







“Determinants of perceived e-learning usefulness in higher education: A case of Thailand”

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| AUTHORS | Long Kim  Pimlapas Pongsakornrungsilp  Siwarit Pongsakornrungsilp  Teerada Cattapan  Nuttaprachya Nantavisit  |
| ARTICLE INFO | Long Kim, Pimlapas Pongsakornrungsilp, Siwarit Pongsakornrungsilp, Teerada Cattapan and Nuttaprachya Nantavisit (2022). Determinants of perceived e-learning usefulness in higher education: A case of Thailand. <i>Innovative Marketing</i> , 18(4), 86-96. doi: 10.21511/im.18(4).2022.08 |
| DOI | http://dx.doi.org/10.21511/im.18(4).2022.08 |
| RELEASED ON | Tuesday, 15 November 2022 |
| RECEIVED ON | Tuesday, 04 October 2022 |
| ACCEPTED ON | Saturday, 05 November 2022 |
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| JOURNAL | "Innovative Marketing " |
| ISSN PRINT | 1814-2427 |
| ISSN ONLINE | 1816-6326 |
| PUBLISHER | LLC “Consulting Publishing Company “Business Perspectives” |
| FOUNDER | LLC “Consulting Publishing Company “Business Perspectives” |



NUMBER OF REFERENCES

49



NUMBER OF FIGURES

2



NUMBER OF TABLES

4

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BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Received on: 4th of October, 2022
Accepted on: 5th of November, 2022
Published on: 15th of November, 2022

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Long Kim, Master of Business Administration, School of Management, Center of Excellence for Tourism Business Management and Creative Economy, Department of Digital Marketing, Walailak University, Thailand.

Pimlapas Pongsakornrungsilp, Ph.D. in Management, School of Management, Center of Excellence for Tourism Business and Creative Economy, Department of Tourism and Prochef, Walailak University, Thailand. (Corresponding author)

Siwarit Pongsakornrungsilp, Ph.D. in Management, School of Management, Center of Excellence for Tourism Business Management and Creative Economy, Department of Digital Marketing, Walailak University, Thailand.

Teerada Cattapan, MSc in Digital Marketing, School of Management, Center of Excellence for Tourism Business Management and Creative Economy, Department of Digital Marketing, Walailak University, Thailand.

Nuttaprachya Nantavisit, Ph.D. in Integrated Tourism and Hospitality Management, School of Management, Center of Excellence for Tourism Business Management and Creative Economy, Department of Digital Marketing, Walailak University, Thailand.



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Conflict of interest statement:
Author(s) reported no conflict of interest

Long Kim (Thailand), Pimlapas Pongsakornrungsilp (Thailand),
Siwarit Pongsakornrungsilp (Thailand), Teerada Cattapan (Thailand),
Nuttaprachya Nantavisit (Thailand)

DETERMINANTS OF PERCEIVED E-LEARNING USEFULNESS IN HIGHER EDUCATION: A CASE OF THAILAND

Abstract

Perceived e-learning usefulness as a marketing element has significantly affected student satisfaction, which results in a high propensity to continue using the current e-learning services with their universities. Therefore, this study aims to examine the effects of perceived risk, confirmation, and student motivation on perceived e-learning usefulness. This paper employed a convenience sampling technique to collect opinions from 689 university students at different universities (e.g., Thaksin University, Hatyai University, Prince of Songkla University, and Rajabhat University) around Thailand. Those students were actively using e-learning to access their education. After checking data validity, only 527 valid responses were analyzed through the path analysis method. According to empirical findings, confirmation significantly influenced student motivation, while perceived risk did not significantly impact student motivation. Finally, perceived e-learning usefulness was significantly influenced by confirmation, student motivation, and perceived risk. Furthermore, although these factors significantly influenced perceived e-learning usefulness, attitudes toward perceived e-learning usefulness relied mainly on the degree of confirmation, as this factor highlighted the most substantial effect on perceived e-learning usefulness. Moreover, perceived e-learning usefulness as a marketing element is a promising topic in the e-learning service sector, which requires future studies to examine to which extent the current study findings could apply to other groups of students or practitioners.

Keywords motivation, e-learning, usefulness, marketing, students, Thailand

JEL Classification I23, M30, M31

INTRODUCTION

After the industrial revolution reached 4.0, technologies significantly influenced many areas of individuals' daily lives, especially their education (Hartelina et al., 2021). In the latest education system, students can study through many electronic devices (e.g., smartphones, laptops, and tablets) (Isaac et al., 2019), which consist of advanced technology and the internet (Tamilmani et al., 2019). In particular, Sari (2012) revealed that this learning method is called "e-learning." Thus, students can study without time and space barriers. Moreover, Solanki (2020) mentions that this kind of service provides students with the knowledge and other training activities through digital resources. As the e-learning service has made such a significant contribution to students' learning processes, many academic institutions have integrated advanced technology into their education system to develop e-learning services to be more available for their consumers, particularly their students (Hartelina et al., 2021).

Meanwhile, e-learning services have become an essential tool for university students (Puntularb et al., 2021) since there is a high number

of Covid-19 infections (around 2,500 daily cases) in Thailand. However, those students may face a new learning challenge since the degree of e-learning service usefulness to Thai university students' academic performance has been narrowly revealed. Considering information system services, Wu et al. (2020) have reported that once users understand the significance of service to their job performances, they probably have a high desire to continue using it with the firms. In this case, if the current e-learning service is critical to students' class activities and knowledge, more students are likely to use it with their universities. Thus, examining factors that cause perceived e-learning usefulness among university students is very important to all related universities.

In e-service sectors, perceived usefulness is an essential factor influencing users' electronic activities (e.g., searching, shopping, booking, and paying online transactions); therefore, different suggestions to improve perceived usefulness have been offered. For instance, Wu et al. (2020) from the online shopping sector suggest reducing perceived service risk. Once people feel less concerned with service risk, the service is considered useful for their usage. On the other hand, Gupta et al. (2020) from the mobile wallet sector suggest increasing user confirmation on the firm's services. When users have a positive agreement on service performance, they can see the service usefulness to their job performance. Unlike these studies, Bastari et al. (2020) from the digital banking sector suggest enhancing user motivation. Once the service can attract users' desires, it can be considered valuable for its utility.

In the present study, although e-learning can be regarded as one of the e-services provided by universities, the students' perspectives on the current e-learning usefulness are different from other e-service sectors. Moreover, consumers from different service sectors will likely show different attitudes and behaviors (Kim & Jindabot, 2022). Thus, the perspectives on how the above-suggested factors influence perceived e-learning usefulness in higher education are also different from those sectors. At the same time, the current literature has not yet demonstrated enough information to explain the impacts of these factors on perceived e-learning service usefulness in the higher education sector. To fill in the research gap, this paper aims to examine the impact of perceived risk, confirmation, and motivation on perceived e-learning usefulness.

1. LITERATURE REVIEW

Based on the theoretical review, Gupta et al. (2021) defined perceived usefulness as a positive opinion on a particular application system, which is considered to help users' job performance improve. Based on the expectation-confirmation model (ECM), the term "perceived usefulness" has been widely used to indicate an individual's opinion on a level of information system performance (Dai et al., 2020). Furthermore, it has been investigated to understand how technological innovation contributes to and enhances users' commercial transactions and other daily activities (Alhassany & Faisal, 2018; Yang & Park, 2019). In consumer behavioral studies, Bhattacharjee (2001) defined perceived usefulness as a predictor of users' satisfaction and intention to continue utilizing services. Because of its significant impact on consumer behavior, many studies have been conducted to investigate factors that significantly influence per-

ceived usefulness in different sectors. For instance, Altin Gumussoy et al. (2018) applied multiple regressions to investigate how mobility access, compatibility, perceived risk, ease of use, and perceived self-efficacy influence perceived usefulness in the mobile banking sector. Sun et al. (2020) applied SEM to investigate how power distance, uncertainty avoidance, collectivism, and masculinity influence perceived usefulness in the e-booking hotel sector. Yang and Park (2019) applied SEM to investigate how mobile literacy, mental model, and attitude toward change influence perceived usefulness of e-tickets in the airline sector. In the e-learning service sector, Baki et al. (2018) applied quantitative meta-analysis to investigate how self-efficacy, compatibility, and subjective norm influence perceived usefulness.

According to a research gap review, analysis on the integrative impact of confirmation, motivation, and perceived risk on perceived usefulness in the

e-learning context has not been widely conducted in the existing literature. However, many factors have already been investigated. To fulfill this gap, this study aims to build a new conceptual model of perceived usefulness and test the relationships among the variables.

Based on a definition of perceived risk, Kim and Jindabot (2022) defined perceived risk as a perceived uncertainty of a service or product that a person evaluates before or after using it. Based on behavioral science, the risk concept reflects an individual's negative assessment, in which a user feels unsatisfied with the services (Li et al., 2020). To evaluate the overall risk, financial and performance risks are suggested to be checked (Yang et al., 2016). Yang et al. (2016) also continue that financial risk indicates possible losses of a person's investment with the firms, while performance risk indicates lousy service or product performance received from the firms. In conceptual comparisons between risk and motivation, the concept of risk highlights the person's suspicion of the poor performance of the firm's service or product (Kim & Jindabot, 2022).

In contrast, the concept of motivation indicates a personally positive desire to perform tasks (Gagne & Deci, 2005). These two conceptualizations reveal opposite directions. Regarding behavioral acceptance of information technology (TAM), once users feel pessimistic about an IT application, they demonstrate low passion for continuing using it (Cocosila et al., 2009). According to motivation to acquire cybersecurity skills, when a person feels safe to conduct commercial activities through the internet, he or she gains high trust and more positive views to complete personal activities through the internet (Blackwood-Brown, 2018). These theoretical arguments show that perceived risk and motivation have a negative relationship. In health studies, Zhao et al. (2022) highlighted that high perceived risk leads to low individual motivation. In marine sports studies, Park et al. (2014) revealed that participants have high motivation to participate in events if they face low risks.

According to conceptual comparisons between risk and usefulness, the concept of risk indicates consequences that make users face possible losses (Kim & Jindabot, 2022). At the same time, the

concept of usefulness represents a certain degree of service performance that increases the users' job productivity (Sarkar & Khare, 2019). Both of these concepts show different directions. In adopting e-government services, once the service is considered low risk, users believe that the e-governmental service can play a significant role in providing accurate online transactions and other online tasks to users (Horst et al., 2007). Based on electric vehicle studies, if they show poor performance, users expect fewer benefits from using those products (Wang et al., 2018). The above theoretical arguments have revealed that high service or product risk can significantly lead to low perceived usefulness. According to the online shopping sector, when consumers feel high service risk, their perceived service usefulness reduces (Wu et al., 2020). Moreover, Wang et al. (2018) have found that perceived usefulness is negatively influenced by perceived risk.

According to a definition of confirmation, Daneji et al. (2019) conceptualized confirmation as a perspective that users agree with an actual information system (IS) performance compared to their expected IS utility. In expectation-confirmation theory, a person's confirmation indicates her or his positive attitude that can increase the degree of using information and communication technology (ICT) with the firms (Park, 2020). Considering consumer service marketing, Gupta et al. (2021) explained that confirmation can show a consumer's decision-making process and repurchase behavior. In conceptual comparisons between confirmation and motivation, high confirmation of a particular service or product utility can enhance an individual's positive attitude toward using it (Park, 2020). In contrast, high motivation can result in a high desire to perform duties (Bastari et al., 2020). Based on these explanations, confirmation and motivation seem to have similar directions. In evaluating learning outcomes, once students positively agree with current teaching performance, they seem more energetic to learn harder (Goodboy & Myers, 2008). Using behavior of e-learning technology, teachers strongly desire to use e-learning technologies for students' learning process when they agree that the actual performance of such a service is good (Sørebø et al., 2009). Based on the relationship perspectives between these variables, confirmation and motiva-

tion seem to have a positive connection. Regarding academic engagement studies, Gao (2021) found that high confirmation can increase student motivation. In high school studies, Cranmer et al. (2018) reveal that confirmation positively affects students' learning motivation.

According to conceptual comparisons between confirmation and usefulness, high individual confirmation can positively influence pre- or post-behavior when the actual service can be performed as expected (Lin et al., 2005). In contrast, high perceived usefulness can lead to high intention to use the service with the firms (Lee, 2010). These two main perspectives indicate the same direction. In an expectation-confirmation framework in web-based service, users see the significance of using the web service once the actual service is agreed to provide users with correct information and performance functions (Lee & Kwon, 2011). According to an electronic textbook confirmation, students think the e-textbook can improve their learning processes when its accurate performance is highly confirmed (Stone & Baker-Eveleth, 2013). The above theoretical explanations show that confirmation has a positive link with perceived usefulness. In smart fitness wearables, perceived product usefulness is positively influenced by confirmation (Gupta et al., 2021). In mobile wallets, when students highly confirm the service performance, they also see high service usefulness (Gupta et al., 2020).

Motivation refers to an individual's desire to do a particular activity for personal reasons (Sørenbø et al., 2009). In a theory of self-determination, Gagne and Deci (2005) mentioned two forms of motivation (extrinsic and intrinsic). Gagne and Deci (2005) also added that intrinsic motivation is derived from the individual's sense and passion, where he or she feels responsible for his or her successful performance. In contrast, extrinsic motivation is derived from the external environment (e.g., intangible reward or regulations), where a person has to carefully exercise his or her work in order to avoid any possible undesired consequences. Based on conceptual comparisons between motivation and usefulness, high motivation can positively influence individuals' attitudes and behavior (Gagne & Deci, 2005). At the same time, high perceived usefulness enhances

users' desire to use or keep using a particular service or product (Bhattacharjee, 2001). The two concepts display positive directions. In technology acceptance studies, when technology makes users feel motivated to use it for smoothing their workflows, they think that a significant role of technology is to promote their job productivity (Wang et al., 2012). Based on virtual reality learning, technology is considered significant for usage once it helps boost individuals' desire to learn more (Huang & Liaw, 2018). These explanations indicate that motivation and perceived usefulness have a positive connection. In education studies, Sun and Gao (2020) have identified that high motivation leads to high perceived usefulness. Considering digital banking studies, increasing motivation to use e-banking services can result in high perceived service usefulness (Bastari et al., 2020).

2. AIM AND HYPOTHESES

Following the literature review, this study attempts to fulfill in the research gap by developing a theoretical framework that investigates determinants of perceived e-learning usefulness in higher education. Therefore, the paper examines how perceived risk, student motivation, and confirmation affect perceived e-learning usefulness as a marketing element among university students. Based on the above theoretical discussions, the study analyzes systematic effects among variables (perceived risk, student motivation, confirmation, and perceived e-learning usefulness). Thus, the hypotheses are formulated as follows (Figure 1):

- H1: High perceived risk reduces student motivation to learn through e-learning services.*
- H2: High perceived risk reduces perceived e-learning usefulness.*
- H3: High confirmation increases student motivation to learn through e-learning services.*
- H4: High confirmation increases perceived e-learning usefulness.*
- H5: High student motivation increases perceived e-learning usefulness.*

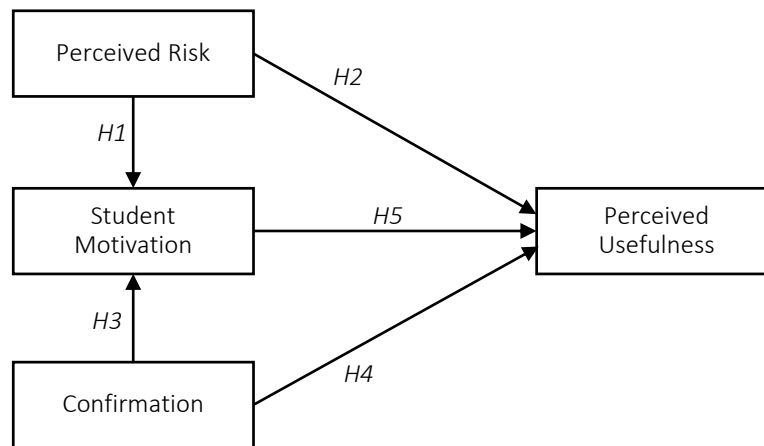


Figure 1. Conceptual framework

3. METHODOLOGY

The population of this study was students currently studying through e-learning services. However, this study mainly focused on students who were at the university level. In addition, this paper applied the convenience sampling method to survey 689 students at different universities (e.g., Thaksin University, Hatyai University, Prince of Songkla University, and Rajabhat University) around Thailand.

In survey procedures, students were approached around the university campuses and asked for their consent to join the survey. Next, the students completed self-administered questionnaires for around 10 minutes; they received explanations on how to fill in the questionnaires correctly. As a result, 689 responses were gathered from the students at the end of August 2022. However, only 527 valid responses were used for further analysis after eliminating the outliers.

A survey contained four variables whose items were constructed by borrowing items from previous studies. For instance, perceived risk borrowed three items from Ariffin et al. (2018). Next, confirmation used three items from Ifinedo (2017). Then, motivation used three items from Behforouz et al. (2021). Finally, perceived usefulness borrowed three items from Park (2020). The constructed items were rated using a 5-point Likert scale. This type of Likert scale offered a middle point (3 = neutral) that exhibited a clear cut between positive and negative scales in the questionnaire;

therefore, it made the questionnaires easy for the respondents to answer (Kim & Jindabot, 2022). Furthermore, according to Kim et al. (2021), it was suitable for data collection of this study because a 5-point Likert scale saved time and caused low frustration to the respondents.

4. RESULTS

The path analysis method was applied to analyze the data in this study. However, three main analyses were required before generating regressions of the path analysis method. First, reliability and convergent validity were checked (Table 1). In the reliability test, Cronbach's Alpha and composite reliability scores were higher than 0.7; thus, content reliability existed in the constructed variables (Kim & Jindabot, 2022). The variable constructs of this study showed convergent validity due to the average variance extracted (AVE) scores of each variable being above 0.5 (Ge et al., 2021).

Next, discriminant validity was also tested in this study. The data were processed in the statistical software to generate the square root of AVE scores, which were further compared with scores of correlation constructs. When scores of correlation constructs were below the square root of AVE scores, the variable constructs contained discriminant validity (Seo & Lee, 2021). According to Table 2, all square roots of AVE scores were higher than all scores of correlation constructs; therefore, all of the variable constructs had discriminant validity.

Table 1. Reliability and convergent validity

| Variable | Items | Cronbach's Alpha (α) | CR | AVE |
|----------------------|--|-------------------------------|------|------|
| Perceived Risk | 1: I may pay too much money for this e-learning service. 2: I may receive a lower quality of this e-learning service compared to my payment. 3: This e-learning service has poor performing functions. | 0.89 | 0.97 | 0.69 |
| Confirmation | 1: This e-learning service was the right choice for me. 2: This e-learning service was easier than I expected. 3: This e-learning service quality was better than I expected. | 0.82 | 0.86 | 0.83 |
| Motivation | 1: I am interested in this e-learning service. 2: Studying through this e-learning service can improve my grades. 3: I can improve my knowledge through this e-learning service. | 0.78 | 0.73 | 0.85 |
| Perceived Usefulness | 1: I think that e-learning services are helpful in my life. 2: E-learning services help me learn and catch up with other friends' knowledge. 3: E-learning services help me conveniently perform many tasks. | 0.91 | 0.77 | 0.71 |

Table 2. Discriminant validity

| Variable | 1 | 2 | 3 | 4 |
|----------------------|-------|-------|-------|-------|
| Perceived Risk | 0.883 | 0.671 | 0.586 | 0.663 |
| Confirmation | | 0.891 | 0.476 | 0.557 |
| Motivation | | | 0.799 | 0.610 |
| Perceived Usefulness | | | | 0.803 |

Note: Highlighted scores indicated square roots of AVE scores.

Finally, some main indicators (e.g., GFI, NFI, CFI, and RMSEA) had to pass minimum scores of path analysis model fitness based on a recommendation of Kim et al. (2021). In Table 3, each indicator's scores passed the thresholds of model fitness. Thus, the model of this study was suitable for generating regressions in the path analysis method.

Table 3. Model fitness of path analysis

| Indicator | Index Scores | Threshold | Result |
|-----------|--------------|-----------|--------|
| GFI | 0.947 | >0.9 | Passed |
| NFI | 0.968 | >0.9 | Passed |
| CFI | 0.995 | >0.9 | Passed |
| RMSEA | 0.071 | <0.08 | Passed |

Path analysis results, regression results, and other critical ratios are reported in Figure 2 and Table 4. Regardless of the effects on student motivation, confirmation showed a significant effect on student motivation ($\beta = 0.56, p < 0.001$), which accepted hypothesis 3. On the other hand, perceived risk negatively affected student motivation; however, its effect on student motivation was insignificant ($\beta = -0.09, p > 0.05$); thus, hypothesis 1 was rejected.

According to effects on perceived usefulness, confirmation showed a significant effect on perceived usefulness ($\beta = 0.54, p < 0.001$), which accepted hypothesis 4. Next, student motivation significantly affected perceived usefulness ($\beta = 0.28, p < 0.001$), which accepted hypothesis 5. Finally, perceived risk showed a significant effect on perceived usefulness ($\beta = -0.12, p < 0.001$), which accepted hypothesis 2.

Based on the above discussions, the research findings and hypotheses testing results are summa-

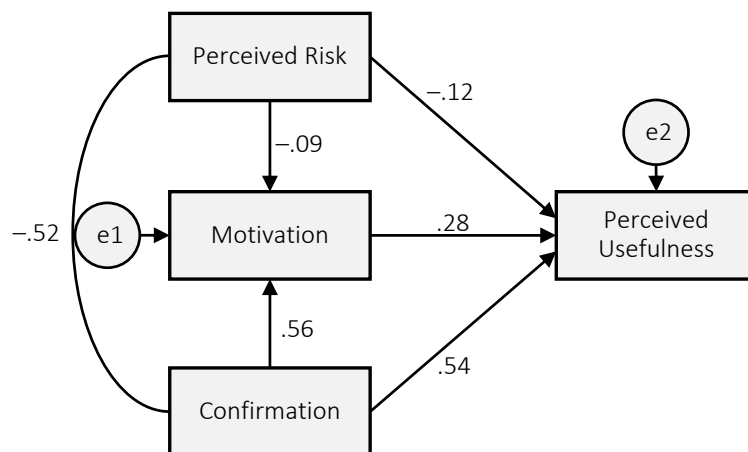


Figure 2. Path analysis findings

Table 4. Findings and hypotheses testing

| No. | Relationships | | St. Beta (β) | p-value | Sig. Lv | Result |
|-----|----------------------|----------------------|--------------|---------|---------|----------|
| | Independent Variable | Dependent Variable | | | | |
| 1 | Perceived Risk → | Motivation | -0.09 | 0.118 | Insig. | Rejected |
| 2 | Perceived Risk → | Perceived Usefulness | -0.12 | 0.000** | Sig. | Accepted |
| 3 | Confirmation → | Motivation | 0.56 | 0.000** | Sig. | Accepted |
| 4 | Confirmation → | Perceived Usefulness | 0.54 | 0.000** | Sig. | Accepted |
| 5 | Motivation → | Perceived Usefulness | 0.28 | 0.000** | Sig. | Accepted |

Note: ** shows significant level $p < 0.001$.

rized in Table 4. Four hypotheses were accepted, while hypothesis 1 was rejected.

5. DISCUSSION

Based on the effects on student motivation, confirmation positively influenced student motivation to use e-learning services. The concept of confirmation reflects individuals' belief in a particular service or product performance (Goodboy & Myers, 2008; Sørebo et al., 2009). As this belief grew, it led to a positive emotion to use the firms' product or service. In the e-learning service, students possibly felt more positive about using the current e-learning service with their universities once they agreed that the e-learning service could improve their learning and overall grade performance. Thus, their desire to learn could continue after they highly confirmed the performance of the e-learning service. Next, perceived risk did not indicate any significant impact on student motivation to use e-learning services. Based on empirical findings, student motivation relied significantly on the effect of confirmation. Once users confirmed an excellent service or product performance, they were less likely to care much about the service or product risk. In this case, as those students had a favorable agreement with the actual e-learning service performance, they possibly felt motivated to learn without concerning much about the risk of using the existing e-learning service.

Based on the effects on perceived e-learning service usefulness, confirmation showed a positive impact on perceived usefulness. First, individuals' confirmation of a certain service or product performance significantly affected their behavior toward the current firm's service or product (Lee & Kwon, 2011; Stone & Baker-Eveleth, 2013). Once they positively agreed with the actual per-

formance of a service or product, they expected a certain degree of benefits. In this scenario, if the e-learning service was highly confirmed among the students, it may have been expected to benefit the students' learning and other class activities at their universities. Thus, enhancing students' confirmation of the e-learning service could make them understand how effective the e-learning service is to their academic performance. Next, student motivation to use e-learning services positively influenced perceived usefulness. An individual's motivation reflects the positive desire to do certain things despite facing obstacles (Huang & Liaw, 2018; Wang et al., 2012). Once a service or product was positively desired to be used by many users, it was positively viewed by the public. In this circumstance, the positive ratings, which resulted from the users' motivation to use, indicated the advantages of using the firm's service or product. In the existing e-learning service, once the e-learning service could somehow enhance students' desire to learn, those students highly acknowledged the significant contribution of the e-learning service to their academic performance. Overall, e-learning services, which could boost student motivation to learn, were essential to assist the students' learning processes.

Furthermore, perceived risk showed a negative connection with perceived usefulness. The concept of risk reflects the consequences of using a particular service or product (Horst et al., 2007; Wang et al., 2018). Once a person felt suspected of the service or product performance, he or she was likely to expect a certain degree of loss from using that service or product. In particular, users may have highly raised questions on how the service or product could benefit their daily work and other transactions if the risk of using that service or product is high. Based on this concern, many students saw fewer benefits of using the current e-learning service if they felt risky to use it. They

probably faced issues such as slow internet connection, highly complex functions, and other unsatisfactory class experiences. If these issues were highly concerned, e-learning services could be less valuable to students. According to the empirical findings, the usefulness of using e-learning services with the universities remained questionable since students perceived the risk of using this tool.

CONCLUSION

The aim of this study was to investigate the impacts of student motivation, perceived risk, and confirmation on perceived e-learning usefulness as a marketing element. Based on the results of this study, student motivation was significantly influenced by confirmation, except for perceived risk. Finally, perceived e-learning usefulness was significantly influenced by confirmation, student motivation, and perceived risk. However, in spite of their significant effects on perceived e-learning usefulness, attitudes and behaviors of students' perceived usefulness depended mainly on the degree of student confirmation because the effect of this factor on perceived usefulness was the strongest. To sum up, students highly feel more advantages of using e-learning services when they confirm the usefulness of e-learning services and have more desire to use it with their universities. Furthermore, the level of perceived usefulness of e-learning services among Thai university students may drop significantly if universities fail to fulfill students' agreements on their e-learning service performances. Student confirmation is identified as the most decisive factor in perceived e-learning usefulness.

Although this study finally completes its primary objective, it still contains some limitations. For example, this study's findings probably contain some biased answers because the convenience sampling method allowed the students to fill in the answers in the survey by themselves. Therefore, future research should strictly implement the data collection method to ensure high data quality (e.g., face-to-face interviews with structural questionnaires). Next, using the findings of this study to generalize them in other service sectors (e.g., hotels, banks, and restaurants) may not be appropriate because the results are based on the university students' perspectives. Future studies may apply these variables to further investigate those sectors so that the studies may come up with new insights and conclusions. Finally, the conclusions were based on university students' opinions. As a result, applying these results to generalize student behavior at a lower degree (e.g., primary or high school) would be difficult because there are distinctive differences in learning environments and behaviors between young and adult learners. Thus, future studies can also adopt these variables to study young learners' perspectives toward perceived e-learning service usefulness in their schools.

AUTHOR CONTRIBUTIONS

Conceptualization: Long Kim.

Data curation: Pimlapas Pongsakornrungsilp.

Formal analysis: Siwarit Pongsakornrungsilp, Teerada Cattapan, Nuttaprachya Nantavisit.

Funding acquisition: Teerada Cattapan, Nuttaprachya Nantavisit.

Investigation: Long Kim.

Methodology: Pimlapas Pongsakornrungsilp.

Project administration: Siwarit Pongsakornrungsilp.

Resources: Teerada Cattapan, Nuttaprachya Nantavisit.

Software: Long Kim.

Supervision: Pimlapas Pongsakornrungsilp, Siwarit Pongsakornrungsilp.

Validation: Siwarit Pongsakornrungsilp, Nuttaprachya Nantavisit.

Visualization: Teerada Cattapan.

Writing – original draft: Long Kim.

Writing – review & editing: Pimlapas Pongsakornrungsilp.

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