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HAPPY WORKPLACE FACTORS AND ACTIVITIES OF FOOD INDUSTRY EMPLOYEES

Kamol Nomngamsak[1*], Paratchanun Charoenarpornwattana[1], Chalong Tubsree[1]
[1]The Faculty of Education, Burapha University, Chon Buri, 20131, Thailand

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ABSTRACT

The purposes of this research were 1) to explore the happiness factors of Thai employees who are working in the happy workplace award-winning companies, 2) to explore the human resource department activities in promoting happy workplace in the companies, and 3) to investigate the happiness factors among different generations of the employees. The research design was an exploratory sequential mixed-method. The participants consisted of 9 interviewees, and the participants in the quantitative part were 221 employees in three food companies. The qualitative research tools are a semi-structured in-depth-interview guide. The data collection method for the quantitative part was questionnaires. The data collection method was utilized by Google online application. The results of the studies, according to the research questions, revealed that the happiness factors from the qualitative studies are Healthy: exercise, Healthy: relax, Teamwork, Regulation, Leadership, Income, and Environment. Generation X attaches importance to teamwork, leadership, good salary and welfare, and work characteristics. Whereas, Generation Y gives priority to teamwork, freedom, good salary and welfare, environment, and work characteristics. For Generation Z, they place importance on teamwork, freedom, regulation, healthy, good salary, and work characteristics. The statistical analysis of happiness factors among three different generations is significant.

Keywords: Happy workplace, Happiness factors, Happiness activities, Generation, Food industry

Background of the Research

Thai Health Promotion Foundation (ThaiHealth) appreciated that "human resources" were the heart of every organization, and "reating happiness" of people within the organization was a strategy for creating "Happy Workplace". Happy Workplace is a part of increasing the capacity of personnel for modern organizations. It does not only impact the efficiency and effectiveness of the organization, but it can extend results to the family's happiness community and society as well (Panison, Sadaenghan, & Ingard, 2017). The concept of a happy workplace has been applied in many organizations and widely used as criteria for evaluating in several organizations. The results may be different depending on the context of the organizations. However, the study of the consequences of the organization that has implemented such concepts seriously can be summarized into various issues. It was divided into 3 levels (Supamas, 2011) as follows.

*corresponding author: e-mail: kamolnomngamsak@yahoo.com

1. Benefits to employees: employees in the organization will be happy to live properly and affect to the creation of good works and efficiency. For instance, they receive good compensation and welfare, feel that they are valuable resources and important to the organization. The relationship between employees and managers would be better. It creates motivation at work, causing stability in the profession to know how to improve the quality of life. It can be distributed to individuals, families, and communities.
2. Benefits to the organization: employees in the organization are the driving force of the organization to achieve the organizational goals. They are happy and fun to work. When employees are enjoy working, it could decease of the absence of job attendance statistics, sick leave or errand leave. Besides, it would result in higher productivity of the organization, and improve the quality of product and service, also make a better working environment. When the relationship between managers and employees is improved, it causes a decrease in work dissatisfaction and resignation rate. Moreover, if employees are more committed to the organization, the company will save costs in recruiting and training new employees. Furthermore, it creates a strong community in the organization and promotes a good image for the organization.
3. The benefit to the country: one function of the organization for society and the nation is creating effective labor relations in the organization. When employees are happy in their work, they will be able to create works benefiting the organization effectively. So the organization then turned its attention to creating happiness within the organization to increase the efficiency and effectiveness of the work of employees.

The study of happiness in an organization tends to focus on happiness factors. There are many factors affecting happiness at work. Many scholars had presented the examples of happiness: the connection, love of the work, work achievement, recognition (Manion, 2003), the participation in decision making, independence to work, empowerment (Kumsiripituk, 2002), work in freedom, challenging job, and the power of making a decision (Dierendonk, 2005), etc. These are the studies of happiness factors affecting the employees' working life, but the study of happiness in different generations among the employees is still not available.

The human resources department of the company, applying the happiness factors, has utilized several human resource development activities such as training, doing study tours to the prototype company of a happy workplace, celebrating New Year or birthday parties, etc. These activities are organized for all employees to participate without concerning employees' differences. Employees in companies are different in many aspects, whether it be generation, religion, ethnicity, etc. Although the activities are focusing on the participation of various generations of employees, there are still no specific studies or researches. It is the reason for the happy workplace activities are not successful in applying to each employee.

Objectives of the Research

1. To explore the happiness factors of Thai employees who are working in happy workplace award-winning companies.
2. To explore the human resource department activities in promoting the happy workplace in the companies.
3. To investigate the happiness factors among different generations of the employees.

Research Questions

1. What are the happiness factors for award-winning companies to promote a happy workplace?
2. What are the activities organized by the companies to create a happy workplace?
3. How do the companies organize the activities to promote a happy workplace which is suitable for all employees' generations?
4. How do the companies arrange the activities for the different generations?

Literature Reviews

Happiness is a feeling or an emotion. There are several levels of happiness from a little happiness or satisfaction to enjoyment or full of fun. It is physical and mental comfort. Besides, the word "happiness" is often collocated with other words, such as "eat well, be happy (well-being)". Several studies have placed the word "happiness" with others. Therefore, happiness is a part of "well-being". It is a social indicator, but it is concrete and also the objective measurement. These are many indicators used for measuring the components of physical happiness, such as health, educational level, job, and social environment (National Health Assembly, 2005).

Happiness factors

Many scholars had explained the happiness factors for decades. Manion's study (2003) introduced 4 components of happiness which consist of connection, work affection, work achievement, and recognition. Kumsiripituk (2002) found that satisfaction or happiness at work has happened from participation in decision making, independence to work, and empowerment. Dierendonk (2005) had studied and found that job descriptions that promotes happiness are work in freedom, challenging job, and the authority of making a decision. Warr (2007) said that the employee's working happiness is caused by work satisfaction. Happiness at work comes from the inside of personal mind. Having a response to working incident or having the experience of the person consists of work pleasure, work satisfaction, and enthusiasm for work. Diener (2003) said that the factors affecting the happiness of employees are life satisfaction, job satisfaction, positive affect, and negative emotions. Janesantikul (2018) found that happiness in the workplace was positive, that workers were satisfied in the work environment, good relationships with colleagues, and were motivated to work. Guidelines for creating happiness in the workplace are to focus on the organization of the working environment with regard to cleanliness, hygiene and health, design, operation and process improvement, continuous reward and enhancing labor relations.

Generation

In the organization, the generation of employee is certainly different. Costanza, Badge, Fraser, Severt, and Gade (2012) explained the differences in the three generations. First, Baby Boomers (1951-1965) are described as the person of idealistic, hard-working and dedicated, valuing positioning promotions, and titled. Second, Generation X (1964-1978) is described as the person who seeks a balance between work and family or leisure. They are likely to be realistic, team-oriented. They own advanced technological skills, prefer working independently, and seek a working environment in which they can apply their ability and expertise. In addition, members of Generation X are often viewed as not sharing Baby Boomers' emphasis on career and loyalty to their employers. Some authors have noted that it is just some of them because many Generation Xers have observed Baby Boomer parents losing their job, even though they did hard work. For example, the downsizing and

reconstruction of the organization could eventually lay them off no matter how hard they work for the organization. Members of Generation X usually consider Baby Boomers a domineering, whereas Baby Boomers often regard Generation X as a "wild generation" without a sense of social commitment. Third, members of Generation Y (1979-1993) are characterized as dynamic, confident, straightforward, and opinionated. Members of Generation Y have grown up using computers and cellular phones—they are sometimes referred to as the "Linked Generation"—and they expect ready access to electronic communication and up-to-date technology (Costanza et al., 2012). A new generation is starting to emerge. Generation Z, the cohort born between 1996 and 2010, is ready for the spotlight. Generation Z (1997-2010) is arriving and they are different from previous generations. Gen Z has characteristics that are extremely valuable to employers, such as their willingness to work hard, work nights and weekends, and willing to relocate for a better job opportunity. In fact, they believe they need to work harder than the previous generations. They see a clear difference between a first job and a dream job. The most important aspects of their first job are the opportunity for career growth and stability, fulfilling work and a friendly work environment. When it comes to their dream job, the most important factors are salary, leadership development, obvious career path, work culture, work-life balance, flexible schedule, and travel opportunities.

Food industrial

The food industry of Thailand is the main industry of the country as an important export product and attracts foreigners to visit the country. Together with the government's policy to make the country a "world kitchen". Therefore, the companies that produce and distribute food are an organization that is very important to the country's development. When those companies are managed in terms of raw materials, machinery, finance and most importantly "Human resources" will be good, it will contribute to the prosperity and economic stability.

This research had studied 3 generations, all 3 generations of employees are different in the background, ideas, beliefs, experiences, daily life which cause the "generation gap" in the organization. These differences bring about the problems to the human resource department to create and organize happiness activities matching various needed of employees' generation.

Methodology

This research is the exploratory sequential mixed methods. Quantitative research had used the questionnaires as a tool for data collection. Besides, the researchers had applied the interview forms as a tool for collecting data for in-depth interviews. The researchers decided to choose the employee group in 3 food companies as the purposive selection. The employees, nine persons in total, had been divided into 3 generations which are Gen X, Gen Y, and Gen Z.

For qualitative study, the researchers had used the semi-structured in-depth interview tool and open-ended response questions for collecting information about happiness factors, happiness activities, and human resource department roles. After receiving the information from the in-depth interview, the researchers took the transcript of the interview, read all the information to capture important issues, then, compile the same or similar points to create happiness factors at the work for each generation (coding). For the next process, the researchers compared and re-organized the group of information to

create the factors of overall happiness at work of all 3 generations for statistical analysis.

For quantitative study, the researchers had used questionnaires as the tools by questioning the samples-it was calculated by applying the Cochran's Formula (Cochran, 1963) for sample size, consisting of 400 employees in 3 food companies. Finally, we had received 221 questionnaires back. The questionnaire were divided into 4 parts as follows:

The first part is the demographic questions: gender, age, working experience, position level, income, marital status, and education level. These questions are close-ended.

The second part is the questions about happiness factors applied from the Likert's scale rating (Likert, 1932). The questionnaire is divided into 5 levels, consisting of 40 questions. Eventually, they are divided into 7 happiness factors as follows,

1. Healthy: exercise (5 questions)
2. Healthy: relax (6 questions)
3. Teamwork (9 questions)
4. Regulation (4 questions)
5. Leadership (5 questions)
6. Revenue has (6 questions)
7. Environment (5 questions)

The third part is the questions about happiness activities and human resource department roles utilizing the Likert's scale rating. The questionnaire are divided into 5 levels, consisting of 12 questions. Then the researchers divided them into 2 areas as follows,

1. Happiness Activities (7 questions).
2. The Role of the Human Resource Department (5 questions)

After receiving the questionnaires back, the researchers had validated the questionnaire and recorded the data in SPSS program. The researcher used statistics to analyze descriptive data: percentage, mean, and standard deviation. The statistics used to analyze comparative data were One-way Analysis of Variance (One-Way ANOVA).

The research hypothesis is that employees of different generations of food companies are happy to work differently.

The Research Findings

The researchers demonstrate the results of the data analysis by separating the research objectives as follows:

Happiness factors

The researchers had interviewed 9 participants from 3 food companies (Table 1) and the results of the qualitative data analysis gave the happiness factors of each generation.

Table 1 Participant characteristics

Company	Gender	Generation	Age	Experience	Department
A	Female	X	45	10	Production
	Male	Y	27	2	IT
	Male	Z	23	1	Accounting
B	Female	X	39	3	Production
	Female	Y	33	10	Production
	Female	Z	22	6	Sale
C	Male	X	45	25	Business development
	Male	Y	31	9	HR
	Female	Z	23	1	Marketing

The result revealed that Generation X participants gave precedence to teamwork, leadership, good salary and welfare, and work characteristics. While, Generation Y participants attached importance to teamwork, freedom, good salary and welfare, environment, and work characteristics.

And Generation Z participants placed importance on teamwork, freedom, regulation, healthy, good salary, and work characteristics (Table 2).

Therefore, happiness factors from qualitative analysis can be divided into 7 factors which are healthy: exercise, healthy: relax, teamwork, regulation, leadership, income, and environment

Table 2 Happiness factors of each generation

Generation	Happiness factors							
	Teamwork	Leadership	Salary & welfare	Work characteristics	Freedom	Environment	Regulation	Healthy
X	✓	✓	✓	✓				
Y	✓		✓	✓	✓	✓		
Z	✓		✓	✓	✓		✓	✓

Happiness activities and human resource department roles

The researchers found that all generations of participants had agreed in the same direction that happiness activities had an impact on their happiness of working. Therefore, the companies should arrange happiness activities for employees and allow them to be parts of creating happiness activities. Happiness activities that participants want the company to organize are the New Year Party, sports day, CSR activities, making merit, etc.

For the role of the human resource department, the participants have also similar opinions. The respondents showed that the employees require the human resource department to play a role in planning and organizing work happiness activities. However, as of now, the human resource department has not fulfilled the mentioned role yet because senior executives do not support and they have limited budgets.

The difference of happiness factors in each generation

After determining the happiness factors, the researchers then brought the happiness factors to create a questionnaire for compared different types of happiness factors, happiness activities, and human resources roles in each generation. The questionnaire is divided into 4 parts and the research results shown as follows:

Part 1 represented the characteristics of the participants in Table 3, regarding gender, age, experience, position, income, marital status and educational level.

Table 3 Demographic of participants' data

Personal factors	Sub-variable	Number (people)	Percentage
Gender	Male	55	25
	Female	165	75
Age	Less than 25 years	82	38.6
	25-39 years	115	53.9
	40-54 years	16	7.5
Working experience	Less than 3 years	143	65.3
	3-5 years	49	22.4
	More than 5-10 years	12	5.5
	More than 10-15 years	7	3.2
	More than 15 years	8	3.6
Position	Manager or supervisor	30	14
	staff	184	86
Income	Less than 10,000 baht	24	11.1
	10,001-30,000 baht	176	81.1
	30,001-50,000 baht	16	7.3
	50,001-100,000 baht	1	0.5
Marital status	Single	169	76.8
	Married	42	19.1
	Divorce	6	2.7
	Separated	3	1.4
Educational level	Less than Bachelor's degree	117	52.9
	Bachelor's degree	101	45.7
	Master's degree	3	1.4

Part 2, the researcher analyzed data by using descriptive statistics from the 7 happiness factors of each generation (Table 4). It is found that the highest average score for all generation is Leadership (X, $\bar{x}$ = 4.51, Y, $\bar{x}$ = 4.22, Z, $\bar{x}$ = 4.07) and the lowest average score is Healthy: exercise (X, $\bar{x}$ = 3.62, Y, $\bar{x}$ = 2.94, Z, $\bar{x}$ = 2.93).

Table 4 Average score and standard deviation of happiness factors

Happiness factors	X		Y		Z		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Healthy: exercise	3.62	1.001	2.94	0.794	2.93	0.777	2.97	0.877
Healthy: relax	3.64	0.534	3.13	0.505	3.18	0.504	2.88	0.669
Teamwork	4.34	0.521	4.07	0.547	4.06	0.636	4.07	0.623
Regulation	3.64	0.567	3.22	0.486	3.25	0.468	3.51	0.664
Leadership	4.51	0.719	4.24	1.057	4.07	0.857	3.82	0.792
Revenue	3.63	0.631	3.27	0.951	3.16	0.744	3.23	0.891
Environment	3.86	0.776	3.56	0.661	3.43	0.736	3.51	0.723

Part 3, the average scores from happiness activities and the roles of human resource department revealed that Generation X has the highest mean scores of happiness activities and human resource department roles ($\bar{x}$ = 3.09, $\bar{x}$ = 3.52), followed by Generation Z ($\bar{x}$ = 3.07, $\bar{x}$ = 3.24), and the lowest is Generation Y ($\bar{x}$ = 3.05, $\bar{x}$ = 3.15) (Table 5).

Table 5 Average score and standard deviation of happiness activities and human resource department roles

Generation	Happiness activities		The role of human resource department	
	Mean	**SD**	**Mean**	**SD**
X	3.09	0.756	3.52	0.465
Y	3.05	0.838	3.15	0.579
Z	3.07	0.852	3.24	0.559

Part 4, the researchers compared the differences in happiness factors between all 3 generations. It shows that the results of the statistical analysis are significantly different (Table 6).

Table 6 Analysis of variance in Happiness factors

Happiness factors		SS	df	MS	F	Sig.
Healthy: exercise	Between groups	7.612	2	3.806	5.498	.005*
	Within groups	144.676	209	.692		
	Total	152.288	211			
Healthy: relax	Between groups	3.080	2	1.540	3.809	.024*
	Within groups	84.506	209	.404		
	Total	87.586	211			
Regulation	Between groups	4.3.46	2	2.173	5.246	.006*
	Within groups	86.573	209	.414		
	Total	90.920	211			

*$p \leq 0.05$

Table 7 showed that Generation X has a statistical difference from generation Y and Z in 3 factors which are Healthy: exercise (Sig. = .005), Healthy: relax (Sig. = .024), and Regulation (Sig. = .006).

Table 7 Analysis of differences in pairs of Happiness factors

Happiness factors	Generation (I)	Generation (J)	Mean difference	Std. error	Sig.
Healthy: exercise	Z	Y	.476	1.205	.693
		X	-.685	.227	.003*
	Y	Z	-.048	.121	.693
		X	-.732	.222	.001*
	X	Z	.685	.227	.003*
		Y	.732	.222	.001*
Healthy: relax	Z	Y	-.016	.920	.864
		X	-.465	.174	.008*
	Y	Z	.016	.092	.864
		X	-.449	.169	.009*
	X	Z	.465	.174	.008*
		Y	.449	.169	.009*
Regulation	Z	Y	.064	.093	.492
		X	-.492	.176	.006*
	Y	Z	-.064	.093	.492
		X	-.557	.172	.001*
	X	Z	.492	.176	.006*
		Y	. 575	.172	.001*

*$p \leq 0.05$

The analysis of statistical differences of happiness activities and the roles of human resource department revealed that it has not statistically significant differences.

According to the analysis of happiness factors, happiness activities, and human resource department roles, it can be concluded that the research objectives are happiness factors: Healthy: exercise, Healthy: relax, Teamwork, Regulation, Leadership, Revenue, and Environment. These factors were collected from participants' opinions.

The analysis of F-test (One-Way ANOVA) statistics showed that Generation X had a significant difference in 3 happiness factors from Generation Y and Z. Those are Healthy: exercise, Healthy: relax, and Regulation.

Employees agreed that the company should organize various happiness activities, and create new activities every year. Furthermore, it should allow employees to share their views on organizing happiness activities. As for the roles of human resources department, the employees believed that the human resource department played an important role in organizing happiness activities, presented new and various happiness activities, encouraged and supported employees to participate in happiness activities organized by the company. The analysis of the statistical differences of happiness activities and human resource department roles for all generations are not significantly different.

Discussion

Addressing the first research question, it is supported by Abadi, Choiriyah, Sukmana and Karuniawan. (2018) who summarized that

factor affecting the happiness is health, it can lead us to be more happiness. Furthermore, Yoocharoen and Aungabsee (2018) supported this result and provided that the definition of a happy workplace was the organization that encouraged its employees to have a common goal, focus by adjusting a new work process. The organization should have operation guidelines which supported one another and strive for highest efficiency. Moreover, the employees themselves should have an opportunity to do what they loved, and own a good attitude towards work. Importantly, they deserve to have good colleagues, they will happy to work and love their work. The overall factors that created a happy workplace are a total of 9 elements in accordance with the concept of a happy workplace of Thai Health Promotion Foundation (Thai-Health). In addition, the researchers found additional 2 elements i.e. Happy Instrument and Happy Environment. The happy workplace which affected employees' work is divided into three types: the happy workplace affecting employees themselves, the happy workplace affecting colleagues, and the happy workplace affecting the organization.

A happy workplace can be created in several ways, but organizations that focus on internal factors in promoting happiness among employees will be able to achieve more sustainable development. In this regard, the critical success factor is inspiration from leaders, and other supporting factors such as teamwork and employee participation (Kaeodumkoeng, Junhasobhaga, & Thummakul, 2015).

Addressing the second research question, the results of the survey and quantitative data analysis in terms of the role of human resource department, most participants accepted that the human resource department is the most important unit for organizing activities to promote happiness at work. The human resource department should have well planned to organize activities that promote happiness at work. Also, the department should provide new and various activities for happiness at the workplace. It was found that "Human Resource Practices" to conducting happiness in workplace started from a change in the management's outlook, by asking how to make employees royal to the company, and how to make the employers love and admire their employees. As of now, the company started to pay attention to the development of intra-company relationships, in parallel with restructuring and improvement of work methods. Therefore, human resource department should play a major role to create happiness working environment. It can highlight that happiness activities cannot success without the fully support from human resource department (Charoenarpornwattana, 2016 a). A study of Andrea, Gabriella and Tímea (2016), guided that HR managers have to cope with new tasks if they want to maintain the young employees and to ensure knowledge-sharing, which is the key to competitiveness.

Addressing the third research question, most of the participants agree that the employees should participate in all activities and involve in presenting new activities to promote the happiness of the company. The company should give employees the opportunity to participate in activities that promote happiness at work and organizes activities sufficient for the needs of employees. This is congruent with Charoenarpornwattana (2016 b), he concluded that the company has a variety of happy workplace activities to develop its employees and organization. Also, it should create virtue and happiness for society and the country. The president and the top executives realized that the importance of happy workplace is to encourage all employees to participate, and it should be integrated into the

organization's policies. Moreover, companies should encourage all employees to be good people. Encouraging employees to uphold their merit, it can be achieved by supporting activities and cordial collaborations. The company must place importance on employees' work-life quality as the basic factor of quality and effective production at the highest level. They assume that healthy employees are not only working well, but also being happy by promoting variety of happy workplace activities such as making merit, arranging parties on big days, doing volunteer activities, and so on.

Addressing the fourth research question, the results of analysis of variance in happiness activities between Generations found that the different generations have different happiness factors at the significant level 0.05. Generation X has different from other Generations in aspects of Healthy: exercise, Healthy: relax and Regulation. So the company should determine and organize appropriated activities for the employee differences. On the contrary, Eisenberg (2019) found different result which shows that Generation X turns out to be the least happy and most financially stressed generation. On the other hand, Tunyateerapong and Jindarak (2019) propose the different view that there are no difference in happiness factors among generations. The reason is that different generation have different happy workplace factors, owing to their ability to accept and perception in different ways.

There is just few studies about generation differences related to happy workplace in Food Industry. It is possible that different industry has different context. Researchers had reviewed the literature on happiness factors of employees working in the food industry and other organizations. The results are not finding the research or academic studies that compare the happiness factors in working of employees with different generations. Even though some researchers have compared the happiness factors among different generation of employees, but they did not collect the data directly from sources and the data of Generation Z (Andrea et al., 2016; Ötken & Erben, 2013). Therefore, this research can be considered a research that no researchers have studied before.

Recommendations

The purpose of this research is to study the happiness factors in each generation of employees for the executives and the human resources department to understand the differences in the important issues that make the employees happy in working life. The results of this study found that every generation has 7 happiness factors: Healthy: exercise, Healthy: relax, Teamwork, Regulation, Leadership, Revenue and Environment.

For details, the edges of each generation are slightly different about the happiness factor. Generation X has 4 happiness factors as teamwork, leadership, good salary and welfare, and work characteristics. Generation Y has 5 happiness factors as teamwork, freedom, good salary and welfare, environment and work characteristics. And Generation Z has 6 happiness factors as teamwork, freedom, regulation, healthy, good salary, and work characteristics. In statistical analysis of the differences in the happiness factors of the generation of employees, the generation X has a statistical analysis which is different from the other generation in 3 factors. The 3 happiness factors are Healthy: exercise, Healthy: relax, and Regulation. As for statistical analysis of other happiness factors, there are no differences.

The research showed that happiness activities should be organized in accordance with the different happiness factors of each generation of employees. The executives and the human

resources department can use the results from the research as a guideline for organizing happiness activities.

Generation X pays attention to 3 happiness factors which are higher than the average of other generations, which are Healthy: exercise, Healthy: relax, and Regulation. The happiness activities that are appropriate for the happiness factors of generation X employees are annual health check-ups, arranging exercise areas for employees, keeping the workplace clean and airy, or activities that look after the health of employees. In addition, the Generation X employees participate in various recreational activities such as the New Year's party, going to rest in the provinces, making merit at the temple etc. And establishing fair company regulations and facilitating work is a matter of importance for Generation X employees.

For Generation Y and Z, the results show that happiness factors are not different. However, according to the interviews, generation Y employees who have been working for months or years they started to have the idea of wanting to be successful at work and wanting to build their own family. For Generation Z employees, they just finished their studies. They needs was to find experiences from talented people and live an independent life.

The happiness activities that are appropriate for the happiness factors of generation Y and Z employees are activities in which employees are able to fully demonstrate their abilities, such as project work, promotion of good working relationships, teamwork, providing an environment that facilitates work.

Recommendations for Further Study

There is one interesting issue for the researchers who interested in the happy workplace and generation of employees in the company, it is the influence of "New Normal" on the behavioral changes of each generation of the employee and happiness in working. Another issue is to conduct research on the happiness factors and generation of employees in other industries in order to conduct in-depth studies of the different types of industries.

Furthermore, an interesting issue is the research of 3 generations in other industries such as the automotive industry, real estate industry, medical industry, or educational institution. There are very few studies of 3 generations as of now.

Limitation

The COVID-19 outbreak in Thailand made data collection difficult. This is because the companies that the sample work has to establish a communication system and follow up work. This is a major obstacle in data collection, resulting in less data collected than the researcher specified.

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WEBSITE DESIGN FOR SEXUAL FLUIDITY IN LGBT BY USING USER EXPERIENCE A CASE STUDY OF BlazingLove.com

Juthamas Vadhanapanich[1*], Wannayos Boonperm[1]
[1]College of Social Comminication Innovation, Srinakharinwirot University, Bangkok, Thailand, 10110

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ABSTRACT

Sexual fluidity has been used in the context that gender identity or sexuality of people could be changed fluidly according to their context of living. There are social issues and arguments regarding sexual fluidity, gender identity, and equality. One of them is that they do not want to express their gender identity publicly, while it is an important personal factor to segment customers for marketing purposes. Doing business with this group of people needs to manage this sensitive issue properly. Hence, this research aims to first coin the term sexual fluidity and empathize the desires and the pain points of the users with sexual fluidity, and then using the findings to design an updated version of BlazingLove that will solve the issue using the user experience (UX) concept. BlazingLove.com was selected to be a case study for this research as their users are likely to have sexual fluidity due to the nature of the business. Mix methodology research was designed and developed by employing quantitative questionnaire survey and qualitative in-depth interview with experts. The result shown that sexual fluidity could be defined as personal sexual orientation that may or may not be expressed physically, which can be changed according to personal preferences does not concern their genders and it can be changed anytime according to the person living contexts. Further, this group of people preferred to be segmented by their lifestyle, interest, and preferences, rather than their gender identity. The updated version of BlazingLove was therefore designed by using the new segmentation to identify their target users and develop personas.

Keywords: User experience, Website design, Sexual fluidity, Equality

Introduction

Nagoshi, Louis, Nagoshi, and Lothamer (2019) found that assigned sex at birth as male or female could create prejudices. Once people grown up their sexual orientation may change, and the prejudices may create social pressures and issues. There are various terms for gender identities and the most common terms are LGBTQ, which stands for lesbian, gay, bisexual, transgender, and queer (College, 2019; Milton, 2002). There are also other gender identity classifications depending on their purposes (College, 2019; Milton, 2002; Savin-Williams, 2017). However, it is more complicated than just identifying one gender as the gender is somewhat fluid and could be changed from times to times, this is where the term “sexual fluidity” arrived i.e., human has

*corresponding author: e-mail: juthamas_v@banpu.co.th

no definite gender, it fluids like water depending on their context of living (Savin-Williams, 2017). Although, the term has been used for quite some time, there is no exact definition for sexual fluidity as this term has been used in a number of meanings and these may cause certain negative attitude toward ones with sexual fluidity (Katz-Wise, 2015; Nagoshi et al., 2019) especially for Thais, as the Thai word for sexual fluidity could be interpreted to "keep changing their mind" or giving the sense of uncertainty. Therefore, people who have different genders from their assigned sex at birth are most likely to have uncomfortable to express themselves or perceived that they were prejudiced. In developing digital products for people with sexual fluidity, these issues need to be concerned.

However, market segmentation usually use gender as a personal factor to segment customers (Diamond, 2008). This research would like to tackle this issue by studying desires and pain points of these groups when using digital products. However, there is a limit research on the sexual fluidity in Thailand, but these group of people have significant purchasing powers toward their desired products. BlazingLove.com was chosen as a case study for this research because of the nature of their business and the users are mostly LGBT.

BlazingLove.com is a friend finder community for users who have various gender identities. It founded and launched in 1995 (BlazingLove, 2019 a) as a bootstrapping startup. The number of users visiting BlazingLove on average of 500 users in 2019 and increase to average of 1,000 users in 2020, it shown that there is a potential to expand and access to wider range of users. However, according to the statistics from Google Analytic, it shown that 97.89% and 97.69% were new users for the year 2019 and 2020, respectively (BlazingLove, 2019 b, 2020). These figures shown that the website has relatively low repeat users, which is not so good for business if it would like to be a community platform as well as making money due to the fact the cost of acquiring new users are at least eight times higher than retain the existing ones (Chakravarty & Sarma, 2021).

User Experience or UX refers to "all digital interactions between a user and a company or a brand". It is a significant factor for acquiring and retaining users on the digital platforms (Susiva & Vadhanapanich, 2020). The term user experience has been brought into wider discussion in 1990s by Norman (1988), which was shifted from the term "user centered system design." The UX focuses not only the system design and the aesthetics of the user interfaces, but also emphasizes on the needs of the users (Norman, 1988; Norman, 2013).

Similarly, for BlazingLove, desires, and pain points of the users shall be empathized prior to design an updated version to deliver the best user experience. One main problem the researcher found from the users' complaints is they are uncomfortable with identifying their sexual orientations as it may be changed depending on their living context, or do not want to publicly identify themselves.

Objectives of the Study

1. To coin the term of "sexual fluidity" that generates from LGBT people
2. To study the desire and the pain points of the users regarding how to segment people with sexual fluidity.
3. To design an updated version of BlazingLove that solving the issue of sexual fluidity using user experience concept.

Literature Reviews

There are three main sections of literature reviews starting with concepts Sex, Sexual Orientation and Sexual Fluidity, Brief information on matching service websites, and then finishing with main elements of user experience that user experience designers could use for designing websites or digital platforms.

Sex, sexual orientation and sexual fluidity

Savin-Williams (2017) proposed a new concept that breaks the old thought regarding sex, and sexual orientation. He authored a book name "Mostly Straight: Sexual Fluidity Among Men" that said there is no man or woman that express a hundred percent masculinity or femininity. He also mentioned that sex is somewhat fluid like water, it can be changed according to the person's living context (Savin-Williams, 2017).

Sex refers to physical at birth or by chromosomes, while gender or gender identity are roles and behaviors that social expected from persons who hold the gender identity (Nagoshi et al., 2019). The other dimension to consider, somethings that related to emotion, love, and attractions that is sexuality or sexual orientations. By these definitions, there are a few sexes: male, female and perhaps intersexual, yet a few genders and sexual orientations, namely gay, lesbian, bisexual, transgender, queers, asexual and pansexual and a few others (Diamond, 2008; Katz-Wise, 2015; Savin-Williams, 2017). There are some terms that could be considered as bullying or sexual harassment. So, terminology should be considered in referring to gender equality.

Brief information on matching service websites

Matching services are not a new business. However, when we have the internet in 1990s, it is another arm for this business to access to their target customers wider, faster as well as easier. The first online dating website is match.com (Stylight, 2019) that serving men and women who seeks to build serious relationship.

Nowadays, matching services are not limited to men and women, it extended to cover all kind of matching, not just lovers, but also friends, services, and animals. The matching business value around 4,000 million USD worldwide, 2,000 million USD in Asia, and in Thailand it values at 1,000-2,000 million Baht (mynd, 2018).

CNet has published top dating applications in 2021 as follows: Bumble is the best website for confident woman, Tinder is the best at speed, OKCupid is the best free dating website, Hinge is the best for serious relationship seekers, Coffee Mets Bagel is the greatest for initiate conversation, Her is the best for lesbians, bisexuals, and queers. These shown that there are a few online dating websites and applications existing globally, each have their own uniqueness to attract their target users.

BlazingLove is a Thai online matching website that seeks to provide matching services and build a community for users of all genders. Since it was found, BlazingLove is slowly picking up in their business and has constantly growth for acquiring new users but has difficulty in retaining the existing ones. Currently, BlazingLove have asked the users to identify themselves by their sexual orientations, there are 11 genders to choose, which may not cover every feasible option and cause some awkward for ones who do not want to identify themselves by their sexual orientations as well as the ones who do not yet know their gender identity or having more than one identity (BlazingLove, 2019 b, 2020).

BlazingLove currently offers only three

simple features, which are "creating posts", "searching", and "sorting". There are four tags to represent purposes of using BlazingLove, which are lonely room, working room, party lovers' room, and friend seekers room. These four rooms represent the heart as it has four rooms. BlazingLove did not allow users to perform illegal activities, especially prostitution of any genders (BlazingLove, 2019 a).

User experience and its honeycomb

The term "user experience" or so called "UX" was firstly coined by Don Norman in 1993 for his group at Apple Computer. User experience encompasses all aspects of the end-user's interaction with the company, its service, and its products. Don Norman is the world first UX architect appointed by Apple in 1995.

Before that once the computer existed, the design started with human-computer interaction or HCI, which is "multidisciplinary fields of study focusing on the design of computer technology and, in particular, the interaction between humans (the users) and computers". It then developed into user centered design or UCD that was discussed in a book named "The Design of Everyday Things" by Norman (1988). This book become a principle of product and service designs as well as application and website design later (Norman, 1988, 2013). In this book, Norman (1988) first explains the importance of user-centered design. He said that design decisions should be based on the needs and wants of users. Hence, UCD is an iterative design process in which designers focus on the users and their needs in each phase of the design process.

Apart from UCD, designers also focus on usability of the products. There are ten usability principles for interaction design, which are 1) Visibility of system status, 2) Match between system and the real world, 3) User control and freedom, 4) Consistency and standards, 5) Error prevention, 6) Recognition rather than recall, 7) Flexibility and efficiency of use, 8) Aesthetic and minimalist design, 9) Help users recognize, diagnose, and recover from errors, and 10) Help and documentation (Nielsen, 1994).

However, since we are in the experience economy and digital as usual era, designing digital products focusing only usability alone is not sufficient. Experience the product delivers to the users are incredibly significant. Based on a number of literature search, user experience can be defined as "the digital interactions between a user and a company or a brand" (Susiva & Vadhanapanich, 2020).

According to the definition, user experience is involved with information architect, usability, competitor analysis, content strategy, visual design, sound, interaction, animation, coding, user research, empathy, prototype, interface, and wireframe (Brad Nunnally, 2016).

In order to deliver the best user experience and solving the users' pain points, Morville (2014) has suggested the UX honeycomb (See Figure 1) that will comprehensively help UX designers to deliver the best experience as well as answering user pain points. The UX honeycomb consists of seven core elements that when combining the surrounding six elements, the design will finally deliver the seventh at its heart.

The seven elements are 1) useful: the design should provide greater benefits to the users, 2) desirable: the design should be desired by the users both functionality and emotionally, 3) accessible: it should be reached and designed to serve everyone who is the target users, 4) credible: it should be able to build trustworthiness, 5) findable: users should be

able to find things they look for at ease when using the websites, 6) usable: the design should contain all usability elements so that target users can effectively use it, and 7) valuable: the design should deliver its value propositions to the users, or the users should be able to meet their goals by using our products

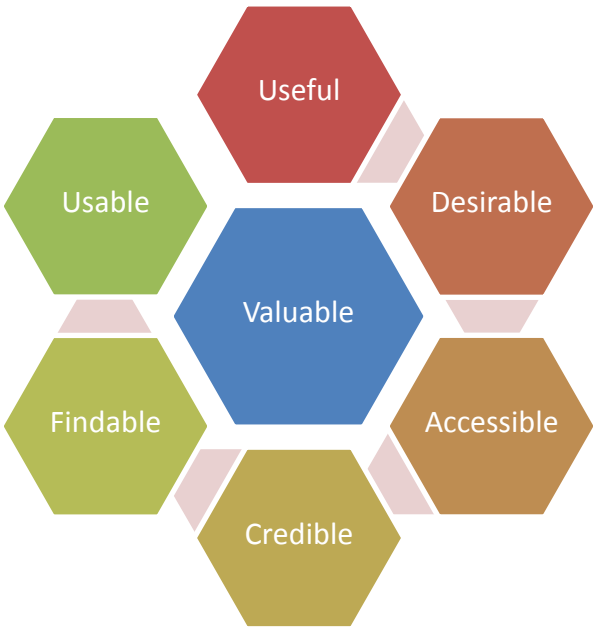


Figure 1 User experience honeycomb (Morville, 2014)

Research Framework

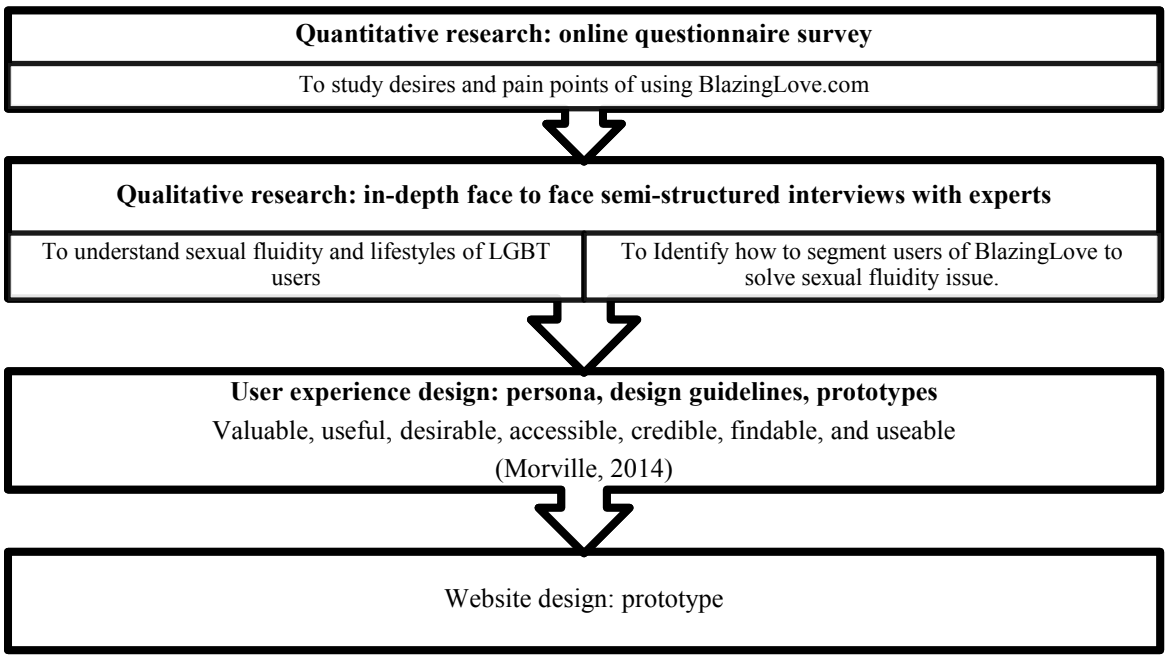


Figure 2 Research framework

Research Methodology

To achieve the research objectives, mixed methodology research was employed by collecting relevant data using both quantitative and qualitative methods (Schindler, 2005). Quantitative questionnaire online survey was used to understand the desires and the pain points of the users of BlazingLove.com. Prior to collect the data, questionnaire and interview guide have gone through the processes of content validity test as well as reliabilities test and obtained average score of 0.7 in every question and the alpha of 0.863. After that the proposal, data collection tools, and pre-test results were submitted to the Research Ethics Committee of Srinakharinwirot University to ensure that the research is ethically conducted.

400 sets of questionnaires were gathered, processed, and analyzed using descriptive statistics and crosstabulation analysis. While qualitative in-depth interview with experts who have experience related to sexual fluidity and sexual orientations to understand and find an appropriate way to segment the users to solve the problems of sexual fluidity. Eight interviews had been mutually conducted, edited, and analyzed using content analysis.

Data gathered from both methods were treated equally and used to define the definition of sexual fluidity, identify the appropriate methods to segment people with sexual fluidity and then identify the target users, develop personas and design guidelines, identify features that answer the users' pain points, their latent needs, as well as solving the sexual fluidity issues, then developing user journeys, user flows and delivering prototypes of the new versions (Brad Nunnally, 2016).

Results

As aforementioned, this research consists of three parts: quantitative, qualitative, and the synthesis for the new user experience design. The results are as follows.

Quantitative research results

The objective of the survey was mainly to understand desire and pain points of the users in using BlazingLove.com. The findings shown that there are 14 different gender identities with a no identity group. Almost 20% said that they have more than one sexual orientation. These figures shown that BlazingLove users are somewhat fluid with their gender identities. Their gender identities were mostly female (35.02%), tom (19.46%), male (9.73%), gay (7.39%), dee (7%), female bisexual (5.45%), transgender (5.06%). Most users were 40-49 years old (40%), 30-39 years old (37%), and 20-29 years old (20%), worked as employees, freelance or entrepreneurs (75%). There were two major groups of monthly income. One was 15,000-25,000 Baht and the other was over 75,000 Baht, which means that the users have medium to high income range. The users were from every region of Thailand, but mostly live in Bangkok Metropolitan Region. Hence, BlazingLove's target users were those who have various gender identities, age between 20-49 years old, work as employees or freelancers, having a medium to high income, and living around Thailand.

Users visiting BlazingLove were mainly to make new friends and look for business networking, not seek for lovers or committed relationship. They usually visited BlazingLove around 1-4 times a month. About 23.5% are new users. They were looking for friends who have similar lifestyles such as travelling, business networking, and sports.

Favorite activities of the users were watching movies, listening to music, and singing songs, playing sports and outdoor activities. While the most wanted features were chat,

private room, online events, on-site events, membership, notification, which having similar scores. Pain points that the users faced were 1) cannot change profile pictures, 2) met some perverts, 3) do not know where to start, 4) should be easier to find new friends, 5) reduce the atmosphere of in search of lovers as it causes uncomfortable, 6) cannot perform self-deleted the old posts, etc. The users also suggested that it must have chat. The navigation should provide more details. Lastly, the website should not cause any uncomfortable feeling to the users.

According to crosstabulation analysis between gender identity and desires, behaviors, and pain points, it shown that gender identity do not have a significant association to them, i.e., different gender identity does not have different desires, behaviors, or pain points. Therefore, segmenting users based on their gender identity is not significant.

Qualitative research results

There were eight interviews in total with experts who have direct and indirect experiences working related to sexual diversity and sexual fluidity domestically and internationally. The results helped to coin a definition of the sexual fluidity as "personal sexual orientation that may or may not be expressed physically, which can be changed according to personal preferences does not concern their genders and it can be changed anytime according to the person living context."

With the definition, the sexual fluidity affected to their personal lifestyles, which may come in a form of social and family pressures so that they could not express their gender identity, being talked behind their backs, so on. So, users did not prefer to be segmented by their gender identities, on the other hands, they preferred to define themselves by lifestyles, hobbies/ favorite activities, ages, and origins. While collecting data on their physical sexes and gender identities may be acceptable and useful in terms of searching and making new friends, however, it should not be publicly expressed.

Pain points for using BlazingLove and other similar matching websites were fraud, harassment, insufficient data, and photos to support decisions and so on. BlazingLove should verify users' data, suggest friends based on their similar lifestyles, set a clear and not complicated membership system, add features to allow users to block unwanted persons, and establish a good privacy system.

Solving the issue of sexual fluidity by using the user experience design

After obtaining both quantitative and qualitative research results, the researchers have synthesized the data and found that the users desires and pain points can be categorized and matched with the seven elements of the user experience honeycomb (Morville, 2014), which is one of the most acceptable model for user experience design of any digital products.

Prior to design, it is best to choose the right technology. According to the Google Analytic data, more than 90% of the BlazingLove users accessed the website via mobile devices, a few using their tablets and desktops. Hence, ensuring the accessibility of all users, responsive web design has been chosen i.e., the website will support multiple type of devices.

After that the researchers developed assumed eight personas based on demographic data of the respondents that are best representing various target users and use these personas to draw a new design guideline for BlazingLove, which contains logo, primary color pallet, secondary color pallet, font type, font size, tagline, as well as guideline on how to use these elements. User experience strategy was then defined to decrease the atmosphere of

dating website, fostering friendships, and building a community of equally love. BlazingLove was designed to encapsulate all seven elements of the user experience: useful, desirable, accessible, credible, findable, usable, and valuable.

To deliver the best user experience, the updated version of BlazingLove will have more features to answer the user needs and pain points. The existing version has only three features: Creating Post, Searching, and Sorting. The new version consisted of ten new features, which are Navigation, Log in/ Sign up, Homepage, Events, BlazingLove Match, Notifications, Explore, Profile, Chat and Friend list. With these features, BlazingLove would deliver the following experience to the users (See Figure 3).

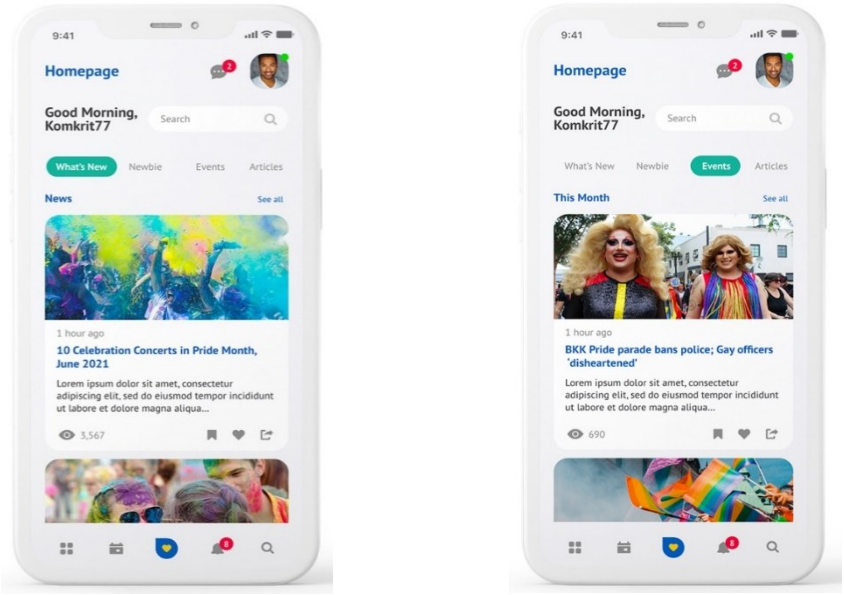


Figure 3 Examples of new design of BlazingLove

1. Useful: it will convey greater benefits to the users' needs and solving their pain points especially with the Chat function, better Navigation, membership system, events and other relevant information that may help fostering community.

2. Desirable: the updated version was designed to solve the users' pain points and answering their latent needs and requirements.

3. Accessible: to ensure that all target users are accessible to the updated version, responsive web design was deployed.

4. Credible: with the innovative design guideline and new features especially the membership system that will help verify user data, Block unwanted users, and so on. These will help reducing fraud, perverts and misused of the website as well as build atmosphere of user friendly and community of equally love.

5. Findable: BlazingLove Match and Explore were new features designed to ensure that every user will find a match to their lifestyles, events, interests and so on. The users also allowed to create and add tags by themselves for the benefits of searching. The navigation was also improved to ensure that the users can find things they are looking for.

6. Useable: the updated version was designed for the ease of searching, adding, making, and following new friends. It was also easier

to browse for friend lists, chat with new and existing friends on the list, search and delete chat conversations, and the most importantly the users can block unwanted friends, and report unwanted behaviors by themselves.

7. Valuable: overall, the ultimate goals of the users were to make new friends, and establish a network for business purposes, the updated version was then designed as aforementioned to ensure that the users are reaching their goals as well as fostering the community of equally love.

Conclusion

The research results helped defining the term sexual fluidity as "personal sexual orientation that may or may not be expressed physically, which can be changed according to personal preferences does not concern their genders and it can be changed anytime according to the person living context".

The users did not prefer to label themselves to any gender identity, yet it is preferable to be identify by their lifestyles, interests, and preferences. Target users of BlazingLove are the people of all gender identities who are seeking to make new friends and expand their networks, age between 20-49 years old, with medium to high income, and living around Thailand. The updated version of BlazingLove is designed to answer the users pain points and needs. New features were added as listed to ensure that the best user experience is delivered, and it will attract more of the new users to the website as well as retain the existing users and becoming a community of equally love. It will finally generate more revenue for the BlazingLove business and resulting in business sustainability.

Discussion

As suggested by the findings, in dealing with sexual fluidity people, businesses should not segment their customers with their gender identity, rather shall segment their customers by lifestyle, interests, and preferences because of the gender identity is a significant sensitive issue that the users did not want to express publicly, which is similar to the findings of College (2019), Savin-Williams (2017) and Nagoshi et al. (2019). However, the other personal factors can also be used such as age, income, and hometown. These results consistent with the customer segmentation concept of Armstrong and Kotler (2011); Kotler, Kartajaya, and Setiawan (2021).

Moreover, the research shown that there are more gender identities of the users the existing classifications as well as the data obtained from Google Analytics, this may imply that when collecting user data, especially regarding to sex or gender for marketing purposes, more details of the data may be necessary so the marketers will have sufficient data and information to formulate the most appropriate marketing strategies and marketing activities. Although, the users do not want to identify their gender identities, yet the data remains important for segmentation and marketing purposes. Therefore, it is wiser to consider collecting data related to gender identity and sexual fluidity, for the purposes only, not for publicly expression.

The results also shown that the main purposes of using BlazingLove are to meet new friends and build their business networks, not seeking lovers. This was somewhat surprise, yet understandable. When compared the result with competitors, we found that BlazingLove users have similar purposes to the users of Plenty of Fish. So, the researcher may consider study further by comparing with the platform to ensure that the new design will deliver the best experience to the target users.

The other significant point found in this

research was average monthly income of the users that is divided into two distinct groups i.e., the users who have income around 15,000-25,000 Baht a month, the other is the users who have income more than 75,000 Baht a month. These two groups of people have significantly different purchasing power and will be affected to pricing strategy for membership packages as well as event tickets too. Membership pricing should be designed to best accommodate both groups who may have different willingness to pay. Further, budgeting for events will also be affected by the purchasing power, it is better to design and create activities that have different in pricing for distinct groups of users. We may also use the price to target separate groups of users too.

Since, most favorite activities of the users were traveling, playing sports, and singing songs, this information could be used for designing events and activities to match their lifestyles and preferences to fostering the community of equally love as well as generate sustainable revenue for BlazingLove. It could also use to find the right partners and vendors to create secondary revenue stream like advertisement, lowing cost for hosting activities and events. It could also be utilized to expanding customer base, increase brand awareness on BlazingLove by parting with other brands too.

Recommendations

There are a few recommendations for those who seek to design and develop a successful website or digital products for those with sexual fluidity.

1. Before start developing any website or application, it is better to empathize and understand business context and environment to identify potential target segments and use to develop personas for conduct research for user experience design (Brad Nunnally, 2016).
2. Once know exactly who the target users are, empathize users pain points and desire of the target users. There are a few techniques to collect relevant data such as qualitative questionnaire survey, in-depth interview, design thinking process, brainstorming and so on. The research could be conducted in an informal manner.
3. After gathered all relevant data, understand the desirable, and pain points of the users, then analyze and synthesize the data to formulate the user experience design by mapping with the user experience honeycomb to ensure that the new design will deliver the better experience.
4. When designing the user experience, it is necessary to obtain the data from all stakeholders, not just the users. It is particularly important to gain input from marketing, business, and technological experts to ensure that the websites are desirable by the users, viable for the business, and technologically feasible.

This research focused only on the user experience, so it is ensuring that the updated version of BlazingLove will be desired by the target users, but remain questions for the latter two, business viable and technology feasible. Hence, after the prototype is designed, business and technology are the other factors to be considered. As the founder of BlazingLove, the updated version shall be developed if it is expecting to generate revenue and reach breakeven point within five years.

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FACTOR AFFECTING ICT-BASED LEARNING IN HIGHER EDUCATION IN PHNOM PENH, CAMBODIA

Bunteng Long[1*], Kitti Phothikitti[1], Rawin Vongurai[1]
[1]Graduate School of Business and Advanced Technology management,
Assumption University, Bangkok, Thailand, 10240

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ABSTRACT

The purpose of this study was to examine the factors affecting the adoption of ICT-based learning of students in higher education in Phnom Penh, Cambodia. The conceptual framework was developed from previous studies which includes facilitating conditions, self-efficacy, perceived ease of use, performance expectancy, effort expectancy, behavioral intention and use behavior. The quantitative method was applied to distribute a questionnaire to 527 respondents. The multistage sampling technique was conducted in nonprobability sampling, using judgmental sampling to select undergraduate students in three private universities, quota sampling to calculate the sample size of each group, and convenience sampling to distribute a questionnaire online and offline. Before collecting data, Item-Objective Congruence Index (IOC) and Cronbach's Alpha were employed to validate constructs. Confirmatory Factor Analysis (CFA) was used to verify convergent and discriminant validity, and goodness of fit indices. Structural Equation Model (SEM) was carried out to test the relationship among variables. The findings showed that performance expectancy and effort expectancy significantly affected behavioral intention, and behavioral intention positively affected use behavior. However, the results contradicted that facilitating condition, self-efficacy, and perceived ease of use were not significant on behavioral intention. Government, educators and practitioners are recommended to encourage significant factors to increase ICT-based learning adoption and learning efficiency of students by clearly communicating the benefits of system usage, improving system to be user-friendly and promoting the usage of the system more effectively to increase the level of system adoption among students.

Keywords: Higher education, ICT-Based leaning, Performance expectancy, Effort expectancy, Behavioral intention, Use behavior

Introduction

The globalization of higher education institutions (HEIs) has become a principal (Hong, 2018). This agenda has been endorsed by the World Conference on Higher Education (WCHE) to improve a quality of education system and reduce an inequality among developed and developing countries. In Cambodia, international standard has remarkably influenced local higher education. Since the end of civil war in the 1990s, Royal Government of Cambodia

*corresponding author: e-mail: longbunteng@gmail.com

has been restoring society, economy and education of the country, benchmarking with other developing countries. The government has focused to develop its citizens for the country's reconstruction and to upkeep with regional and global economic standard (Tan, 2007). The vision of the higher education in Cambodia is "to build a higher standard of higher education system that can develop talents with excellent knowledge, skills and moral values to succeed in work and life, especially in the era of digitalization and knowledge-based society" The education development goal of Cambodia is "to develop a good governance system and higher education mechanisms to ensure that students can access the quality education programs in responding to the needs of socio-economic development and labor market" (MoEYS, 2014, p. 3). The statistical data showed that higher education's enrollment of students in Cambodia between 2009 and 2013 has raised to 207,000 and scholarships were awarded to 4,200 students (MoEYS, 2014).

Information and Communication Technology (ICT) is a fundamental term for information technology (IT), which refers to communication technologies, including the internet, wireless networks, smart phones, computers, software, videoconferencing, social networking, and other media applications and services, allowing users to access, retrieve, store, transmit, and manipulate information in a digital form. The usage of ICT in higher education institutions represents a new form of education and has become an integral part of global education transformation. It refers to the process of improving and developing education facilitated by the widespread usage of information and communication technology i.e., e-learning (Blurton, 1999).

This study aims to investigate determinants of ICT-based learning's adoption of students in higher education in Phnom Penh, Cambodia which includes facilitating conditions, self-efficacy, perceived ease of use, performance expectancy, effort expectancy, behavioral intention and use behavior.

Literature Review and Hypotheses

Facilitating conditions

Facilitating conditions refer to the degree to which a person perceives that the organizational and technical infrastructure are available to support the use of the system (Venkatesh, Morris, Davis, & Davis, 2003). Several studies (Chang, 2012; Chau & Hu, 2002) found that facilitating conditions significantly affect the utilization of technology. Users expect to access information or tools that can help them to adopt the technology successfully (Venkatesh et al., 2003; Zhou, Jindal-Snape, Topping, & Todman, 2008). Venkatesh, Brown, and Bala (2013) argued that there is a positive association between facilitating conditions and behavioral intention in the technology's usage. Venkatesh and Bala (2008) elaborated that facilitating conditions are related to the belief of individuals in organization's resources and technical support that can facilitate the use of a system. Thus, the following hypothesis is set:

H1: Facilitating conditions has a significant impact on behavioral intention.

Self-efficacy

Self-efficacy represents an inspiration of individuals to execute behaviors (Agarwal & Sambamurthy, 2000). Self-efficacy is described as one's capability to use the technology to achieve a task (Alenezi, Abdul Malek, & Veloo, 2010; Johnson, Burke, Brinkman, & Wade, 2017; Venkatesh & Morris, 2000). Compeau and Higgins (1995) characterized self-efficacy as person's confidence to adopt personal computers and smart phone. The higher level of self-efficacy represents the higher level of intention to use a technology

(Hatlevik, Throndsen, Loi, & Gudmundsdottir, 2018). Ajzen (1991) viewed self-efficacy as a self-evaluation on one's capacity to conduct an action. Many studies also found that self-efficacy impacts intention to use ICT (Ariff, Yeow, Zakuan, Jusoh, & Bahari, 2012). Therefore, this research suggests that self-efficacy significantly effects behavioral intention as stated in the following hypothesis:

H2: Self efficacy has a significant impact on behavioral intention.

Perceived ease of use

Davis (1989) identified perceived ease of use as the simpleness of the technology that can enable individuals to use it. Venkatesh (2000) pointed that perceived ease of use is a key indicator of the technology acceptance model (TAM). In educational technology context, an individual's intention to use e-learning is positively affected by the ease of use, which means the system requires less physical and mental effort of using it (Chen & Tseng, 2012; Mohammadi, 2015). Perceived of use is characterized as the degree to which an individual expects to have no problem of using a technology (Changchit, 2014). Many researchers have investigated perceived ease of use in various form of technology, for example, web-based business (Pavlou, 2003), e-learning (Chui, Hsieh, Kao, & Lee, 2007), personal computer (Doll & Torkzadeh, 1988) and have confirmed the positive association between perceived ease of use and behavioral intention. Hence, this study considers that perceived of use has a significant effect on behavioral intention as indicated in the following hypothesis:

H3: Perceived ease of use has a significant impact on behavioral intention.

Performance expectancy

Performance expectancy has gained widely attention from many researchers to examine the technology adoption (Venkatesh et al., 2003; Derntl, Neumann, Griffiths, & Oberhuemer, 2011; Khayati & Zouaoui, 2013). Rogers and & Singhal (2003) postulated that performance expectancy is a viable construct used in the unified theory of acceptance and use of technology (UTAUT) model to determine the adoption of information system. Performance expectancy is explained as an individual who believes that the use of technology would benefit him or her to accomplish tasks (Venkatesh et al., 2003). Cheok and Wong (2015) investigated that performance expectancy is a key influencer of e-learning adoption in higher education. The number of research proved that performance expectancy positively impacts behavioral intention (Dulle & Minishi-Majanja, 2011; Mtebe & Raisamo, 2014; Venkatesh et al., 2003). Hence, the following hypothesis is set:

H4: Performance expectancy has a significant impact on behavioral intention.

Effort expectancy

According to Venkatesh et al. (2003), effort expectancy is defined as the degree of ease related with the system usage. Effort expectancy is also one of the key constructs in UTAUT model. In this study, effort expectancy is described as the level of simplicity associated with the use of e-learning among university's students. Effort expectancy has a significant impact on behavioral intention, investigating by many scholars (Bandyopadhyay & Fraccastoro, 2007; Liebenberg, Benade, & Ellis, 2018; Jairak, Praneetpolgrang, & Mekhabunchakij, 2009; Nassuora, 2012; Venkatesh et al., 2003). Giesing (2003) proved that effort expectancy significantly impacts intention to use of the technology. The theoretical relationship is derived to determine a hypothesis:

H5: Effort expectancy has a significant impact on behavioral intention.

Behavioral intention

Behavioral intention is a predictor of actual use behavior of new technology (Liébana-Cabanillas, de Luna, & Ríos, 2017). It is defined as a willingness of an individual to use a provided technology. Furthermore, behavioral intention is an essential concept and widely applied as a main construct in various technology adoption theories, which includes TAM by Davis (1989), UTAUT by Venkatesh et al., (2003), and theory of reasoned action (TRA) by Ajzen (1991). Likewise, Ajzen and Fishbein (1975) conceptualized behavioral intention as the probability of users to perform a certain behavioral action. Many researchers supported that behavioral intention critically affects use behavior (Ajzen, 1991; Saha, 2009; Kim, Shin, & Lee, 2009). Consequently, H6 is formulated as:

H6: Behavioral intention has a significant impact on use behavior.

Use behavior

Use behavior is generalized as an intensity or frequency of users to use information technology (Liébana-Cabanillas et al., 2017). Use behavior depends on the users' impression on the system. The system is more likely to be accepted if users are interested and confident that the technology can offer them some advantages or benefits. A usage behavior is conceptualized as a behavior in which users finally interact with the technology (Venkatesh et al., 2003). Numerous studies considered that behavioral intention and attitude toward use are moderators between other determinants and use behavior (Chen, 2011).

Research Methods and Materials

Research framework

The research framework is developed from previous theoretical studies which associates with the technology adoption in higher education. This study aims to examine the factors, which include facilitating condition (FC), performance expectancy (PE), perceived ease of use (PEOU), self-efficacy (SE), and effort expectancy (EE) that significantly impacting behavioral intention (BI). In addition, researchers also investigate a relationship between behavioral intention and use behavior (UB). The conceptual framework of this study is shown in Figure 1.

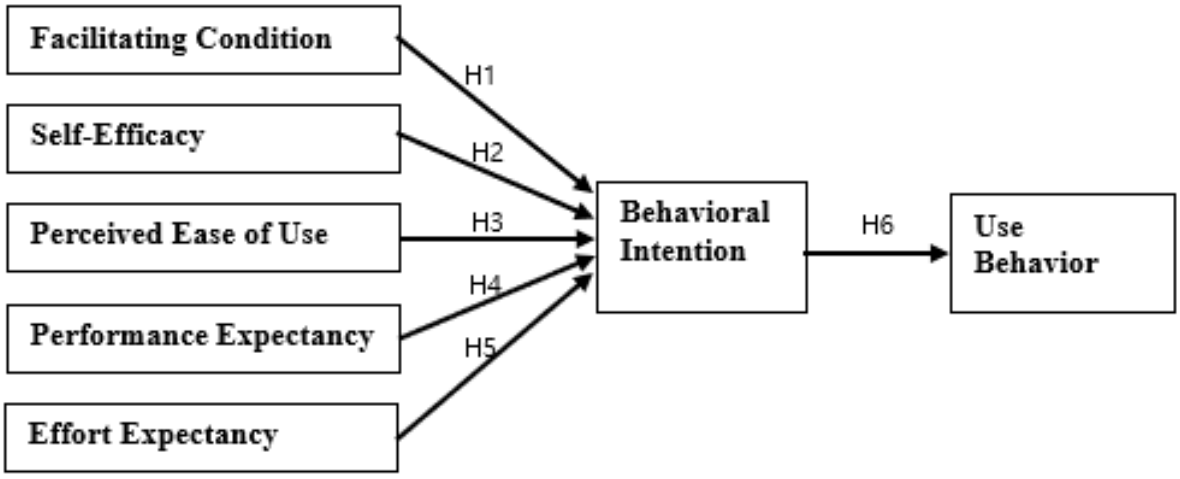


Figure 1 Conceptual framework

Methodology

This research used quantitative method by distributing questionnaire via offline and online channels. Research instruments were composed with screening questions, measuring items used Five-points Likert scale, ranging from strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1) and demographic information. Before collecting data, this study applied Item-Objective Congruence Index (IOC) validity test, using three experts to verify constructs. Later, Cronbach's Alpha (CA) reliability test was used to measure items among 50 respondents as pilot study. The IOC results were passed at the value above 0.6, and all items were reserved at the CA's value higher than 0.7.

Data collection was carried out with the distribution of questionnaire to 527 respondents. Researchers analyzed the data by SPSS 26 and AMOS 26.0. Afterwards, Confirmatory Factor Analysis (CFA) was conducted to test the convergent which was verified by fitness model test and discriminant validity that showed greater value than the correlation between constructs (Hair, Black, Babin, & Anderson, 2010) to confirm the quality of the questionnaire used for collecting data. The measurement model fits the overall test with given data to ensure the accuracy and reliability of the model. Finally, Structural Equation Modeling (SEM) was used to examine the association among variables.

Population and sample size

The target population used in this study were undergraduate students of business administration and arts of humanity, who have been experiencing ICT-based learning method from three private universities in Phnom Penh, Cambodia. A-priori Sample Size Calculator for Structural Equation Models of Soper (n.d.) was used to calculate minimum sample size which was recommended at 425. After 580 responses were screened, the usable data for this study were 527.

Sampling technique

The multistage sampling technique, using nonprobability sampling, was applied in this study. Firstly, the judgmental sampling was used to select undergraduate students of business administration and arts of humanity, who have been experiencing ICT-based learning method from three private universities in Phnom Penh. Secondly, the quota sampling was employed to calculate sample size from each group as illustrated in Table 1. Finally, researchers applied convenience sampling method to collect the data during February to May 2021 via online by using telegram messenger application and offline by using paper-based questionnaire.

Table 1 Sample size by universities in Phnom Penh

Universities	Percentage	Sample size
Western University (Phnom Penh campus)	68%	358
Royal University of Phnom Penh	12%	64
Acleda Institute of Business	20%	105
Total	100%	527

Results and Discussion

Demographic factor

The demographic profile of 527 respondents is summarized in this section. The number of female respondents is the 373 (70,7%), and the number of male respondents is 154 (29.3%) Most of the respondents are 4th year students (Senior), which represent 269 (51.1%) of total respondents, followed by 3rd year students (Junior) which account for 33.1% (174), 2nd year students (Sophomore) which account for 3% (16), and 68 (12.9%) are 1st year students (Freshman). For the city of residence, 81.9% of the respondents live in Phnom Penh, and 18.1% live outside the province as shown in Table 2.

Table 2 The results of demographic information

Demographic profile data (N = 527)		Frequency	Percentage
Gender	Male	154	29.3%
	Female	373	70.7%
University rank	Freshmen	68	12.9%
	Sophomores	16	3.0%
	Juniors	174	33.1%
	Seniors	269	51.1%
Citi of residence	Live in Phnom Penh	432	81.9%
	Live Outside Phnom Penh	95	18.1%

Confirmatory factor analysis

Confirmatory Factor Analysis (CFA) is a statistical technique, which enables consistency testing of data (Bollen, 1989). Factor loading, Composite Reliability (CR), and Average Variance Extracted (AVE) can be examined by CFA. Factor loading is required to be higher than 0.5 and p-value is lower than 0.05. In addition, Fornell and Larcker (1981) suggested that Composite Reliability must be greater than 0.7 and the Average Variance Extracted must be higher than 0.5 (Hair et al., 2010). However, Lam (2012) stated that AVE is acceptable at the value less than 0.5 if CR is higher than 0.6. as demonstrated in Table 3. Table 4 showed that the values of discriminant validity were greater than the correlation between constructs (Hair et al., 2010) which confirms the quality of the questionnaire used for collecting data. Additionally, the results of Table 3, 4 and 5 also confirm the construct validity were validated as the convergent and discriminant validities.

Table 3 Confirmatory factor analysis results, composite reliability (CR) and average variance extracted (AVE)

Variables	Sources of questionnaires (measurement indicator)	No. items	Cronbach's Alpha	Factor loading	CR	AVE
Facilitating condition	Arif (2017)	5	.800	0.659-0.673	0.774	0.409
Self-efficacy	Sharma (2019)	4	.684	0.513-0.685	0.685	0.355
Perceived ease of use	Sharma (2019)	3	.781	0.685-0.713	0.758	0.511
Performance expectancy	Badwelan (2016)	5	.845	0.700-0.810	0.857	0.546
Effort expectancy	Kolog (2015)	4	.733	0.594-0.780	0.804	0.509
Behavioral intention	Maldonado, Khan, Moon, and Rho (2010)	5	.856	0.733-0.831	0.875	0.585
Use behavior	Maldonado et al. (2010)	3	.828	0.611-0.997	0.905	0.767

Table 4 Discriminant validity

Constructs	FC	SE	PEU	EE	BI	UB	PE
FC	**0.787**						
SE	0.766	**0.796**					
PEU	0.600	0.683	**0.715**				
EE	0.656	0.662	0.679	**0.714**			
BI	0.489	0.543	0.555	0.674	**0.765**		
UB	0.064	0.102	0.131	0.128	0.117	**0.876**	
PE	0.624	0.633	0.621	0.607	0.763	0.116	**0.739**

Remark FC: Facilitating condition, PE: Performance expectancy, SE: Self-efficacy, PEU: Perceived ease of use, EE: Effort expectancy, BI: Behavioral intention, UB: Use behavior

From Table 5, the acceptable values can determine the goodness of fit which include CMIN/ DF = 2.029, GFI = 0.915, AGFI = 0.893, CFI = 0.956, TLI = 0.948, NFI = 0.918 and RMSEA = 0.044. Hence, the results are acceptable and in harmony of with empirical data.

Table 5 Goodness of fit for confirmatory factor analysis (CFA)

Index	Acceptable values	Values
CMIN/ DF	< 3.00 (Hair et al., 2010)	2.029
GFI	≥ 0.80 (Filippini, Forza, & Vinelli,1998; Greenspoon & Saklofske, 1998)	0.915
AGFI	≥ 0.80 (Filippini et al., 1998)	0.893
CFI	≥ 0.90 (Byrne, 2013)	0.956
TLI	≥ 0.90 (Vandenberg & Scarpello, 1994)	0.948
NFI	> 0.90 (Arbuckle, 1995)	0.918
RMSEA	< 0.08 (MacCallum, Browne, & Sugawara, 1996)	0.044

Structural equation model (SEM)

Structural Equation Modeling is a multivariate statistical concept that verifies the association between variables in a model and covers measurement falsity in the structure coefficient (Hair et al., 2010; Mackenzie, 2001). After the modification of SEM model, the results show the overall model fit, which include CMIN/ DF = 2.403, GFI = 0.906, AGFI = 0.881, CFI = 0.940, TLI = 0.930, NFI = 0.903 and RMSEA = 0.052 as shown in Table 6.

Table 6 Goodness of fit for structural equation model (SEM)

Index	Acceptable values	Values
CMIN/ DF	< 3.00 (Hair et al., 2010)	2.403
GFI	≥ 0.80 (Filippini et al.,1998; Greenspoon & Saklofske (1998)	0.906
AGFI	≥ 0.80 (Filippini et al., 1998)	0.881
CFI	≥ 0.90 (Byrne, 2013)	0.940
TLI	≥ 0.90 (Vandenberg & Scarpello, 1994)	0.930
NFI	> 0.90 (Arbuckle, 1995)	0.903
RMSEA	< 0.08 (MacCallum et al., 1996)	0.052

Research hypothesis testing

Form Table 7, this study reveals the result of SEM in this study. H1 showed no support in a relationship between facilitating conditions and behavioral intention with standard coefficient value of 0.097 (t-value = 1.041). This result contradicts with numerous research (Chang, 2012; Chau & Hu, 2002; Venkatesh et al., 2003; Zhou et al., 2008) who confirmed that facilitating conditions has positive effect on behavioral intention. Therefore, facilitating conditions were not significant on behavioral intention.

The standard coefficient value of H2 was 0.169 (t-value = 0.150), presenting no support relationship between self-efficacy and behavioral Intention. This result aligns with many studies that self-efficacy significantly

impacts intention to use ICT (Ariff et al., 2012) Thus, self-efficacy had no significant impact on behavioral intention.

H3 has the standard coefficient value of 0.153 (t-value = -1.349), which means the structural pathway between perceived ease of use and behavioral intention was not supported. It was opposed by previous literatures (Chen & Tseng, 2012; Mohammadi, 2015; Changchit, 2014; Pavlou, 2003; Chui et al., 2007; Doll & Torkzadeh, 1988) that the perceived ease of use can enhance the intention of learners to use ICT-based learning. Hence, perceived ease of use showed no significant impact on behavioral intention.

Nevertheless, results of the structural model analysis showed that performance expectancy positively affects behavioral intention, which supports H4 in this study, with a standard coefficient value of 0.085 (t-value = 5.129). Supported by many studies (Venkatesh et al., 2003; Derntl et al., 2011; Khayati & Zouaoui, 2013; Dulle & Minishi-Majanja, 2011; Mtebe & Raisamo, 2014), it is assumed that learners are encouraged to use ICT-based learning by beliefs in the benefit of the system that would help them to achieve tasks. As a result, performance expectancy significantly impacted behavioral intention.

H5 has a standard coefficient value of 0.085 (t-value = 6.967), which can be posted that effort expectancy significantly affects behavioral intention of ICT bases learning. It can be further explained the effortless of using the system can stimulate the intention to use the system, which was confirmed by many scholars (Bandyopadhyay & Fraccastoro, 2007; Liebenberg et al., 2018; Jairak et al., 2009; Nassuora, 2012; Venkatesh et al., 2003; Giesing, 2003). Consequently, effort expectancy had a significant impact on behavioral intention.

Regarding H6, the positive relationship of behavioral intention and use behavior was found with the standard coefficient value of 0.72 (t-value = 2.769). This result signifies that behavioral intention significantly effects actual use behavior of new technology, reported by many researchers (Liébana-Cabanillas et al., 2017; Ajzen, 1991; Saha, 2009; Kim et al., 2009). So, behavioral intention is confirmed that it had a significant impact on use behavior.

Table 7 Hypothesis and the structural equation model analysis

Hypothesis	**Paths**	**Standardized path coefficient**	**T-value > 1.98**	**Test results**
H1	Facilitating condition behavioral intention	0.097	1.041	Not supported
H2	Self-efficacy behavioral intention	0.169	0.150	Not supported
H3	Perceived ease of use behavioral intention	0.153	-1.349	Not supported
H4	Performance expectancy behavioral intention	0.085	5.129	Supported
H5	Effort expectancy behavioral intention	0.085	6.967	Supported
H6	Behavioral intention use behavior	0.072	2.769	Supported

Conclusion, Recommendation and Limitation

Conclusion

The globalization of higher education institutions (HEIs) has been developed rapidly in the digital era. Hence, ICT-based learning has been expanded in Cambodia and worldwide. This study responded the research questions that performance expectancy and effort expectancy significantly affected behavioral intention. Nevertheless, the results opposed with many studies that facilitating condition, self-efficacy, and perceived ease of use did not significantly impact behavioral intention. The quantitative method and nonprobability sampling were used in this study. The multistage sampling technique was applied. Firstly, judgmental sampling was conducted to select undergraduate students of business administration and arts of humanity who have been experiencing ICT-based learning method from three private universities in Phnom Penh. Next, quota sampling was carried out to calculate a sample size of each group. Finally, online and offline questionnaire were distributed, using convenience sampling method. The conceptual framework was constructed from previous theories which includes facilitating conditions, self-efficacy, perceived eased of use, performance expectancy, effort expectancy, behavioral intention, and use behavior. The preliminary analysis was tested with IOC validity and CA reliability. The data was collected and analyzed by Confirmatory Factor Analysis (CFA), including convergent and discriminant validity, and goodness of fit indices. Structural Equation Modeling (SEM) was employed to examine relationships between variables. The results report that there are no association between facilitating condition, self-efficacy, perceived ease of use and behavioral intention. However, performance expectancy and effort expectancy were found to have a significant impact on behavioral intention. Additionally, behavioral intention positively effects use behavior of ICT-based learning among university's student in Phnom Penh, Cambodia

Recommendation and application

Per the results of this study, recommendations are provided to government, educators and practitioners to develop factors that strongly effect ICT-based learning adoption to elevate student's learning efficiency. Firstly, performance expectancy can be enhanced by the development of technological tools for ICT-based learning that offers benefits for users to arouse them to use the system. Secondly, effort expectancy can be a consideration of a user whether the system is user-friendly and effortless or not. Thirdly, use behavior is affected by behavioral intention, backing up with factors that can stimulate users to adopt ICT-based learning. Therefore, universities should design ICT-based learning to be easy, accessible, and convenient, and provide effective communications to promote the adoption of this technology.

Limitation for application

The study is limited to undergraduate students in three private universities in Phnom Penh, Cambodia. The different geographic and demographic background potentially produce different findings.

Recommendation for further study

Other variables can be added, considering TAM and UTAUT model such as perceived usefulness and social influence. Furthermore, the qualitative method, which includes interview and focus group, should be further explored for deeper understanding and insights.

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INFLUENCING FACTORS OF ONLINE LEARNING SATISFACTION AND BEHAVIORAL INTENTION AMONG CHINESE COLLEGE STUDENTS

Yu Zhou[1*], Somsit Duangekanong[1]
[1]Graduate School of Business and Advanced Technology management,
Assumption University, Bangkok, Thailand, 10240

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ABSTRACT

The purpose of this study is to investigate the key influencing factors of college students' online learning satisfaction and behavioral intention during the epidemic period. The examined variables are convenience, benefit, self-efficacy, student engagement, flexibility, perceived usefulness, satisfaction and intention. The methodology used is quantitative method (n = 550) by sending questionnaires to senior art and design students in three private universities in Sichuan Province. Multistage sampling was accounted to use nonprobability sampling with judgmental sampling to select top three private art colleges and universities. Next, probability sampling with stratified random sampling was taken to calculate the amount of each group. Last, the convenience sampling was to distribute questionnaire via offline and online channels. The Structural Equation Model (SEM) and Confirmatory Factor Analysis (CFA) including model fit, reliability and validity were deployed for data analysis. Research findings showed that convenience, benefit, self-efficacy, student engagement, flexibility, perceived usefulness have significant impact on satisfaction and intention. Satisfaction has the strongest influence on online learning intention, followed by benefit, student engagement, flexibility, perceived usefulness, convenience and self-efficacy. In summary, seven hypotheses were proven to achieve research objectives. Therefore, this study suggests academic practitioners to assess influencing factors to improve college students' online learning satisfaction and behavioral intention.

Keywords: Convenience, Benefit, Self-efficacy, Student engagement, Flexibility, Perceived usefulness, Satisfaction, Intention

Introduction

In the past 20 years, the development of information and network technology has impacted online teaching in China. It has rapidly grown especially in the two pandemic periods of SARS in 2003 and COVID19 in 2020. In 2003, due to the limitation of information and network technology, the teaching was mainly a one-way mode, teachers and students could not timely communicate. In the later stage of online education development, the Ministry of Education randomly launched high-quality audio and visual development for online learning materials to provide a strong construction of online teaching resources. At

*corresponding author: e-mail: 344855127@qq.com

the beginning of 2020, the COVID-19 epidemic had swept across almost all countries in the world, causing immeasurable losses. The sudden outbreak of COVID-19 disrupted the normal order of education, leading to the closure of classes. It impacted more than 850 million students around the world and the disruption of existing teaching programs in almost every school worldwide. Many countries immediately offered online teaching services to students through various conference platforms such as Zoom, Skype and FaceTime. Online learning has restored normal teaching in most areas. Under the background of "no suspension of classes" initiated by the government, China's education, especially higher education institutions, had unexpectedly realized the transformation and docking between online and offline through internet technology. China had begun to use Ding Ding, Tencent, Zoom and other office meeting software tools to provide online learning on a large scale. Urdan and Weggen (2000) pointed that online learning referred to e-learning, distributed learning, web-based training, learning and teaching, or virtual learning.

Ministry of Education confirmed online learning during epidemic that it had organized 37 online course platforms and technology platforms, opening free online courses such as Massive Open Online Courses (MOOCs) and virtual simulation experiments, providing online learning solutions and technical support and promoting active participation of more than 110 societies and platforms to universities across the country. Teachers and students have transited from "knowing nothing" to "gradual adaptation", from "hasty battle" to "smooth transition" and from "deep suffering" to "gradual appreciation". Every university have been utilizing the power of internet and education technology, proving a strong education's capability among higher level of colleges and universities in China. Online learning as a new way of education is facing extraordinary opportunities. Facts have proved that the progress of educational technology, especially popularization of the Internet and widely use of online learning, has changed teachers' cognition of educational technology via internet network and educational concept of students' way of learning.

The purpose of this study is to investigate the key influencing factors of college students' online learning satisfaction and behavioral intention during the epidemic period. The examined variables are convenience, benefit, self-efficacy, student engagement, flexibility, perceived usefulness, satisfaction and intention. The sample group is senior students of three private art colleges in Sichuan province, which ranked among the top three colleges in China. In addition, the study also assesses the causal relationship between each variable to reveal the support factors on satisfaction and behavioral intention.

Literature Review and Hypotheses

Online learning

Online learning is described as an instruction delivery and learning experiences that are derived from electronic platforms using technological hardware and software with internet access. There are other terms used such as e-learning, m-learning and internet-based learning (Maddison, Doi, Lucky, & Kumaran, 2017).

In China, online learning has been vastly used during the epidemic era. As out of home activities have been limited, online learning is viewed as an alternative channel that provides the interaction between lecturer and learners during an outbreak. The Chinese government has upgraded the online schools' infrastructure and has originated a number of dedicated online courses to support the distance learning programs (Wang, Zhu, Chen, & Yan, 2009).

Massive open online courses (MOOCs)

Massive Open Online Courses (MOOCs) is referred to an online learning ecosystem that is widely used in an education system worldwide. It provides accessible and affordable online learning for a wide range of learners' group (Yunusa & Umar, 2018). The concept of MOOCs was developed in 2008 and has grown rapidly during pandemic. Chinese academic organizations have optimized its equipment to support the MOOCs system for more efficiency and to increase the adoption level in schools and universities. There were more than 9,000 massive open online courses in China via platforms such as XueTangX and iCourse International (McConnell, 2018).

Intention

Pollack (1990) signified that intention is a representative of the actions that a system might be taken to achieve its goals. Triandis (1980) considered that "individuals give themselves instructions to behave in a particular way is called behavioral intention". Ajzen (1985) attested that people might not have enough control to formulate their intentions although it could serve as an important reference for behavior prediction, which is explained in the theory of planned behavior (TPB). Hogarth (1991) posited that "intention is determined by the subjective norms of people's attitude and behavior".

Convenience

Collier, Ponder, and White (2007) referred convenience as "the flexibility and convenience of allowing students to participate in online courses". Brown (1990) explained that the task completion in the shortest time with the least manpower and material resources reflects the convenience of service which provides the advantage of time and effort saving. According to Kaura, Prasad, and Sharma (2014), service convenience is a concept and idea that could reduce the cost of energy and time spent and also add value to product/ service.

Per the report of Berry, Seiders, and Grewal (2002), service process is reflected mainly through five dimensions of service convenience in the activities that users engage, which can dominate users' satisfaction. Keaveney (1995) believed that inconvenient service causes users to change their behavior. Kaura, Prasad, and Sharma (2015) found another similar study exploring the mediating role of satisfaction which showed convenience has a positive and direct effect on satisfaction. Many studies have examined the incidental relationship between convenience and satisfaction. Hence, researchers proposed the hypothesis that convenience significantly affects satisfaction per the following hypothesis.

H1: Convenience has a significant influence on satisfaction.

Benefit

Perceived (system) benefits referred to the extent to which users benefit effectively from an information system (Wixom & Watson, 2001; Staples, Wong, & Seddon, 2002; Wu & Wang, 2006). Kinard and Capella (2006) identified that familiarity with users and friendly relationship between providers and users are manifestation of social benefits. Fisher (2010) assumed that tangible benefits directly relate to products and services and is defined as utilitarian or functional benefits.

Oliver (1997) indicted that the relational benefits intend to capture the impact of differences i.e., the effect of intention or behavior on satisfaction. According to Bhattacharya, Korschun, and Sen (2009), organization could achieve positive results from its CSR practice only if it brings benefits to its stakeholders.

Reynolds and Beatty (1999) captured those relational benefits could affect user satisfaction and loyalty to further learning and use. In the perceptual success model, perceived system

benefit could be used as an indicator of perceived usefulness. Therefore, this study proposed that benefit has a significant effect on satisfaction with the assumptions shown below.

H2: Benefit has a significant influence on satisfaction.

Self-efficacy

Bandura (1995) alleged that self-efficacy referred to "the belief of one's ability to organize and execute the action plan required to deal with the potential situation". Shen, Cho, Tsai, and Marra (2013) considered students' trust in their ability to successfully use online learning courses as a manifestation of self-efficacy, which presents a personal trait that plays an important role in the use of technology and information systems.

Bandura (1994) argued the determination on how people motivate themselves and their behavior per the belief about self-efficacy. Per the study of Peltier, Drago, and Schibrowsky (2003), Peltier, Schibrowsky, and Drago (2007) and Eom, Ashill, and Wen (2006) postulated that various research had surveyed in the past 10 years and had found that self-efficacy is a factor affecting student satisfaction of online learning courses.

Johnson, Hornik, and Salas (2008) discovered the perceived utility of the network learner's system. Self-efficacy positively correlated with perceived content value, course performance and satisfaction. Satisfaction's level has increased when people believe in their abilities. Consequently, a positive correlation between self-efficacy and satisfaction exists (Federici, 2013; Federici & Skaalvik, 2012; Skaalvik & Skaalvik, 2009). The study of Hong et al. (2016) and Yu (2012) indicated that there is a significant and positive correlation between self-efficacy, satisfaction and system use, which was concluded by many scholars. Therefore, the following hypothesis is derived.

H3: Self-efficacy has a significant influence on satisfaction.

Student engagement

Bomia et al. (1997) argued that the degree to which students' willingness and succession are required to the participation of the learning process which can be defined as student engagement. Briggs (2015) claimed that student engagement is referred to the level of students' interest, how they interact with others, and their motivation to obtain knowledge in the course. According to Schaufeli, Salanova, Gonzalez-Roma, and Bakker (2002), engagement is characterized by diligence, dedication and focus, representing a positive and satisfied mindset. Mandernach, Donnelli-Sallee, and Dailey-Hebert (2011) regarded that several factors related to student engagement are including attitude, personality, motivation, effort and self-confidence.

Several studies strengthened that when people are highly engaged, they would achieve a balance between work, study and life, reflecting intrinsic characteristics of their engagement (Rothbard, 2001), thus become more satisfied with that balance (Wrzesniewski, 2012). Another study of Shea, Fredericksen, Pickett, and Pelz (2003) learned that students who participate in cohort studies with other students, interact with teachers and receive detailed feedback from them, tend to express satisfaction of the learning experience. Based on the above arguments, this study has proposed the hypothesis that student participation has a significant impact on satisfaction.

H4: Student engagement has a significant influence on satisfaction.

Flexibility

Kickert (1985) urged that flexibility, as a meta-control, could increase variety, speed and responsiveness to cope with future uncertainties. Previous research presented that flexibility of time and place for online learning are ideal and attractive for those who

both work and study. Moreover, the flexibility of space and time allow them the freedom to study and work and life management (Arbaugh, 2000; Chiu & Wang, 2008; Githens, 2007; Marks, Sibley, & Arbaugh, 2005).

The study of Upton (1995) and Thomke (1997) indicated that flexibility could be achieved without excessive cost, time, organizational disruption, or performance loss. Scholars believed that the ability to utilize the internal capabilities of the department to meet the changing needs of users, and then quickly and effectively create and reconstruct goals and plans could defined as the flexibility of strategic development, reflecting the positive relationship between flexibility and satisfaction (Hayes & Pisano, 1994; Pisano, 1994; McGrath, MacMillan, & Venkataraman, 1995).

Jin and Oriaku (2013) clarified those users who would benefit from flexibility are those who can solve unexpected problems according to their needs. The flexibility of strategy formulation has a direct impact on the ability of information dissemination in supply chain. In the research of mobile service conducted by Kim, Park, and Jeong (2004), factors such as quality, pricing structure, value-added services, procedural convenience and customer support were considered to promote user satisfaction. Therefore, this study proposed that flexibility potentially effects satisfaction, with the assumptions shown below.

H5: Flexibility has a significant influence on satisfaction.

Perceived usefulness

Thirumalai and Sinha (2011) argued that perceived usefulness is the primary determinant for users (people) to identify and use a system. It is a degree to which an individual decides to use a particular system and he/ she would be able to improve his/ her (job/ academic) performance and productivity. According to Aboelmaged (2010), one of the influential determinants of various systems acceptance and technology applications in information systems research is perceived usefulness. Tandon, Kiran, and Sah (2016) mentioned that the empirical analysis to confirming user satisfaction in the network environment inserts perceived ease of use and perceived usefulness as important determinants. Roca, Chiu, and Martinez (2008) considered that perceived usefulness and ease of use are the predictors of learner satisfaction in e-learning programs. Perceived usefulness, as a key factor in technology adoption models, not only reflects the values associated with the application of information technology, but also enables users to judge their satisfaction based on these values. The study of Bhattacherjee (2001) used the adoption model to confirm the most important factor affecting user satisfaction which is perceived usefulness. In the context of mobile Internet, many researchers found that the use of mobile internet sites has a positive impact on user satisfaction (Lee, Kang, & McKnight, 2007; Zhou, 2014). Therefore, it is deduced that perceived usefulness has a significant impact on satisfaction, and the hypothesis is as follows.

H6: Perceived usefulness has a significant influence on satisfaction.

Satisfaction

Oliver (1980) certified that the accumulation of interactive feelings reflects satisfaction. Wang (2015) considered user expectation, quality awareness, convenience and maintainability as the main contents of user satisfaction. With the improvement of satisfaction, users' trust in products or services would be enhanced. Previous studies had shown the only variable that directly affects the behavior model of some information systems is user's satisfaction, which plays a mediating role between perceived usefulness and the information systems

acceptance (Seddon, 1997; Seddon & Kiew, 1996).

Oliver (1980) pointed out that the first prerequisite factor for users' positive affirmation of service and expectations' level is satisfaction. Kim and Jang (2014)'s study showed that users' satisfaction has a beneficial effect on permanent intention in social networks. Jeong (2004) signified the most important indicator of users' satisfaction with the information provided by websites is their willingness to re-use certain websites. Bitner, Booms, and Tetreault (1990) posited that users' purchase and reusage, and purchase intention play a key role in the study of users' satisfaction and trust. Therefore, it is concluded that satisfaction has a significant impact on intention. Hence, the hypothesis is as follows.

H7: Satisfaction has a significant influence on intention.

Research Methods and Materials

Research framework

Based on previous theoretical and historical research, researchers used five main preliminary research frameworks to support and develop the conceptual framework of this study (Zhang & Kim, 2019; He, Kim, & Lee, 2019; Gray & Diloreto, 2016; Sahin & Shelley, 2008; Tandon, Kiran, & Sah, 2017), which aims to identify and analyze the impact of factors such as convenience, benefit, self-efficacy, student engagement, flexibility, perceived usefulness, satisfaction and intention. The conceptual framework of this study is shown in Figure 1.

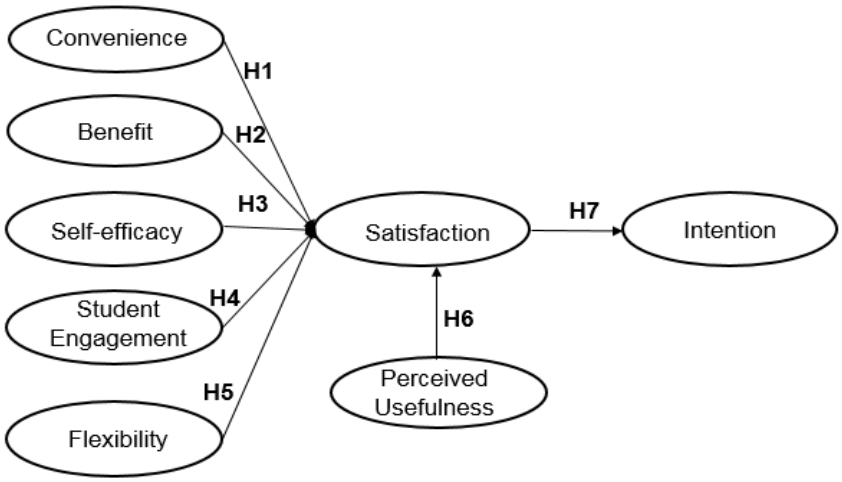


Figure 1 Conceptual framework

Methodology

This study adopts quantitative method of nonprobability and probability sampling by sending questionnaires to target group of sophomores, juniors and seniors majoring in art and design collages of the top three private universities in Sichuan Province in China through online and paper questionnaires. Data had been collected and factors influencing online learning satisfaction and behavioral intention during the epidemic had been analyzed. The questionnaire consists of three parts including screening questions, measured items by using the 5-point Likert scale, ranging from strongly inconsistent (1) to strongly consistent (5), and demographic profile including gender, age and university years of students.

The prior validity and reliability test were conducted by using expert rating based on Item-Objective Congruence Index (IOC) and pilot test of 30 respondents based on Cronbach's Alpha method. After the test score passed with the reservation of all items, the questionnaire was validated to distribute to 506 target respondents. The data was analyzed by SPSS AMOS 21.0. Confirmatory Factor Analysis (CFA) was used to test the convergent and discriminant validity. The fitting degree of the model was ensured and calculated by the overall test of the given data. Finally, Structural Equation Models (SEM) was applied to test the relationship among variables.

Population and sample size

The target population of this paper was Chinese students from second year (Sophomore) third year (Junior) and fourth year (Senior) of art and design colleges in the top three universities in Sichuan Province, China, who have been experiencing online learning. Israel (1992) suggested that the sample size of structural equation models should include 200-500 respondents. In this study, the survey was completed by 550 respondents. After the data screening process, 506 responses were used for the analysis.

Sampling technique

The researchers applied multistage sampling of three stages. Firstly, nonprobability sampling using judgment sampling is used to select the top three art and design students from similar universities Secondly, the number of target respondents in each group was calculated by using stratified random sampling in probability sampling as shown in Table 1. Last stage is to distributing questionnaires online and offline by the method of convenience sampling. The data was collected about three months between April and June 2021 and was screened to ensure the right target group. The online version was distributed through a joint research group of the three universities and respondents shared survey links with their classmates. Offline survey was conducted by the course teacher by the means of sending paper questionnaires directly to the students.

Table 1 Population and sample size in three universities

University name (Art and design category)	Population size total	Proportional sample size total
Art Design and Animation of Sichuan University of Media and Communications	1,587	177
Design and Fine Arts College of Sichuan Film and Television University	1,442	161
School of Art of Sichuan Technology and Business University	1,507	168
Total number of questionnaires distributed	**4,536**	**506**

Results and Discussion

Demographic information

The demographic profile summarized in Table 2 involving 506 participants. Male respondents accounted for 54.9% and female respondents for 45.1%. The largest group of age in this study was 21-22 years old of 45.1%, followed by 35.0% of 19-20 years old, 19.4% of 23-24 years old and 0.5% of 18 years old and below. In terms of the student's years, the junior students were the major group which accounted 37.9%, followed by senior students of 33.6% and sophomore students of 28.5%.

Table 2 Demographic profile

Demographic profile (N = 506)		Frequency	Percentage
Gender	Male	278	54.9%
	Female	228	45.1%
Age	18 years and below	3	0.5%
	19-20 years old	177	35.0%
	21-22 years old	228	45.1%
	23-24 years old	98	19.4%
Student's years	Second year (Sophomore)	144	28.5%
	Third year (Junior)	192	37.9%
	Fourth year (Senior)	170	33.6%

Confirmatory factor analysis (CFA)

Confirmatory Factor Analysis was used in this study. All items in each variable were significant representing factors loading to test the validity of the discriminant. According to Henseler and Sarstedt (2013), Goodness of fit (GoF) measurements were fundamentally applied to verify the fit of the model for each item. Fornell and Larcker (1981) recommended that the relative change that Goodness of Fit could indirectly evaluate convergent effect that was represented by the extracted mean variance when the structural model remains unchanged. Hair, Black, Babin, and Anderson (2010) believed that the comprehensive reliability (CR) value should be greater than 0.7 and above, indicating that the structure was reliable. Additionally, the average variance extraction (AVE) must be greater than 0.5, indicating the convergence effectiveness. In Table 3, all estimates are acceptable at the cutoff points with structural reliability greater than 0.7 and at the cutoff points with extracted mean variance greater than 0.5.

Table 3 Confirmatory factor analysis result, composite reliability (CR) and average variance extracted (AVE)

Variables	Source of questionnaire (measurement indicator)	No. of item	CA	Factors loading	S.E.	T-value > 1.98 & p-value < 0.5	CR	AVE
Convenience (C)	Colwell, Aung, Kanetkar, and Holden (2008)	4	.821	0.679-0.757	0.053-0.056	14.881***-16.649***	0.822	0.537
Benefit (B)	Wu and Wang (2006)	4	.838	0.714-0.797	0.051-0.054	16.071***-18.056***	0.839	0.566
Self-efficacy (SL)	Eom (2012)	4	.846	0.735-0.786	0.057-0.061	16.290***-17.460***	0.846	0.580
Student Engagement (SE)	Cain, Busser, and Baloglu (2015)	8	.923	0.702-0.877	0.037-0.043	18.770***-27.011***	0.911	0.563
Flexibility (F)	Sahin and Shelley (2008)	4	.808	0.664-0.798	0.055-0.059	14.507***-15.753***	0.855	0.598
Perceived Usefulness (PU)	Ajzen and Fishbein (1977), Davis (1989)	4	.908	0.805-0.945	0.045-0.048	21.278***-26.548***	0.911	0.720
Satisfaction (S)	Sahin and Shelley (2008)	5	.888	0.692-0.820	0.045-0.048	16.735***-20.899***	0.883	0.601
Intention (I)	Mols (1998)	4	.895	0.776-0.933	0.048-0.050	19.251***-23.943***	0.898	0.689

*** = Significant at the 0.05 significant levels ($p < 0.05$)

Remark CA = Cronbach's Alpha, CR = Composite reliability, AVE = Average variance extracted

The square root of the extracted mean variance determined that all correlations were greater than the corresponding correlation value of the variable, as shown in Table 4. In addition, GFI, AGFI, CFI, NFI, TLI and RMSEA were used as indicators for model fitting to verify convergence validity and discriminant validity.

Table 4 Discriminant validity (Factor correlations)

Variable	C	B	SL	SE	F	PU	S	I
C	0.732							
B	0.551	0.753						
SL	0.562	0.649	0.761					
SE	0.39	0.59	0.507	0.777				
F	0.386	0.532	0.438	0.712	0.717			
PU	0.482	0.411	0.411	0.494	0.395	0.848		
S	0.592	0.708	0.623	0.689	0.645	0.565	0.775	
I	0.304	0.321	0.366	0.475	0.421	0.388	0.547	0.83

Remark The diagonally listed value is the AVE square roots of the variables

The fit values of this study were shown in Table 5, which were all greater than acceptable values. The convergence validity and discriminant validity were guaranteed. In addition, these model measurements were used to verify the convergence and discriminant validity of structural model estimation.

Table 5 Goodness of fit for confirmatory factor analysis (CFA)

Index	Acceptable values	Values
CMIN/ DF	< 3.00 (Hair et al., 2010)	1.737
GFI	≥ 0.80 (Greenspoon & Saklofske, 1998)	0.904
AGFI	≥ 0.80 (Forza & Filippini, 1998)	0.887
CFI	≥ 0.90 (Hair et al., 2010)	0.962
NFI	≥ 0.90 (Arbuckle, 2008)	0.915
TLI	≥ 0.90 (Vandenberg & Scarpello, 1994)	0.945
RMSEA	< 0.08 (Browne & Cudeck, 1993)	0.038

Remark CMIN/ DF = The ratio of the chi-square value to degree of freedom, GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, CFI =comparative fit index, NFI = normalized fit index, TLI = Tucker Lewis index, and RMSEA = root mean square error of approximation

Structural equation model (SEM)

Cadell, Regehr, and Hemsworth (2003) described that structural equation modeling (SEM) not only verify the measurement model, but also measure the Goodness of Fit index of the structural model. Jaccard and Wan (1996) posted that SEM can solve the inherent difficulty of multiple regression analysis in which measurement errors caused by multiple interactions. As shown in Table 6, the Goodness of Fit index of the structural equation model was measured. For Chi-square/ Degree of Freedom (CMIN/ DF) ratio, the model fit measure should not exceed 3, and GFI and AGFI should be higher than 0.8 (Greenspoon & Saklofske, 1998; Forza & Filippini, 1998). In SEM, SPSS AMOS was applied to calculate and adjust the model. As a result, the fitting values as shown in Table 6 were all acceptable including CMIN/ DF = 1.768, GFI = 0.901, AGFI = 0.885, CFI = 0.960, TLI = 0.956, NFI = 0.912 and RMSEA = 0.039.

Table 6 Goodness of fit for structural equation model (SEM)

Index	Acceptable values	Values
CMIN/ DF	< 3.00 (Hair et al., 2010)	1.768
GFI	≥ 0.80 (Greenspoon & Saklofske, 1998)	0.901
AGFI	≥ 0.80 (Forza & Filippini, 1998)	0.885
CFI	≥ 0.90 (Hair et al., 2010)	0.960
TLI	≥ 0.90 (Vandenberg & Scarpello, 1994)	0.956
NFI	≥ 0.90 (Arbuckle, 2008)	0.912
RMSEA	< 0.08 (Browne & Cudeck, 1993)	0.039

Testing result of research hypothesis

The significance of each variable was calculated by regression weights and R^2 variance. All hypothesis results of the structural model in Table 7 were significantly supported when p = 0.05. Satisfaction has the strongest effect on intention at β = 0.562, followed by benefit (β = 0.260), student engagement (β = 0.220), flexibility (β = 0.184), perceived usefulness (β = 0.171) and convenience (β = 0.142). Accordingly, all estimates were supported.

Table 7 Hypothesis result of the structural model

Hypotheses	Paths	Standardized path coefficients (β)	S.E.	T-value	Tests result
H1	S<---C	0.142	0.054	2.958**	Supported
H2	S<---B	0.260	0.061	4.581***	Supported
H3	S<---SL	0.121	0.061	2.364*	Supported
H4	S<---SE	0.220	0.056	3.899***	Supported
H5	S<---F	0.184	0.067	3.314***	Supported
H6	S<---PU	0.171	0.035	4.267***	Supported
H7	I<---S	0.562	0.045	12.182***	Supported

Remark ***p < 0.05, **p < 0.1 and *p < 0.5

The results in Table 7 are explained further in this part. H1 demonstrates convenience as one of the key factors of satisfaction, revealing the standard coefficient value of 0.142 in the structural path. Bansal, McDougall, Dikolli, and Sedatole (2004) illustrated that convenience must be fully considered to improve students' satisfaction with online learning and their willingness to take action. For H2, the analysis results support the significant effect of benefits on satisfaction with a standard coefficient value of 0.260. The empirical research of Wu and Wang (2006) showed that perceived system benefits have a positive impact on users' satisfaction to engage online learning. H3 assumes the significant influence of self-efficacy on satisfaction, and the standard coefficient value obtained was 0.121. Researchers confirmed the ability to acquire knowledge, skills, and intrinsic motivation can lead to the goal accomplishment (Bakker, Albrecht, & Leiter, 2011). H5 is a proof of the flexibility influence on satisfaction with the standard coefficient value of 0.184. Zhang and Kim (2019) verified that the flexibility in goal setting is an external factor of competitive advantage that can improve users' satisfaction. H6 states the impact of perceived usefulness on satisfaction and the standard coefficient value was 0.171. Wen, Prybutok, and Xu (2011) viewed usefulness as the determinant of user satisfaction which aligns with the results. H7 displayed the significant effect of satisfaction on intention with a standard coefficient value of 0.562. Bodet (2008) argued that satisfaction is an attitude component and reflected as one of the main predictors of user willingness. In summary, these findings support the previous literatures that satisfaction has the strongest effect on intention which mean that students who are satisfied with all aspects of online learning are willing to adopt the system.

Conclusion and Recommendation

Conclusion

This paper mainly investigates the factors of online learning satisfaction and behavioral intention among college students in China during COVID-19. All hypotheses were proposed as conceptual framework of how convenience, benefit, self-efficacy, student engagement, flexibility, perceived usefulness significantly impact online learning satisfaction and intention. The quantitative approach

was applied with questionnaire design. The multistage sampling technique was to employ nonprobability sampling with judgmental sampling to select art and design students who have been experiencing online learning during the outbreak from the top three private colleges in Sichuan, China. Later, probability sampling with stratified random sampling was applied to calculate the sample size of each group. Last, the convenience sampling was accounted to circulate survey offline and online. Prior to data collection, the validity test of Item-Objective Congruence Index (IOC) and reliability test of Cronbach's Alpha were used. Data analysis was deployed to explore the influencers of online learning satisfaction and behavioral intention. CFA was measured and tested the validity and reliability of the conceptual model. Afterwards, SEM was adopted to assess relationship among variables. The results are that convenience, benefit, self-efficacy, student engagement, flexibility, perceived usefulness have a significant impact on satisfaction and intention. Satisfaction shows the strongest influence on online learning intention, followed by benefit, student engagement, flexibility, perceived usefulness, convenience and self-efficacy. In conclusion, all hypotheses are supported and considered to fulfil the research objectives.

Recommendation

During the epidemic period, this study concluded the determinants of satisfaction and behavioral intention towards online learning including convenience, benefit, self-efficacy, student engagement, flexibility, perceived usefulness, satisfaction and intention. Consequently, researchers suggest to strengthening these aspects for online learning adoption for better learning efficiency of learners. For literatures and practical implication, academic practitioners and teachers are required to consider development plans to promote online learning for enhancing students' satisfaction and behavioral intention. In this context, students can benefit from convenience (anytime and anywhere) of learning. Students are able to personalize their learning and gain more practical knowledge through field experiences such as internships, mentoring projects, and collaborative projects remotely. Students' learning satisfaction and behavioral intention are the prerequisites to adopt online learning in universities. In conclusion, the results of this study are useful for the academic management, functional departments of colleges and lecturers to measure and optimize the satisfaction and behavioral intention of students in online learning and realize the gradual improvement of relevant mechanism. For further clarification and examples, the school should gather results from satisfaction surveys to define the online learning adoption level for better development on some aspects such as developing system's ease of use, training on how to use online learning more effectively and building creative environment in online class i.e., vote, games and group activities to enhance student's engagement and satisfaction.

Limitation and further study

The limitations of this study are explained in this last section. Firstly, the population and sample were only scoped in art and design college students of the top three art and design universities in Sichuan Province, China. The different program, region or country of higher educations may produce different outcome. Secondly, further research can consider other related variables such as online teaching resources, teaching plan and teaching strategy, fairness and efficiency, team learning etc. to explore more drivers for the online learning adoption. Lastly, the methodology can be extended with the inclusion of qualitative approach i.e., interview, focus group etc. for deepen understanding the view of participants.

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E-COMMERCE MARKETING MIX FACTORS FOR SAFE VEGETABLE PURCHASE DECISION: THE SECOND ORDER CONFIRMATORY FACTOR ANALYSIS

Thipkesone Phetsopha[1*], Krisada Chienwattanasook[2], Wisit Rittiboonchai[3]
[1]Faculty of Food Science, Savannakhet University, Lao People's Democratic Republic.
[2]Faculty of Business Administration, Rajamangala University of Technology Thanyaburi, Thailand.
[3]Faculty of Management Sciences, Nakhon Pathom Rajabhat University, 85 Malaiman Road, Muang, Nakhon Pathom 73000 Thailand.

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ABSTRACT

The purpose of this research was to study the e-commerce marketing mix factors in the purchase decision of safe vegetable products by using the second order confirmatory factor analysis. The data of 750 consumers and their safe vegetable consumption were collected on the electronic system based on convenience sampling. The collected data consist of questionnaires with validity and reliability. In terms of product, after-sales service has the highest weighting value if the seller is willing to refund for poor product quality ($\lambda y_{18} = 0.63$). In terms of price, offering lower price than other channels have the highest weighting value ($\lambda y_{25} = 0.63$). In terms of place, ease of use has the highest weighting value ($\lambda y_{31} = 0.61$). In terms of promotion, consistent after-sales follow-up has the highest weighting value ($\lambda y_{44} = 0.62$). In terms of personalization, prompt communication with customers when there is a problem has the highest weighting value ($\lambda y_{56} = 0.63$). Also, in terms of privacy factor, allowing customers to revoke their consent to be tracked and their data to be retained at any time has the highest weighting value: PRIV04 ($\lambda y_{64} = 0.63$). After being tested by convergent validity: AVE and Construct reliability: CR, the weighting values must not be lower than 0.50 and more than 0.60 respectively.

Keywords: E-commerce marketing mix factors, Safe vegetable purchase decision, Second order confirmatory factor analysis

Introduction

Sustainability in agriculture is the strength of Thailand. With the advantages of topography and fertility, Thailand is the world's leading country in terms of producing quality agricultural products and can be upgraded to be the kitchen of the world. Despite the fact that agricultural policy is an important policy that previous Thai governments paid attention to, the policy was not successful, and the income of Thai farmers was low compared to farmers of other nations. However, with the attentive care of the current government, the income of Thai farmers tends to increase.

Farmers are the largest group of people in Thai society. The well-being of farmers reflects the stability and sustainability of the country. Applying modern knowledge, and principles in farming is necessary that farmers understand agriculture, business administration, and the use of marketing mix factors which would bring success to them in the future. Nowadays, "Healthy Trend" is one of the popular trends in the world. People pay more attention to exercise, natural products, non-chemical products, especially safe vegetables.

*corresponding author: e-mail: thipkesone.phetsopha@gmail.com

Due to COVID-19 epidemic, consumers have to work from home, and the government support on the use of financial transactions via mobile phones to purchase products using their phones. Thus, consumer behavior tends to purchase goods and services by using more technology. The key element of success in the new era is to create marketing proposals through individual customers, together with the harmonization of the use of e-commerce marketing mix factors in purchasing decisions.

Life Style of people in this era using technology through mobile applications is constantly increasing. According to the National Statistical Office, there are 62.8 million people over 6 years old in Thailand. 31.7 million or 50.5% of them are smartphone users, while there were only 5million users or 8% in 2012. The majority of activities done via smartphones are social networks (91.5%), download movies, music (88.0%), upload data. (55.9%) and follow the news (46.5%). According to the survey, digital technology has become part of everyone's daily life (National Statistical Office, 2021). Studying the growing online market is useful for marketers to understand the purchasing behavior of modern consumers whose purchasing power tends to continuously grow. In addition, internet usage behavior of Thais has also increased with an average weekly online time of 16.6 hours, which is more than time spent on TV. They spend more time on interesting online VDOs, and online marketing videos or advertisements, as well as viral clips of certain brands had more than 1 million views in 2012. Facebook is the most popular internet service with 18 million social network users or 85%, while 10% of users use twitters, and 5% use Instagram. Thais are active on Facebook with likes, comments, and shares 31 million posts per day, or an average of 624,000 times a day. 60 percent of Facebook users in Thailand use mobile phones, and other mobile gadgets. Besides building awareness of the product, it is necessary that digital media strategies need to be adjusted to attract consumers, and build word of mouth and loyalty to the brand. The value in digital media has grown at least 30 percent or 3,000 million baht (Positioningmag, 2019).

It is necessary to develop online channels for agricultural products in this era. Furthermore, lifestyles of Thais have been changed during the COVID-19 crisis. Thus, there must be ones of the e-commerce marketing mix factors that allow conducting business transactions via the Internet, such as selling and purchasing, providing information of products and services, and financial transaction (Tassabehji, 2003). Marketing mix factors consist of product, price, place and promotion, personalization, and privacy. from the process of buying goods, selling goods, delivering goods, exchanging goods and services on the Internet (Iamsiriwong, 2013), all of them must be consistent with the behavior of consumers who tend to buy products through electronic commerce systems. The research on e-commerce marketing mix factors for safe vegetable purchase decision through the second confirmatory factor analysis aims to elevate farmers to become middle-class farmers with sustainability and understanding the behavior of customers in Bangkok and surrounding provinces. This research is expected to be a case study for those who are interested in producing safe vegetable products.

Research Objectives

To study e-commerce marketing mix factors for safe vegetable purchase decision through the second confirmatory factor analysis.

Literature Review

E-commerce marketing mix factors

Marketing mix is a group of activities in an organization's marketing program. Each organization can have different marketing mix factors (Tangchakwaranon & Makhasiranon, 2013)

Kotler (2003, p. 68) suggested that effective marketing combines the fundamentals of the marketing mix factors to achieve an entity's marketing goals, and deliver value to consumers. Thus, the marketing mix factors consists of materials, and business strategies to build a strong position in the target market.

Sereerat (2009, pp. 80-82) explained the principles of marketing mix factors as follows:

1. Products include tangible and intangible goods offered in the market. They must be valuable in the view of consumers.
2. Price is the total value that customers perceive from using the product. High price does not reduce the number of purchases.
3. Place emphasizes on comprehensive and distribution channels.
4. Promotion, such as advertising public relations, sales promotion and direct marketing, is a communication tool to create brand satisfaction.

Bleier, De Keyser, and Verleye (2018) stated that 6Ps of marketing mixes factors consist of product, price, place, promotion, privacy, and personalization. They are all interrelated and crucial in digital marketing.

Department of Industrial Promotion (2008, p. 40) also explained that e-commerce marketing relies on the marketing power to manage and promote marketing. To achieve this goal, it is necessary to apply the traditional 4Ps, as well as the additional 2 Ps which are the results of information technology. The details of 6Ps are related to marketing promotion in online commerce, while the new marketing elements: 2Ps focus on

1. Privacy refers to policies imposed by entrepreneurs or organizations to protect personal data, and build credibility. The reason is that, to purchase products online, consumers need to disclose their personal information, such as full name, address, telephone number, e-mail, credit card number, etc. The seller shall keep customer's personal information confidentially, and shall not disclose their information without consent. Thus, customer's privacy and system stability are vital factors which affect the trust of customers, and leads to purchasing decisions.
2. Personalization refers to the nature of interactive services between entrepreneurs and customers in order to meet the needs of customers. Technology constantly leads to the development of online channels. Entrepreneurs can provide personalized customer services which allow sellers to directly interact with customers (Pogorelova, Yakhneeva, Agafonova, & Prokubovskaya, 2016).

According to the concepts and theories about e-commerce marketing mix factors, it can be concluded that marketing mix factors include 4 marketing management tools which are product, price, place, and promotion. There are also 2 additional tools which are personalization and privacy to build trust among consumers. Channels to respond to customers promptly and the security have been created and developed to meet the needs of customers while shopping online.

Digital marketing

Digital channel, a new form of marketing, is used to communicate with consumers. Digital marketing is still based on the marketing principles, but the method regarding communication channels with consumers and collecting consumer data are changed. Wertime and Fenwick (2008) defined digital marketing as "the development of future market which occurs when companies do most of their marketing activities through digital communication channels. Digital media can identify users, which enabling marketers to continuously communicate with their customers individually. The information obtained from communicating with each customer is mutual learning which is beneficial when providing services to the next customers. Marketing is similar to a neuron network since marketers can obtain real-time information and opinions from customers to improve for the consumer' best benefits in the future" or methods of promoting products and services by using online database to respond consumers promptly to meet the demand of consumers while protecting their privacy, as well as remaining a cost-effective manner.

Digital media and digital marketing

The Internet allows users to quickly access information and communicate directly with consumers. In fact, consumers interested in the product gather, discuss various related issues, and communication through the provided digital channels as a One-to-One communication. In addition, consumer's personal data is saved in a database. At

present, there are several popular digital media and channels to find consumers.

Digital marketing is completely changing the world and the fundamentals of business operations with these five key points (Chonsirungsakul, 2019).

1. Connections: digital channels are rapidly changing communication in business. Globalization allows people to communicate at all times and borderless. With a video conferencing system, it is possible to hold meetings around the world which means working in different places is no longer a hindrance. Digital tools also help sales team to service their customers in terms of ordering, inventory management and create an efficient promotional system. Thus, digital channels have a huge influence in changing the work system and investment.

2. Conversations: digital has changed the way brands interact with their target consumers. One-way communication from producers to consumers has been replaced by instant and continuous conversations between the brand and the consumer. In addition, internet has become the world's largest focus group research that allows conducting online research, reading research papers on websites, and social networking. Thus, it is possible to learn and understand consumers widely by obtaining information from the internet.

3. Co-Creation: digital channels support creation of collaborative marketing content, or co-creation. Innovation and new ideas can be created by collaboration within the organization or with external agencies, such as institutes, scientists, and entrepreneurs. In addition, the original marketing content can be replaced by user-generate content, the contents created by the ideas of consumers. Consumers are able to express their opinions or present products on digital platforms.

4. Commerce: the rising trend of e-commerce comes from the popularity of AppStore, such as iTune, and an e-commerce website, such as Amazon.com, and Rakuten. Due to this trend, leading brands have become interested in e-commerce, and websites.

5. Community: The definition of the word 'community' has been changed due to the influence of social network which builds relationships and social responsibility-sustainability programs by effectively connecting brands and organizations. Social network focuses on five factors: connection, conversation, co-creation, commerce, and community, which makes marketing communication technology with consumers becomes successful. In addition, understanding customer demand can also promote effective marketing communication. E-commerce marketing becomes an alternative to modern consumers who have changed their behavior to use a variety of digital media. Modern media plays an important role since it is a convenient and easy channel for consumers to shop and get more information. Thus, consumers tend to buy more products if there are more available marketing channels (Baran, Galka, & Struk, 2008).

Conceptual Framework

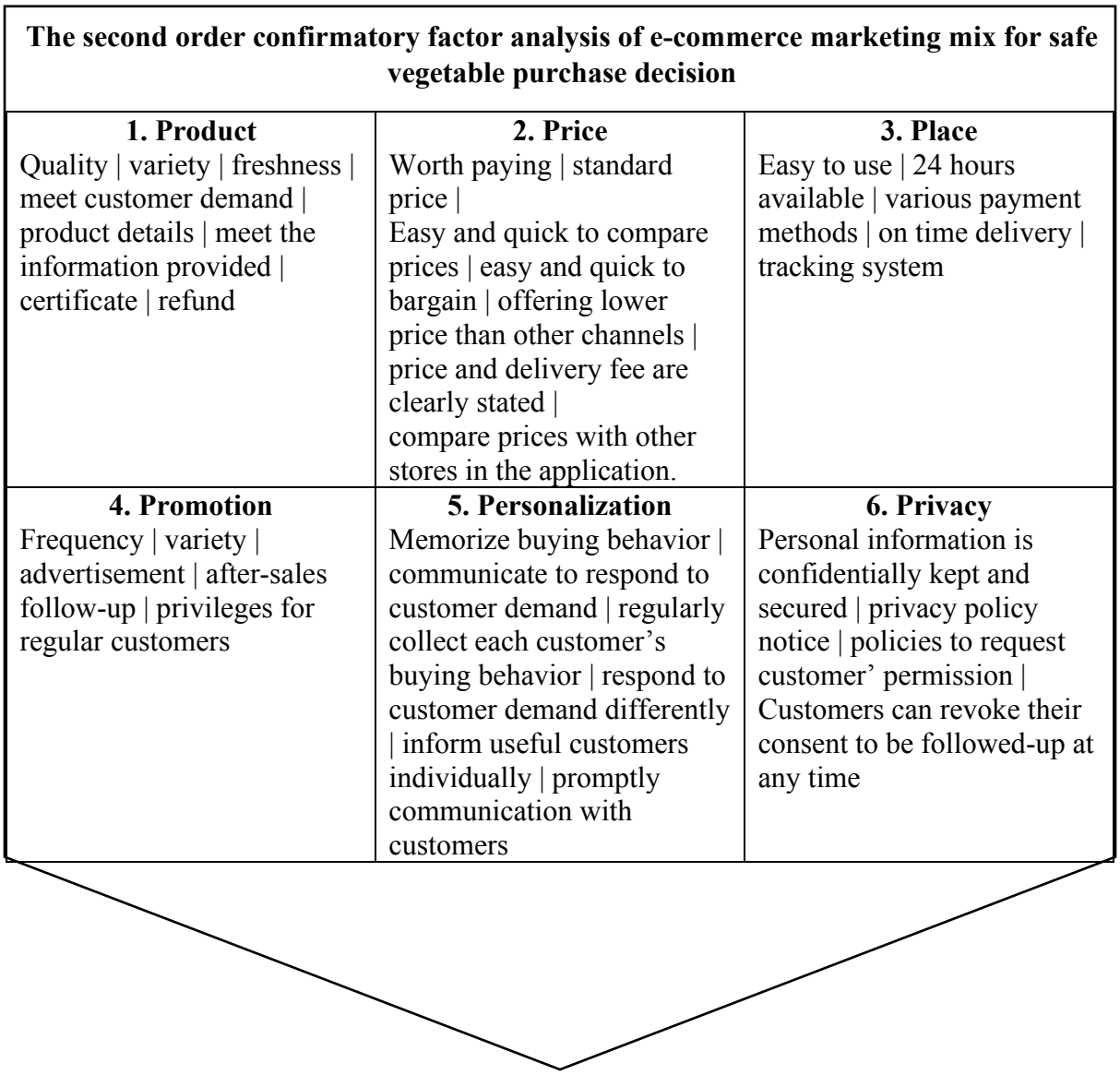


Figure 1 Conceptual framework

Data and Methodology

This is quantitative research. The data were collected from 750 consumers of safe vegetable products on e-commerce system in Bangkok and its vicinity. The sample size was calculated based on the formula of Hair, Black, Babin, and Anderson (2010, pp. 100-102), who suggested that the appropriate ratio between the sample to the number of parameters or variables should be at least 20-50 samples per observable variable. In this study, there are 35 observable variables; therefore, the maximum threshold of 21 samples per observable variable was used. Convenience sampling was applied in this research to distribute questionnaires online and onsite to customers who used to purchase safe vegetables. The collected data consist of questionnaires with validity and reliability. For the second order confirmatory factor analysis, frequency, percentage, mean, standard deviation, and structural equation modeling (SEM) were used.

Empirical Result

Most of the respondents or 68% are female, 70.67% of them are between 21-30 years old, 59.47% are single, 60.13% hold bachelor's degree, and the salary of 81.60% of the respondents is less than 20,000 baht per month. 53.07% are students.

The result of e-commerce marketing mix factors for safe vegetable purchase decision: the second order confirmatory factor analysis are shown in the figures and tables as follows:

Table 1 Empirical proof of data coherence

Value	Criteria	Values before adjustment	Results	Values after adjustment	Results
χ^2/df	Less than 5	3.71	√	1.93	√
RMSEA	0.03-0.08	0.060	√	0.042	√
NFI	More than 0.9	0.98	√	0.99	√
CFI	More than 0.9	0.98	√	0.99	√
GFI	More than 0.9	0.86	×	0.90	√
SRMR	Less than .05	0.03	√	0.02	√

Remark √ means the value meets the index test results criteria used to verify the coherence of the model with the empirical data

The results of the index analysis used to verify the coherence of the model with the empirical data showed that χ^2 = 1,003.18, df = 534, χ^2/df = 193, RMSEA = 0.042, NFI = 0.99, CFI = 0.99, GFI =0.90, SRMR = 0.02. The index shows that the new model has better empirical consistency with sufficient empirical data. The results of the analysis can be explained from the internal latent variables to the internal observable variables, and from external latent variables to external observable variables.

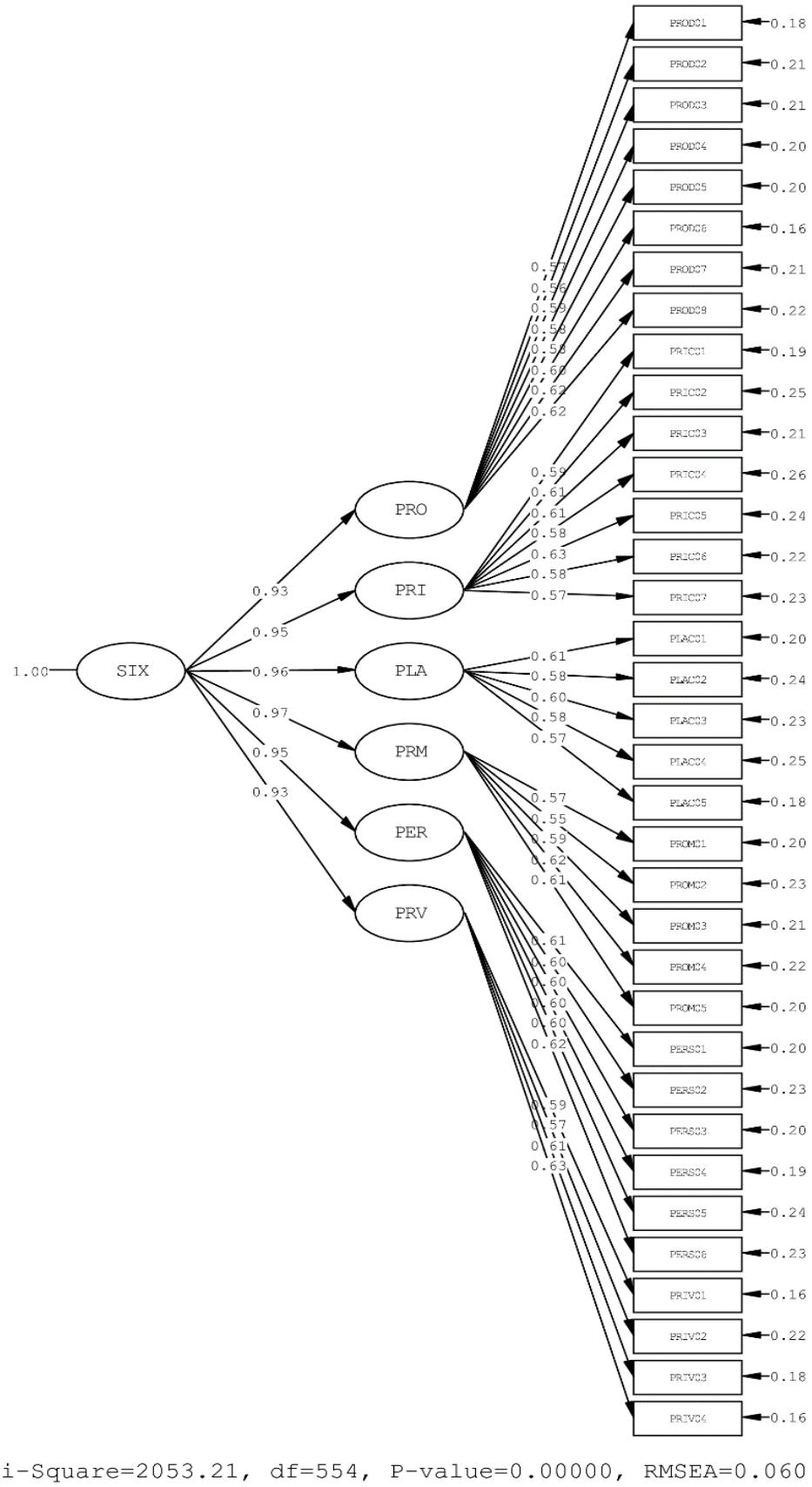


Figure 2 E-commerce marketing mix factors for safe vegetable purchase decision through the second order confirmatory factor analysis before adjustment

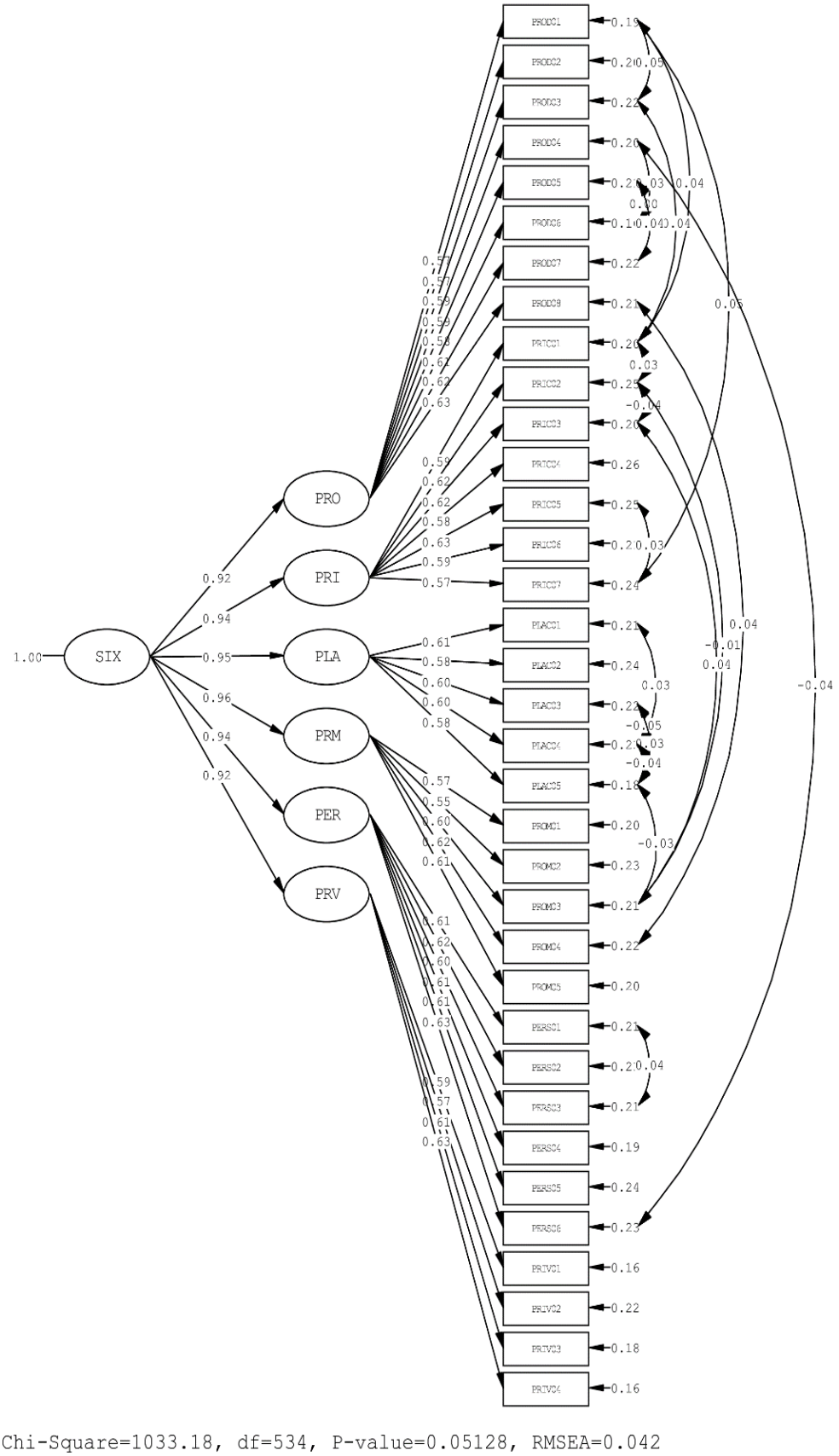


Figure 3 E-commerce marketing mix factors for safe vegetable purchase decision through the second order confirmatory factor analysis after adjustment

Table 2 E-commerce marketing mix factors for safe vegetable purchase decision through the first order confirmatory factor analysis

Matrix LAMDA-Y AVE =	**0.90**	**CR =**	**0.98**
E-commerce marketing mix factors: SIX	**λy**	**t-value**	**R^2**
Product: PRO	0.92	23.87	0.87
Price: PRI	0.94	24.33	0.89
Place: PLA	0.95	24.69	0.92
Promotion: PRM	0.96	24.35	0.93
Personalization: PER	0.94	24.65	0.92
Privacy: PRV	0.92	24.97	0.86

The results of this research on e-commerce marketing mix factors for safe vegetable purchase decision through the first order confirmatory factor analysis showed that the product factor has the highest weighting value ($\lambda y_4 = 0.96$).

Table 3 E-commerce marketing mix factors for safe vegetable purchase decision through the second order confirmatory factor analysis

Matrix LAMDA-Y AVE =	**0.64**	**CR =**	**0.93**
Product: PRO	**λy**	**t-value**	**R^2**
Quality of safe vegetable: PROD01	0.57	-	0.62
Variety of safe vegetable: PROD02	0.57	23.79	0.61
Freshness of safe vegetable: PROD03	0.59	26.86	0.61
Meets customer demand: PROD04	0.59	24.05	0.62
Product details are provided: PROD05	0.58	23.50	0.60
Safe vegetable meets the information provided: PROD06	0.61	25.54	0.69
Certificate to guarantee safe vegetable: PROD07	0.62	24.26	0.63
Refund policy: PROD08	0.63	24.72	0.65
Matrix LAMDA-Y AVE =	**0.61**	**CR =**	**0.92**
Price: PRI	**λy**	**t-value**	**R^2**
Worth paying: PRIC01	0.59	-	0.63
Standard price: PRIC02	0.62	25.51	0.60
Easy and quick to compare prices: PRIC03	0.62	24.74	0.65
Easy and quick to bargain: PRIC04	0.58	22.54	0.56
Offering lower price than other channels: PRIC05	0.63	23.74	0.61
Price and delivery fee are clearly stated: PRIC06	0.59	23.83	0.61
Compare prices with other stores in the application: PRIC07	0.57	22.85	0.57

Table 3 (Continued)

Matrix LAMDA-Y AVE =	**0.62**	**CR =**	**0.89**
Place: PLA	**λy**	**t-value**	**R^2**
Easy to use: PLAC01	0.61	-	0.64
24 hours available: PLAC02	0.58	23.22	0.59
Various payment methods: PLAC03	0.60	23.78	0.62
On time delivery: PLAC04	0.60	25.28	0.61
Tracking system: PLAC05	0.58	24.67	0.65
Promotion: PRM	**λy**	**t-value**	**R^2**
Offering discounts on special days or festivals: PROM01	0.57	-	0.61
Sale, collect points, free shipping: PROM02	0.55	22.43	0.57
Marketing promotion through other advertising media: PROM03	0.60	23.93	0.63
Regular after-sales follow-up: PROM04	0.62	24.14	0.64
Privileges for regular customers: PROM05	0.61	24.40	0.65
Privacy: PRV	**λy**	**t-value**	**R^2**
Personal information is confidentially kept and secured: PRIV01	0.59	-	0.68
Privacy policy is clearly informed: PRIV02	0.57	24.24	0.59
Policies to request customer' permission: PRIV03	0.61	26.53	0.67
Customers can revoke their consent to be followed-up at any time: PRIV04	0.63	27.57	0.71
Matrix LAMDA-Y AVE =	**0.63**	**CR =**	**0.91**
Personalization: PER	**λy**	**t-value**	**R^2**
Memorize buying behavior: PERS01	0.61	-	0.63
Communicate to respond to customer demand: PERS02	0.62	24.01	0.62
Regularly collect each customer's buying behavior: PERS03	0.60	27.07	0.63
Respond to customer demand differently: PERS04	0.61	25.10	0.66
Inform useful customers individually: PERS05	0.61	23.63	0.60
Promptly communicate with customers when there is an issue: PERS06	0.63	24.15	0.62

The results of e-commerce marketing mix factors for safe vegetable purchase decision through the second order confirmatory factor analysis show that in terms of product, refund policy has the highest weighting value (λy_{18} = 0.63). In terms of price, offering lower price than other channels have the highest weighting value (λy_{25} = 0.63). In terms of place, ease of use has the highest weighting value (λy_{31} = 0.61). In terms of promotion, consistent after-sales follow-up has the highest weighting value (λy_{44} = 0.62). In terms of personalization, prompt communication with customers when there is a problem has the highest weighting value (λy_{56} = 0.63). Also, in terms of privacy factor, allowing customers to revoke their consent to be tracked and their data to be retained at any time has the highest weighting value: PRIV04 (λy_{64} =0.63). After being tested by convergent

validity: AVE and Construct reliability: CR, the weighting values must not be lower than 0.50 and more than 0.60 respectively.

Conclusion

When e-commerce marketing mix factors for safe vegetable purchase decision through the first order confirmatory factor analysis was taken into consideration, all of the weighting values had similar high (from 0.92-0.96) which shows that all factors need to be in focus. However, the factor that gives the best effect is promotion. The result is consistent with Wattanachaitham (2014), who studied the effect of e-commerce in promoting local community enterprise products and found that the sample group realized the importance of e-commerce to promote their products at a high level. Hoang, Sansom, and Charoenchai (2019) conducted a study on factors affecting decision- making behavior on e-commerce of the people in Muang Maha Sarakham, Maha Sarakham Province. They found that promotion, personalization, and product are the first three factors affecting decision-making behavior on e-commerce. In addition, Siripipat and Chaiwan (2016) studied marketing mix factors affecting online shopping decision of Thai senior citizens, and found that the sample group prioritize place, promotion, place, product/ services, and price respectively. However, tracking system that allows customer to track their product is the most important in terms of sub-factors.

When the first order confirmatory factor analysis is applied, it is found that entrepreneurs should focus on providing refund policy if the quality of the product is low, lower price than other channels, easy-to-use steps, regular after-sales follow-up, prompt communication with customers when there is a problem, and allowing customers to revoke their consent to be tracked and their personal data to be retained at any time. This is in line with Vongchavalitkul et al. (2017), who studied Purchasing Behaviors and Analysis of Marketing Factor Affecting Consumer's E-Business transactions in Nakhonratchasima Municipality, Nakhonratchasima Province, and found that consumers are able to find products or services easily and quickly which is the key reason why they tend to shop online. The factors affecting the purchase of goods through the e-commerce system consist of those focusing on privacy, one of the marketing mix factors. Moreover, Deelers and Rattanapongpun (2018), who studied the Factors that Influence Consumer with Purchasing Decisions Process of E-Commerce Market Niches, the most important factors affecting purchasing decision are privacy, place, and price respectively. However, Donkwa, Pomahad, and Pitsuwan (2019), who studied marketing mix factors affecting consumer behavior in purchasing the organic vegetables in Nakhon Ratchasima Province, found that marketing mix factors from the perspective of cost consumers and the convenience of purchasing affect consumer behavior in purchasing the organic vegetables with coefficients of 0.32 and 0.33, respectively. Furthermore, Sisi and Visitnitikija (2019) studied distribution of processed fruits through e-commerce with the purpose of studying the behavior and marketing mix factors affecting the behavior of purchasing processed fruit through e-commerce. The results indicated that product, and promotion have a statistically significant effect on fruit purchasing behavior through e-commerce at .05. It is suggested that suppliers should pay attention to product standards, such as having the products inspected by relevant government authorities, or certificates granted by food-related agencies. It is also necessary that they produce their own high-quality products at lower cost to compete with other suppliers in the market. Moreover, social media, such as Facebook, and Line, should be used to present products.

Suggestions

Suggestions for contribution

1. In the era of globalization, entrepreneurs are unable to avoid transactions made through e-commerce. Traditional business is replaced by online business. With paradigm shift, if entrepreneurs are able to understand and

operate their business through e-commerce, they can create a competitive advantage.

2. To sell safe vegetable products, it is important to focus on all the 6 Ps. However, the factor that gives the best results is promotion. Thus, entrepreneurs must focus on continuity of marketing promotion due to e-commerce creates a close relationship between entrepreneurs and buyers. Moreover, the continuity of conveying the message to consumers is essential. Since vegetables are rather delicate, regular after-sales follow-ups, refund policies, and freshness guarantee lead to product loyalty. In addition, loyal customers will also recommend the products to their relatives, which strengthens business operations.

Suggestions for future research

1. This qualitative research focuses on customers, not entrepreneurs. The research can be more complete if demand side and the supply side are together studied. Thus, it is recommended that future research should conduct quantitative research as aforementioned, together with qualitative data collection, as well as a focus group. The details from the focus group among customers, entrepreneurs, and farmers would provide a more in-depth view.

2. In this study, the data were collected at the end of 2020, during the first wave of COVID-19 outbreak. The trend of purchasing through e-commerce sharply increased due to government orders, and lockdown that changed "consumer behavior". In case this research is studied again in the future, the result may completely differ.

3. The products studied in this research were safe vegetables. Obviously, the shelf life of such products is rate short; therefore, the delivery process should also be studied in the future. In fact, delivery process is the limitation and uncontrollable variable in this research. However, it can be assumed that a fast delivery process can maintain product quality and increase sales.

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