

HOW TO ENHANCE PERCEIVED E-LEARNING USEFULNESS: EVIDENCE FROM THAI UNIVERSITY STUDENTS

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Abstract

As perceived usefulness has been acknowledged as a significant predictor of individuals' behavior, understanding perceived e-learning usefulness among university students is very important to all related universities. Thus, this study aimed to investigate perceived e-learning usefulness among Thai university students. Researchers used a convenience sampling method to gather data from 625 students who were currently studying through an e-learning platform. Among the responses a total sample of 478 contained valid data for structural equation model analysis (SEM). Findings revealed that confirmation and perceived risk showed significant impacts on students' perceived enjoyment. Finally, students' perceived usefulness of e-learning was significantly influenced by confirmation and perceived enjoyment, but not perceived risk. Moreover, these findings indicated that the usefulness of an e-learning platform could be highly considered by the students once they confirmed and felt happy with the high performance of their existing e-learning platform. Those students possibly considered less risk which in turn increased their positive perspectives on the usefulness of the e-learning platform.

Keywords: E-learning, Confirmation, Enjoyment, Risk, Usefulness

1. INTRODUCTION

The 4.0 industrial revolution has emerged in the 21st century. This has automatically influenced all areas of people's daily life, especially education (Hartelina et al., 2021). In the modern education system, advanced technologies and Internet services have been developed and merged with many electronic devices (e.g., laptops, smartphones and tablets) (Tamilmani et al., 2019), which can now be used by many students to study through online channels (Isaac et al., 2019). Generally known as "e-learning platforms"

these channels allow students to learn without constraints of time and space (Sari, 2012). In addition, e-learning is conceptualized as a tool for the delivery of education and training through digital resources (Solanki, 2020). It enables students to learn anywhere at any time through electronic devices such as computers and tablets. Students can either learn courses directly or download them from the e-library of their schools to study wherever they want. On the other hand, communication with teachers and lecturers slightly suffers due to its occurrence through non face-to-face channels, mainly email, chat, forum, and

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video conferences (Aleem, 2022). If e-learning is found to contribute to students' learning processes, students will acknowledge a degree of usefulness in e-learning. At the same time, it will positively influence the student's decision to continue studying through the current e-learning platform. Therefore, increasing awareness of the perceived usefulness of e-learning in the education industry is very important to all related academic institutions that can further strengthen the e-learning tools for their students.

Meanwhile, the Thai ministry of education required all academic institutions to provide an e-learning platform to all students due to high infection rates of covid-19 around Thailand (Puntularb et al., 2021). However, it can be a challenge to students who have shifted from a traditional education system to the e-learning system as the usefulness of the e-learning system to students' performance has not been extensively reported. Based on information system services, Wu et al. (2020) reported that when users perceived high usefulness of a firm's technology, they were happy and continued using it. In this scenario, if the students understand the usefulness of the e-learning system, they are likely to continue using the current e-learning platform with their schools. Therefore, investigating students' perceived e-learning usefulness is essential to the education industry.

Since increasing perceived usefulness can have a huge impact on various electronic activities (e.g., online meetings, e-commerce, and other electronic businesses), some researchers from different contexts have offered different suggestions to enhance perceived usefulness in all related organizations and institutions. In the context of smart wearables, Gupta et al. (2021) suggested ensuring the high confirmation of service utility among their users. They mentioned that enhancing service confirmation could allow the users to have more positive views on the current service utility which could result in high values of perceived service usefulness. Meanwhile, Wu et al. (2020) recommended lowering users'

perceived service risk. When the concept of risk is reduced, users see the value of the service utility and feel safe to invest with the firm. To and Trinh (2021) suggested enhancing perceived enjoyment in the context of mobile wallets. When the users feel happy to use the service, they may have high desire to continue using the service with the firm. At the same time, users may acknowledge a certain degree of service usefulness.

There are similar characteristics between the previous contexts and the education context as e-learning can be regarded as one of the education services which schools and universities provide to their customers, particularly students. However, users' attitudes and behavior toward perceived usefulness between the education context and those contexts are not the same, as different contextual users have different attitudes and behaviors toward the service which they are using (Kim & Jindabot, 2022b). Although previous studies have individually raised concerns about the impacts of perceived risk, confirmation, and perceived enjoyment, on perceived usefulness, the impacts of these factors on perceived e-learning usefulness have not been widely investigated. Thus, the existing literature does not have sufficient information to explain students' perspectives toward the contributions of e-learning to their learning experiences and outcomes. As this research attempts to uncover the perceived e-learning usefulness among university students in order to judge overall student attitudes and behaviors toward their existing e-learning platforms, the two primary objectives of this research are: (1) to examine the impacts of confirmation and perceived risk on perceived enjoyment and (2) to examine the impacts of confirmation, perceived risk, and perceived enjoyment, on the perceived usefulness of e-learning. The following manuscript sections are prepared as follows: (1) theoretical foundation, (2) theoretical foundations and hypotheses (3) methods, (4) results, (5) discussion, (6) academic and practical implications and (7) conclusion and future studies.

2. THEORETICAL FOUNDATIONS AND HYPOTHESES

2.1. Perceived Usefulness

According to Gupta et al. (2021), perceived usefulness is defined as the opinions of agreement held by users regarding a particular application system that can enhance their work productivities. In the expectation-confirmation theoretical model (ECTM), perceived usefulness has been adopted to represent a person's perception of information system performance (Dai et al., 2020). Furthermore, previous studies have acknowledged that perceived usefulness plays a huge role in increasing user satisfaction and intentions to continue using a service (Bhattacharjee, 2001; Keržič et al., 2019).

In the education context, perceived usefulness has been used as a measurement of e-learning systems' performance for students' learning productivities by Joo et al. (2011) and Hsieh and Cho (2011). These studies revealed that perceived usefulness is a valid factor to measure and predict the effectiveness of e-learning systems. In addition, perceived usefulness has been identified as a key to promote perceived satisfaction, further contributing to learners' behavioral intentions to use an e-learning system. Therefore, identifying the factors which influence perceived usefulness can not only help to support understanding of learners' behavior but also promote the effectiveness and efficiency of e-learning systems to the learners (Keržič et al., 2019). Based on the study of the role of technology, Webster and Hackley (1997) developed the Technology Acceptance Model (TAM) to explain the dynamics of technology adoption and utility among users. Later, Ramírez-Correa et al. (2015) successfully used TAM to explain the acceptance of e-learning systems by students. The theoretical perspectives of ECTM (Dai et al., 2020) and TAM (Ramírez-Correa et al., 2015) both commonly serve as theoretical backgrounds which can be used to explain user's perspectives on how technology contributes changes to their work

productivities. Thus, these two theoretical models have been further developed to seek greater understanding of users' perspectives regardless of the roles of technology and work productivities in different service industries, including the education service industry. For instance, Abdullah et al. (2016) studied perceived usefulness, finding that subjective norms, experience, computer anxiety, and self-efficacy, were predictors of perceived usefulness. Baki et al. (2018) raised self-efficacy, compatibility, and subjective norms as the main factors affecting perceived usefulness in the e-learning service industry.

As understanding perceived usefulness can predict users' behavior, researchers have mainly concentrated on perceived usefulness and the factors affecting it in the higher education context. Based on scholars' perspectives from different contexts, confirmation (Gupta et al., 2021), perceived risk (Wu et al., 2020), and perceived enjoyment (To & Trinh, 2021), have been highlighted as the major concerns among service users. In fact, confirmation, perceived enjoyment, and perceived usefulness, are the main variables which have been used to study users' attitudes and behaviors in the roles of technology (Gupta, Yousaf, & Mishra, 2020; Stone & Baker-Eveleth, 2013; To & Trinh, 2021) while perceived risk has been widely used to study consumers' attitudes and behaviors in various contexts (e.g., banking service and latex glove products) (Kim & Jindabot, 2022b; Kim et al., 2021). Despite these different contexts, the four variables demonstrate similar purposes which can be commonly used to explain individuals' attitudes and behaviors. Therefore, integrating these four variables can extend the current knowledge of how individuals' perspectives of perceived usefulness develop, as the existing literature in the education context has not demonstrated sufficient information to explain how these factors influence the perceived usefulness of e-learning among learners, especially regarding university students. Therefore, the aim of the current study is to determine the student's subjective opinions on the above aspects of e-

learning platforms which can help researchers to determine the factors affecting the perceived usefulness of e-learning.

2.2. Confirmation and Perceived Enjoyment

Confirmation refers to users' agreement between actual information system performance (IS) and their expectation of IS utility (Daneji et al., 2019). Based on the expected confirmation theory, individuals' confirmation reflects their positive behavior which possibly leads to a high propensity for using information and communication technology (ICT) (Park, 2020). Particularly, Gupta et al. (2021) emphasized that confirmation could represent an individual's decision making process and his or her repurchase in the marketing context.

High confirmation indicates individuals' positive attitudes on service utilities (Min & Shenghua, 2007). Meanwhile, perceived enjoyment indicates individuals' positive feelings which result from a satisfactory experience of service utility (Ifinedo, 2017). The two main concepts display positive directions. In an expectation-confirmation model (ECM) of mobile data service, users are very happy to use a service with a firm once they have witnessed an obvious high degree of service performance (Kim, 2010). In blog users' behavioral intentions, when the service ensures a better performance to the users, it can create a high positive and favorable desire for the service among its users (Shiau & Luo, 2013).

The above theoretical explanations seem to demonstrate a positive relationship between confirmation and perceived enjoyment. In travel applications, Liu et al. (2020) acknowledged that increasing confirmation led to the high perceived enjoyment of tourists using the travel application. Regarding smart wearable devices, Park (2020) found that high user confirmation made users enjoy using more devices with the respective firms. In this study, confirmation and perceived enjoyment are hypothesized as follows:

H1: High confirmation leads to high perceived enjoyment in online study.

2.3. Confirmation and Perceived Usefulness

Gaining a certain degree of confirmation can result in a positive impact on both pre-behavior and post behavior once the actual performance reaches the person's expectations (Lin et al., 2005). In contrast, enhancing perceived usefulness positively influences the person's behavioral intentions, which in turn leads to increasing the actual service utility of the firm (Lee, 2010). Confirmation and perceived usefulness seem to show positive directions. Following an expectation-confirmation model for web-based services, the web service is considered to be significant to web users when the actual service performance can serve the users' purposes (Lee & Kwon, 2011). In the confirmation of electronic textbooks, students can see the significance of using the electronic textbooks when the electronic textbooks can actually help them to gain the required information or knowledge (Stone & Baker-Eveleth, 2013).

Based on the existing theoretical explanations, confirmation and perceived usefulness, there is a possibility for a positive relationship. In smart fitness wearables, Gupta et al. (2021) revealed that confirmation positively influenced perceived product usefulness. In the context of mobile wallets, high confirmation leads to high perceived product usefulness among users (Gupta et al., 2020). In this study, confirmation and perceived usefulness are hypothesized as follows:

H2: High confirmation leads to high perceived usefulness in online study.

2.4. Perceived Risk and Perceived Enjoyment

Perceived risk refers to the perceived uncertainty of the product or service which results from a person's evaluation (Kim & Jindabot, 2022). In consumer behavioral

science, the concept of risk results in a negative evaluation from a person who has an unsatisfactory service experience with the firm of interest (Li et al., 2020). In overall risk evaluation, Yang et al. (2015) recommended evaluating financial risk and performance risk. These researchers also explained that financial risk indicated any possible financial loss resulting from investing with the firm, whilst performance risk indicates the quality of service performance obtained from the firm.

Perceived risk can cause users to have anxiety or paralyze action (Chang et al., 2016) while perceived enjoyment indicates the user's positive feelings toward their current product or service utilities (Park, 2020). The two concepts of perceived risk and perceived enjoyment reflect opposite directions. Following the risk perspective in network site usage, network users will not feel comfortable to use a service with a firm once it has been shown to be unsafe to use (Ernst, 2015). In social network services, when users have high perceptions of risk in using the service, this leads to an unfavorable desire to continue using the existing service with the given firm (Chang et al., 2016).

The above theoretical explanations reveal that perceived risk negatively affects perceived enjoyment. In the fashion renting service, Lang (2018) has found that high perceived risk causes low perceived enjoyment. In smartwatch usage, Ernst and Ernst (2016) revealed that when users suspect high product risk, their joy with the current product is reduced. In this study, perceived risk, and perceived enjoyment are hypothesized as follows:

H3: High perceived risk leads to low perceived enjoyment in online study.

2.5. Perceived Risk and Perceived Usefulness

For a conceptual comparison, risk reflects the consequences which cause possible losses to users (Kim & Jindabot, 2022), while the concept of usefulness indicates a service performance which can enhance the users' job performance (Sarkar &

Khare, 2019). This conceptual comparison reveals that there are contradicting concepts between perceived risk and perceived usefulness. Based on the adoption of e-government services, when the public consider a low risk of using the e-service with public firms, the e-service seems to play a significant role in smoothing users transactions and other tasks (Horst et al., 2007). In adoption behavior for electric vehicles, the products are considered to benefit the users a lot once the users feel safe or less risky in using the products (Wang et al., 2018).

The existing theoretical explanations seem to outline a significant relationship between perceived risk and perceived usefulness. In online shopping services, Wu et al. (2020) found that increases in perceived risk led to low perceived usefulness. In the electric vehicle context, Wang et al. (2018) emphasized perceived risk as a negative factor on perceived usefulness. In this study, perceived risk and perceived usefulness are hypothesized as follows:

H4: High perceived risk leads to low perceived usefulness in online study.

2.6. Perceived Enjoyment and Perceived Usefulness

Perceived enjoyment refers to an individual's intrinsic motivation which may influence his or her behavior (Kim, 2010). In information systems, Oghuma et al. (2016) defined perceived enjoyment as the fun and pleasure resulting from using the information technology. In internet-based learning, enjoyment plays a significant role in increasing involvement which can enhance students' attention and concentration (Roca et al., 2006).

Enjoyment indicates the intrinsic motivation in which users have more positive feelings regarding their service utility (Shiau & Luo, 2013). Meanwhile, perceived usefulness indicates an individual's belief in the significance of the service in helping them to achieve their tasks (Daneji et al., 2019). These two perspectives seem to indicate

positive directions. In an augmented reality teaching platform, students will gain a stronger belief in the importance of the role of the school teaching platform when they feel happy with the current teaching platform (Balog & Pribeanu, 2010). Regarding behavioral intentions in relation to technological utility, many teachers require technological assistance in their teaching services after the current adopted technology is able to increase the enjoyable service utility for those teachers (Teo & Noyes, 2011).

Based on these theoretical explanations, perceived enjoyment is likely to have a positive relationship with perceived usefulness. In the mobile wallet context, To and Trinh (2021) found that increasing perceived enjoyment could result in the high perceived usefulness of users. In the mobile shopping service context, Saprikis et al. (2018) revealed that perceived enjoyment positively influenced perceived usefulness. In this study, perceived enjoyment and perceived usefulness are hypothesized as follows:

H5: High perceived enjoyment leads to high perceived usefulness in online study.

2.7. Theoretical Model Construct

The theoretical model of perceived e-learning usefulness was constructed following the above proposed hypotheses. In Figure 1, confirmation and perceived risk show direct effects on enjoyment, confirmation and perceived risk show direct effects on perceived usefulness, and enjoyment shows a direct effect on perceived usefulness.

3. RESEARCH METHOD

3.1. Sample and Data Collection

This research focused mainly on students who were studying at university level in Thailand. Those students were the ones who were currently using various electronic devices (e.g., computer, laptop, table, or iPad) to study their subjects at their own convenience. Most of their learning processes involved the universities' e-contents (e.g., course materials and video lectures) including communication with lecturers, which occurred via video conferences, chats, and emails. Convenience sampling was used to collect the data from 625 students who were from different universities (e.g., Thaksin University, Prince of Songkhla University, Hatyai University, etc.) in Thailand.

3.2. Survey Construct

The survey of this study consisted of four main variables that were adopted from previous studies. The three items of confirmation were adopted from Ifinedo (2017), while the three items of perceived risk were adopted from Ariffin et al. (2018), the three items of perceived enjoyment were adopted from Oghuma et al. (2016), and the three items of perceived usefulness were adopted from Park (2020).

Furthermore, a 5-point Likert scale (1=absolutely disagree to 5=absolutely agree) was applied. Kim et al. (2021) revealed that this rating technique contained a mid-scale value (3=neutral); thus, the participants could

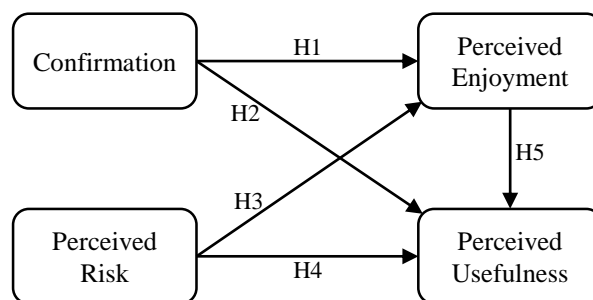


Figure 1. Theoretical Model of Perceived E-learning Usefulness

easily detect the boundary between negative and positive scales in the questionnaires. Similarly, Kim and Jindabot (2022) also agreed that using this Likert scale could lower the participants' frustration and time to complete the questionnaire. Thus, using this rating technique for data collection in this study was acceptable.

3.3 Pre-Test, Data Collection and Data Validity

The self-administered questionnaires were pre-tested to check content reliability with 50 students who were mainly from bachelor's degree programs. Moreover, the content reliability of each variable was evaluated based on Cronbach's Alpha scores which requires a score of at least 0.7 to indicate content reliability (Kim & Jindabot, 2021). Based on statistics in Table 1, it was found that each Cronbach's Alpha score in the pre-testing stage passed the minimum requirements for content reliability; therefore, the data collection was ultimately conducted on the full scale.

In the data collection processes, the student respondents were first approached and asked for their agreement to fill in the self-administered questionnaires. All respondents were informed that their personal information would be kept only for academic purposes. Only those who agreed and volunteered to participate in the survey were given around 8-12 minutes to complete the surveys. Finally, all 625 completed responses were collected from the participants over two months (14th January- 20th March, 2022) of data collection.

Data were cleaned to remove outliers which were indicated as bias data through a statistical software. Furthermore, outliers were checked through the possibility scores of

Mahalanobis which identified outliers when those outliers contained possibility scores below 0.001 (Grande, 2015). As a result, 147 data which contained the possibility scores of Mahalanobis below 0.001 were detected and removed from further analysis. Thus, a total sample of 478 responses were deemed to contain valid data suitable for further data analysis.

4. FINDINGS

4.1. Model Measurement and Data Analysis

A structural equation model (SEM) method was used to analyze the 478 valid data. However, before findings could be generated from the SEM method, model fitness and model measurement were required to pass some minimum requirements of the SEM method. Regarding model fitness, confirmatory factor analysis (CFA) was used to modify the fitness index scores (e.g., CMIN²/df, GFI, NFI, CFI, AGFI, RMSEA, and PCLOSE) following the suggestion of Kim et al. (2021). After modification, all the index scores surpassed the minimum requirements of the SEM, as shown in Table 2.

Finally, the model measurement of the SEM method was checked to ensure qualified and reliable content for each contributed item in Table 3. First, loading factors which had acceptable scores of more than 0.5 were kept for analysis. Next, the measurement constructs contained reliability due to Cronbach's Alpha and composite reliability (CR) scores which were above 0.7 (Kim & Jindabot, 2022). Convergent validity was also found in each measurement construct as scores of average variances extracted (AVE) were higher than 0.5 (Ge et al., 2021).

Table 1 Content Reliability of Pre-testing Stage

Variables	Cronbach's Alpha Scores	Results
Confirmation	0.701	Passed
Perceived Risk	0.823	Passed
Perceived Enjoyment	0.782	Passed
Perceived Usefulness	0.760	Passed

Discriminant validity was evaluated through a comparison of the square roots of the AVE scores with the intercorrelation coefficients. The results in Table 4 indicate the discriminant validity of each construct as the square roots of the AVE scores were higher than the intercorrelation coefficients (Seo & Lee, 2021).

Furthermore, multicollinearity analysis was conducted by checking the collinearity

scores. Kim et al. (2022) suggested checking multicollinearity through the variance inflation factor scores (VIF) which are required to be below 10, otherwise, multicollinearity should be suspected. Table 4 indicates that the VIF scores for all variables were below 10; thus, the data did not show any sign of multicollinearity in this study. As a result, the regressions of the SEM were performed as shown in Figure 2.

Table 2 Model Fit

Indicator	Index		Thresholds	Results
	Before Modification	After Modification		
CMIN ² /df	1.301	1.123	≤ 3	Good
GFI	0.902	0.945	>0.9	Good
NFI	0.894	0.923	>0.9	Good
CFI	0.978	0.991	>0.9	Good
AGFI	0.889	0.911	>0.8	Good
RMSEA	0.048	0.029	<0.08	Good
PCLOSE	0.788	0.808	>0.05	Good

Note: Thresholds of CMIN²/df, GFI, NFI, CFI, AGFI, RMSEA, PCLOSE are recommended by (Kim et al., 2021).

Table 3 Model Measurement

Variable	Components	Loading Factors	Cronbach's Alpha	CR	AVE
Confirmation	C1: This e-learning platform was the right choice for me.	0.75			
	C2: This e-learning platform was easier than I expected.	0.73	0.72	0.79	0.75
	C3: This e-learning platform's quality was better than I expected.	0.62			
Perceived Risk	PR1: I may pay too much money for this e-learning platform.	0.63			
	PR2: I may receive lower quality from this e-learning platform compared to my payment.	0.75	0.80	0.77	0.89
	PR3: This e-learning platform has poor performing functions.	0.52			
Perceived Enjoyment	PE1: I have fun interacting with my teachers and classmates.	0.79			
	PE2: During class activities, this e-learning platform provides me with lots of enjoyment.	0.80	0.86	0.82	0.88
	PE3: Overall, I'm really happy to study through this e-learning platform.	0.81			
Perceived Usefulness	PU1: I think that online study is useful for my life.	0.70			
	PU2: Online study helps me learn and catch up with other friends' knowledge.	0.78	0.79	0.91	0.74
	PU3: Online study conveniently helps me to perform many tasks.	0.70			

4.2. Findings of the Structural Equation Model

All critical regressions and other ratios are briefly reported in Figure 2 and Table 5. Regardless of the impacts on perceived enjoyment, confirmation was indicated to have a significant impact on perceived enjoyment ($\beta=0.55$, $p<0.001$), while perceived risk was indicated to have a significant impact on perceived enjoyment ($\beta=-0.20$, $p<0.001$).

Regardless of the impacts on perceived usefulness, perceived enjoyment was indicated to have a significant impact on perceived usefulness ($\beta=0.70$, $p<0.001$), while confirmation was indicated to have a significant impact on perceived usefulness ($\beta=0.25$, $p<0.001$). In contrast, perceived risk was not indicated to have any significant

impact on perceived usefulness ($\beta=-0.01$, $p>0.05$).

Based on the relationships of Confirmation-->Perceived Enjoyment-->Perceived Usefulness, confirmation was revealed to have both indirect and direct impacts on perceived usefulness ($\beta=15$, $p<0.001$ and $\beta=25$, $p<0.001$, respectively) which indicates that perceived enjoyment is a partial mediator between confirmation and perceived usefulness. In the relationship of Perceived Risk-->Perceived Enjoyment-->Perceived Usefulness, the indirect impact of perceived risk on perceived usefulness was significant ($\beta=-0.11$, $p<0.001$) while its direct impact on perceived usefulness was insignificant ($\beta=-0.01$, $p>0.05$). This finding emphasized perceived enjoyment as a full mediator between perceived risk and perceived usefulness.

Table 4 Discriminant Validity

Variable	1	2	3	4	Collinearity
					Scores
VIF					
Confirmation	0.881	0.458	0.539	0.651	4.802
Perceived Risk		0.890	0.697	0.598	5.003
Perceived Enjoyment			0.792	0.701	3.902
Perceived Usefulness				0.813	3.669

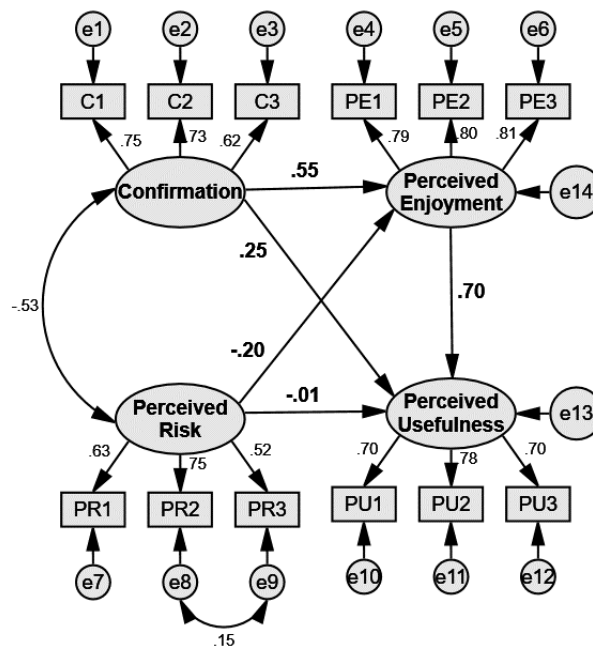


Figure 2. Findings in SEM

5. DISCUSSION

Based on the impacts on perceived enjoyment, confirmation was shown to have a positive impact on perceived enjoyment, resulting in acceptance of hypothesis 1. Increasing confirmation led to higher user agreement with the actual information system (IS) which could be expected to provide high performance to the users (Daneji et al., 2019). Thus, it made the users have greater favorable desires to use the current service. Regarding the current e-learning platforms, it was found that once the students could highly confirm the actual e-learning performance, they felt comfortable and enjoyed using the e-learning platform offered by the universities. Next, perceived risk was shown to have a negative impact on perceived enjoyment, leading to the acceptance of hypothesis 3. In the study of risk concept, it was highlighted that a certain degree of risk indicated uncertainty of service performance (Kim & Jindabot, 2022). Consequently, this may raise more concern among the service users as risk could place the users in a vulnerable position. Similarly, it was found that the university students were likely to be unhappy with the e-learning platform once they viewed a high risk of using the current e-learning platform (e.g., lower performance of e-learning platform or frustration with e-learning service functions).

Based on the impacts of perceived usefulness, perceived enjoyment showed a positive impact on perceived usefulness leading to the acceptance of hypothesis 5. Based on the study of psychology among service users, enjoyment positively influences an individual's attitude and behavior (Shiau & Luo, 2013). When users find themselves to be happy with using a service of a firm, they acknowledge the significance of the service which may help them to accomplish their utility purposes. Likewise, it was found that the e-learning platform was also considered to be useful for their absorption of knowledge as well as sharing knowledge and communicating with their lecturers once they indicated positive feelings with the current e-learning platform. Confirmation was shown

to have a positive impact on perceived usefulness leading to the acceptance of hypothesis 2. In the study of individuals' technological confirmation, it was revealed that a high degree of confirmation allowed the users to understand high actual service performance (Stone & Baker-Eveleth, 2013). Thus, high confirmation of the service utility possibly enhances positive perspectives on how the service can contribute to users' productivities. In this case, it was found that the students began seeing the benefits of studying through the e-learning platform when the high performance of e-learning platform was confirmed among them. This led to an assumption that students acknowledged that the e-learning platform provided by their universities somehow promoted their learning processes, experiences, and the outcomes of their exams. Finally, perceived risk was shown to have a negative impact on perceived usefulness; however, its impact on perceived usefulness was insignificant, leading to the rejection of hypothesis 4. Based on the empirical findings of this study, the perspectives of usefulness among the students relied significantly on the impacts of perceived enjoyment and confirmation. In other words, when the students had high enjoyment and confirmation on the e-learning platform, they understood how significant the existing e-learning platform was to their academic performance. Thus, they seemed to feel less concerned with the risk of using the current e-learning platform provided by their universities.

Based on the mediation test findings, perceived enjoyment was identified as a partial mediator between confirmation and perceived usefulness. This revealed that students' confirmation on the e-learning platform somehow promoted both student enjoyment and perceived usefulness of the e-learning platform. In other words, students not only enjoyed using the e-learning platform but also acknowledged how the e-learning platform positively contributed to their learning productivities once its performance was checked and confirmed. Perceived enjoyment was also identified as a

full mediator between perceived risk and perceived usefulness. This revealed that perceived risk could change perceived usefulness directly, however, it somehow promoted perceived enjoyment to influence the perceived usefulness of the e-learning platform in a direct way. Based on this empirical finding, it was found that students saw the great contribution of the e-learning platform on their learning productivities when their enjoyment reached the maximum level through minimizing the degree of performance risk of the e-learning platform. To sum up, student enjoyment was the main predictor of perceived e-learning usefulness.

Based on the above discussion, the main findings and hypotheses testing are summarized in Table 5. In this study, four hypotheses were accepted while hypothesis 4 was rejected.

6. ACADEMIC AND PRACTICAL IMPLICATIONS

In light of the results, the theoretical model developed in this study contributes significantly to the existing literature by extending the investigation of student confirmation, perceived risk, and perceived

enjoyment, on perceived usefulness in the context of e-learning platforms. In contrast to previous studies (Gupta et al., 2021; To & Trinh, 2021; Wu et al., 2020), this extension to the theoretical model improves the existing knowledge on how service users, particularly students, see the usefulness of their university’s e-learning platform when their confirmation, concept of risk, and enjoyment, change. Furthermore, the current theoretical model has also identified the significant mediating roles of perceived enjoyment on the relationships between confirmation and perceived usefulness and between perceived risk and perceived enjoyment; thus, it has also increased understanding of how pleasure and joy can enhance the overall significance of service to many users’ working productivity level, especially regarding the significance of e-learning platforms to students’ academic performance.

In a practical context, the existing empirical findings can help academic institutions to develop new mechanisms to improve their e-learning platform for their students. Many academic institutions can enhance the usefulness of their e-learning platform to students by increasing students’ confirmation and enjoyment. To enhance

Table 5 Findings and Hypothesis Testing Summary

Panel A: Regressions and Critical Ratios						
<i>Hyp. No.</i>	<i>Proposed Relationships</i>		<i>Std. Beta (β)</i>	<i>p-value</i>	<i>Sig. Level</i>	<i>Hyp. Result</i>
	<i>Dependent Variable</i>	<i>Independent Variable</i>				
1	Confirmation	Perceived Enjoyment	0.55	0.000**	Sig.	Accepted
2	Confirmation	Perceived Usefulness	0.25	0.000**	Sig.	Accepted
3	Perceived Risk	Perceived Enjoyment	-0.22	0.000**	Sig.	Accepted
4	Perceived Risk	Perceived Usefulness	-0.01	0.302	Insig.	Rejected
5	Perceived Enjoyment	Perceived Usefulness	0.70	0.000**	Sig.	Accepted

Panel B: Mediation Testing				
<i>Relationships</i>	<i>Indirect</i>	<i>Direct</i>	<i>Mediation</i>	<i>Result</i>
Confirmation-->Perceived Enjoyment-->Perceived Usefulness	0.15**	0.25**	Partial Mediation	Sig.
Perceived Risk-->Perceived Enjoyment-->Perceived Usefulness	-0.11**	-0.01	Full Mediation	Sig.

Note: *** indicates sig. level $p < 0.001$.

students' confirmation, they must ensure that the adopted technology which is applied in their e-learning platform provides sufficient functions. For example, students can obtain all e-learning materials (e.g., e-books, e-library, educational videos, Kahoot, etc.) and gain instant access to online communications with their lecturers (e.g., google classroom, chat, email, and video conferences). When these functions run smoothly, it is obvious that the e-learning platform becomes an important tool to support the students' learning as well as their academic performance. Students' enjoyment can be promoted through creating convenient and simple functions within the e-learning platform, with easy access to learning materials and other fun class activities (e.g., puzzle or Q&A gaming sessions). As a result, students may feel not only comfortable to use the e-learning platform but also enjoyable with their class activities such as provided feedback, sharing of learning materials, and other communications. As a result, the academic institutions can maximize their students' perceptions of e-learning usefulness.

7. CONCLUSION AND FUTURE STUDIES

This study aimed to investigate the perceived e-learning usefulness among Thai university students. To fulfill this goal, a convenience sampling method was selected as the means to collect data from 625 university students from around Thailand. The SEM method was used to analyze data from the 478 valid responses. The findings revealed that confirmation and perceived risk showed significant impacts on perceived enjoyment. Only confirmation and perceived enjoyment, but not perceived risk, were shown to have significant impacts on the perceived usefulness of e-learning. Overall, the attitudes regarding perceived usefulness in the context of e-learning depend significantly on students' confirmation and enjoyment with the current e-learning platform, while the risk of using this e-learning platform is not considered as a major

threat to students.

Despite of achieving the main goal of this study, some limitations can be seen. First, this study used a convenience sampling method, in which students filled in the surveys by themselves. Consequently, this survey technique may contain some bias answers from the students. Therefore, new studies should practice structural questions for face-to-face interviews to improve the quality of answers and reliability. Finally, the findings of this study rely significantly on university students' opinions. Thus, it may be difficult to generalize the results to lower-level students (e.g., high school) as young learners may face different e-learning situations and have lower understanding of technology or internet background. Therefore, new studies can use the same variables to further investigate their perspectives and determine new findings and conclusions.

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