have achieved a high level of service management. The total quality of airport services is directly proportional to the number of times an airport is used and the number of times a destination is visited (Prentice, 2019).

The Bangkok IATA code was formerly assigned to Don Mueang International Airport (DMK), and was later reassigned to Suvarnabhumi Airport as an important hub of Asia and that of Thai Airways International. At its peak, it served most air traffics for the entire country, with 80 airlines operating 160,000 flights and handling over 38 million passengers and 700,000 tons of cargo in 2004. It was the 14th busiest airport in the world and the 2nd in Asia by passenger volume (Donmueang Airport, 2020). Domestic flights were also serviced at Don Mueang International Airport, such as Nok Air, Thai AirAsia, and Thai Lion Air. Terminal 1 was for international flights, Terminal 2 for domestic flights with the airport's increased capacity to 30 million passengers per year, and Terminal 3, a previous domestic terminal, was no longer in operation. In the third phase of current airport development, Terminal 3 was in the planning stages as of 2019, with construction projected between 2020–2025 to accommodate 18 million people per year. As part of the 39 billion baht project, Terminals 1 and 2 will be upgraded to 22 million domestic passengers annually, raising overall airport capacity from 30 to 40 million annually.

2. Objectives

The study had two objectives:

(1) To identify the airport's strengths and areas for improvement as perceived by passengers traveling on domestic flights, and

(2) To assess the passengers' satisfaction with the airport infrastructure and service management.

3. Literature Review

3.1 Passengers

The vital part of the airport's service management rests upon passengers who bring income to the airport. Passenger is defined as a person who is traveling in a vehicle but is not driving it, flying it, or working on it: airline/rail/train/car passengers (Cambridge Dictionary, 2020).

3.2 Passenger Experience

Pine & Gilmore (1998) defined customer experience as events that engage individuals in a personal way, and Sheth et al. (1999) explained that customer experience is shaped by social, cultural, and personal variables. Shaw & Ivens (2005) asserted that customer experience has been conceptualized as a psychological construct, which has its origin from a set of interactions between a customer and a product, a company, or part of its organization. Gentile et al. (2007) viewed customer experience as a multi-dimensional construct of elementary components, including sensorial, emotional, cognitive, pragmatic, lifestyle, and relational components. Meyer & Schwager (2007: 118) put it "customer experience is the internal and subjective response customers have to any direct or indirect contact with a company."

As cleanliness can impact customers' first impression of the service, the sanitary condition of such a place as an airport is a fundamental factor (Pijls & Groen, 2012). Hence, airports require regular cleaning and maintenance to maintain their good image. An experienced and knowledgeable facility manager can handle cleaning tasks for better quality faster and more proficiently. Thus, outsourcing airport assistance and cleaning service seem the best solutions to meet the passengers' expectations of the airport facilities at any time. As for operational efficiency, any major airport has a large number of customers and airlines crews. Passengers usually demand facilities when checking in, waiting, and boarding. Airlines require space for airplanes, facilities for routine maintenance, places for passengers and flight crews while on the ground. Air-freight companies need space for cargo airplanes. Pilots and the cabin crew need runways, facilities for aircraft storage and maintenance, and places to relax while on the ground. The growing capacity of the airport requires good planning and operational efficiency.

On-time performance is a major parameter for evaluating the operational efficiency of airlines, which is directly associated with customer satisfaction, and is positively correlated with profitability (Mellat-Parast et al., 2015). Top operational efficiency occurs when the right combination of people, processes, and technology come together to optimize business performance. A clean and safe workplace will increase airport staff productivity. Automating daily operations and administrative tasks are crucial to support the airport staff in providing good services consistently. According to a report commissioned by Amadeus Airport, airports can improve operational efficiency through the digital transformation of processes, well-executed data analytics, and insight sharing. While delivering an excellent passenger experience and improve its operational efficiency, airports also need to increase non-aeronautical (retail) revenue. For airports, ensuring passengers enjoy a smooth transit through the airport is vital: Spending increases by 2.5% for every minute a customer is in a retail area and not stuck in a queue (Atalian Global Service, 2019).

As for Safety and Security, unfortunately, airports are targets for terrorist activity. For that reason, it is crucial that airports take extremely strict security measures. The facility manager guarantees that the airport be safe and secure by monitoring, checking, and improving the security systems, video surveillance system, and other airport equipment constantly. Failure to do so may lead to undesirable conditions leading to poor operation, loss, injury, prosecution, and insurance claims to the airports. The security screening procedure is deemed necessary for air travel. However, its strict procedure can be a painful

experience for passengers. According to a survey conducted by the International Air Transport Association (IATA), airport security is one of the unpopular aspects of travel. As a result, some airports are making efforts to make the experience of being touched, scanned, and having suitcases rummaged through as painless as possible while maintaining sensitivity and courtesy toward the passenger. Airports are also introducing effective procedures to optimize the workflow during the security screening in the light of the snail-pace queues. By outsourcing technical maintenance and security service, airports also grant access to innovative ideas and leading practices from passengers that will enhance the quality of facilities and overall airport experience.

Using Innovation and Technology, facility management wants to ensure efficiency and effectiveness in coordinating demand and supply of airport facilities and services. Continuous development of innovation and new technology is useful and necessary to achieve high-quality service offered. According to Skytrax's research, being a global travel leader means constantly striving to improve, innovate and impress. A poll conducted by SITA finds airline passengers happier when technology eases their way through the airports (SITA, 2019). According to ACI World Director General, Angela Gittens in the Connected Aviation Today, investing in new and improved infrastructure, as well as making the most of existing infrastructure, is the bedrock on which smooth airport operations and improved passenger experiences are built (Seawright, 2019). New technology in surveillance monitoring systems enables digital surveillance streams to travel over the Internet so that operators in various airport departments, such as police, customs, fire and medics, baggage, and airport operations, can all monitor the video feeds from separate PC workstations. Airports and airlines can take note that technology solutions can boost passenger satisfaction, every step of the way including the cleanliness of their washrooms.

3.3 Related Research

Allen, Bellizzi, Eboli, Forciniti & Mazzulla (2020) revealed that both direct and indirect effects account for a total effect of ACCESS on OVSERVICE at 0.604. That is to say that having clear information and signposting inside the terminal makes the airport services more accessible and, at the same time, increases the sense of passengers' well-being in the terminal. In turn, passengers' satisfaction with the overall service is improved. On the other hand, having clear information and signposting inside the terminal makes control operations easier and check-in or baggage handling faster, improving passengers' satisfaction with CONTROL and OVSERVICE latent aspects. Evidence from measurement shows that accessibility to the airport services (ACCESS) is better explained for indicators related to information than signposting; specifically, the biggest standardized weight is obtained by the indicator "accessibility of information". However, a higher weight is found for the item considering the airport's physical layout because it permits easy movements of passengers. As expected, CONTROL latent construct (control operations in the terminal) is better explained by indicators related to passenger control and personal security. The terminal environment gives a sense of well-being to the passengers more if the cleanliness of the terminal and toilets are perceived as satisfactory.

Granberg & Munoz (2013) revealed the initial selection of KPI's of both the activity areas and the selection of indicators was based on results from previous work. The activity

areas are (1) airport operations including all physical movements and flows at the airport, (2) airport economy incorporating costs, income, and profit, (3) airport environmental issues consisting of noise considerations, water quality, and energy consumption, (4) airport safety and security incorporating both work to prevent and handle accidents (safety) and threats originating from humans (security) and airport, and (5) Customer Service collecting various aspects of passenger satisfaction.

Angrave (2019) concluded about good and bad passenger experiences depended on what and how customers defined efficiency, not on how airports measured it.

- The ideal passenger experience is in the airport that simply does what it's supposed to and in a pleasant environment.
- The consequences of long queues, inadequate facilities, and the wrong staff attitude are what make people use a different airport next time.
- An airport's obsessive focus on processing efficiency risks doing the wrong things well and spending resources on fixing self-inflicted problems.

The gap between what airports and passengers think is a crucial one. All the while that metrics are being collated and analyzed, if they are the wrong ones, airports will be oblivious to why passengers are exercising their choices and voices. In Barcelona last year, Andy Lester of Christchurch Airport summed it up well when he talked of rebuilding after the 2011 New Zealand earthquake and observed "If you think like an airport, you'll never understand your customers." We've seen recently a flurry of airports celebrating bigger passenger numbers and new routes with new airlines. Yet their customers react with a sigh because many of those airports are already at or beyond passenger numbers that make going through the airport a tolerable experience. At the risk of generalizing, airports aim to get as many people through the airport as possible, as efficiently as possible. It needs to be done in a way that means they can spend as much money as possible, come back as often as possible and tell everyone they know to do the same. If it moves (that is either people or bags) they can barcode, processed, and measured. How many get from A to B in as little time or at least cost becomes the primary, sometimes, sole focus. All of which makes good operational sense, given the complexity and challenges of running an airport in a way that airlines will be confident in using. But what are passengers concerned with and what is their version of what efficiency means? Kiosks with red, orange, and green buttons greet us everywhere to ask how the service was. While that allows an AQS metric to be reported and tracked, there is no qualitative, actionable insight let alone allowances for mischievous kids or cleaners tapping away as they pass. However, the travel industry is blessed with no shortage of customers willing and able to give their feedback – and that in turn creates a vast reservoir of insight not only for customers choosing an airport but for the airports to tap into themselves.

George & Gomes (2015) underlined implications regarding the use of meaningful service dimensions instead of such a large set of variables as predictors of passenger satisfaction. Moreover, the study emphasizes the need for considering how passenger characteristics may be related to different perceived levels of service quality.

Kraal, Popovic & Kirk (2009) reported potential application to airport terminal design as it advances existing knowledge of user experiences and engagement. The most significant findings presented concern the differences in interactions at the security checking domain—both before and after. This has implications for the consideration of passenger facilitation in the design of future airports.

Atalian Global Service (2019) argued that the first impressions always count. Therefore, passengers' satisfaction depends on their experience from the minute they reach the airport, expecting to feel relaxed throughout the check-in, waiting, and boarding process. The basic requirements for better customer experience at the airport weigh from the speed of baggage delivery, smooth check-in at the airport terminals, little time taken for security checks, and the cleanliness of the facilities. Even though these days most passengers have obtained a boarding pass before they arrive at the airport; however, not knowing how long it will take to move through the terminal, passengers tend to arrive very early for flights and thus spend more time waiting at the airport. The ground experience before passengers board an aircraft can be divided into these segments: getting to the airport, waiting in the terminal before security check, passing through security checkpoints, and finding the gate. It is important that practical check-in facilities improve arrival and departure flow at the airport.

Gerlif & Lund (2016) revealed that the passengers need comfortable seating in a quiet environment, a wide selection of different shops, and bright and spacious airports. Furthermore, by placing the insights from the interview data on economy class experience, the researchers concluded that airport passengers, in general, prefer aesthetic and escapist experiences. The data analysis pointed to a need for a physiological perspective in the conceptual model of passenger experience creation.

Graham, Wattanacharoensil & Schuckert (2017) asserted that air travelers tend to view their experience as a combination of separate activities (e.g., experiences provided by different parties, such as airlines, immigration, security, or duty-free), but they have a holistic judgment of overall airport environment or AE. Helkkula (2011) emphasized the experience of air travelers in an airport as event-specific. The perspectives of air travelers show the two dimensions of AE as a process and a phenomenon; and the dimensions of AE as outcomes are inter-associated. In AE as a process, airport activities concerning functional experience and service personnel received the most passenger comments. These experiences strongly associate the dimension of experience outcome, particularly with the emotional and memory aspects of air travelers.

Kirk et al. (2014) studied the perspective of air travelers even during pre-experience at an airport as mainly centered on necessary activities. These fundamental experiences, namely, functional and service personnel, are highly significant. Passengers only feel that their AE are satisfactory once these fundamental AEs are met. However, the study found that air travelers are unlikely to appreciate any additional experience provided at the airport (e.g., aesthetic and some hedonic activities) when their perceptions and memories are influenced by the negative emotional responses attributed to inefficient fundamental processes.

Ketjutarat (2020) found out that ground staff services have five areas which are (1) plane ticket sales, (2) check-in services, (3) boarding services at the gate, (4) airport

parking area services, and (5) airport services. It was found that service at the point ticket sales requires further improvement concerning service quality provided to customers. The survey of 200 passengers claims that some of 'failure' lies in staff's inability to communicate in English to full understanding for passengers. While providing services at the check-in point, staff should be better prepared when providing for service recipients; their knowledge, understanding and full attention to the passenger's needs for benefits and seat selection are of paramount importance in providing assurance to clients. The ground staff need to provide not only quality service, high reliability, empathy, and responsiveness, but also confidence and assurance toward the clients. This particular study signifies passengers be ascertained in satisfaction and needs. Airlines must collect the information to investigate the existing problem that may affect the customer experience and remedy those identified limitations for better service quality.

4. Research Methodology

4.1 Participants

The participants were 350 passengers on domestic flights to Don Mueang International Airport between October–December 2020. They were selected by quota sampling on a voluntary basis at the departure terminal, a total of 350 passengers.

4.2 Instrument

This quantitative research used a questionnaire to collect data in in three parts: the participants' general information, passenger satisfaction with Don Mueang Airport service management, and open-answer questions. The part on general information consists of gender, age, main travel purpose, and section seating in the aircraft. The second part deals with passenger experiences of airport service management in terms of (1) Accessibility to the airport; (2) Check-in; (3) Passport/personal ID control; (4) Security; (5) Finding your way; (6) Airport facilities; (7) Airport environment; (8) Cleanliness of airport terminal, (9) Ambiance of the airport, (10) Decoration of the airport. The third part taps participants' answers to open-ended questions on the cultural decoration effect and revisit intention.

5. Data Analysis

The researchers analyzed general information and the participants' responses on passenger experiences by descriptive statistics, mean, chi-square, and t-test. The response data were at five levels: Level 1= the service should be improved, Level 2 = the service is fair, Level 3 = the service is good, Level 4 = the service is very good, and Level 5 = the service is excellent. And interpretation criteria for mean values were: the average score of 1.00-1.80 for Level 1, the average score of 1.81-2.60 for Level 2, the average score of 2.61 - 3.40 for Level 3, the average score of 3.41 - 4.20 for Level 4, the average score of 4.21 - 5.00 for Level 5. The researchers used multi-regression to find out passenger experiences on the airport environment, finding your way, check-in process, airport facilities, and security. In the third part, the participants' responses to open-ended questions were analyzed by contents.

6. Results

The obtained data on passenger satisfaction with the airport service management in the three parts of the research instrument were presented below.

6.1 General Information

The survey collected passenger data from three airlines: AirAsia, Nok Air, and Thai Lion Air. The largest number of passengers collected was AirAsia at 173 (49.4%), followed by Nok Air at 97 (27.7%), and Thai Lion Air at 80 (22.9%).

Gender: of 350 domestic passengers traveling within the country, there were 222 women (63.4%), and 168 men (36.6%).

Age: of 350 domestic passengers traveling within the country, Age 16-21 years = 37 (10.5%), Age 22-25 years = 51 (14.5%), Age 26-34 years = 106 (30.3%), Age 35-44 = 83 (23.7%), Age 45-54 = 45 (12.9%), and Age 55+ = 28 (8%).

The travel purpose: of 350 domestic passengers traveling within the country, 196 (56%) travel for other purposes, 111 (31.7%) travel for tourism, and 43 (12.3%) travel for business.

Passenger class on board: of 350 domestic passengers traveling in the country, 332 (94.9%) travel in economy class, and 18 (5.1%) travel in business class.

Airplane travel frequency in the past 12 months: of 350 domestic passengers traveling in the country, 139 (39.7%) on 1-2 trips, 112 (32.0%) on 3 -5 trips, and 60 (17.1%) on 6 -10 trips.

Airport at the end of the domestic passenger: of the top 3 destinations for domestic passengers, the most frequent is Chiang Mai Airport 47 (13.4%), Phuket International Airport 33 (9.4%), and Ubon-Ratchathani Airport 29 (8.3%).

Travel types of passenger to the airport: 166 (48.1%) by taxi, 96 (27.8%) by private car, and 60 (17.2%) by bus.

Period for passengers to arrive at the airport before departure: for both domestic and international passengers, 85 (24.3%) came to the airport 1 hour-1 hour 15 minutes before departure, 79 (22.6%) 1 hour 30 minutes - 2 hours, and 56 (16.0%) 45-60 minutes before departure.

The Check-in methods: 202 (57.7%) check-in over the counter, 95 (27.1%) by telephone check-in, and 77 (22.0%) via the Internet.

The age ranges of passengers classified by airlines: 28 (33.7%) of Nok Air travelers age between 35-44, 57 (53.8%) of AirAsia travelers age between 26-34, and 22 (20.8%) of Thai Lion Air travelers age between 26-34.

The travel purpose classified by gender: 197 (56.2%) travel for returning home or studying, 110 passengers (31.5%) for tourism, and 43 (12.3%) for business.

6.2 Passenger Experiences

Table 1: Scores from Passenger Experiences in Using Service

Passenger Experiences	Measure Variable	Average	SD	Service Level
Access to the airport	A. Ground transportation to/from airport	3.78	.889	very good
	B. Parking facilities	3.39	1.087	good
	C. Value for money of parking facilities fee	3.29	1.025	good
	D. Availability of baggage carts/trolleys	3.77	.896	very good
	Total	**3.55**	**.851**	**very good**
Check-in (at this airport)	E. Waiting time in check-queue/line	4.06	.850	very good
	F. Efficiency of check-in staff	4.08	.861	very good
	G. Courtesy and helpfulness of inspection staff	4.07	.867	very good
	Total	**4.07**	**.796**	**very good**
Passport/personal ID control	H. Waiting time at passport/personal ID inspection	4.08	.863	very good
	I. Courtesy and helpfulness of inspection staff	4.07	.884	very good
	Total	**4.075**	**.835**	**very good**
Security	J. Courtesy and helpfulness of security staff	4.04	.879	very good
	K. Thoroughness of security inspection	4.00	.852	very good
	L. Waiting time at security inspection	3.96	.867	very good
	M. Feeling of being safe and secure	4.03	.863	very good
	Total	**4.00**	**.788**	**very good**
Finding your way	N. Ease of finding your way through the airport	3.95	.871	very good
	O. Flight information screens	4.01	.864	very good
	P. Walking distance inside the terminal	3.76	.966	very good
	Q. Ease of making connections with other flights	3.82	.908	very good
	Total	**3.89**	**.798**	**very good**

Passenger Experiences	Measure Variable	Average	SD	Service Level
Airport Facilities	R. Courtesy and helpfulness of airport staff (Excluding check-in, passport control and security)	3.99	.831	very good
	S. Restaurant/Eating facilities	3.91	.885	very good
	T. Value for money of restaurant/eating facilities	3.43	1.065	very good
	U. Availability of bank/ATM facilities/Money changers	3.85	.904	very good
	V. Shopping facilities	3.72	.888	very good
	W. Value for money of shopping facilities	3.46	1.038	very good
	X. Internet access/Wi-Fi	3.41	1.062	very good
	Y. Business/Executive lounges	3.72	.921	very good
	Z. Availability of washrooms/toilets	3.92	.936	very good
	AA. Cleanliness of washrooms/toilets	4.07	.846	very good
	BB. Comfort of waiting/gate areas	4.04	.838	very good
	Total	**3.78**	**.708**	**very good**
Airport Environment	CC. Cleanliness of airport terminal	4.18	.825	very good
	DD. Ambience of the airport	4.09	.796	very good
	Total	**4.135**	**.790**	**very good**
Overall Satisfaction with the airport		**4.09**	**.767**	**very good**

Table 1 shows results of the passengers' experience at Don Mueang International Airport. the study found that the service scores were very good. The service users were most satisfied with the cleanliness of the terminal building with a mean score of 4.18 (S.D. = .825), followed by overall satisfaction with Don Mueang International Airport with a mean score of 4.09 (S.D. = .767), and an overall atmosphere of the airport with a mean score of 4.09 (S.D. = .824). All three criteria were at a very good service level. The points with the low scores were C "Value for money of parking facilities fee" at 3.29 (S.D. = 1.025), followed by B "Parking facilities" at 3.39 (S.D. = 1.087), at a good service level.

The overall service quality of passengers on their experiences at Don Mueang International Airport was very good, which had an overall satisfaction mean of 4.09 (S.D. = .767)

Table 2: Experience Scores of Don Mueang International Airport Service Classified by Gender

Passenger Experiences	Male		Female		Total	
	Mean	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
Access to the airport	3.4109	.89001	3.6190	.82421	3.5474	.79614
A. Ground transportation to/from airport	3.67	.901	3.84	.877	3.78	.889
B. Parking facilities	3.22	1.145	3.49	1.047	3.39	1.087
C. Value for money of parking facilities fee	3.15	1.024	3.36	1.021	3.29	1.025
D. Availability of baggage carts/trolleys	3.69	.960	3.81	.859	3.77	.896
Check-in (at this airport)	4.0560	.84533	4.0691	.76835	4.0643	.79614
E. Waiting time in check-queue/line	4.01	.934	4.10	.798	4.06	.850
F. Efficiency of check-in staff	4.09	.895	4.07	.844	4.08	.861
G. Courtesy and helpfulness of inspection staff	4.09	.886	4.06	.857	4.07	.867
Passport/personal ID control	4.0413	.86020	4.0936	.82209	4.0750	.83496
H. Waiting time at passport/personal ID inspection	4.05	.880	4.09	.855	4.08	.863
I. Courtesy and helpfulness of inspection staff	4.04	.907	4.08	.872	4.07	.884
Security	3.9667	.80108	4.0283	.78215	4.0060	.78839
J. Courtesy and helpfulness of security staff	3.98	.914	4.07	.859	4.04	.879
K. Thoroughness of security inspection	3.98	.837	4.01	.863	4.00	.852
L. Waiting time at security inspection	3.90	.954	4.00	.813	3.96	.867
M. Feeling of being safe and secure	4.01	.846	4.04	.874	4.03	.863
Finding your way	3.9183	.81880	3.8832	.78750	3.8958	.79770
N. Ease of finding your way through airport	3.95	.886	3.95	.864	3.95	.871
O. Flight information screens	4.00	.867	4.02	.864	4.01	.864
P. Walking distance inside the terminal	3.76	1.037	3.76	.926	3.76	.966
Q. Ease of making connections with other flights	3.82	.944	3.82	.890	3.82	.908
Airport Facilities	3.8114	.63366	3.8561	.74117	3.8419	.70760
R. Courtesy and helpfulness of airport staff (excluding check-in, passport control and security)	4.00	.789	3.99	.856	3.99	.831
S. Restaurant/Eating facilities	3.86	.830	3.94	.916	3.91	.885
T. Value for money of restaurant/eating facilities	3.28	1.113	3.51	1.031	3.43	1.065
U. Availability of bank/ATM facilities/Money changers	3.88	.870	3.84	.925	3.85	.904
V. Shopping facilities	3.70	.858	3.73	.906	3.72	.888

Passenger Experiences	Male		Female		Total	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
W. Value for money of shopping facilities	3.34	1.068	3.52	1.018	3.46	1.038
X. Internet access/Wi-Fi	3.38	1.100	3.42	1.042	3.41	1.062
Y. Business/Executive lounges	3.65	.985	3.75	.889	3.72	.921
Z. Availability of washrooms/toilets	3.94	.857	3.90	.979	3.92	.936
AA. Cleanliness of washrooms/toilets	4.15	.795	4.03	.874	4.07	.846
BB. Comfort of waiting/gate areas	4.09	.804	4.02	.858	4.04	.838
Airport Environment	4.1339	.74920	4.1312	.81379	4.1322	.78974
CC. Cleanliness of airport terminal	4.20	.787	4.16	.848	4.18	.825
DD. Ambience of the airport	4.07	.765	4.10	.814	4.09	.796
Overall Passenger Experiences	4.05	.719	4.12	.793	4.09	.767

Table 2 shows the passengers' experience of Don Mueang International Airport service, classified by gender, that females and males were satisfied with the airport environment. Males were satisfied with a mean score of 4.1339 (S.D. =. 74920), while females were satisfied with a mean score of 4.1312 (S.D. =. 81379) at a very good service level.

Table 3: Overall Passenger Experience Score of Don Mueang International Airport

Score	Number	Percentage	Service Level
3	88	25.1	Good
4	142	40.6	Very Good
5	120	34.3	Excellent
Total	**350**	**100.0**	

Table 3 affirms the overall of passenger experience at Don Mueang International Airport at 40.6% as very good.

Table 4: Passenger Experiences at Don Mueang Airport Service in Order of Importance

No	Passenger Experiences		Number of passengers	Percentage
1	A	Ground transportation to/from the airport	51	14.6
2	N	Ease in finding your way through the airport	25	7.1
	B	Parking facilities	25	7.1
3	E	Waiting time in check-queue/line	24	6.9
4	C	Value for money of parking facilities fee	17	4.9
5	J	Courtesy and helpfulness of security staff	11	3.1
6	H	Waiting time at passport/personal ID inspection	10	2.9
	M	Feeling of being safe and secure	10	2.9
7	O	Flight information screens	9	2.6
8	K	Thoroughness of security inspection	8	2.3

No	Passenger Experiences		Number of passengers	Percentage
9	Z	Availability of washrooms/toilets	7	2.0
10	R	Courtesy and helpfulness of airport staff (Excluding check-in, passport control and security)	6	1.7
	X	Internet access/Wi-Fi	6	1.7
11	D	Availability of baggage carts/trolleys	5	1.4
	G	Courtesy and helpfulness of inspection staff	5	1.4
12	I	Courtesy and helpfulness of inspection staff	4	1.1
13	F	Efficiency of check-in staff	3	.9
	P	Walking distance inside the terminal	3	.9
	S	Restaurant/Eating facilities	3	.9
	U	Availability of bank/ATM facilities/Money changers	3	.9
	W	Value for money of shopping facilities	3	.9
14	L	Waiting time at security inspection	1	.3
	V	Shopping facilities	1	.3
	Y	Business/Executive lounges	1	.3
	T	Value for money of restaurant/eating facilities	1	.3
Total			**243**	**69.1**
Passenger who did not respond			**107**	**30.6**

Table 4 indicates that 243 respondents viewed the quality of service as the first in importance. Considering service quality, 107 (30.6%) identified the top 10 indicators that affect the quality of service as follows:

1) A Ground transportation to/from the airport
2) N Ease of finding your way through the airport
3) E Waiting time in check-queue/line
4) C Value for money of parking facilities fee
5) J Courtesy and helpfulness of security staff
6) H Waiting time at passport/personal ID inspection
7) O Flight information screens
8) K Thoroughness of security inspection
9) Z Availability of washrooms/toilets
10) R Courtesy and helpfulness of airport staff (excluding check-in, passport control, and security)

The relationship between gender and the travel purpose is shown in Table 5.

Table 5: Number and Chi-square Values of Relationship between Gender and Travel Purpose

Travel Purpose	**Gender**				
	Male		**Female**		
	Number	**%**	**Number**	**%**	
Business	23	18.1	19	8.7	Pearson Chi-square P=.098
Tourism	40	31.5	69	31.7	
Others	64	50.4	130	59.6	
	127	100.0	218	100.0	

* Significantly at the .05 level

Statistical assumptions

H_0: p = 0 travel purpose in not dependent on gender

H_1: p ≠ 0 travel purpose is dependent on gender

P (probability) = 0.098, α (significance level) = .05.

Therefore, the P-value is more than the α, so accepted H0 and rejected H1.
In conclusion, the travel purpose is not dependent on gender at the significance level 05.
Table 5 shows the travel purpose is independent on gender at the significance level .05, with 64 people (50.4%) with other purposes for travel, and 130 women (59.6%) also with other travel purposes.

Table 6: Number and Chi-square of the Relationship between Age and Travel Purpose

Age	**Travel Purpose**						
	Business		**Tourism**		**Others**		
	Number	**%**	**Number**	**%**	**Number**	**%**	
16-21	1	2.3	8	7.3	26	13.4	Pearson Chi-square P = .144
22-25	6	14.0	13	11.8	32	16.5	
26-34	9	20.9	42	38.2	55	28.4	
35-44	17	39.5	22	20.0	44	22.7	
45-54	8	18.6	14	12.7	22	11.3	
55-64	2	4.7	8	7.3	10	5.2	
65-75	0	0	3	2.7	4	2.1	
more than 76	0	0	0	0	1	0.5	
Total	**43**	**100**	**110**	**100**	**194**	**100**	

* Significantly at the .05 level

Statistical assumptions

H_0: p = 0 travel purpose is not dependent on age

H_1: p ≠ 0 travel purpose is dependent on age

P (probability) = 0.144, α (significance level) = .05.

Therefore, the P-value is more than the value α, so accepted H_0 and rejected H_1.
In conclusion, the purpose of the trip is not dependent on the age range at the significance level .05.

Table 6 shows the travel purpose not dependent on age at the significance level 05.

Age 35-44, 17 respondents (39.5%) with the travel purpose for business,
Age 26-34, 42 respondents (38.2%) with the travel purpose for tourism,
Age 26-34, 55 respondents (28.4%), or 28.4%, with travel purposes for other reasons.

Comparison of differences between independent variables with Independent – Samples T-Test is shown in Table 7.

Table 7: Mean, Standard Deviation and Experience in Using Airport Services Classified by Gender

Experience of Don Mueang International Airport Service	**Male**		**Female**		**t**	**p**
	Mean	**S.D.**	**Mean**	**S.D.**		
Transportation	*2.8366*	*1.22854*	*3.1044*	*1.24330*	*-1.938*	*.053*
Transport	3.44	1.247	3.56	1.309	-.821	.412
Parking	2.47	1.697	2.85	1.649	-2.047	.041*
Value of money of parking	2.39	1.623	2.64	1.652	-1.351	.177
Baggage carts	3.08	1.631	3.38	1.461	-1.746	.082
Check-in	*4.0052*	*.93622*	*4.0336*	*.82764*	*-.293*	*.770*
Check-in waiting	3.95	1.052	4.05	.922	-.971	.332
Check-in efficiency	4.02	1.023	4.04	.917	-.167	.867
Check-in courtesy	4.06	.954	4.01	.965	.428	.669
Passport	*3.8398*	*1.20356*	*4.0550*	*.89247*	*-1.759*	*.080*
Passport waiting	4.06	.926	4.06	.926	-1.725	.085
Inspection staff	3.82	1.276	4.05	.942	-1.776	.077
Security	*3.9063*	*.83419*	*3.9493*	*.93093*	*-.431*	*.667*
Security staff	3.83	1.185	3.92	1.131	-.732	.464
Thoroughness	3.98	.837	3.94	1.039	.335	.738
Inspect timing	3.81	1.114	3.92	1.004	-.912	.363
Feeling in safety	4.01	.846	4.00	.979	.075	.940
Finding a way	*3.6953*	*.92213*	*3.7087*	*.89804*	*-.133*	*.895*
Easy to find a way	3.95	.886	3.92	.940	.304	.762
Screens	3.94	.994	3.98	.976	-.361	.718
Walking distance	3.73	1.085	3.73	.990	-.065	.949
Connections	3.16	1.683	3.20	1.639	-.205	.838
Facilities	*3.4374*	*.82852*	*3.5718*	*.84380*	*-1.436*	*.152*
Airport staff	3.84	1.097	3.87	1.097	-.190	.849
Restaurants	3.77	1.008	3.84	1.104	-.658	.511
Value of money of restaurant	3.16	1.264	3.46	1.120	-2.312	.021*
Bank	3.51	1.408	3.66	1.243	-.989	.323
Shopping	3.23	1.466	3.54	1.219	-2.064	.040*
Value of money of shopping	3.05	1.388	3.33	1.271	-1.913	.057
Internet	2.85	1.593	3.07	1.447	-1.299	.206
Lounge	2.11	1.957	2.58	1.892	-2.217	.027*
Adequacy of washroom	3.91	.922	3.91	.975	.055	.956

Experience of Don Mueang International Airport Service	**Male**		**Female**		**t**	**p**
	Mean	**S.D.**	**Mean**	**S.D.**		
Cleanliness of washroom	4.15	.795	4.04	.866	1.145	.253
Comfortable	4.16	.867	4.15	.890	.631	.529
Environment	*4.1172*	*.76971*	*4.1193*	*.85706*	*-.023*	*.982*
Cleanliness of terminal	4.16	.867	4.15	.890	.129	.897
Ambience	4.07	.765	4.09	.857	-.184	.855
Overall	***4.05***	***.719***	***4.12***	***.791***	***-.904***	***.355***

* Significantly at the .05 level

Statistical assumptions

(1) Parking

Statistical assumptions

H_0: $\mu_{male} = \mu_{female}$ Male and female have no different opinions on their experiences of using parking services at Don Mueang International Airport

H_1: $\mu_{male} \neq \mu_{female}$ Males and females have different opinions about their experiences in using the parking services at Don Mueang International Airport.

P (probability) = .041, α (level of significance) = .05.

Therefore, the value of P is less than the α (equivalent to Sig.), thus rejected H_0, accepted H_1.

It can be concluded that males and females have different opinions on their experiences of using parking services at Don Mueang International Airport, at the significance level .05.

(2) Restaurants and dining places

Statistical assumptions

H_0: $\mu_{male} = \mu_{female}$ Male and gender have no difference in their experience of using restaurants and dining places

H_1: $\mu_{male} \neq \mu_{female}$ Males and genders have different opinions on their experiences of using restaurants and dining places at Don Mueang International Airport.

P (probability) = .021, α (level of significance) = .05.

Therefore, the value of P is less than the α (equivalent to Sig.), thus rejected H_0, accepted H_1.

It can be concluded that males and females have different opinions on experiences in using restaurants and dining places at Don Mueang International Airport, at the significance level .05.

(3) Duty-free shops/other shops

Statistical assumptions

H_0: $\mu_{male} = \mu_{female}$ Male and gender have no different opinion on duty-free shops/other shops at Don Mueang International Airport.

H_1: $\mu_{male} \neq \mu_{female}$ Males and gender have different opinions on duty-free shops/other shops at Don Mueang International Airport.

P (probability) = .040, α (significance level) = .05.

Therefore, the value of P is less than the α (equivalent to Sig.), thus rejected H_0, accepted

H_1.
It can be concluded that males and females have different opinions about their experiences in duty-free shops/other shops at Don Mueang International Airport, at the significance level .05.

(4) Lounge for business/management
Statistical assumptions
H_0: $\mu_{male} = \mu_{female}$ Males and genders have no different opinions on their business/management lounge experiences at Don Mueang International Airport
H_1: $\mu_{male} \neq \mu_{female}$ Males and genders have different opinions on their business/management lounge experiences at Don Mueang International Airport
P (probability) = .027, α (level of significance) = .05.
Therefore, the value of P is less than the α (equivalent to Sig.), thus rejected H_0, accepted H_1.
It can be concluded that males and females have different experiences in using management business/ lounges at Don Mueang International Airport, at the significance level .05.
Table 7 shows the results of the data analysis comparing the differences of service experience at Don Mueang International Airport classified by gender, that the overall service experience satisfaction was not different at the significance level .05. There were statistically significant differences at the level .05 of 4 items as follows: (i) Parking: the female respondents were more satisfied with the parking experience than the male respondents; (ii) Restaurants and dining places: the female respondents were more satisfied with the restaurant service and dining experience than the male respondents; (iii) Duty-free shops/shops, the female respondents were more satisfied with the service experience in duty-free shops/other stores than the male respondents; (iv)Business/management lounges, the female respondents were more satisfied with the business/executive lounge experience than the male respondents.

Table 8: Coefficients of Experience of Don Mueang International Airport Service

Experience of Don Mueang International Airport Service	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
Airport Environment	1.463	.151		9.680	.000
	.628	.035	.689	17.737	.000
Airport Environment	1.087	.150		7.253	.000
Finding Your Way	.495	.038	.543	13.121	.000
	.247	.034	.303	7.322	.000
Airport Environment	.865	.154		5.630	.000
Finding Your Way	.442	.038	.485	11.537	.000
Check-in Process	.181	.036	.222	5.061	.000
	.171	.037	.201	4.605	.000

Experience of Don Mueang International Airport Service	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Airport Environment	.793	.152		5.203	.000
Finding Your Way	.404	.039	.443	10.293	.000
Check-in Process	.133	.038	.163	3.518	.000
Airport Facilities	.157	.037	.184	4.258	.000
	.135	.038	.159	3.579	.000
Airport Environment	.745	.152		4.890	.000
Finding Your Way	.380	.040	.417	9.479	.000
Check-in Process	.103	.039	.127	2.639	.000
Airport Facilities	.134	.038	.157	3.541	.000
Security	.123	.038	.144	3.250	.001
	.099	.039	.120	2.511	.013

Table 9: Analysis of Variance of Experience of Don Mueang International Airport Service

Experience of Don Mueang International Airport Service		Sum of Squares	Df	Mean Square	F	Sig.
Airport Environment	Regression	97.367	1	97.367	314.591	.000
	Residual	107.707	348	.310		
	Total	205.074	349			
Finding Your Way	Regression	111.780	2	55.890	207.880	.000
	Residual	93.294	347	.269		
	Total	205.074	349			
Check-in Process	Regression	117.168	3	39.056	153.725	.000
	Residual	87.906	346	.254		
	Total	205.074	349			
Airport Facilities	Regression	120.315	4	30.079	122.431	.000
	Residual	84.759	345	.246		
	Total	205.074	349			
Security	Regression	121.840	5	24.368	100.711	.000
	Residual	83.234	344	.242		
	Total	205.074	349			

Table 10: Multiple Regression Analysis of Experience of Don Mueang International Airport Service

Experience of Don Mueang International Airport Service	R	R Square	Adjusted R Square	Std. Error of the Estimate
Airport Environment	.689	.475	.473	.55633
Finding Your Way	.739	.545	.542	.51852
Check-in Process	.756	.571	.568	.50405
Airport Facilities	.766	.587	.582	.49566
Security	.771	.594	.588	.49189

Tables 9, 10, and 11 show the airport environment as the most significant factor that can explain passenger satisfaction, followed by a process-oriented experience, starting from check-in, to airport facilities and finding your way, and security perception—all equally important. The other two factors--passport control and arrival services--are considered not indirectly explaining satisfaction, but could play a moderating role; that is, the less favorable experience is associated with less favorable of the factors affecting satisfaction. For connecting flights, finding your way becomes significantly more important than the other factors. Overall, passengers of all flight classes are quite satisfied with the airport experiences. It was noted that those in the economy class had a rather relatively low level of satisfaction. Overall, the airport has not been able to differentiate its services for the first class passengers. In this regard, the airport should take the point on service differentiation into a serious consideration when planning for improvements in passengers' service experiences for the airport's overall images of quality service.

6.3 Open-Ended Questions

The open-ended questions asked passengers to identify the service elements they consider of the best quality. The results were the top ten best and the top ten worst as follows:

(1) Employee service and support including politeness, friendliness, and smiling staff,
(2) Airport cleanliness and environment including the cleanliness of the bathroom and the waiting area, nice and quiet atmosphere,
(3) Check-in system,
(4) Speed of service both in terms of check-in, passport examination, security check,
(5) Good overall,
(6) Information search including results at getting to the boarding gate,
(7) Facilities especially having enough seats,
(8) Access to various shops and money exchange points,
(9) Security systems, and
10) Food and beverage shops.

The top ten worst service elements were:

(1) Food and drinks are expensive and lack variety on menu, particularly vegetarian dishes,
(2) Cleanliness / Bathroom queuing,
(3) Information search for combined routes and exits too distant,
(4) Facilities inside the airport with unpleasant smell, insufficient chairs in the waiting area,
(5) There is no smoking area,
(6) Check-in staff not polite with poor attitude toward passengers waiting in long lines,
(7) Parking services too expensive,
(8) Internet / Wireless access Wi-Fi not connected well to the system,
(9) Employees not paying attention to the service, rather laxed in security, for example, officers pass without passport check, and
(10) delayed service.

7. Discussion and Conclusion

This study aimed to identify the airport's strengths and areas for improvement as perceived by passengers traveling on domestic flights, and to assess the passengers' satisfaction with the airport infrastructure and service management. This study found that *the airport environment* is the most important factor that can explain passenger satisfaction, in accordance with Subha, Bina & Archana (2012) who emphasized passenger satisfaction as stemming from airport service quality being fulfilled or exceeding the passenger expectation. While airport service cannot meet passengers' expectations of accomplished needs, Pijls & Groen (2012) asserted that cleanliness be the key to customers' first impression of the service and experience regarding sanitary conditions as a fundamental factor. Hence, airports require regular cleaning and maintenance to maintain their sanitation image. An experienced and knowledgeable facility manager will be able to monitor cleaning tasks for good quality services. Angrave (2019) highlighted the airport's pleasant environment as the first priority in an ideal passenger experience for a pleasant environment.

As for the process-oriented experience, starting with "check-in, to airport facilities and finding your way, of course, security perception is crucial. The other two elements--passport control, and arrival services--are thought to play a moderate influence on satisfaction, rather than directly accounting for it. The less pleasant experience is also linked to the less favorable of the previously stated characteristics as well as contentment. Finding your way becomes far more essential than not finding your way on connecting flights. Overall, passengers in all flight classes are pleased with their airport experiences at Don Mueang International Airport. However, the economy class passengers were less satisfied than those in the business and first class. Overall, the airport has not been able to differentiate its services for first-class travelers, and it is possible that the airport could investigate into this matter to enhance its overall image and experiences for economy-class visitors, as earlier discussed by Angrave (2019).

Passenger experiences have been widely recognized as one of the most important factors for airport service excellence. Where good encounters were reported, 98 percent of the remarks fell into one of two categories: it worked or it was in a pleasant atmosphere. Each category may appear self-evident, and it is to a considerable extent. Definitely, it is clear why passengers are constantly complaining to one another about those situations when things are not working. The outcome usually turns out as a result of inefficiency in service management. Airport encounters don't have to be all that exciting, but all the essentials in service provision need to be delivered effectively and regularly as expected by customers. In their assessments, a significant percentage of passengers used the word "efficient," referring to items of their concerns. Everything should function as it is supposed to, and when passengers need to interact with personnel, they look for greetings with politeness and helpfulness. Getting to the airport is in fact simple, but giving a pleasant experience is complex. It takes good and proactive service management to be able to deliver to passengers a pleasant environment that satisfies them with experiential services to ensure their revisit to the airport of their choice.

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An Innovative Organization Model for Efficient Industrial Business Operations in the Digital Era

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Abstract

The objective of this research was to propose an innovative organization model for efficient industrial business operations in the digital era under the new normal condition in Thailand. The researchers used a qualitative method by conducting in-depth structured interviews with 50 business executives from 50 best practices in the industrial sector, participating in the study on a voluntary basis. Data collection was done in four stages: (1) analysis of documents and relevant research reports, (2) data collection and model component categorization, (3) analysis and synthesis of the categorized components, and (4) component validation and verification by seminar with nine experts. The research results revealed that an innovative organization model for efficient industrial business operations in the digital era under new normal situation in Thailand consists of eleven elements: (1) establishing a vision and strategy that will lead to an innovation organization; (2) setting an appropriate innovation organizational structure; (3) creating an organizational culture that supports all dimensions of innovation; (4) setting models, processes and practices that facilitate innovation; (5) determining appropriate hardware, software and digital platforms for service; (6) developing innovative leadership team striving for a systematic innovation organization; (7) forming the team with innovative habits in creating quality innovation; (8) creating uniqueness of atmosphere and innovative ecosystem; (9) creating efficiency in innovative knowledge management; (10) encouraging personnel to initiate and exchange knowledge freely; and (11) inspiring digital learning across the organization.

Keywords: *Innovative organization, industrial business, digital era, new normal situation.*

1. Introduction

The 21st century has arrived with global rapid changes driven by knowledge, innovation, technology, society, culture, and public demand for environmental friendliness (Edwards-Schachter, 2018). Thailand has currently faced disruption and risks in the development of the

country in almost every dimension. In the midst of the changes in modern society that relies on knowledge known as the knowledge-based society, Thailand has stepped into a new dimension of digital life. In all types of organizations--the government sector, the business sector, state enterprises, and services, it is necessary to build talents with determination to meet the expectations of society as an advantage under the conditions of competition. Especially in the small industrial sector, small- or medium-sized enterprises (SMEs) are regarded as the main source of employment in the country and are vitally important to the economy for various reasons: (1) help create jobs, (2) create added value, (3) generate income, (4) reduce imports of foreign products, (5) operate cost-effective business, (6) link with large-scale activities and other manufacturing sectors, (7) be a source of skill development, and (8) strengthen the Thai economy. This is a necessity for executives at all levels to pay close attention to their own knowledge and continuous changes in business development and management to survive and achieve its objectives. As Charles Darwin (1809-1882) said, "It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change."

As widely known, in the digital economy, the world's trade and service model has changed dramatically. The export structure of Thailand over the past 40 years has changed along with the other newly industrialized countries in Asia, namely Taiwan, South Korea and Singapore. The importance of resource-based products and labor-intensive products tends to decline while science-based products are on the rise. Such a trend requires research and development (R&D) as well as creative design for new products. When considering the proportion of investment and expenditure on research and development with the Gross National Product (GDP), entrepreneurs need to look at the innovation development process for success in business investment and operations. Fostering an innovative culture and the creation of innovative systems and organizations definitely counts for business success in the digital age (Serdyukov, 2017; Brunetti et al., 2020). The country's competitive advantage in education and human resource development is essential in that search for new knowledge for applications in modern technology and adaptation to benefit life and work efficiently. Therefore, for industrial enterprises to succeed and survive in the rapidly changing world, their leaders need to create innovation from their traditional organization top to bottom in the first place. Their operations and plans must be transformed into those of an innovative organization (World Bank, 2019; Brunetti et al., 2020), which requires an effective management development model. New administration and personnel need training in application of technology and innovation, and new innovative habits for employees at all levels in the organization. This will result in new working styles and digital learning modes for industrial business organizations in line with the digital age society. Creativity as the origin of innovation has been a valuable intangible asset that makes excellence possible in business productions and operations, yet not easy to find in personnel of an organization (Phakamas et al., 2021). Moreover, it has been noted that the concepts of excellence, luxury and prestige count for a positive image of the organization from the perspective of stakeholders regarding image creation and overall performance. These concepts help identify a unique vision, mission, structure and culture, and the creation of a

physical environment to return benefits to the society. Striving to develop excellence in each area of the organization is the overall image or reputation for organizational excellence (QE). Organizational excellence arises from the components of an organization—intelligence in learning and innovation (Sriboonnark, 2020).

Since the creative economy is driven by innovation, its system is dynamic in nature and rapidly changing. Thus, the characteristics of modern human resources rest upon communication, creativity, cooperation, coordination and adaptation for higher value of products or services than those in basic manufacturing. The digital learning network can connect individuals, departments and organizations together, enable the exchange of knowledge, ideas, information, news and resources, and promote missions for greater success and efficiency (Alves et al., 2018). In this regard, the researchers of this study explored innovative organizational patterns for efficient digital business operations under the new normal condition in Thailand. A qualitative research method was used to collect data from Thai best-practice businesses on the importance of innovation, the process of creating and developing innovation, dissemination of innovation, and creation of an innovative organization in the digital age industry under the new normal condition. The researchers expected to identify a business operations model with practical components as a guideline to help develop innovative organizations in the business and industrial sector pertinent to the National Strategy 20 Years 2018-2037 of Thailand.

2. Objectives

The objective of this research was to propose an innovative organization model for efficient industrial business operations in the digital era under the new normal condition in Thailand.

3. Research Methodology

The researchers used a qualitative research method to identify the innovative organization model for efficient digital industrial business operations under the new normal condition in Thailand.

3.1 The Participants

The participants were 50 key executive informants from 50 best-practice industrial businesses in Thailand by purposive sampling. Their specific variables were:

(1) They were business executives or entrepreneurs of the industrial sector who have received awards in various categories or quality system certification from the Ministry of Industry Thailand, other ministries, or institutions.

(2) Their companies are listed on the Stock Exchange of Thailand (SET) with paid-up capital after IPO of 300 million baht or more.

(3) Their companies are listed on the secondary market (MAI) with paid-up capital after IPO of 50 million or more.

(4) They had management experience in the industrial business group for small- and medium-sized enterprises (SMEs) for at least 3 years.

(5) They were successful executives or entrepreneurs with an empirical quality award for creating an innovative organization at all levels.

3.2 The Research Instrument

The research instrument was structured interview with open-ended questions on the issues on digital innovation organizations for efficient digital industrial business operations under the new normal condition in Thailand. The listed issues on innovative organizations included:

(1) Definition of industrial business innovation,
(2) Process of industrial business innovation creation and development,
(3) Dissemination of industrial business innovation,
(4) Creating innovative organizations in business, industry, digital, powerful under way of a new normal,
(5) Factors of innovative organizations in business, industry, digital, powerful under way of a new normal, and
(6) Innovative organization model for efficient digital industrial business operations under the new normal condition.

The instrument was presented to the experts for content validity, and then tested for internal consistency of the items by Cronbach's Alpha Coefficient at 0.986.

4. Data Collection

4.1 There were four steps prior to data collection:

1) Analyzing relevant documents and research reports
2) Planning for data collection and determining model components
3) Synthesizing a model
4) Verifying model components by nine experts in innovation and technology (connoisseurship)

4.2 Data collection was by interviewing 50 participating business executives both

offline and online between January - March 2021.

5. Data Analysis

The researchers analyzed the obtained interview data by content analysis to synthesize a model of an innovative organization with efficiency in digital industrial business under the new normal condition in Thailand.

6. Results of the Study

The research results from data analysis were reported according to the research objectives as follows:

6.1 Definition of Industrial Business Innovation

Innovation introduces new ideas, new practices, or new inventions, or improved aspects of a product or service to suit the current situation. In general, they are tested, proved and developed step by step in a systematic way to ensure their reliability, better results, and improved practices. The aspects of efficiency in industrial business innovations include:

1. Business Strategy Concepts Innovation
2. Service and Product Innovation
3. Delivery Innovation
4. Process and Organization Administration Innovation
5. Process Interaction Innovation

6.2 Process of Industrial Business Innovation and Creation

The researchers comprehensively analyzed literature and research reports related to innovation, followed by in-depth interviews with 50 industrial business executives to conclude the process of creating and developing industrial business innovations of high quality as six standard steps in accordance with the work by Konst & Kairisto-Mertanen (2020). They are:

Step 1: Determining: determine what to develop, that is, set goals and key points in solving problems or developing desirable attributes of innovation.

Step 2: Identifying: identify innovation, that is, find the conceptual framework of the learning process which consists of media or materials, equipment, techniques, methods and processes that are thought to be most appropriate for solving problems or developing business operations to meet needs.

Step 3: Creation and Development: create and develop, that is, determine the method for creating the innovations in detail with a quality audit and a performance audit during creation and development. And then complete the innovation to meet the requirements by using the research and development (R&D) process.

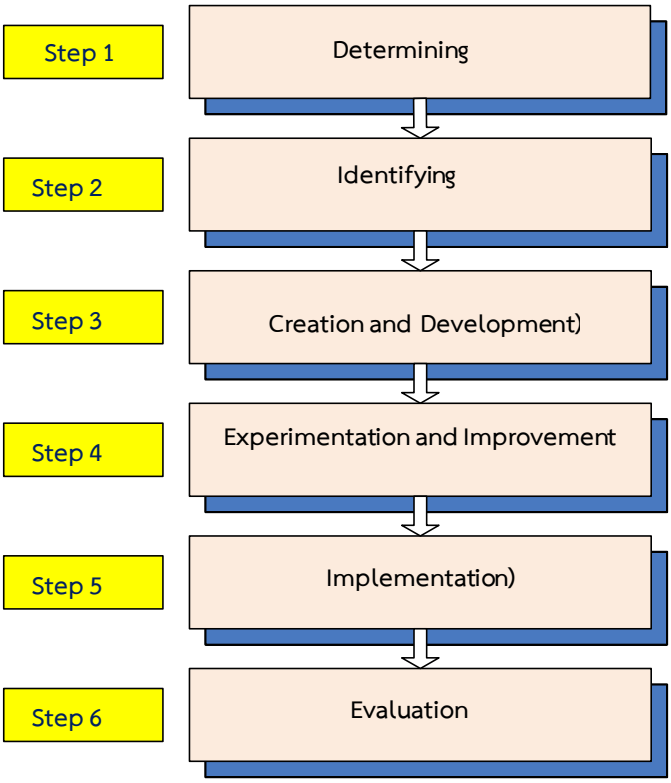
Step 4 Experimentation and Improvement: trial and improve, that is, improve and complete before using it. This includes the examination of quality by determining the effectiveness or efficiency of the innovation.

Step 5 Implementation: apply in a real situation, that is, experiment with innovations and improve them until they are in the expected quality of the innovation and then put it into practice in the real operations while collecting data along from time to time.

Step 6 Evaluation: evaluate the use, that is, collect data on the results of the innovation by various techniques, which will reflect the quality as specified to be used for report writing of research and development, to further expand the results and disseminate the innovations.

The overall process of industrial business innovation and creation is summarized in Figure 1

Figure 1: Process of Industrial Business Innovation and Creation



6.3 Dissemination of Industrial Business Innovation

Dissemination is a process through which innovation is transmitted through communication channels for a period of time to gain acceptance from members of a social system. According to the analysis of the nature of dissemination, there are five relevant factors that influence the operations of the dissemination process:

(1) the innovation itself,
(2) the information or information used to communicate in the matter of innovation,
(3) time conditions,
(4) nature of the social system or community in which innovation will be disseminated, and
(5) acceptance of research in the field of innovation dissemination.

It should be noted that these five factors interact with each other in promoting adoption and use of the products of innovators and technologists.

Dissemination of innovation in industrial business is a process that leads to adoption and use of innovation. It can be divided into six steps of effective innovation dissemination as follows:

(1) Injection: a process to introduce new ideas or methods to introduce and inform members of the organization.

(2) Examination: new ideas or methods presented to get the attention of members of the organization, research, planning and research are being carried out, as well as the formation of a committee.

(3) Preparation: those involved in the institute or organization prepare themselves to experiment with that innovation in the training for innovation development.

(4) Sampling: the innovation applied for the first time. Then sampling is for some users to try for the results of users.

(5) Spread: it is the distribution or extension of trial on effective innovations to a large target group of users, especially those who are trusted with sufficient potential for innovation.

(6) Institutionalization: innovation is recognized and applied in practice for a wide scope to become a common practice by all members.

6.4 Creating an Innovative Organization for Efficient Digital Industrial Business under The New Normal Condition

From the analysis of documents and the results of interviews with 50 key executive informants from 50 best-practice industrial businesses in Thailand, it was found that a successful innovation organization contains related elements as follows:

6.4.1 The organization's direction in innovation consists of:

(1) *A shared vision* is established by the leader to bring in innovation and change intentions and actions to adjust the focus of the organization. The organization's workforce has to be clear with its vision to work together to achieve the organization's objectives. Dedication of top management to the organization is fundamental to the success of innovation. It is a challenge for managers to be able to transform ideas into actions while taking a risk of innovation in possible failure.

(2) *Organizational design* for its structure is a critical component of the organization's performance to achieve its objectives. In addition, the corporate network counts as an essential part of the organization and a mechanism for the organization's systems to work in harmony.

(3) *Individuals' contribution* to facilitate innovation in teamwork with good understanding of the technology hidden in innovation and abilities to solve problems. Sponsors and customers may not need to know all about technology, but have confidence in the potential of that innovation. Tech keepers are to act upon a selection of news and forwarding important information on created innovation to stakeholders.

6.4.2 Creating continuous innovation

It is important to link and form at the same time a sense of unity in driving innovation organizations.

(1) Have an efficient working team. The working team is used to solve various problems properly, invest in the selection and build collaboration to get the quality results.

(2) Develop long-term practice for expansion. Training and development of personnel to have operational skills serves as an important tool to foster innovation in the organization. Personnel need to know the reasons for the changes and who holds decision-making power to give confidence in creating innovation within the organization.

(3) Communicate in all directions. Communicating within the organization, between organizations and outside the organization for clarity of the goals of the implemented innovation. Within the organization, there are three ways of contact: contact with a higher, lower level and the same level. Organizations can use multiple communication channels and use different media to reduce differences between and within the organization that perform different functions. This is to create an understanding of how the organization's activities are run in one specific direction.

(4) Open to the angle. Looking from the outside, the organization has its operations directed from the perspective of both internal and external clients, and opportunities or threats via organizational communication. This will help the organization to cope with various threats while seeking new opportunities for innovation in the organization.

6.4.3 Enabling sustainable innovation

(1) Create a culture that makes creativity a common sense of the organization. The culture that promotes innovative behaviors for people, such as the challenges of starting something new, the courage and the daring spirit to do it.

(2) Build knowledge management systems and learning organizations. Organizations need to create a knowledge management system in order for knowledge to circulate and create a continuous learning organization.

(3) Continue improvement of the organization. It has a high influence on innovation and a direct impact on innovation that comes from existing modifications or developments. Continuous quality improvement can find defects in products or services. This includes expanding policies with specific goals in each job that requires a hierarchical understanding of those particular policies.

Creating an innovative organization for efficient digital industrial business under the new normal condition prompts an organization to restructure, adapt, and bring in innovation to make better products and services. It is certain that personnel have to change their learning process quickly and develop the ability to innovate and do things differently in the work process. As a result, an administrative model in creating a new working style is to maximize the workforce’s potential in coping with innovation with newly required transactions effectively

7. Factors for Efficiency of an Innovative Organization in Digital Industrial Business under the New Normal Condition

As mentioned earlier, the researchers would like to propose a model of innovative organization under the new normal condition that can be applied to all types of industrial

enterprises in Thailand. The researchers first looked at the factors affecting an innovative organization in the work of Teece et al. (2018), Rehman & Iqbal (2020), Reetu & Redhu (2020), and Phakamas et al. (2021) that report such main factors as innovative leadership, innovation atmosphere, innovative habits, shown in this section.

7.1 Innovative Leadership

The characteristics of innovative corporate executives in the areas of innovative leadership are: (1) organizational executives have a clear vision, policy and framework; (2) executives in the organization are ready to listen to opinions and set a good example to personnel, and (3) executives in the organization pay attention to the development of work processes. As for the key roles of human resource managers in advancing to a successful innovative organization, the key points are: (1) Human resource managers must work together with corporate executives and be business partners and support each other; (2) Transformation and Business Risk Management; (3) Strategic Human Resources Executives; and (4) Human Resources Executives who support and coordinate the organization-wide (Phakamas & Pancharatanakorn, 2020; Phakamat et al. (2021).

The key leadership development approaches in the development process of industrial business executives contain the following standard steps:

(1) Leading to Learn is part of the innovative thinking development process in an event focused on opening up new ideas / methods of work, and being ready to learn from a variety of perspectives.

(2) Leading to Think: executives must think with vision or strategic thinking, can analyze the strengths and development points of the organization, and foresee opportunities and obstacles to use the analysis results to formulate plans and strategies for corporate development.

(3) Leading to Change: driving the organization through new plans or strategies will bring about change. Therefore, positive change must begin with a positive attitude adjustment process in order to provide all personnel with a collaborative direction through constructive communication. Management has a role to play in influencing and negotiating so that all personnel have a common understanding of how the upcoming changes will have a positive impact on them.

(4) Leading to Innovate. When personnel within the organization realize the benefits of such a change, executives must support factors that promote innovative learning, such as the ICT system, online learning resources, media and equipment, and various platforms to lead to quality innovation.

(5) Leading to Dissemination. When it is certain that the created innovation has been tried with the desired quality and efficiency, the innovation is ready to be disseminated to be known, accepted and used widely. Executives need to understand the formats and methods of innovation dissemination and continue to be a promoter of official dissemination.

7.2 Innovative Climate

Rehman & Iqbal (2020) and Reetu & Redhu (2020) identified four aspects of innovative climate: (1) the development of creativity in the management process for the development of innovation, (2) development of creativity in professional personnel, (3) Promotion and development of digital technology systems for work, and (4) Building research and development cooperation.

7.3 Innovative Behavior

(Teece et al., 2018) reports innovators with the following traits:

(1) Leadership of professional work with consciousness and work ethics toward the identified goals,
(2) Creativity with positive thinking and expertise in technology and innovation,
(3) Ability to work effectively with others, and create works according to the standard,
(4) Readiness with both primary and secondary skills, multitasking or multi-functions to change and adapt to keep pace with changes, and
(5) Ability to use technology widely suitable for the job.

8. The Model of an Innovation Organization with Efficiency in Digital Industrial Business Operations under the New Normal Condition

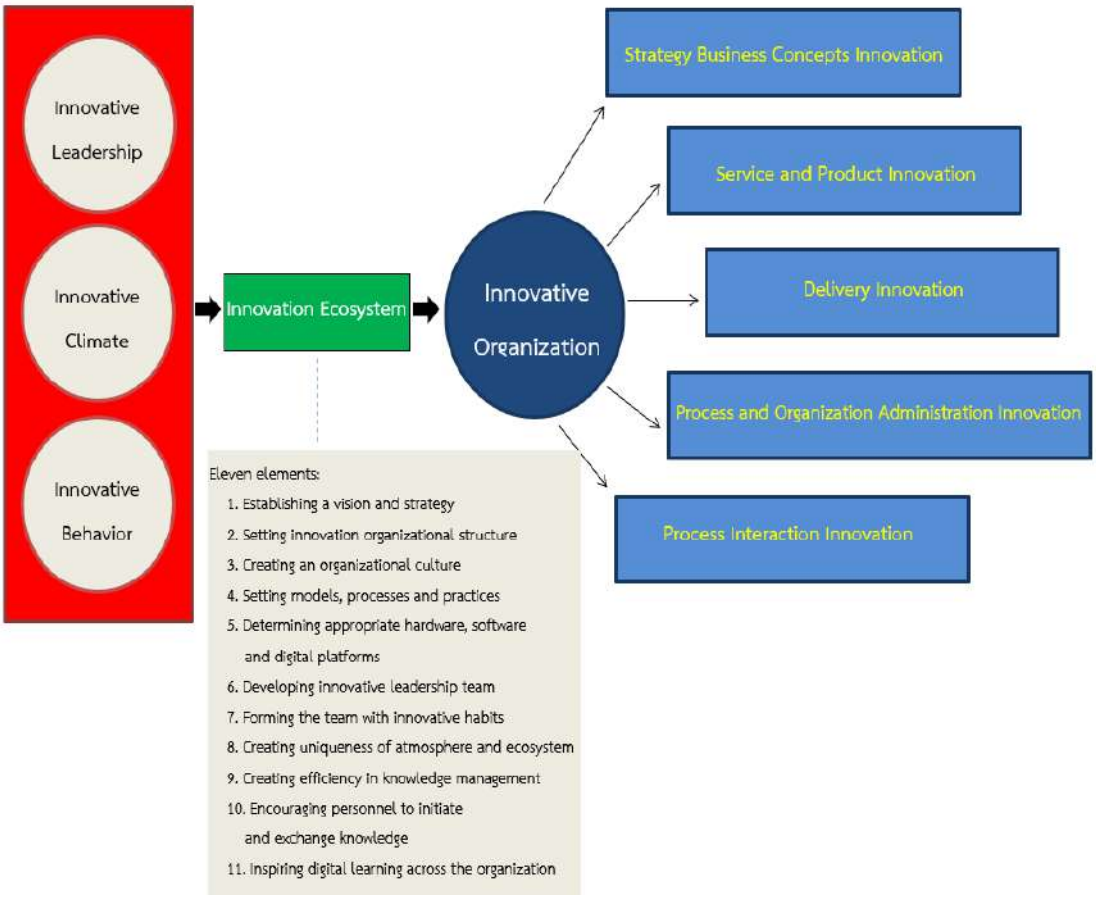
Based on the information reported in Section 7, the researchers collected relevant interview data with discretion from 50 industrial business executives regarding the innovative organization model with efficiency in digital industrial business in the digital era under the new normal condition in Thailand. The obtained data were content-analyzed for possible elements or factors and later validated by nine experts in business management and leadership.

The obtained results point to both internal and external elements which are fundamental to form an innovation organization model with efficiency in digital industrial business under the new normal condition as follows:

(1) Establishing a vision and strategy that will lead to an innovation organization,
(2) Setting an appropriate innovation organizational structure,
(3) Creating an organizational culture that supports all dimensions of innovation,
(4) Setting models, processes and practices that facilitate innovation,
(5) Determining appropriate hardware, software and digital platforms for service,
(6) Developing innovative leadership team striving for a systematic innovation organization,
(7) Forming the team with innovative habits in creating quality innovation,
(8) Creating uniqueness of atmosphere and innovative ecosystem,
(9) Creating efficiency in innovative knowledge management,
(10) Encouraging personnel to initiate and exchange knowledge freely, and
(11) Inspiring digital learning across the organization.

The model of an innovation organization with efficiency in digital industrial business operations in the digital era under the new normal condition, integrates three factors for efficiency of an innovative organization in digital industrial business under the new normal condition as described in Section 7. The innovation organization model is shown in Figure 2.

Figure 2: The Model of an Innovation Organization with Efficiency in Digital Industrial Business In the Digital Era under the New Normal Condition



9. Conclusion and Discussion

The results of this research focus on an innovative organization that adopts appropriate digital technology and relevant digital strategies to help increase organizational efficiency. In addition, organizations must be able to manage research and innovation well for management and learning management. Personnel in industrial enterprises enjoy the high standard that the organization wants and have been continuously using creativity to developed various aspects of innovation. Organizations are capable of managing research in line with the needs of innovators and contribute to the development of a sustainable learning society. In addition, executives should endeavor to encourage researchers and innovators to be involved and participate in business operations. Moreover, the leader or management should allow everyone

to independently express opinions and take part in shaping the organization's direction in a creative way to become a digital innovation organization that can grow sustainably in the long run.

The researchers synthesized research results of the earlier works (see Section 7) with the interview data obtained from 50 Thai executives of the best-practice industrial businesses, and seminars with business management experts. The proposed innovative organization model for efficient digital industrial business under the new normal condition in Thailand carries eleven key elements as shown in Section 8 and Figure 2.

The results can be discussed in light of the main issues on innovative organization studied by Granstrand & Holgersson (2020), Phakamas & Pancharatanakorn (2020) and Striteska & Prokop (2020). These earlier works report that the management plays an important role in setting a direction to achieve goals. Various types of leaders, particularly transformational leaders have a vision of management that is ready for change and an atmosphere of creative innovation by providing adequate support. Human resource development supports creating and disseminating innovation with international quality. There are incentives and determination to create new innovations to be successful in the digital age. Brunetti et al. (2020) and Reetu et al. (2020) emphasized the importance of organizations to support research to cultivate innovative ideas at the foundation level for researchers and innovators of domestic and international organizations for excellence in operations. The results of this study identify an innovation organization model with eleven components in accordance with the findings of the preceding researchers. All of the foregoing can confirm that the proposed innovative organization model can serve as a practical guidance for digital industrial enterprises to operate effectively under the new normal condition in Thailand.

10. Suggestions

Based on the findings of this study and the proposed innovation organization model, the researchers would like to recommend business transformation with innovation as guided by the model of eleven elements. Training in innovative thinking and personnel creativity with good support in digital technology should make it possible to create an appropriate innovative organization to fit in a particular context. Intentional change with visionary planning from the management along with support from the personnel can bring out the best potential of the workforce to attain the goal on becoming an innovation organization. This is for such an innovation organization to succeed and survive well in the digital era that has currently faced with the new normal condition imposed by the Covid-19 pandemic, followed by its post-impacts on the country’s economy in the upcoming years.

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Learning Administration Model of Thai Higher Education in the Digital Age

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Abstract

The objectives of this research were (1) to compare the opinions of faculty members toward learning administration in higher education in the digital age, and (2) to propose the model of learning administration in higher education in the digital age in Thailand. The questionnaire was used to collect data from 400 faculty members from public and private universities on a voluntary basis. The statistics used to analyze the data were descriptive statistics for percentages, means, and standard deviation, and inferential statistics for t-test, One-way ANOVA and LSD, followed by exploratory factor analysis. The results showed General management with the highest mean ranking for learning administration in higher education in the digital age, followed by Curriculum and instructional management, Educational evaluation, and Research. First, the aspects of *General management* included the collaboration among university members, policy planning and making, appropriate and selections of technological devices for learning in the digital age. Second, the aspects of *Curriculum and instructional management* focused on learning activities, online learning using different teaching software, learning outcomes emphasizing on ethical and moral development, instructional media development, new knowledge construction, and online learning preparation for both faculty and students. Third, the aspects of *Educational evaluation* emphasized formative evaluation, problem solving skills, innovation, and creativity. And fourth, the aspects of *Research* focused on collaborative research projects between institutions, collaborative research projects across different departments in the same institution to examine the impacts of learning and teaching in the digital age in Thailand. The researcher found differences of faculty members at the statistically significant level .05, by age, education level, position, university type and experience. Based on gender, males and females differed in all aspects except in General management. Participants with a Ph.D. and M.A. in public and private universities had different opinions in the aspects of Curriculum and instructional management. Those in administrative positions and non-administrator positions differed in the aspects of General management and Educational evaluation. Since the highest mean ranking for the learning administration in higher education in the digital age was General management followed by Curriculum and instructional management, Educational evaluation, and Research, the proposed model was GCER.

Keywords*: Model, learning administration, Thai higher education, digital age*

1. General Information

The university is an institution for higher education that offers undergraduate and graduate degrees. Universities offer graduate programs leading to a master's degree and Ph. D. The role of universities as repositories and generators of knowledge with the obligation to help graduates to obtain employment, while providing timely criticism in areas of public policy and social and economic life as influential bodies in civil society for

cohesive and tolerant communities (Ministry of Education, 2014) . In Thailand, the traditional missions and functions of higher education institutions are teaching, researching, provisioning of academic services to society, and promoting arts and cultures. Higher education institutions are to play roles as watchdogs, social beacons and society conscience builders in the rapid socio-economic transformation of Thailand in the last two decades Kirtikara (2001). Meanwhile Phosa (2016) said that such roles require good management and improvements in the efficient use of manpower, all which will build up higher capacity for good higher education institutions. Likewise, a coherent government policy with clear continuity must be seriously implemented for success of the education reform sufficiently supported by relevant morale and physical/ digital infrastructure development.

The 21st Century is the digital age that uses Internet technology in storing, linking, sharing and disseminating information via electronic media across universities. Therefore, universities need to provide education using digital media and technology skills. The main media and auxiliary media are used to facilitate e-learning in addition to face-to-face teaching and learning management system. Learning through electronic media can be organized in many forms, such as online, website, m-learning, multimedia, multi-application programs and platforms for real time meeting or non-real time in combination. Rennie & Morrison (2013) said that students must learn and adapt to keep up with change, develop information skills by searching through the web, creating a webpage and understanding assessments through online quizzes after practicing through e-book, groups blog, Pod cast, Webcasts, YouTube, Wikis, Skype and Line. Learners are expected to possess fluency in (1) technical skills in the use of use computers and the Internet skills including word processor, web browser, email, communication tools to access knowledge and online database via search engine and cloud computing. (2) Understanding context and evaluating digital media to be able to make decisions about the nature of work and the effects of network technology realizations on behaviors, perspectives, beliefs and feelings toward the outside world for effective communication and coordination at work. (3) Creating contents and communicating them through a variety of digital media tools. Creating with digital media is more than just knowing how to use word processing programs or writing emails, but it means that media users are able to create, modify and share contents in specific contexts via blogs, images, videos, social media and other forefront platforms (Media Smarts, 2015).

Educators need to assess learners' achievement in terms of gained knowledge and abilities in various learning activities based on blogging or peer assessment. After the course of study, students can be tested by electronic measuring instruments both in the classroom and afterward. The researchers noted the role of technologies in changing assessment to be smarter, faster, fairer and more effective. Assessment is a broad term and takes a broad approach to formative, summative and other types of assessment, such as e-assessment and e-portfolio. However, an argument here is that through the social affordances of digital technologies, such as social media, blogs, wikis, e-portfolios and electronic voting for assessment, there should be opportunities to extend assessment challenges to aggregated, collective, crowd-sourced grading for learners to decide on artifacts to be used in assessment by particular assessors or evaluators. Such new assessment opportunities can empower learners' decision-making skills, which are

important in preparing young people to participate effectively in a democratic society (Schwartz & Arena, 2009).

Considering changing technology and individual learning styles in the digital age and beyond in higher education as affecting the quality of education administration, the researcher would like to find out a model in learning administration in Thai higher education in the digital age, as perceived by educators concerned. It was expected that the obtained findings could benefit of short- and long-term planning for faculty members and students in higher education institutions in line with the current and upcoming changes in the near future.

2. Research Objectives

The objectives of this research were (1) to compare the opinions of faculty members toward *learning administration* in higher education in the digital age, and (2) to propose the *model of learning administration* in higher education in the digital age in Thailand.

3. Hypothesis

The faculty members, classified by (1) gender, (2) education level, (3) position, (4) university type and (5) experience have different opinions on learning administration in higher education in the digital age.

4. Conceptual Framework of Learning Management Model in Higher Education in the Digital Age

4.1 Roles of Higher Education

(1) development of human resources and social development,
(2) creation and diffusion of knowledge in the creation and transmission of knowledge in a knowledge society,
(3) reforming the social system and cultivating social cohesion, and
(4) mean of self-realization people can improve their income and quality of life through increasing knowledge or skills and then expand on their own choices available in life, including those related to work life.

The traditional missions and functions of higher education are teaching, researching, providing academic services to society, and promoting arts and cultures (Ministry of Education, 2014).

4.2 Digital Technologies, Technology Enhanced Assessment

Technologies can support or spur educational changes, particularly assessment as a vital part in the learning process, as it provides observable evidence of learning, determines student progress and demonstrates understanding of the curriculum. More broadly, it could be said that an institution, culture, or society depicts its conceptualization of learning and ideal future citizens by how assessment is created and used Bates (2016). As known, Information Communication Technology (ICT) has now accounted for success in curriculum and teaching (Petchroj, 2021).

5. Research Methodology

The participants in the study were 400 faculty members in public and private universities in Thailand, 200 for each type on a voluntary basis. The research instrument for collecting data was a questionnaire which was checked by three experts for IOC value calculation at 0.87 and its reliability was at 0.97.

As for data analysis, the researcher used descriptive statistics to find percentages, means, and standard deviation, and inferential statistics: t-test, One-way ANOVA, LSD, and exploratory factor analysis by using the principle axis method and varimax rotation technique.

6. Data Analysis

6.1 The Results on Learning Administration in Higher Education in the Digital Age

The results on learning administration in higher education in the digital age are shown in Tables 1-5.

Table 1: Mean and Standard Deviation of Faculty Members' Opinions toward Learning Administration in Higher Education in the Digital Age

Aspect	Description	$\overline{X}$	SD	Meaning	Series no.
1	General Management	4.39	.59	high	1
2	Curriculum and Instructional Management	4.26	.56	high	2
3	Educational Evaluation	4.16	.49	high	3
4	Research	3.97	.57	high	4
	Total	4.20	.47	high	

Table 1 shows the faculty member's opinions toward learning administration in higher education at a high level. The highest aspect was general management, followed by curriculum and instructional management, educational evaluation and research. The details of each aspect are presented in Tables 2-5.

Table 2: Mean and Standard Deviation of Faculty Members' Opinions toward Learning Administration by General Management

	Description	**$\bar{x}$**	**SD**	**Meaning**	**Series no.**
1	Setting digital matters as part of the policy and action plan of the university	4.63	.58	highest	3
2	Making university development plan for both short term and long term to support the digital age	4.58	.59	highest	4
3	Determining the direction, goals, and management plans to be consistent with higher education in the digital age	4.68	.57	highest	2
4	Setting criteria to monitor the management of university in the digital age	4.57	.75	highest	5
5	Promoting the participation of all sectors of the university in implementing strategies in the digital age	4.74	.44	highest	1
6	Providing appropriate equipment to support learning activities in the digital age	4.53	.68	highest	6
7	Fostering an atmosphere conducive to learning in the digital age	4.21	.85	high	11
8	Supporting sufficient budget for activities	4.21	.77	high	10
9	Organizing digital media in education in a concrete way	4.21	.59	high	9
10	Developing and improving the environment to be a modern learning center	4.11	.85	high	13
11	Developing the university's infrastructure to have international quality	4.21	1.00	high	12
12	Providing personnel suitable for preparing university for the digital age	4.26	.84	high	8
13	Providing training for personnel to have good language skills for communication	4.10	1.02	high	14
14	Developing information, communication technology systems and increasing facilities in various fields	4.47	.68	high	7
	Total	4.39	.59	high	

Table 2 reports faculty members' opinions toward learning administration in higher education in a digital age with the total at a high level and 6 items at the highest level. The highest number was promoting the participation of all sectors of the university in implementing strategies in the digital age. The lower numbers were determining the direction, goals, and management plans to be consistent with higher education, setting digital matters as part of the policy and action plan of the university, making university

development plan for both short term and long term to support the digital age, setting criteria to monitor the management of university, and providing appropriate equipment to support learning activities.

Table 3: Mean and Standard Deviation of Faculty Members' Opinions toward Learning Administration by Curriculum and Instructional Management

	Description	$\bar{x}$	**SD**	**Meaning**	**Series no.**
1	Increasing more online courses	4.36	.67	high	6
2	Curriculum focus on teaching and learning comparable to international standards	4.21	.77	high	12
3	Developing teachers to have technological competencies	4.21	.79	high	9
4	Making an agreement with Cyber University to develop students' potential together	3.79	1.06	high	15
5	Inserting content in teaching and learning that emphasizes students' awareness of morality	4.47	.60	high	2
6	Preparing the language for students to communicate better	4.21	.70	high	11
7	Preparing innovation technology for students to be able to use them fluently	4.36	.74	high	8
8	Using textbooks, electronic media to enhance learning management	4.05	.76	high	13
9	Teaching through electronic media	4.36	.59	high	5
10	Using more modern electronic media (ICT)	4.21	.62	high	10
11	Promoting teaching and learning activities through various applications, such as Google Classroom, Class Start, Zoom meeting, and the like	4.52	.68	highest	1
12	Developing modern teaching materials	4.36	.67	high	6
13	Organizing teaching and learning activities to enhance learning experience through ICT	4.42	.59	high	3
14	Supporting credit transfers between Thai higher education universities	3.90	.72	high	14
15	Encouraging teachers to create knowledge innovation about learning online	4.42	.73	high	4
	Total	4.26	.46	high	

Table 3 shows all items at a high level; the highest number was promoting teaching and learning activities through various applications, such as Google Classroom, Class Start, Zoom meeting, and the like. The lower numbers were inserting content in teaching and learning that emphasizes students' awareness of morality, organizing teaching and learning

activities to enhance learning experience through ICT, encouraging teachers to create knowledge innovation about learning online, teaching through electronic media, developing modern teaching materials and increasing more online courses.

Table 4: Mean and Standard Deviation of Faculty Members' Opinions toward Learning Administration by Educational Evaluation

	Description	**$\bar{x}$**	**SD**	**Meaning**	**Series no.**
1	Having training, meetings, seminars, exchange of knowledge and experience in measuring and evaluating online	4.05	.83	high	11
2	Providing necessary basic assessment skills to the faculty members concerned	4.42	.59	high	3
3	Providing opportunities to evaluate and assess knowledge in each unit of study	4.37	.67	high	5
4	Organizing activities to measure learning results in various forms instead of the final exam	4.42	.59	high	3
5	Continuing to publicize the measurement data through various media channels	4.21	.69	high	9
6	Having various types of examination of knowledge	3.84	.75	high	13
7	Providing instruction manuals for learning instruction and evaluation	3.95	.94	high	12
8	Organizing knowledge exams between university and related institutions	3.58	.82	high	15
9	Encouraging faculty members to prepare a library for online learning exams	3.84	.99	high	14
10	Promoting learning assessment based on learning development criteria	4.16	.81	high	10
11	Evaluating by online exam (quiz online) before and after class	4.26	.71	high	8
12	Evaluating of 3-phase activities: before, during, and the end of study	4.42	.49	high	1
13	Evaluating student creativity	4.26	.64	high	7
14	Evaluating students' problem-solving ability	4.42	.54	high	2
15	Assessing students' self-study report	4.26	.63	high	6
	Total	4.16	.50	high	

Table 4 shows all items at a high level; the highest number was evaluating of 3-phase activities: before, during, and the end of study. The lower numbers were: evaluating of students' problem-solving ability, providing necessary basic assessment skills to the faculty members concerned, organizing activities to measure learning results in various forms instead of the final exam, and providing opportunities to evaluate and assess knowledge in each unit of study.

Table 5: Mean and Standard Deviation of Faculty Members' Opinions toward Learning Administration by Research

	Description	$\bar{x}$	**SD**	**Meaning**	**Series no.**
1	Focusing more on research in education in the digital age	4.00	.72	high	4
2	Doing network of co-research between private and public institutions	4.05	.76	high	3
3	Doing network of co-research between universities in Thailand and institutions abroad	3.95	.89	high	7
4	Promoting cooperation for a research center in the university	3.89	.85	high	10
5	Supporting and promoting the preparation of information to support research	3.95	1.07	high	6
6	Promoting the dissemination of research for digital transformation of Thailand	4.21	.69	high	1
7	Promoting / supporting / allocating budget for foreign professors with good knowledge, abilities and expertise. Doing research in the institute to raise the quality of the standard	3.97	.66	high	11
8	Promoting joint research cooperation activities between institutions	4.10	.64	high	2
9	Promoting research cooperation activities to make Thailand a research center for digital learning	3.90	.91	high	9
10	Developing information centers for research in higher education institutions	3.95	.94	high	8
11	Promoting education with impact on digital age teaching and learning in Thai society in the future	4.00	.92	high	5
	Total	3.97	.50	high	

Table 5 reports all items at a high level; the highest number was promoting the dissemination of research for digital transformation of Thailand. The lower numbers were: promoting joint research cooperation activities between institutions, doing network of co-

research between private and public institutions, focusing more on research in education in the digital age, and promoting education as impact on digital age teaching and learning in Thai society in the future.

6.2 Results of Comparison of Faculty Members' Opinions toward Learning Administration in Higher Education

The results of comparison of faculty members' opinions toward learning administration in higher education in the digital age are shown in Tables 6- 7.

Table 6: Comparison of Faculty Members' Opinions toward Learning Administration Classified by Gender, Education, Position and University Type

Aspect	Learning Administration	Gender (Male/female)		Education (MA/PhD)		Position (Administrator /non-administrator)		University Type (Public U. /Private U.)	
		t	sig	**t**	sig	t	sig	**t**	sig
1	General Management	.83	.41	-.66	.51	7.44*	.00	-1.31	.19
2	Curriculum and Instructional Management	-4.32*	.00	-3.03*	.00	-1.18	.24	-6.30*	.00
3	Educational Evaluation	-3.68*	.00	-.16	.88	-2.13*	.03	-2.32*	.01
4	Research	-3.28*	.00	.28	.77	1.41	.16	-.51	.61
Total		-3.16*	.00	-.87	.38	1.81	.07	-2.62*	.00

*Statistical significance at level .05

Table 6 reveals that the total aspect of learning administration classified by gender and university type was statistically significant at the .05 level. The aspect of general management was different when classified by position. Differences were found in (1) the aspect of Curriculum and Instructional Management classified by gender, education and university type, (2) the aspect of Educational Evaluation classified by gender and university type, followed by (3) the aspect of Research classified by gender, position and university type.

Table 7: Analysis of Variance of Faculty Members' Opinions toward Learning Administration Classified by Experience

Aspect	Strategies	Sources of Variance	SS	df	MS	F	Sig
1	General Management	between group	27.951	3	9.317	33.177**	.000
		within group	111.21	396	.281		
		total	03.741	399			
2	Curriculum and Instructional Management	between group	9.027	3	3.009	16.115**	.000
		within group	73.938	396	.187		
		total	82.965	399			
3	Educational Evaluation	between group	2.826	3	.942	3.896**	.009
		within group	95.748	396	.242		
		total	98.574	399			
4	Research	between group	11.162	3	3.721	9.013**	.000
		within group	163.475	396	.413		
		total	200.676	399			
	Total	between group	7.597	3	2.532	12.364**	.000
		within group	81.102	396	.205		
		Total	88.699	399			

**Statistical significance at level .01

Table 7 shows the results of the analysis of variance of total and individual aspects classified by experience were statistically significant at the .01 level.

Table 8: Pair Comparison of Faculty Members' Opinions toward Learning Administration Classified by Experience

Aspect		≤5 years	6-15 years	16-30 years	≥31 years
1. General Management	$\overline{X}$	**4.20**	**4.04**	**4.52**	**4.70**
≤5 years	4.20	-	.16	-.32*	-.50*
6-15 years	4.04		-	-.48*	- .66*
16-30 years	4.52			-	-.18
≥31 years	4.70				-

Aspect		≤5 years	6-15 years	16-30 years	≥31 years
2.Curriculum and Instructional Management	$\overline{X}$	**4.25**	**3.99**	**4.42**	**4.34**
≤5 years	4.25	-	.26*	-.17	-.09
6-15 years	3.99		-	-.43*	- .35*
16-30 years	4.42			-	.08
≥31 years	4.34				-
3.Educational Evaluation	$\overline{X}$	**4.23**	**4.01**	**4.15**	**4.22**
≤5 years	4.23	-	.22*	.08	.01
6-15 years	4.01		-	-.14	-.21*
16-30 years	4.15			-	-.07
≥31 years	4.22				-
4.Research	$\overline{X}$	**3.78**	**3.98**	**3.86**	**4.20**
≤5 years	3.78	-	-.20*	-.08	-.42*
6-15 years	3.98		-	.12	-.22*
16-30 years	3.86			-	-.34*
≥31 years	4.20				-
Total	$\overline{X}$	**4.12**	**4.00**	**4.24**	**4.37**
≤5 years	4.12	-	.12	-.12	-.25*
6-15 years	4.00		-	-.24*	-.37*
16-30 years	4.24			-	-.13
≥31 years	4.37				-

*Statistical significance at level .05

Table 8 reports the results on pair comparison classified by experience of faculty members ≥31 years had a higher mean than those with 6-15 years in total and individual aspects, those with ≤5 years in total and individual aspects of general management and educational evaluation, those with 16-30 years in educational evaluation and research.

6.3 Results of Factor Analysis of Faculty Members' Opinions toward Learning Administration in Higher Education

Table 9 shows eight factors**.** The important criteria for factors were (1) the Eigen value more than 1.00, (2) factor loading of the variables equal .30 or above, and (3) not less than 3 meaningful variables. Testing of KMO and Bartlett's Test with KMO=.809 nearly 1.00 showed that the data were suitable for factor analysis, for the total co-variance of sample was 87.009 % explaining factors, carrying Eigen value between 1.178-16.806.

Table 9: Factor Loading of Factors of Learning Administration in Higher Education

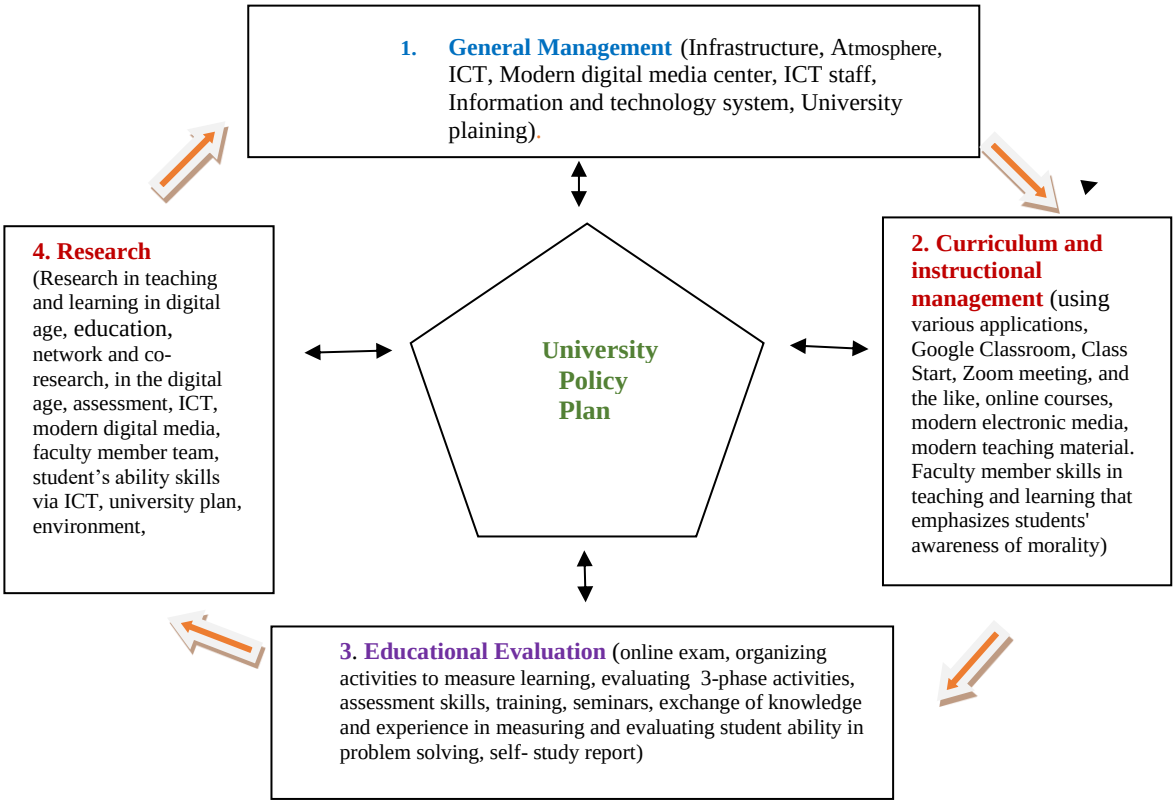
Items	Factor Loading							
	1	2	3	4	5	6	7	8
a7) Fostering an atmosphere conducive to learning in the digital age	.858							
a10) Developing and improving the environment to be a modern learning center	.848							
a12) Providing personnel suitable for preparing university for the digital age	.828							
a9) Organize digital media in education in a concrete way	.819							
a11) Developing the university's infrastructure to have international quality	.784							
a14) Developing information, communication technology systems and increasing facilities in various fields	.767							
a6) Providing appropriate equipment to support learning activities in the digital age.	.725							
Eigen Value Factor 1	16.806							
b11) Promoting teaching and learning activities through various applications, such as Google Classroom, Class Start, Zoom meeting, and the like		.876						
b9) Teaching through electronic media		.865						
b2) Curriculum focus on teaching and learning that is comparable to international standards		833						
b1) Increasing more online courses		.812						
b10) Using more modern electronic media (ICT)		.779						
b8) Using textbooks, electronic medias to enhance learning management		.754						
b12) Developing modern teaching materials		.669						
b3) Developing teachers to have technological competencies		.572						
b12) Encouraging teachers to create knowledge innovation about learning online		.458						
Eigen Value Factor 2		5.449						
d13) Evaluating student creativity			.840					
d11) Evaluating by online exam (quiz online) before and after class			.837					
d5) Continuing to publicize the measurement data through various media channels			.812					
d4) Organizing activities to measure learning results in various forms instead of the final exam			.657					
d12) Evaluating 3-phase activities: before, during, and the end of study			.650					
d2) Providing necessary basic assessment skills for the faculty members concerned			.553					
d1) Having training, meeting, seminars, exchange of knowledge and experience in measuring and evaluating online			.358					
d10) Promoting learning assessment based on learning development criteria			.327					

Items	Factor Loading							
	1	2	3	4	5	6	7	8
Eigen Value Factor 3			4.167					
c2) Doing network of co-research between private and public institutions				.784				
c8) Promoting joint research cooperation activities between institutions				.777				
c6) Promoting dissemination of research for digital transformation of Thailand				.599				
c11) Promote education with impact of digital age on teaching and learning in Thai society in the future				.493				
c1)Focusing on more research in education in the digital age				.400				
Eigen Value Factor 4				2.598				
a3) Determining the direction, goals, and management plans to be consistent with higher education in the digital age					.907			
a2)Making university development plan for both short term and long term to support the digital age					.552			
a1) Setting digital matters part of the policy and action plan of the university					.469			
Eigen Value Factor 5					2.428			
d14)Evaluating students' problem solving ability						.904		
d15)Assessing from the students' self-study report						.603		
b1) Increasing more online courses						.337		
Eigen Value Factor 6						1.505		
a4) Setting criteria to monitor the management of university in the digital age							.420	
b6) Preparing students for better language communication							.369	
b13) Organizing teaching and learning activities to enhance the experience through ICT							.369	
Eigen Value Factor 7							1.283	
d3) Providing opportunities to evaluate and assess knowledge in each unit of study								.681
b5) Inserting content in teaching and learning that emphasizes students' awareness of morality								.511
d15) Assessing the students' self-study report								.376
Eigen Value Factor 8								1.178

Table 9 shows the analysis of the factors of learning administration in higher education in the digital age in 8 factors. The first important factor was (1) General Management, followed by the other factors: (2) Curriculum and Instructional Management, (3) Educational Evaluation, (4) Research, (5) University Technology Planning, (6) and Improving Student Abilities, (7) Enhance the Experiences through ICT, and (8) Student Activities and Morality. Thus, the learning administration model should start from general management, curriculum and instructional management, education evaluation, research, university planning, and improving student abilities.

7. The Learning Administration Model in Higher Education in the Digital Age

From the factor analysis results, the learning management model GCER consisted of 4 steps: (1) factors 1 and 5 for Step 1: General Management (**G**), (2) factors 2, 7 and 8 for Step 2: Curriculum and Instructional management (**C**), (3) factors 3 and 6 for Step 3: Educational Evaluation (**E**), and () Factor 4 for Step 4: Research (**R**).



8. Conclusion of Results

8.1 Learning administration in Thai higher education in the digital age contained total and individual aspects at a high level. The highest aspect was of general administration. The lower numbers were curriculum and instructional management, educational evaluation and research.

8.1.1 General administration had six aspects at the highest level of which the highest mean was promoting the participation of all sectors of the university in implementing strategies in the digital age. The lower mean values were determining the direction, goals, and management plans consistent with higher education, setting digital matters part of the policy and action plan of the university, making university development plan for both short term and long term to support the digital age, setting criteria to monitor the management of university, and providing appropriate equipment in support of learning activities.

8.1.2 Curriculum and instructional management had highest mean in promoting teaching and learning activities through various applications, such as Google

Classroom, Class Start, Zoom meeting, and the like. The lower numbers were inserting content in teaching and learning that emphasizes students' awareness of morality, organizing teaching and learning activities to enhance the experience through ICT, encouraging teachers to create knowledge innovation about learning online, teaching through electronic media, developing modern teaching materials and increasing more online courses.

8.1.3 Educational evaluation had the highest number in evaluating 3-phase activities: before, during, and the end of study. The lower numbers were: evaluating of students' problem-solving ability, providing necessary basic assessment skills to the faculty members concerned, organizing activities to measure learning results in various forms instead of the final exam and providing opportunities to evaluate and assess knowledge in each unit of study.

8.1.4 Research had the highest mean in promoting the dissemination of research for digital transformation of Thailand. The lower numbers were: promoting joint research cooperation activities between institutions, doing network of co-research between private and public institutions, focusing more on research in education in the digital age and promoting education as impact of digital age on teaching and learning in Thai society in the future.

8.2 The comparison of various aspects shows statistical significance at level .05 in total when classified by gender and university type. Meanwhile, individual aspects were found significantly different under general management when classified by position, under Curriculum and Instructional Management when classified by gender, education and university type, under Educational Evaluation when classified by gender and university type, and under Research when classified by gender, position and university type. When classified by experience, faculty members with ≥31 years had higher mean than those with 6-15 years in total and all aspects, those with ≤5 years in total and aspects of General Management and Educational Evaluation, and those with 16-30 years in Educational Evaluation and Research. Meanwhile those with ≤5 years were higher than those with 6-15 years in Curriculum and Instructional Management and in Educational Evaluation.

8.3 From the factor analysis results, the researcher concluded the learning administration model as GCER in higher education in the digital age, derived from 4 steps: factors 1 and 5 for Step1: General Management (**G**), factors 2, 7 and 8 for Step2: Curriculum and instructional management(**C**), factors 3 and 6 for Step 3: Educational Evaluation (**E**), and factor 4 for Step 4: Research (**R**).

9. Discussion of Results

The researcher discussed the obtained results in three major points:

9.1 Learning administration in higher education in the digital age had total and individual aspects at a high level. The highest aspect was General Management in promoting the participation of all sectors of the university in implementing strategies in the digital age. It is possible that a university must change its policy and action plan to develop infrastructure in support of ICT, modern media, wireless, computer, network, teaching

learning tools and facilities (Ghavifekr et al., 2015). In Thailand, ICT is considered one of the main elements in digitally transforming the country's education and economy for a better future as emphasized by Suchato (2017) in integrating information systems for modern education via networking and online courses. Faculty members need to use web/e-learning tools, electronically organize materials, assessments and rosters in coping with delivery of actively blended learning and flipped classroom. As for students, they certainly need digital literacy to access class via their mobile device, update forefront information for personal learning and class activities, with aspiration for life-long learning by online courses.

9.2 The results on the compared aspects significantly different at the .05 level in total when classified by gender and university type, particularly General Management when classified by position. Curriculum and Instructional Management classified by gender, education level and university type, Educational Evaluation classified by gender and university type, and Research classified by gender, position and university type. When classify by experience, faculty member with ≥31 years had higher mean than those with 6-15 years in total and all aspects, those with ≤5 years in total and aspects of general management and educational evaluation, and those with 16-30 years in educational evaluation and research. The researcher noted that both female and male faculty members focus on academic and service. However, those male counterparts tend to show preference for technical matters like machines, mechanics and information technology (IT). This point was earlier reported and discussed by Athanasou (2009), in the development of a career by gender. Holland's Theory also says that males like mechanical careers while females like to contact and chat with people, like to give knowledge, teach others, and have language skills. In the aspects of Education Evaluation and Research founded faculty members≥31 years had higher mean than those with 6-15 years, because they started their teaching career earlier, accumulated their research skills and obtained academic ranks. It is rather typical in an academic career, as pointed out by Banoobhai (2017) who conducted research into the impact of teaching and learning experience on academic achievements. In addition, Pineida (2011) and Jindanuruk (2016) emphasized the vital role of digital literacy and competency in delivering good quality teaching to facilitate students' learning process and desirable outcomes, followed by encouraging students to develop their learning autonomy to become lifelong learners as an ultimate goal in higher education.

9.3 The learning administration model GCER comprises General Management **(G)**, **C**urriculum and instructional management**(C),** Educational **E**valuation **(E)**, and Research (R). (GCER model). We can see that the participating faculty members in the study were in favor of teaching and research. Certainly, they valued Internet technology, use of information via electronic media not only for their academic work, but also benefits for their students. This mutual benefits were studied by Odora & Matoti (2015) in that lecturers perceive their new roles in the digital age by using computer-based technology and other digital technologies for their work both in and out of the classroom. Rennie & Morrison (2013) asserted that it was important to improve students' digital literacy and skills to enable them to search through the Web, create a Webpage, and handle online assessment and quizzes. The use of Blog, Podcast, Webcast, Wiki, YouTube, Skype, and line groups,

and other relevant applications. In this regard, one major government university in Thailand conducted research into digital literacy and skills and concluded that graduate students require digital skills for the knowledge-based economy and deep knowledge learning (Ministry of Education, 2014). This concluded point was agreed by Kiss (2017) who said that digital skills are required of modern learners to search, collect, process, and use information systematically, able to assess the connection and distinguish reality from the virtual world. And certainly, the aspect of Research cannot do without digital literacy and skills for a researcher to complete systematic inquiry on the basis of obtained information and needed data effectively

10. Suggestions

Based on the major findings of the study, the researcher had two suggestions:

8.1 Learning administration in Thai higher education in the digital age would require adjustments from time to time to catch up with changes in needs of new faculty members, students and stakeholders.

8.2 University administrators need to provide constant inhouse training programs for faculty members to fit well and move forward with confidence in the changing contexts of technologies and innovations in the country's higher education system.

11. The Author

Laddawan Petchroj, Ph.D., is now the Dean of the Faculty of Liberal Arts, Rajapruk University, Nonthaburi, Thailand. She has been well-recognized for her role in major government agencies in Thailand in training scholars and educators in quantitative research. Her areas of research interest include major issues in educational management, the use of statistics and data interpretation in quantitative research, strategies for success implemented by private higher education institutions, and current issues in the ASEAN networks.

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Learners' Satisfaction with Online Teaching and Learning Management in a Physics Course

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Abstract

The purpose of this research was to study learners' teaching and management satisfaction in a Physics course via three Applications--Line, Google Classroom and Google Meet. The subjects were 131 university students from four faculties: (1) Agricultural Innovation, (2) Engineering, (3) Optometry, and (4) Criminology and Justice Administration; they were registered in academic year 2020 and participated in the study on a voluntary basis. Online teaching and learning management consist of LINE groups for communication, Google Classroom for a virtual classroom, and Google Meet in real time. The research instrument was a questionnaire on a Likert type scale of 5 levels, with 18 items and an open-ended question on three issues: the application system, the course management system, and the online learning system. The index of Item Objective Congruence (IOC) between the items and the research purpose was not lower than 0.5. The researcher used Google Form to collect data from the participating subjects. The statistics used for data analysis were percentage, mean and standard deviation. The results showed the overall mean and standard deviation of students' satisfaction in each group at a high level: Agricultural Innovation (4.5± 0.7), Engineering (4.5±0.8), Optometry (4.3±0.8) and Criminology and Justice Administration (4.5± 0.7).

Keywords*: Online teaching and learning management, Physics course, learners' satisfaction*

1. Rationale and Background of the Study

In 2019, there was a situation that affected people worldwide, namely the pandemic of the new coronavirus "COVID-19" which started in Wuhan, the capital of Hubei Province, China. The World Health Organization declared the outbreak of COVID-19 as a pandemic that called for an international public health emergency. Thailand confirmed cases of coronavirus later in a month. Since then, Thailand has encountered four waves in 2020 and 2021: the first from the Lumpinee Boxing Stadium cluster, the second from fishery worker clusters in Samut Sakhon Province, the third from Tong Lor Entertainment Area, and the fourth from clusters of low-income communities construction workers' camp sites in Bangkok and its vicinity. The month of April in 2021 marked the beginning of the third wave, followed by the fourth which was expected to drag on until the end of the year, due to delay in vaccination and the government's delayed action in dealing with the outnumbered patients. The government's policy was simply to close all kinds of places with people gathering for regular activities, including schools and universities. In this regard, educational institutions have been affected for nearly two academic years and turned to teaching and learning online. The author as a professor at one large private university and fellow course instructors need to put teaching in a virtual mode by using cloud meeting applications.

Students also have to adjust themselves with online classes and rely more on guided self-study to complete their registered courses.

As generally known, online teaching takes into account the learning outcomes as specified in the curriculum by using one of the following options: (1) online teaching and learning management system (in the researcher's case called RSU-LMS) or Google Class Room, (2) Live online teaching via Google Meet , Webex Meeting , or Zoom, (3) assessment of online learning via Socrative, Quizizz, Kahoot!, followed by (4) plagiarism check using the Turnitin program (Wuthiyan & Srikramkan, 2017; Rangsit University, 2020a, 2020b, 2020c, 2021a, 2021b, 2021c)

Online teaching and learning management have a variety of programs for course instructors to select, such as Microsoft Teams, Google Hangouts Meet, Zoom Cloud Meeting, Line and Facebook Live. Each program has good features for interactive virtual communication. The author was interested in LINE application via smartphone voice conversation. As for group communication, Google Classroom application includes Google Apps for Education suitable for communication, discussion, exchange of opinions, and homework assignment Homework, scoring, grading on Google Meet applications are in Google Apps for Education—easy to conduct group discussions in a virtual class. These applications are available on Desktop, IOS and Android. In this study, the researcher used three applications: Line, Google Classroom and Google Meet, to manage online teaching and learning in a Physics course, and studied learners' satisfaction to secure feedback information on their response to the used applications in teaching; this was also to identify areas of teaching and learning management that require improvement for efficiency in online teaching at the university level.

2. Research Objective

The research objective was to study learners' satisfaction with online teaching and learning management in a Physics course using LINE, Google Classroom and Google Meet.

3. Research Method

The research method was quantitative with the use of a questionnaire via Google Form to collect data from the participating subjects in the study.

3.1 Population and Sample

The population was from four faculties: Agricultural Innovation, Engineering, Optometry, and Criminology and Justice Administration. They were registered in Foundation Physics in the year 2020—all at 167 in total.

Of 167 students, 131 (78.33%) participated in the study on a voluntary basis.

3.2. Research Tools

3.2.1. Online Teaching Tools

The researcher used LINE and Google Meet for real-time online teaching, and Google Classroom for course learning management. The researcher's steps in using the tools were as follows:

(1) Studied the features and usage of LINE applications, Google Classroom and Google Meet.

(2) Used LINE for communicating, Google Meet for real time online teaching, and Google Classroom for course learning management.

(3) Designed an online classroom structure and prepared teaching materials after the course description according to the curriculum (TQF 3 Thailand Qualification Framework).

(4) Prepared teaching materials for online teaching, consisting of PowerPoint and video clips to enhance knowledge, and uploaded the material files on Google Classroom along with teaching videos for uploading after real-time online class.

5) Asked three education experts to check the teaching materials and Physics online classroom structure to obtain IOC of at least 0.5.

3.2.2. The Questionnaire

The researcher used a questionnaire of 18 items and one open-ended question to collect data on learners' satisfaction with online learning management in the physics course. The researcher had two steps in constructing the tool:

(1) Created a questionnaire on learners' satisfaction with Physics learning management using Line, Google Classroom and Google Meet. There were 18 items on online learning satisfaction on the Likert type scale of 5 levels from low to high. The researcher put one open-ended question at the end of the questionnaire on Google Form.

(2) Asked three education experts to check the items and the research objective to obtain IOC of at least 0.5.

4. Data Collection Procedure

The researcher used Google Form to collect data from the participating subjects in the procedure shown below:

(1) Clarified the objective of this research to students in the Physics course and invited them to volunteer as participants in the study. There were 131students showing their interest in helping with data provision.

(2) Managed online teaching and learning as specified in the course description and the curriculum by TQF 3 using LINE, Google Classroom and Google Meet.

(3) Collected data on learners' satisfaction with teaching and learning management in the Physics course using LINE, Google Classroom and Google Meet.

(4) Analyzed the obtained data by interpreting the satisfaction levels from the averages of all answers at 5 levels--highest, high, moderate, low and lowest. The average criteria for interpreting the levels of satisfaction are given in Table 1.

Table 1: Mean Criteria for Interpretation of Satisfaction Levels

Range	Satisfaction Level
4.24 - 5.00	Highest
3.43 - 4.23	High
2.62 - 3.42	Moderate
1.81 - 2.61	Low
1.00 - 1.80	Lowest

5. Data Analysis

The obtained quantitative data were analyzed by using frequency, percentage, mean and standard deviation. The participating subjects' responses to the open-ended question were analyzed by content analysis.

6. Results of the Study

The results of the study were as follows:

(1) The participating subjects were 131 of 167 (78.4%) students registered in the Foundation Physics course in Academic Year 2020: 42 of 42 (100.0%) in Optometry, and 27 of 29 (93.1%) in Criminology and Justice Administration, 22 of 37 (59.5%) in Agricultural Innovation, and 40 of 59 (67.8%) from Engineering. There were 59 males (45.0%), and 72 females (55.0%). Those who graduated from high school in the science stream were 78 of 131 (59.5%) as shown in Tables 2 and 3.

Table 2: Number and Percentage of Participating Subjects

Faculty	Number of Students	Registered (Person)	Percent
Faculty of Agricultural Innovation	37	22	59.5
College of Engineering	59	40	67.8
Faculty of Optometry	42	42	100.0
Faculty of Criminology and Justice Administration	29	27	93.1
Total	167	131	78.4

Table 3: Classified Baseline Data of Participating Subjects

Faculty	Gender Number of Persons (Percent)		Graduation Number of persons (Percent)		
	Male	Female	Upper Secondary Level General (Science)	Upper Secondary Level General (Art)	Secondary School Teacher
Faculty of Agricultural Innovation	15 (11.5)	7 (5.3)	7 (5.3)	5 (3.8)	10 (7.6)
College of Engineering	27 (20.6)	13 (9.9)	20 (16.3)	8 (6.1)	12 (9.2)
Faculty of Optometry	12 (9.2)	30 (22.9)	34 (26.0)	5 (3.8)	3 (2.3)
Faculty of Criminology and Justice Administration	5 (3.8)	22 (16.8)	17 (13.0)	9 (6.9)	1 (0.8)
Total	59 (45.0)	72 (55.0)	78 (59.5)	27 (20.6)	26 (19.8)

(2) For those students in Agricultural Innovation, their average satisfaction with the application system, the physics course management system, and the online learning system in the Physics course via three applications were high at 4.6±0.7, 4.5±0.7 and 4.5±0.7, respectively. The students were a little less satisfied at 4.5±0.7, 4.5±0.7 and 4.4±1.1, respectively. The mean of "announcing the scores in the online system" was at 4.7±0.5 for those students in Agricultural Innovation and Engineering. It was noted that the item "reduce costs and reduce travel time to attend classes" for Engineering students was at 4.4± 1.1. Overall, students in Agricultural Innovation appeared a little more positive than those in Engineering toward online teaching and learning management in the Physics course. Details are shown in Table 4.

Table 4: Satisfaction Results of Students in Agricultural Innovation and Engineering

Assessment Item	Faculty of Agricultural Innovation		College of Engineering	
	$\bar{X}$	SD.	$\bar{X}$	SD.
Satisfaction with the application system	**4.6**	**0.7**	**4.5**	**0.7**
1. Using group lines in communication.	4.5	0.9	4.6	0.6
2. Using google classroom instead of normal classroom.	4.6	0.6	4.4	0.8
3. Using google meet in real-time online learning.	4.6	0.6	4.4	0.7
Satisfaction with the physics course management system	**4.5**	**0.7**	**4.5**	**0.7**
1. Details appear in the online classroom structure.	4.5	0.7	4.5	0.6

Assessment item	Faculty of Agricultural Innovation		College of Engineering	
	$\bar{X}$	SD.	$\bar{X}$	SD.
2. Real-time online learning.	4.4	0.7	4.3	0.7
3. Video recordings of real-time online teaching.	4.4	0.7	4.5	0.8
4. Documents for lectures.	4.3	0.9	4.5	0.8
5. Exercises for learning.	4.4	0.8	4.5	0.7
6. Supplementary media such as video clips answering exercises.	4.3	0.8	4.5	0.8
7. Submitting work in the online system.	4.6	0.5	4.5	0.7
8. Online Exam.	4.5	0.5	4.7	0.6
9. Announcing the scores in the online system.	4.7	0.5	4.7	0.5
10. Content sequencing is more convenient and easy to self-study.	4.5	0.7	4.6	0.6
Satisfaction with the online learning system	**4.5**	**0.7**	**4.4**	**1.1**
1. Help to understand the lesson just like studying in a normal classroom.	4.4	0.8	4.1	0.9
2. Give an opportunity to ask questions in the lesson.	4.6	0.5	4.4	0.8
3. Able to review teaching and learning as needed.	4.5	0.7	4.6	0.6
4. Help to have an increase in academic achievement.	4.3	0.8	4.3	0.8
5. Reduce costs and reduce travel time to attend classes.	4.6	0.7	4.4	1.1

(3) It was found that the average satisfaction with the application system, the physics course management system, and the online learning system in the Physics course via three applications were: Optometry at 4.3±0.8, 4.3±0.8 and 4.2±0.8, respectively; and Criminology and Administration of Justice at 4.6±0.7, 4.6±0.7 and 4.4±0.7, respectively. It was obvious that the students in Criminology and Administration of Justice were positive toward online teaching and learning management in the Physics course, as seen in their mean values ranging from 4.2-4.6 with the highest satisfaction with "Exercises for learning" at 4.7±0.6. Those students in Optometry were slightly lower in their satisfaction with the lowest mean value at 3.9±1.0 for "Help to have an increase in academic achievement," and the highest mean value at 4.6±0.6 for "Announcing the scores in the online system." Details are shown in Table 5.

Table 5: Satisfaction Results of Students in Optometry and Engineering and Criminology and Justice Administration

Assessment Item	Faculty of Optometry		Faculty of Criminology and administration of justice	
	$\bar{X}$	**SD.**	$\bar{X}$	**SD.**
Satisfaction with the application system	**4.3**	**0.8**	**4.6**	**0.7**
1. Using group lines in communication.	4.2	0.8	4.6	0.6
2 Using google classroom instead of normal classroom.	4.4	0.7	4.6	0.7
3. Using google meet in real-time online learning.	4.3	0.8	4.5	0.7
Satisfaction with the physics course management system	**4.3**	**0.8**	**4.6**	**0.7**

Assessment Item	Faculty of Optometry		Faculty of Criminology and administration of justice	
	$\bar{X}$	SD.	$\bar{X}$	SD.
1. Details appear in the online classroom structure..	4.2	0.8	4.5	0.7
2. Real-time online learning.	4.1	0.8	4.5	0.8
3. Video recordings of real-time online teaching.	4.4	0.9	4.6	0.6
4. Documents for lectures.	4.2	1.0	4.6	0.9
5. Exercises for learning.	4.1	0.9	4.7	0.6
6. Supplementary media such as video clips answering exercises.	4.3	0.9	4.4	0.7
7. Submitting work in the online system.	4.4	0.7	4.6	0.7
8. Online Exam.	4.5	0.8	4.6	0.6
9. Announcing the scores in the online system.	4.6	0.6	4.6	0.7
10. Content sequencing is more convenient and easy to self-study.	4.3	0.8	4.5	0.6
Satisfaction with the online learning system	**4.2**	**0.8**	**4.4**	**0.7**
1. Help to understand the lesson just like studying in a normal classroom.	4.0	0.9	4.2	0.7
2. Give an opportunity to ask questions in the lesson.	4.0	0.8	4.4	0.6
3. Able to review teaching and learning as needed.	4.3	0.9	4.6	0.8
4. Help to have an increase in academic achievement.	3.9	1.0	4.3	0.7
5. Reduce costs and reduce travel time to attend classes.	4.6	0.6	4.6	0.7

(4) The students' average satisfaction with three applications in the Physics course using LINE, Google Classroom and Google Meet revealed that those in Agricultural Innovation, Engineering, and Criminology and Justice Administration were satisfied with Application, Course Management and Online Learning at the total average of 4.5±0.7, 4.5±0.8 and 4.5±0.7, respectively. Those students in Optometry were a little less satisfied at 4.3±0.8.

It should be noted that the students in Agricultural Innovation (4.6±0.7) and Criminology and Justice Administration (4.6±0.7) were more pleased with the *Applications* used in the Physics course than those in Engineering (4.5±0.7) and Optometry (4.3±0.8). Those in Criminology and Justice Administration (4.6±0.7) were the highest in satisfaction with *Course Management*, while Agricultural Innovation (4.5 ± 0.7) were the highest in satisfaction with *Online Learning*. Among the four groups, the students in Optometry (4.3±0.8) appeared a little less satisfied overall. Details are given in Table 6.

Table 6: Satisfaction Results of Students with Online Learning Management Using Three Applications

Assessment Item	Faculty of Agricultural Innovation		College of Engineering		Faculty of Optometry		Faculty of Criminology and Justice Administration	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Satisfaction with the *application* system.	4.6	0.7	4.5	0.7	4.3	0.8	4.6	0.7
Satisfaction with the physics *course management* system.	4.5	0.7	4.5	0.7	4.3	0.8	4.6	0.7
Satisfaction with the *online learning* system.	4.5	0.7	4.4	1.1	4.2	0.8	4.4	0.7
Total	**4.5**	**0.7**	**4.5**	**0.8**	**4.3**	**0.8**	**4.5**	**0.7**

(4) Those students who gave opinions or suggestions were 61, representing 46.6%, of which 23 from the Faculty of Optometry, representing 54.8% as shown in Tables 7 and 8.

Table 7: Frequency and Percentage of Participating Students' Responses

Faculty	Number of Respondents	Number of Open-Ended Questions (Persons)	Percent
Agricultural Innovation	22	8	36.4
Engineering.	40	20	50.0
Optometry.	42	23	54.8
Criminology and Justice Administration.	27	10	37.0
Total	131	61	46.6

Table 8 reports comments and suggestions given by the participating students. The total number of responses from the participating students was 61 (one student could give more than one response). By response frequency, more than one-third of the students (F=27) were happy with the teacher's teaching method. Other responses dealt with comments or suggestions on the online course teaching: (1) convenience in learning time (F=8), (2) preference for a real classroom/ admitting affective effects on their mood (F=7), (3) request for slower teaching pace (F=4), (4) request for earlier teaching video clip uploading (F=2), and (5) teaching time keeping or punctuality (F=2). The rest of the responses with Frequency of 1 were on explanations, exercises, lab documents, problem-solving tasks and the like. Details are shown in Table 8.

Table 8: Comments and Suggestions from Participating Students

Faculty	Comments and Suggestions
Agricultural Innovation (F=8)	• Teacher is very good at teaching online. I can review the content myself. I like it very much. • I want Covid to go away. • Good (f=2) • The teacher is kind. • I study for a long time and I feel sleepy. • Sometimes I can't catch up. Maybe it's a subject that I'm not good at. I have to apologize here. • Thank you teacher for inserting knowledge about agriculture for me. It's a lot of fun when the teacher tells stories about the teacher's garden. I like it.
Engineering (F=19)	• Very good teaching, easy to understand. • Want to study at university. • Add exercises that use more complex analysis and calculations • The teacher is very good. I want the teacher to slow down a bit. • I like studying. • I don't understand like in my class. • I like to go to class more. • Thank you. (f=2) • It's easier to understand in my class. • I want you to teach slowly. • The teacher recommends it. Yes, always remind students. There is always something to tell students in the group line, so students are always enthusiastic. • The teacher is very good. If it's slower, it will be very good. • I want the teacher to teach me how to analyze the problems in each lesson a lot. • I want to study in the classroom more. because it makes you concentrate and understand more But with this situation, it's not good. must study online But I understand. • Even though online learning reduces travel expenses, learning is still less than studying in the classroom. • I want teachers to teach a little slower. • Thank you teacher for giving the kids the opportunity. • It might make me lazy to study.
Optometry (F=24)	• Study and have convenient videos. If you can't listen to it in time, you can repeat it over and over. • Good. • About time, sometimes there may be late, sometimes not released on time. Overall ok. • Sometimes the voice may not be very clear. • If you study in the classroom. You will understand more. • Teacher teaches very well. • Teacher teaches in detail and understand. • Online classes can review the content by themselves. This allows students to understand the lesson more.

Faculty	Comments and Suggestions
	• Thank you teacher for giving knowledge and teaching very well throughout the 1 semester. • Thank you (f=2) • The homework briefs should be clear and accurate so that students can understand the lesson better. To understand the correct way of thinking more. • I want to study at the university more. • Thank you for your interest in people suffering from depression like me. Even though I didn't inform the teacher that I am, the teacher still gave me a way for people with depression to show themselves. Thank you very much. • I want the teacher to explain in detail. And I want the teacher to speak a little slower. Thank you. • The teaching recording is very good. It helps us understand many times. We can go back and watch it as many times as we want • I want the teacher to upload the teaching clips one by one to YouTube. Yes, because I will see first and understand. And on YouTube, you can replay and speed clips. • Want to study in the classroom more. When online is not as intended as it should be. • Learning in the classroom is the best choice. But in this situation, online learning is probably the best solution. • Time to teach because it's free in some sessions, the teacher teaches late. • The internet system is not good. This should be improved a bit. • I would like the teacher to clearly divide the teaching video for each chapter. And video labs to specify more clearly for the convenience of studying. • Even online learning is convenient. But I prefer to study in the room. • The lab documents want the teacher to be able to do it in the app. without having to photocopy because of the waste of natural resources.
Criminology and Justice Administration (F=10)	• Studying online and having videos to watch is very good. Because you can always come back and review the lesson. • The teacher gave me good advice on how to study. • Very good. • The teacher teaches well but sometimes I can't keep up. • The teacher is cute. • There is a clip for each teaching. Looking back all the time is very good for this subject because I can come back and review the parts that I don't understand. • Good. • The teacher is very nice and kind. • There may be some difficulties when studying online, but still. It's all right. There is another video to review. • Teach well and be very kind, giving me the courage to ask. Thank you very much.

7. Discussion of Results

(1) The Questionnaire

The questionnaire results revealed the students in four faculties giving average satisfaction with online teaching and learning management of the Physics course via three applications--LINE, Google Classroom and Google Meet—at a high level: Faculty of Agricultural Innovation (4.5±0.7), College of Engineering (4.5±0.8), Faculty of Criminology and Justice Administration (4.5±0.7), followed by Faculty of Optometry at (4.3±0.8). This finding was rather consistent with the studies of other preceding researchers, particularly Chuha et al (2019) who reported students' satisfaction with online teaching via the Zoom Cloud Meeting application in the practice of midwifery courses. These researchers highlighted students' satisfaction with virtual teaching at the mean of 4.61±0.49, followed by 4.59±0.49 on being able to review teaching and learning as needed. Similarly, Wuttiyan & Srikramkran (2017) reported language learners' high satisfaction with format and content used in English online via Skype at ECC Language Institute. Sedrit (2020) also praised Google Classroom in teaching language for communication in Grade 5. It was found that the students were satisfied with the lesson series of activities to develop their English communication skills. The learners in the study liked content in the lesson enhancing the communicative English experience and enjoyed learning English through the Google Classroom application for its ease, speed and access to teaching. Students can save time in traveling to university. It is a great way to handle learning and communication with students as education management strategies required at the university level (Petchroj, 2021); the virtual mode helps reduce costs in teaching and learning management, and alleviate stress over economic hardship on the part of students and their families. Online learning does not limit the number of learners, and students can learn and review their lessons as many times as needed.

(2) The Open-Ended Responses

As seen in Table 8, 61 students gave their opinions/suggestions on the Physics course teaching and learning management via LINE, Google Classroom and Google Meet. Most respondents were positive about being able to review the lessons at their own learning pace to understand the teaching points. They praised the teacher for good attention to learners and effective online teaching techniques. The respondents liked the way the teacher reminded them in group LINE to keep students active in class time. Provision of teaching clips was for students to review them later, as expressed in one response "Sometimes I really can't keep up. Maybe it's a subject that I'm not good at. I'm sorry here." Some respondents asserted that they would prefer to study in a real classroom: "I would rather study in a classroom. When online, it's not as intended as it should be." From these comments or suggestions, the researcher as a Physics course instructor would certainly take their feedback as information for adjustments in the next round of online teaching and learning management

8. Recommendations

Based on the research findings, the following points could be recommended:

(1) Online teaching requires a slow pace in explaining, and time for students to absorb the new points by mainly listening in virtual communication. The course instructor needs to look at the curriculum TQF 2, the course description in TQF 3 in order to plan on how to deliver the course contents in full while keeping the students' interaction, interest and attention span in focus. The contents could be divided into smaller units for the students to digest with ease, followed by their self-paced review and self-study. Therefore, the course instructor may need to provide online supplementary instruction to explain with more examples outside of class time and upload video clips for students to study and review again as needed. Also, it is important to follow up with students via LINE or other social media as agreed in class,

(2) Study programs should facilitate students to submit their assignments online to help reduce the use of paper.

(3) The course instructor can create a YouTube channel to upload video clips obtained from online teaching on Google Meet for the students' viewing after each class without delay.

9. Suggestions for Future Research

Based on the major findings of the study, the researcher would like to suggest future research in three aspects:

(1) Study students in other faculties or fields of study to get a wider scope of feedback for efficiency in online teaching and learning management.

(2) Study teaching management in terms of teacher-student and student-student interactions via Google Meet, Google Classroom, Microsoft Teams, Zoom, VooV, Facebook Live, LINE, and WeChat to identify a combination of use that suits particular groups of students or teaching-learning contexts.

(3) Study satisfaction and reaction on the part of teachers who need to cope with online teaching-learning management for custom-made in-service training programs pertinent to their needs for digital skills.

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The Factors Affecting Thai Tourists' Decision on Visiting Khlong Bang Luang Floating Market, Phasi Charoen, Bangkok

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Abstract

The research was to study factors affecting Thai tourists' decision on visiting Khlong Bang Luang Floating Market, Phasi Charoen, Bangkok in 2018-2019. The tool for data collection was a survey questionnaire distributed to 384 Thai tourists on their visit to Khlong Bang Luang Floating Market. The researchers analyzed the obtained data by percentage, average and standard deviation. It was found that most Thai tourists were female, aged between 20-29 years old, single, the monthly income less than or equal to 15,000 bath, and still studying at university. Their responses revealed four factors affecting their decision on visiting Khlong Bang Luang Floating Market, Phasi Charoen, Bangkok: (1) Attraction, (2) Accessibility (3) Amenities, and (4) Activities.

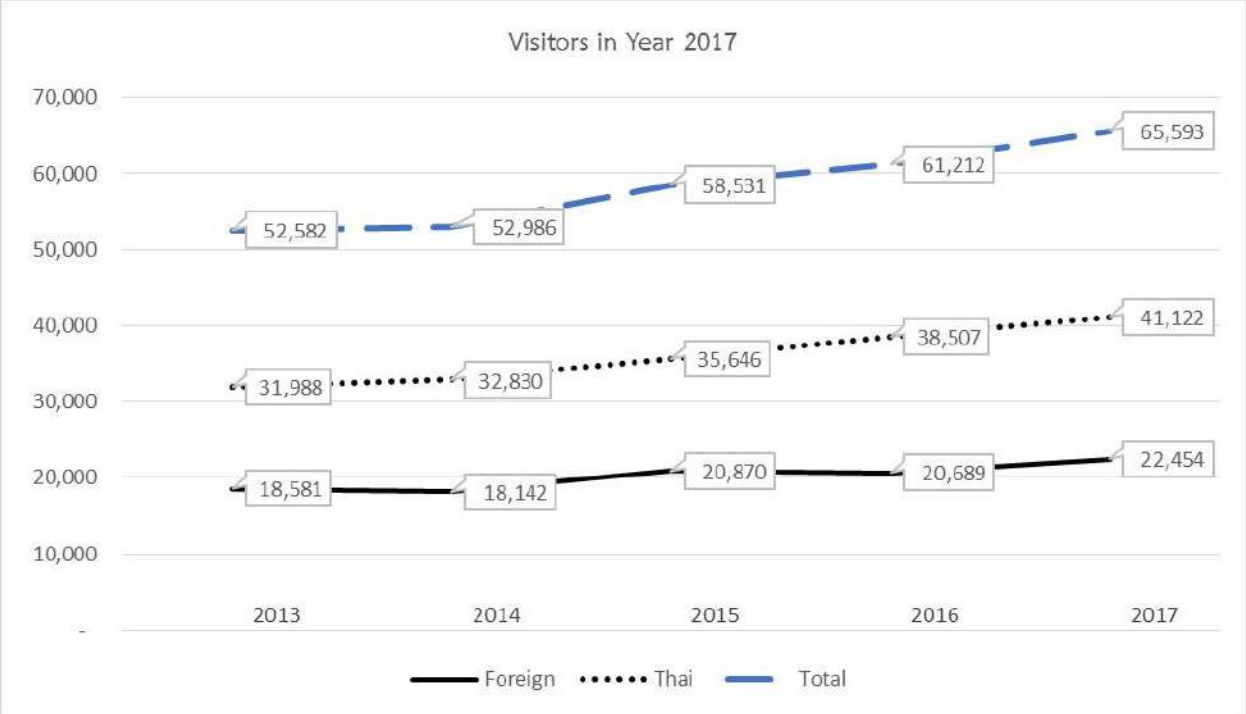
Keyword: *Factors affecting decision, Thai tourists, Khlong Bang Luang Floating Market*

1. Introduction

Tourism plays an important role in the economic and social development of Thailand for competitiveness in generating high income to the country. In particular, countries in Asia and ASEAN have formulated marketing strategies to attract more tourists around the world to visit their countries. Tourism has therefore become a mission that is integrated into other dimensions of the country's economic development (Schiffman & Kanuk, 1994; Samerjai, 2007; Pike (2008). As known, Thailand has prioritized tourism for trade and services to create employment and income distribution as shown in 2013-2017 (Figure 1), and aspired to make Thailand a tourism capital of Asia and a quality tourism destination (Kaewsin, 2007; Rodcham, 2013).

Figure 1 shows growing interest in visiting Bangkok among Thais and foreigners in 2013-2017.

Figure 1: Number of Visitors to Bangkok in Year 2017



Source: Tourism Authority of Thailand (2017), TOT Website

Tourism as a hospitality industry can create various kinds of jobs dealing products and services. Tourists tend to focus more on specialized tourism than traditional tourism in the past, particularly ecotourism, adventure tourism, agricultural tourism, and cultural tourism (Tourism Western Australia, 2008). At present, the Thai government has supported community-based tourism known as Thainess or Thai way of life, or reality tourism which emphasizes local life experience including beliefs that have been passed down through generations to become invaluable heritage that marks the community's uniqueness. Community-based tourism creates a memorable experience for tourists and people in the community to participate in the authentic activities. As known in practices of tourism, the service quality is of prime importance in determining customers' decision (Phakdeephitot, 2020). The circulation of resources, income, skills and knowledge is meant for villagers to have a stake in local tourism and manage their own resources in providing quality service for incoming tourists. By bringing in various local resources that are natural, history, traditions, way of life and production methods, the community can use them as a cost factor in tourism operations, while developing human capital to its full potential in the community. Those involved in local tourism can use local wisdom in tourism business operations, decision-making, planning, implementation, conclusion of

learned lessons, and resource sustainability to benefit the next generation (Collier & Harraway, 1997; Cooper & Boniface. 1998). According to the government's policies, Thai lifestyle tourism has become increasingly popular among Thai tourists. This is a good response from Thai tourists in their enthusiasm to travel more inside the country.

Since the government has supported local areas of Thailand as new or "unseen" tourist attractions. One obvious example was the floating market at Khlong Bang Luang Floating Market, Phasi Charoen District, Bangkok reported by *Post Today* in 2016.

Khlong Bang Luang Floating Market is a local floating market along Bangkok Yai Canal. It is an old community built in Ayutthaya Period and located in Phasi Charoen District, Bangkok. The floating market is part of the small communities with old wooden buildings, 2-storey houses along the banks of Khlong Bang Luang, souvenir shops, restaurants, barber shops, and community exhibit places displaying various kinds of antiques. In addition, around the floating market there is Wat Kamphaeng (Bang Chak), an old temple which has been with the community for a long time. There is an artist house owned by "The Rak Suay Family" of goldsmiths which is now renovated for an art meeting place for artists as well as art lovers. A central court built around the twelve wooden recessed pagoda (chedi)--presumably one of the four chedis--marks the boundary of Wat Kamphaeng. A small puppet theater is for tourists to watch for free at daytime from 9 am to 6 pm. In the olden days, Khlong Bang Luang Floating Market was prosperous, and there were many gold shops and shops selling food, grocery and household products along the canal. Nowadays, villagers have renovated houses, and some neighborhoods have turned their living quarters into shops for tourists, men's barbershops, hair salons, zinc welding shops, and grocery stores. Local people are well aware of the decline in attraction of the community and would like to revive tourists' interest via public relations to attract both Thai and foreign tourists.

Therefore, the research team would like to study factors that affect Thai tourists' decision on visiting Khlong Bang Luang Floating Market. It is important to understand the needs of tourists so that tourist business operators can respond to potential customers' needs. The researchers visited the site to analyze tourist attractions in 4A's: Attraction, Accessibility, Amenities, and Activities. The researchers also looked at relevant agencies in the area--both government and private business--especially people in the community and nearby areas in order to provide homestay services. The research team conducted the study in 2018-2019 and expected that the obtained findings could shed more light on what to be done to upscale this tourist site to attract visitors and respond to their needs well for sustainability of community-based tourism of Khlong Bang Luang.

2. Research Objective

The research was to study factors affecting Thai tourists' decision on visiting Khlong Bang Luang Floating Market, Phasi Charoen District, Bangkok. It was expected that of the identified factors can be used to guide local tourism business development and operations of Khlong Bang Luang.

3. Scope of Research

The researchers specified the scope of the study as follows:

(1) The scope of the study covered the community and the floating market at Khlong Bang Luang, Phasi Charoen District, Bangkok, Thailand.

(2). The content covered factors affecting Thai tourists' decision on visiting Khlong Bang Luang Floating Market, Phasi Charoen District, Bangkok in four A's as Attraction, Accessibility, Amenities, and Activities.

(3). The participating subjects were Thai tourists visiting the floating market at Khlong Bang Luang, Bangkok.

(4). Time for data collection was from August 2018 to May 2019.

4. Research Method

The researcher used a questionnaire on decision factors identified by Thai tourists for their visit to Khlong Bang Luang Floating Market, Phasi Charoen District, Bangkok. The obtained data were analyzed by percentage, mean and standard deviation.

The sample used in this research was 384 Thai tourists visiting Khlong Bang Luang Floating Market, Phasi Charoen District, Bangkok. The selection was based on the formula of Roscoe (Roscoe, 1969). The data collection tool was a questionnaire which analyzed the data using statistics consisting of percentage, mean, standard deviation.

5. Data Collection Tools and Procedure

The questionnaire consisted of three parts.

Part 1: Demographic variables include gender, age, occupation, status and monthly income of the participating subjects.

Part 2: Questionnaire items deal with factors of tourist attractions in four A's: (1) Attraction, (2) Accessibility (3) Amenities, and (4) Activities.

Part 3: Other Suggestions and additional comments from the participating subjects.

6. Results of the Study

The results of the study were as follows:

(1) General information of the participating tourists

From the study, 384 respondents were

Female (64.84%) and male (34.16%),

Aged 20-29 years (41.93%),

Students (35.68%),

Single status (57.55%), and

Average monthly income less or equal to 15,000 baht

(2) The results of the study on the decision factors of Thai tourists in visiting Khlong Bang Luang Floating Market, Phasi Charoen District, Bangkok were:

Attraction factor in tourist attractions. The average was at the highest level ($\bar{x}$ =4.23, S.D.=0.76). Attraction was unique and at the highest level ($\bar{x}$ =4.28, S.D.=0.71). The locals were friendly and willing to serve ($\bar{x}$ =4.26, S.D.=0.68); the site was in harmony with nature and culture ($\bar{x}$ = 4.25, S.D. = 0.77); the traditional way of life of the local people ($\bar{x}$ = 4.20, S.D. = 0.82); and cleanliness of the site ($\bar{x}$ = 4.18, S.D. = 0.81).

Accessibility factor in tourist attractions. Overall, accessibility was at a high level ($\bar{x}$ = 3.74, S.D. = 0.98). The items under accessibility were at a high level. The condition of the transportation route was standard and safe ($\bar{x}$ = 3.77, S.D. = 0.95); there were various types of transportation available--buses, passenger boats, and sky trains ($\bar{x}$ = 3.77, S.D. = 0.90); the site was easily accessible and fast ($\bar{x}$ = 3.75, S.D. = 0.89); there was a navigation guide to various attractions on the site ($\bar{x}$ = 3.72, S.D. = 1.07); and the community had publicity of tourist attraction information ($\bar{x}$ = 3.68, S.D. = 1.07), respectively.

Amenities factor in tourist attractions. Overall, amenities or facilities were at a high level ($\bar{x}$ = 3.46, S.D. = 1.04). Three items under amenities were at a high level: there were sufficient facilities for tourists, such as toilets, trash bins, resting points ($\bar{x}$ = 3.62, S.D. = 0.94); food and beverage outlets were sufficient and of good quality ($\bar{x}$ = 3.57, S.D. = 1.00); and the community provided enough staff to give information and take care of public relations ($\bar{x}$ = 3.49, S.D. = 1.01). Two items were at a moderate level: the number of clear signs of facilities, such as restrooms and parking areas signs ($\bar{x}$ = 3.33, S.D. = 1.09) and enough parking space ($\bar{x}$ = 3.28, S.D. = 1.14).

Activities factor in tourist attractions. Overall, activities were at a high level ($\bar{x}$ = 4.08, S.D. = 0.95). The items under activities were: variety of activities, such as mask coloring and puppet shows ($\bar{x}$ = 4.16, S.D. = 0.87); activities suitable for tourists for all genders and ages ($\bar{x}$ = 4.14, S.D. = 0.86; appropriate duration of activities, such as mask coloring and puppet shows ($\bar{x}$ = 4.07, S.D. = 0.91); activities for knowledge and skill enhancement ($\bar{x}$ = 4.02, S.D. = 0.98); and activities promoting environmental conservation ($\bar{x}$= 4.01, S.D. = 1.09).

Most of the respondents agreed that the four factors affecting tourists' decision on visiting Khlong Bang Luang Floating Market were at a high level ($\bar{x}$ = 3.88, S.D. = 0.99). The order of these factors was: (1) Attraction ($\bar{x}$ = 4.23, S.D. = 0.76), (2) Activities ($\bar{x}$ = 4.08, S.D. = 0.95), (3) Accessibility ($\bar{x}$ = 3.74, S.D/ = 0.98), and (4) Amenities ($\bar{x}$ = 3.46, S.D. = 1.04).

7. Discussion of Results

From the results reported in Section 6, the researchers put them under discussion as follows:

(1) Attraction

The respondents considered *attraction* as most affecting Thai tourists' decision on visiting Khlong Bang Luang Floating Market, Phasi Charoen District, Bangkok ($\bar{x}$= 4.23, S.D. = 0.76).

They liked harmony in nature and culture, friendliness of the community, the traditional way of life of the local people, and cleanliness/ neatness of the tourist areas. This is in line with the research finding of Nuttayasakul (2016), which identifies attraction as the main factor that appeals to tourists. Convenience in traveling or easy access to the tourist site is also important (Suwannin, W. et al. 2014; Dabphet, 2017; Wittayakomollert, 2017).

(2) Activities

Activities were identified by the respondents as a high decision-making factor ($\bar{x}$ = 4.08, S.D. = 0.95). Puppet shows and mask painting were suitable for tourists of all ages for fun and enhancement of local knowledge and skills. This finding corresponds with the point made by Dickman (1996) that a variety of activities can entertain tourists well during their stay and touring. In order to increase tourists' interest in traveling in leisure, various activities should be diverse and meet their needs as well. The findings of other researchers also point to of the importance of activities, particularly marine activities to attract tourists. (Prachayaprut, 1999; Buakwan, 2013; Choochart, 2000).

(3) Accessibility

The respondents considered accessibility vitally important in affecting Thai tourists' decision on visiting Khlong Bang Luang Floating Market, Phasi Charoen District, Bangkok ($\bar{x}$ = 3.74, S.D. = 0.98). Ease in traveling to tourist attractions by public buses, passenger boats, trains need to ensure transportation routes of standard and safety. Maps and navigation facilitation are needed to tell tourists the location of various spots on the site, including publicity for tourist information. Thammabutr (2006) also emphasized accessibility to tourist attractions as part of infrastructure, such as transport systems, airports, as well as industrial transport services by air, land and water. This will allow tourists to travel to their destinations conveniently. Access to cultural resources for sustainable tourism requires that communities have multiple access routes, followed by good road conditions for travelers to get to the community. Regular bus services and well-marked directions to tourist attractions are definitely an advantage in facilitating tourists' visit to the site (Choochart, 2000; Likitsaran, 2016; Losiripat, 2017).

(4) Amenities

The respondents put amenities at a high level in affecting tourists' decision on visiting Khlong Bang Luang Floating Market, Phasi Charoen District, Bangkok ($\bar{x}$ = 3.46, S.D. = 1.04). Amenities or facilities provide pleasant experience for tourists, such as meeting points, quality food and beverage outlets, resting areas, waste bins, and toilets. Important are staff to provide knowledge, information, public relations, location symbols and signs, and parking spaces. This point was earlier made by Choochat (2000) who said that amenities are conveniences that allow tourists to reach places quickly, safely and comfortably, such as transportation systems, communication systems, including electricity and water. Other preceding researchers also emphasized the importance of amenities or facilities. There should be enough food outlets and restaurants serving a number of tourists, together with clean and adequate restrooms (Kangsanan, 1986; Injanin, 2011; Dabphet, 2017; Losiripat, 2017).

It should be noted that at the time of study in 2018-2019, Khlong Bang Luang Floating Market had amenities sufficient for the current number of coming tourists, but the tourist site management would certainly need to provide more facilities for larger groups of tourist groups.

8. Suggestions

Based on the findings of the study on the factors that affect Thai tourists' decision on visiting Khlong Bang Luang Floating Market, Phasi Charoen District, Bangkok, the researchers would like to suggest the following:

(1) Tourist attractions

Tourist attractions need to bring out more uniqueness of the community by including conservation and continuation of local culture under good local management. Community meetings should be held to urge people to be aware of the importance of community-based tourism to benefit members of the community. The unique identity of the community can create a selling point to attract tourists and give good impression and good experience for visitors.

(2) Tourism activities

Small puppet shows are appealing to tourists as well as other activities, such as mask coloring, making strings of beads and stucco painting. There should be more publicity to inform tourists about schedule and availability of these cultural activities.

(3) Access to tourist attractions

There should be the community's arrangement for more frequent public buses or a passenger boats to the tourist site. Standard and safe transportation routes and clear signs to tourist attractions could ensure more visitors to Khlong Bang Luang Floating Market. The community should provide more information via social media.

(4) Amenities

Khlong Bang Luang Community is a small and peaceful community and therefore needs to increase parking space for incoming tourists. Tourists also want more restaurants, resting spots, toilets, and trash cans to meet their needs. The local management of the site should carefully plan for improvement of the needed facilities.

9. The Authors

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College Degrees versus Free Online Courses

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Abstract

This academic paper deals with three types of education: formal, informal and nonformal. The major components of these three types were discussed, mainly on the host or provider, curriculum, instruction, learning modes, learning outcomes, assessment or evaluation, and certification. The author discussed all these components in the light of the necessity of college degrees and the impact of free online courses. The paper was concluded with the author's reflection upon current demands for specific types of education with specific competency desired by the job market and areas of work.

Keywords: *Formal education, informal education, nonformal education, university degrees, online courses*

1. Introduction

Educators are currently concerned with what would be best for teaching and learning at the university level (Sinlarat, 2020). As known, there are three types of education: formal, informal and nonformal. Each type has major components, mainly (1) the host or provider, (2) curriculum, (3) instruction, (4) learning modes, (5) learning outcomes, (6) assessment or evaluation, and (7) certification. All three types of education approach these components slightly differently and very differently, depending on the learner needs and expected learning outcomes. It is important to think carefully about the necessity of college degrees and the impact of free online courses. In this paper, the author gave relevant information and the scope of tasks and operations of formal, informal and nonformal education, and the author's interviews with key executives, followed by reflection upon current demands for types of education with specific competency desired by the job market and areas of work.

The three types of education and their components are shown in Table 1.

Table 1: Major Components of Three Types of Education

Components	Formal Education	Informal Education	Nonformal Education
Host/ Provider	School/ Institution	School/ Institution	Organizations/ Public or Private Sectors
Syllabus/ Curriculum	Subject-oriented/ Structured	Both prescribed and diverse contents	Diverse contents
Instruction	Teaching methods	Diverse methods	Self-teaching/ From environment/ Flexibility

Components	Formal Education	Informal Education	Nonformal Education
Learning modes	Classroom/ Schedule	Adult learning/ Home schooling/ Learning Participation/ Real-life practice/ Learning by preferred place and time/ Various material sources/ Time-efficient learning process/ Resource persons	Life experience/ Daily life situations/ Working with friends/ Learning from history, situation, TV, YouTube, News, Social media
Learning outcomes	By curriculum	By curriculum	Skills by self-learning
Assessment/ Evaluation	Examination	Examination	No need for examination/ Authentic assessment (if any)
Certification	Certificate/ Degree	Certificate/ Degree	Certificate of Attendance Certificate of Completion
Cost	Full fees	Partial fees	Low fees/ Free

Source: Passion in Education.com (2021)

As seen in Table 1, the components of formal and informal education are quite similar, except that informal education allows students to manage their learning time but still need to follow the prescribed methods of assessment and evaluation at the end of each course and the total program. Nonformal education supports students to enjoy freedom in learning online regarding their choice of courses, self-learning pace and time and no burden of traditional examination. Those who choose nonformal education would perhaps need certificate of attendance or completion as preferred. Considering the three types of education concerning their learning modes, we can see that nonformal education has opened up a new learning perspective for those who need technical knowledge and skills development pertinent to their personal needs or particular tools specific to their current work. They can simply shop for what they want to learn, and there is no need to cover the whole curriculum as prescribed in the typical teaching-learning modes in formal or informal education.

2. Nonformal Education

In this 21st century, non-formal education, widely known in the form of free online courses, has shown itself as a current trend on self-education and self-paced learning, which is flexible and matches well with many people's lifestyle. One outstanding example of self-educators is Mark Zuckerberg, the co-founder of Facebook in 2004. He dropped out of college and put himself into non-formal education to learn what he needed for his career to become a creative entrepreneur and a billionaire at a young man. He did not wait for a college degree to start his enterprise; instead he self-taught for the needed knowledge, techniques and skills to pursue for success in the social media business. He has been recognized for excellence in self-education with passion and good self-discipline. From his example, it is possible for a person to learn without boundaries of time and place for what the person has set determination and discipline to learn for specific purposes. In this regard, one question has faced educators: Is a college degree still necessary? Other related questions also follow:

- "Do you have to go to a college to get a good job or to be successful?"
- "Do colleges have curriculums and the right teaching-learning ways for students to have the skill set that matches with workforce nowadays?"
- "Are there many free online courses from Ivy League universities. So why spending money on getting a college degree?"

(Bogle, S. (2017)
https://www.fnu.edu/college-degree-higher-paying-job/. Retrieved on June 24, 2021
https://www.northeastern.edu/bachelors-completion/news/is-a-bachelors-degree-worth-it/. Retrieved on June 24, 2021)

Jomtrai Bunnag, Senior Vice President Business Center Manager-Medium of Krungthai Bank Thailand stated that when talking about the necessity of a college degree, it mostly depends on the business and the skills of each profession. The government, the private sector, or large or medium-sized companies might need to see a college degree on an applicant's document. Having a college degree is still one of the entry requirements in the job market, proving that formal education has a strong grip on graduates to have a degree obtained from accredited education institutions. There has been an argument that knowledge of the subjects listed in the program may not be used in the real job. Some organizations, such as small or family business, may not require a college degree, because such a business usually wants assistants to work in originally set pattern of operations and be willing to conform to the way of work practiced for very many years back in the past. However, staff in sales, accounting and customer relations, if with a college degree, could be an advantage.

As known, some occupations require foundation knowledge, expertise and practice throughout a series of courses in the program, which awards a degree, such as a career in medical sciences, life sciences, physical sciences, engineering, humanities, social sciences, management and education, to name but a few. However, for some careers, a college degree may not always be necessary, such as careers in fine art, music, singing, acting, sports, drivers and YouTubers, because all require specific skills, creativity, and self-training.

Not just that. Even graduates holding a college degree need to retrain themselves with digital technology or new skills to look for a new job amidst digital disruption as seen in the banking industry. Such disruption in digital finance is similar to that in educational institutions being disrupted by digital online learning platforms. In particular, financial institutions with traditional banking need to reduce their operating costs with digital banking in response to needs for data analysis on the digital platform as well as fast customer services. So, digital technology has come in to shift the paradigm on how people value structured formal education to a new mode of information search and self-learning. (The author's interview on 28 June 2021)

3. Successful Leaders Who Do not Have College Degrees

Many leaders have been recognized as self-taught and learned under non-formal education **(**University of People, 2021). They have their own personal interest and are driven by their strong grit. Some might have taken some college courses. However, with their passion and persistence toward the explicit goal, they grasped the clue of the direction of how to get where they want to be. Here are nine examples:

1. Steve Jobs: Steve Jobs went to Reed College for computing but dropped out after just one semester. After spending some time in India for inspiration, he built one of the most powerful and influential company today: Apple.

2. Richard Branson: As a dyslexic student, Branson did not succeed in school and dropped out of high school. He is now a billionaire and the founder and CEO of Virgin Group.

3. Dave Thomas: Founder and former CEO of Wendy's. Thomas left high school to work for a restaurant in Indiana. He opened the first Wendy's in 1969, and the rest is history!

4. Michael Dell: Dell went to college because his parents wanted him to become a doctor. However, during school, he started a side gig refurbishing computers that became so successful, he dropped out after one year. Dell computers are now part of many people's work and life worldwide

5. Rachael Ray: Believe it or not, Rachael Ray has no culinary training or any degree for that matter. However, she used her skills, personality, and tenacity to become a fantastic food star these days.

6. Henry Ford: Ford left his family's farm at the age of 16 to move to Detroit and worked as an apprentice in a machine shop. He has no formal schooling in engineering or business but revolutionized the automotive and industry world.

7. John D. Rockefeller Sr.: Rockefeller, like many of his time, started working at the age of 16 with only some knowledge of bookkeeping. He is known as one of the wealthiest Americans ever to live and founded one of the most successful companies in America, Standard Oil.

8. Steven Spielberg: Spielberg was denied acceptance to film school twice. While attending another school, he started as an intern at Universal Studios and began his career that way. He later received an honorary degree 35 years after first attending college.

9. Mary Kay Ash: Mary Kay Ash, the founder of Mary Kay Cosmetics, started her company in 1963 at the age of 45 after decades of watching men get promoted instead of her. Before she began to Mary Kay Cosmetics, she was a successful businesswoman much ahead of her time.

Nowadays, non-formal education, which includes online learning or free online courses, has massive benefits to many people worldwide. Degrees or certificates may not be needed as much as experience matched with job qualifications and required skills for the company an applicant wants to be part of. It is possible that a degree and the courses a person learned in the last four years no longer match with what today's industry needs.

Harvard Professor Clayton Christensen (Schroeder, 2019)) described disruptive innovation as a process by which a product or service takes root initially in applications at the beginning of a market and then constantly moves upmarket, eventually displacing established competitors. That is just what started in the early to mid-1990s for online courses and continued until today.
(https://brainstation.io/.../why-apple-and-other-tech. Retrieved on June 24, 2021)
https://ecelliitd.wordpress.com/.../google-does-not-care. Retrieved on June 24, 2021)

4. The Impact of Free Online Courses on College Degrees

4.1 The Impact of Free Online Courses from Prestige and Ivy League Universities

Both prestigious higher education institutions and even Ivy League universities have efficiently reached the new and underived markets by basically bringing the University to the student. The trend has resulted from the overall drop in college admission in the U.S. in a fourth year, in contrast with the online courses market edging in. Consequently, individual universities, such as Southern New Hampshire, Arizona State, and Georgia Tech approached the "at-scale" mark. One could say that was concrete evidence of success in online courses. There are now so many online courses, flexible and low-cost, or even free of charge these days that one can find a program within an affordable budget and suits one's daily schedule
(Schroeder, 2019; Boutselis, 2020a; Boutselis, 2020b; Ashe, 2021)

Digitaldefynd (2021) reports the 20 best free online certifications and courses as follows:

1. Free Certification Courses (Stanford University)
2. Free Online Courses (Harvard University)
3. Free Online Courses (LinkedIn Learning)
4. Free Certification (Digital Defend)
5. Free Online Courses (Udemy)
6. Free University Courses (Coursera)
7. Free UC Berkeley Courses (UC Berkeley)
8. Free Creativity Classes Online (Skillshare)
9. Free Online Learning (Alison)
10. Free Google Courses (Google)
11. Free Coding Courses
12. Free Python Courses
13. Free IT Certifications (Udemy)
14. Free University & College Certification Courses (edX)
15. Free Online Courses and Nanodegrees (Udacity)
16. Free Online Courses (Khan Academy)
17. Free Online Courses (Microsoft)
18. IT Training Certifications (Microsoft Learn)
19. Lessons worth Sharing (TedEd Courses)
20. Free Online Programs (MIT Open Courseware)

4.2 Free Online Courses from Top Five Ivy League Universities

Free online courses from top five Ivy League Universities (Difitaldefynd.com, 2021) are:

1. Stanford University is one of the top Private universities in Stanford, United States.

It is ranked #3 in QS Global World Rankings 2022.

The key unique selling points of free online courses:

– The beginner-level programs do not need any prerequisite knowledge.

– Lessons are designed with increasing levels of difficulty.

– Understand the significance of the topics covered and their impact on the real world.

– Complete guidance is provided to configure and install the necessary tools.

– The flexible deadlines allow you to learn at your own pace.

2. Harvard University is the oldest higher education institution in the United States,
located in Cambridge, Massachusetts. It is ranked #5 in QS Global World Rankings 2022.

The key unique selling points of free online courses:
– Cover your chosen topic in-depth with relevant case studies, interactive examples, and more.
– Get hands-on with the exercises and assignments.
– Explore possible career paths relevant to the program.
– Clarify your doubts by interacting with your peers and instructors.
– There is no prerequisite to enroll in beginner-level classes.

3. MIT Open Courseware, Massachusetts Institute of Technology is one of the top Private universities in Cambridge, United States. It is ranked #1 in QS Global World Rankings 2022.

The key unique selling points of free online courses:
– Choose from the collection of complimentary classes, audio/video lectures, and more.
– Use supplementary resources and online textbooks to enhance the learning experience.
– Complete the graded assessments, assignments and pass the examinations to complete the certifications.

Other best free online courses' uniqueness is listed as follows:

1. All courses are effectively free since the first month on the platform is a trial period. After that, it's free, but for some classes, you may pay if you want a certificate.
2. Thousands of skilled instructors from prestigious organizations and universities have created these courses.
3. The option of 'view offline' allows you to attend classes without the Internet and on the go.
4. You can work on the class project to create your portfolio and get feedback.
5. Gain the best practices, techniques, and tips from the instructor.
6. You can learn on your self-paced.
7. Interactive and enriching learning experience.
8. With online learning, it is a great way to keep your education on during Corona lockdown.
9. Most online learning platforms have downloadable resources, video lectures, quizzes, graded assignments, and practice exams to test your knowledge and skills.

5. A College Degree Is Beneficial, but not Always Required

According to FAANG Stocks, FAANG (Facebook, Apple, Amazon, Netflix, Google) are some of the world's renowned and most significant tech companies. FAANG refers to the stocks of the five biggest and best-performing American technology companies and is great to work with for many good reasons (Fernando, 2021).

Sandeep Jain, Founder, and CEO, GeeksforGeeks (Jain, 2021), shared the steps on how you can get a job in FAANG companies. The crucial qualifications are people to think

out of the box, problem-solving skills, expertise in solving algorithms and data structures, teamwork, coding competition expertise, contribution in open source projects, brainstorming, improving solutions, and grasping information quickly. Furthermore, these are the process of FAANG companies to recruit people to work for them:

1. Interview process
It varies from company to company; one should read the blogs which talk about it. Generally speaking, there are around 3-7 rounds of interviews for an entry-level and a lateral role.

2. Pre-screening round
A candidate would need to grab the attention of a recruiter by making their CV stand out. The interviewer tries to understand the candidate's background and asks a few HR questions. The answer should match the job description. If a candidate can crack this round, then next would be a technical test.

3. Technical test
The concepts one needs to focus on are data structures and algorithms.
Doing a bit of competitive programming would help to overcome the challenging problems.

4. Personal interview
Technical and HR interviews. One can crack technical interviews by practicing more and more coding and problem-solving.

Merav Schlesinger Falik, AppsFlyer Vice President of People says:

(1) “From my own experience, I think it is essential, like science. And researching is super important. But for my experience many times, unless it's specific professionals that I will mention shortly, sometimes there's a big difference between the third and theory that you learn on academics, studies, and what happens in the actual field. So it depends because it is particular, many times right around the subject.

I made a career without a degree, and it says everything now. Regarding degree or online courses, it is the experience that will be much more valued”

(2) “The process from FAANG is as similar as other prestigious companies, such as AppsFlyer, a successful global start-up founded in Israel. AppsFlyer is the global leader in mobile attribution and marketing analytics. Data-driven marketers trust AppsFlyer for independent measurement solutions and innovative tools to grow and protect their mobile business. AppsFlyer's platform processes billions of mobile actions every day, empowering marketers and developers to maximize the return on their marketing investments. AppsFlyer's People-based Attribution, NativeTrack™ Attribution, Marketing Analytics Data, OneLink's Deep linking capabilities, and Protect360 enterprise-grade fraud solutions have made AppsFlyer's platform the go-to resource most successful mobile apps in the world. With Facebook, Google, Twitter, Pinterest, Snap Inc., Tencent, and 4,600+ other integrated partners, and clients including HBO, Waze, Alibaba, Skyscanner, Activision, and 12,000+ leading brands worldwide, AppsFlyer has 15 global offices to support marketers everywhere.”

(The author’s interview on 20 June 2021)

6. The Necessity of College Degrees

Here are the thoughts of senior management in the high technology industry regarding the necessity of college degrees:

Jonah Kadish, AppsFlyer Director of People Operations, APAC says:

> "Prior to the Internet, another benefit of going to universities is that it was an indication of the caliber of education you were receiving, and that was a reflection or was meant to be a reflection of your abilities as a knowledgeable employee who could contribute to an organization. But again, this has changed because many universities now have combined online and offline learning curriculums. In addition to this, many of the jobs that people look to get in today's exalt change very quickly day-to-day, and their responsibilities or the information necessary to succeed at a job change just as fast, so I believe one of the most important parts of being successful in today's economy is the ability to learn to unlearn and then relearn And universities don't necessarily prepare people with this skill set. Instead, a person who can find their own way of learning or educating themselves through a number of different mediums, whether they be online-offline official curriculums or do-it-yourself projects, are the ones who will indeed succeed in the new economy.
>
> So if you ask me if college degrees are necessary, my hypothesis is that a number of jobs that require verified knowledge of a specific skill set will still require college degrees, but many jobs, for example, graphic design web development and even field such as HR are going to have far less of a need for people with College degrees. Instead, what I think will find are that people are going to apply to jobs by showing either a Passion for a specific type of work or relevant experience that they might have gained on their own or through previous job experience I think there will also be a large development in Non-degree curriculum Learning. I truly believe that online and in-person boot camps or accelerated learning experiences that give you the foundation skills and also help you collaborate and learn to work together with other people are going to be far more common ways for people to prepare for a specific job or show that they have the foundation that will give them the ability to succeed in the job that they would like to earn."
> (The author's interview on 26 June 2021)

Tiwa York Former managing director e-commerce of Sanook online limited, Former head coach (CEO) of Kaidee, Boad member of Seekster, and Board member of Seven Peaks Software says:

> "Do you know that I never graduated from University. I don't think the world is going to change that fast. And so my opinion like look, the world is still much easier if you have a degree. And it becomes a check in the box. However, from what you can see, in the last 20 years, I don't know too many people that actually worked in the field that they graduated in. So you know, a lot of people, a lot of law students, they'll stress like, Oh, am I getting into the right degree field? And particularly in Thailand is an interesting question. It's kind of dictated by that testing system that Thailand has. But the reality is, most of the people I meet rarely graduated in the field that they're actually working.
>
> So in that way, is the degree important for the field of work that you do? I don't think it's so important, but in terms of getting in the door and being a checkbox, I think it remains important. And the reality is, you know, with the changes in education, particularly with COVID, making, that remote learning has changed things. You can get an education without a university. But there's still a perception that if you've checked that box, you've gone through the hundreds of university people expect it. And that attitude is something that's been instilled in us for the last 100 years.

So the most important thing that I look for in people who are going to work in the company is the mindset. And mindset is everything. So you want them to have an analytical mindset. Also, be willing to learn. I look for team players for me. And these are the key characteristics that I'm looking for, and also their owners. So when they approach the job, that they own their job, that they're not just spinning the wheels to do the job, because somebody else told them. And these are the key things that I look for in terms of technical skillsets; there are certain jobs that do require very technical skill sets that are specific, which can be learned by anybody, for the most part. Right? So for me, unless you're, you know, backend programmer, or a trying to be a data scientist, which those two areas I kind of expect you to at least have a background in most technical things I can teach you. But the one thing I can't teach you is the mindset.

From my perspective, degrees are not important for me personally. But that's also a reflection of my background. So I don't really care about somebody whose degree if they don't have a degree, but I'm looking for their experience and their mindset. All of my best engineers, none of them have computer science degrees. They were self-taught and learned on the job and have their own personal interest, maybe took some courses, but really have their own personal interest in it." (The author's interview on 24 June 2021)

7. The Impact of Free Online Courses

Here are the thoughts of senior management in the high technology industry regarding the impact of free online courses:

Jonah Kadish, AppsFlyer Director of People Operations, APAC says:

"Prestigious universities offer a lot of their curriculum for free online, and what is the impact, if any, for the University, negative or positive. When I consider this question, the 1st thing that comes to mind is that the students who take advantage of the free online classes are a much different segment from the students who want to attend the actual University.

When you take a class online for many of these prestigious universities, typically, to my knowledge, those online classes Do not include classroom components virtual or in-person, so a lot of this online learning is done on your own, and while it might have a testing component to verify your understanding of the knowledge, you're not necessarily in the classroom discussing the concepts and learning with the actual professor instead it's self-paced, and you submit quizzes or answer quizzes that are probably usually automated so that there's no interaction with an instructor.

Therefore the students who attend the free online versions of classes are a much different segment than the students who want to actually attend the University. The students attending the free online classes are looking to gain knowledge without necessarily making connections, building networks, or getting verification of their capability or academic accomplishments through a certificate or degree. This is much different from the students who, in my opinion, attend the actual University.

Students who choose to attend prestigious universities want to go there because they are virtually guaranteed that the quality of the teachers is going to be excellent, but the other part of attending a prestigious university is to build your network, and building your network comes through attending classes together collaborating together on projects as well as just the social component of getting to know your classmates whether it's in parties or study groups or having coffee after class Online learning platforms typically don't fulfill this need. While through an online learning platform you might earn excellent education, you might even earn a certificate to prove or verify your knowledge in a subject matter or potentially

even earn a full degree the component that is typically not fulfilled is the classroom interaction, the social interaction and the ability to build a strong network by working with your peers collaboratively. Because of this, I do believe that prestigious universities will continue to have an advantage and have a segment of students who will, for the mid to long term, prefer to attend the University in person.

So what does this mean for the actual universities? I believe that over the short to mid-term, there will be less of an impact to the University in terms of losing students, but what we will see is a lot more blended learning, so a combination of online and offline we will also see that the professors who are excellent in the classroom and really captivate students with their teaching capabilities will continue to rise to the top And I believe that universities will need to focus on how to retain those excellent professors Who have a true passion and skill for teaching, in other words, I think ranking systems which there are many online already to check on the quality of a professor are going to be more important to a University and understanding which professors they should retain which professors they should promote as the most as a teacher that students should attend their lectures in person or virtually."
(The author's interview on 26 June 2021)

Tiwa York Former managing director e-commerce of Sanook online limited, Former head coach (CEO) of Kaidee, Boad member of Seekster, and Board member of Seven Peaks Software says:

"I think just that it's the before you would attend a university, specifically for their teachers and whom they could recruit. And so there's always a, I guess the competition within the University is trying to attract the best professors. And the best students are the best. And so, I think that model is being disrupted because of the democratization of education, which is a good thing for the world. And so then I think they have to think differently about how they can approach it.

As an investor, Ed Tech remains very interesting for me. But I haven't seen many models in EdTech. That can make money that isn't corporate education focus. So I think there's still a lot more disruption. I don't have the answer for it. I am looking for start-ups that have the answers to fix this in more traditional education. And we need to disrupt how we approach education to actually meet the future needs of the working of skilled workers. And I think that's wrapped, that's going to change even faster with the introduction of technologies. The pace of movement today is going so fast, whether, you know, they named the industry, but a lot of it's being driven by AI. And so if you look at what's happening in machine learning, everything else, and robotics and automation, you know, we won't need the skill sets that we were expected to have. With I need a different skillset and the workers, you know, going to be we're going to have a massive need for people that can address what the world needs. The problem is I don't think the universities can produce those people anytime soon. That is true."
(The author's interview on 24 June 2021)

8. Conclusion and Reflection

8.1 The Necessity of College Degrees

To get in a good company with a high pay takes skillset and how an applicant can display what it takes and what the company needs the right man for the right job. As shown in this academic paper, a college degree could be an advantage, but the company prefers employees who are determined, self-disciplined, goal-oriented, and well-equipped with preliminary skills for specific positions. However, according to the author's interview with the senior management from high technology companies, they value experience and mindset in an applicant rather than a college degree.

Certainly careers, such as doctors, civil engineers, computer engineers, computer scientists, pharmacists, or pilots who are working on mission-critical or life-dependent programs still require college degrees. However, for the vast majority of other kinds of work, certification, hands-on learning, and proof in the ability to collaborate and deal with highly dynamic, fast-changing environments could be far more desirable to employers than a college degree with less relevant work experience (Chamorro-Premuzic & Frankiewicz, 2019).

8.2 The Impact of Free Online Courses

With the disruption of free online learning platforms, which now have more than thousands of courses from the best universities in the world, those who have less time in educational institutions take this trend of nonformal education as a great learning opportunity to educate themselves to match today's industry workforce needs. In the long run, we could see universities adjusting their models from formal to nonformal education to provide for learners of diverse needs for study and work life in parallel. University professors may not be able to enjoy only teaching and research as they did in the past, but they need to look for effective means to provide knowledge and essential skills for various groups of learners via digital technology (Webster, 2016). In the author's view, it may not be possible now to draw a line for clear-cut boundaries of the digital learning mode in the years to come. What we can see at the moment lies in the products like a variety of online courses. Other teaching techniques using digital devices and real time streaming of learning materials in lessons are yet to emerge to benefit students of the 21st century via online learning platforms.

9. The Author

Pannarat Kadish, Ed.D., works as an independent scholar in education and a part-time lecturer in educational management and corporate communication. She has currently held a managerial position at a private company. Her academic and research interest lies in the areas of educational administration, professional practicum coaching, corporate communication issues, remedial language skills, and digital skills development.

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Sharing Professional Viewpoint:

Advantages and Disadvantages of Online Teaching and Face-to-face Teaching

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1. Introduction

In 2020, the Covid-19 pandemic broke out worldwide, and since then the Thai government has advised schools and universities to change their teaching methods to online teaching. One question has come up: whether or not networked methods can completely replace the traditional face-to-face teaching methods in the long term. In this regard, the author has put his current teaching practice in the online mode for Course ICE 1105 Accounting for Decision Making in the BBA program by analyzing and comparing advantages and disadvantages between network and face-to-face teaching. Here are some viewpoints to be shared with readers.

2. Positive Aspects of Online Teaching

First of all, there is a large amount of information on the Internet. The emergence of convenience and speed has built an "information highway" for learners to obtain various information easily and quickly.

Secondly, online learning breaks through the barriers of time and space. Although Chinese students cannot come to Thailand to study at the time of the COVID-19 pandemic, they can still learn online in China without delaying their studies. Students can also search for materials through the Internet, watch learning-related videos, use the courseware to learn, and discuss with other students on the Internet, and communicate with teachers using online media to ask questions.

Thirdly, the online teaching method is more conducive to promoting students' autonomous learning because "teacher-student separation" and "teaching separation" promote the network teaching method in place of the traditional teacher-led to student-led learning, which in turn encourages students' participation in knowledge construction activities. All these make the teaching process more scientific and reasonable.

3. Problems in Online Teaching in Course Teaching

First of all, online learning requires students to have a clear learning purpose, good learning habits, and a proactive learning attitude. Course instructors need to recognize individual differences in students' learning styles and attitudes. For those who are not well motivated, the separation between teachers and students could pose a real problem in that learners may not be attentive to their study, and may not do their homework on their own or at worst even copy from their peers or information resources on the Internet. The Internet is vibrant with vast information for students to choose for their studies. If students are not strong in self-management and control, they can easily get lost in the network. If things go on like this, they will not be able to achieve their learning goals. Moreover, such students may be able to mislead other students in the virtual learning context.

Secondly, as for the ICE 1105 Accounting for Decision Making course taught by the author, there are a lot of valuable contents, such as auditing and filling in original vouchers, making accounting vouchers, registering account books, and the like in practical operation and

training. With the current network teaching method, the author is very concerned over spatial difficulties which may delay students' opportunity to conduct practical training.

Thirdly, it is difficult to get spontaneous feedback from students via online teaching because the teacher cannot always observe their facial expressions and reactions in the online teaching session; the teacher only sees students on the screen and has to ask or guess the extent to which they have grasped the content in the lesson. It is also difficult to conduct group work or get quick reaction from individual students. From the author's experience, students tend to delay their responses or if at worst, turn off their video contact.

Fourthly, since ICE 1105 Accounting for Decision Making has a mid-term exam and a final exam, it is difficult to administer a genuinely rigorous closed-book exam via the online teaching method. Therefore, it is not easy for the author to know the actual learning situation on the students' side.

4. Advantages and Problems of Face-to-Face Teaching

As known, teachers are familiar with the face-to-face teaching method to obtain immediate feedback from students in the teaching process and can adjust their teaching strategies and learning activities as seen fit in a particular learning context. Teachers are sensitive to the learning atmosphere and pressure of teaching pace on students, and naturally willing to adjust the interactive process in support of students' learning. Whether specific points need to be explained or consolidated, could be done with ease in face-to-face situation. Both verbal and non-verbal cues from students can prompt the teacher's appropriate actions to facilitate students' learning. More importantly, face-to-face interactions enable the teacher to better supervise students who are rather passive in learning and encourage their participation in learning activities. However, the author is well aware that even with limitations of online teaching, the teacher should make best efforts to deliver online teaching to achieve the target learning outcomes at the time of the COVID-19 pandemic.

5. Recommendations

In the online teaching mode, teachers and students are physically separated but virtually united. To the author, it is very important to pay attention to the emotion factor in building social skills when communicating with students online. Interactions before opening and closing the lesson are vital in keeping a good interactive relationship with students. All files on the course plan, objectives, specific learning points and learning activities per lesson, learning outcomes, assignments, references, and evaluation criteria need to be sent to students one week before the first class for their self-preparation. The use of social media in support of communication throughout the course is advisable; students can then write questions, make suggestions, or even request clarification or consultation after class. The use of email or social media can boost communication between the teacher and students, and ensure that the former has provided well for the latter's learning conditions, the teaching process, and effective course monitoring for overall quality teaching.

6. The Author

The author Li Ming is a full-time lecturer in the BBA Program in Business Administration and Creative Industry, Rattanakosin International College of Creative Entrepreneurship (RICE), Rajamangala University of Technology Rattanakosin (RMUTR), Thailand. His research interest

is in the areas of human resource training, tourism entrepreneurship and creative hospitality industry.

7. References

Li, W. (2009). "Squatted at home" university-international network allows you to get a diploma at home. *Journal of World Education, 3*(10), 08-13.

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