ISSN 2409-2665
Journal of Logistics, Informatics and Service Science
Vol. 8 (2021) No. 1, pp. 67-81
DOI:10.33168/LISS.2021.0105

The Effect of UTAUT2 on Use Intention and Use Behavior in Online Learning Platform

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Abstract. Recently, the rapid development of computer technology has made the Internet an indispensable part of our daily lives. The sudden outbreak of new crown pneumonia disrupted the original teaching plan and the non-face-to-face teaching is adopted all over the world, thus, the online learning platform has attracted everyone's attention. This research aims to conduct empirical research on the factors that influence the intention to use online learning platforms. To this end, researchers establish a theoretical background and a set of hypotheses by examining and analyzing materials related to the online learning platform and studying the use of expanded technology acceptance and unified theory and previous research (UTAUT2) research design models. Through the representative extended integrated technology acceptance model (UTAUT2), in addition to performance expectancy (PE), effort expectancy (EE), social influence (SI) and price value (PV), variables that may affect use intention (UI) and use behavior (UB) can also explain the acceptance of new technologies. We also added perceived risk on the variables. This study uses SPSS 22.0 for basic statistics and the Smart PLS 2.0 statistical software package for hypothesis testing. A survey on 60 students using online learning platform was conducted. The results of checking the relationship between performance expectations, effort expectations, social impact, price, perceived risk, use intention, and use behavior are as follows: performance expectations, effort expectations, social impact, and price has a positive effect on the enterprise's use intention. There is a negative impact of perceived risk on use intention and a positive impact of use intention on use behavior.

Keywords: Use intention, use behavior, online learning platform, UTAUT2.

1. Introduction

With the popularization of the Internet, the use of the web has become more common and the scope of use has been expanded so that relationships that have only occurred offline in the past had become possible online. People can meet a wide variety of people by simply connecting anytime, anywhere through the internet. With the development of mobile technology, various communication methods and platforms have appeared, making communication between people more convenient and bringing convenience to people's lives.

The world is in trouble with the corona virus 19 epidemic in 2020. This has caused great confusion not only in politics, economy, society, and culture but also in education around the world. As of now, people have been alienated from social interaction for a long time and have become a part of life. People are forced to stay at home, and most things have to be done at home through computers, the Internet and smart devices, including study and work (Lee, 2018).

At the same time, all countries introduced a new type of education system. The Ministry of Education of South Korea suggested four types of online classes: real-time interactive class, content-oriented class, task performance-oriented, and others. Interactive classes are based on real-time distance education, using Naver Line Works, Gurumi, Google Hangouts, MS Teams, ZOOM, Cisco Webex, and video classes between teachers and students. Using online learning platforms allows learners to learn in a more flexible and independent environment (Ryu et al., 2017).

However, on August 4, 2020, zoom, video conferencing software for many users worldwide, announced that due to the personal information leak in April, from August 23, 2020, the ZOOM online learning platform will completely withdraw from the Chinese market (Bhavana, 2015). This has attracted worldwide attention to the security of online learning platforms. This is also our initial motivation for writing this study.

The purpose of this study is summarized as follows. First, the factors influencing the use intention of the online learning platform are analyzed by applying the extended integrated technology acceptance theory model (UTAUT2). Second, it analyzes whether the perceived risk and use intention of the online learning platform influence the use behavior of users. Third, it points the way forward for companies using mobile technology for online learning platforms.

2. Materials and Methods

2.1. Online Learning Platform

Online learning platform includes online teaching and counselling, online self-study, new staff training, online assignment, online testing and quality evaluation, enterprise knowledge staff training online learning, online communication between teachers and students, and other services. It has an integrated teaching service

support system that can provide real-time and non-real-time teaching and guidance services for students, teachers and enterprises (Zhai and Shin, 2019). The purpose is to help managers control the content, status and progress of learning. The biggest feature of online learning platforms is that teachers and students are separated in practice, and students are usually in an independent learning environment, without geographical or time constraints, and can be completed through mobile products such as pocket PC and mobile phones (Jang, 2018).

2.2. Use Intention and Use Behavior

Use intention is the degree of intention to perform a specific action, that is, when trying to use new technology in education, it is a concrete plan to use and will actively use for learning. Intention to use includes the use intention continuously, which is a major factor influencing actual behavior, and it is said that actual behavior is predictable (Shin, 2011; Lee, 2020).

Therefore, in this study, the use intention refers to degree use intention of online learning platform, and use behavior is defined as the degree to which the user is using online learning platform and intends to continue using the online learning platform in the future.

In the existing theories related to technology use, the relationship between use intention and use behavior is presented in a theoretical model. The rational behavior theory (TRA), planned behavior theory (TPB), and radix usage model (TAM) have argued that use intention predicts actual use, but most empirical previous studies have used new systems or technologies rather than measuring the actual use. In many cases, personal intention to use was measured as a means to predict whether users would accept it (Venkatesh et al., 2012).

2.3. TAM

In order to explain the determinants of accepting computers, Davis proposed the Technology Acceptance Model (TAM) in 1989.

The technology acceptance model proposes two main factors: perceived usefulness and perceived ease of use. The degree to which a person uses a particular system to improve job performance is called perceived usefulness. The degree to which a person is easy to use a particular system is called perceived ease of use.

Davis believes that: external variables determine perceived ease of use, external variables and perceived ease of use determine perceived usefulness, attitude and perceived usefulness determine usage intentions, and usage intentions determine the use of the system (Davis, 1989).

2.4. UTAUT

Venkatesh and Morris put forward a model on the basis of the relevant research on TAM, aiming at the problem of factors affecting users' cognition. UTAUT has four core dimensions: Performance Expectancy (PE) refers to how much you feel the

system is helpful to your work, while Effort Expectancy (EE) refers to how much Effort you need to make to use the system; Social Influence (SI) refers to the degree to which individuals feel influenced by their surrounding groups. Facilitating Conditions (FC) refers to your perception of your organization's commitment to the use of the system in terms of relevant technology and equipment.

UTAUT proposed 4 core variables, gender, age, experience and willingness. It also pointed out that the combined effect of two or more variables will be more significant (Venkatesh et al., 2012). Currently, the representative research model used in connection with the adoption of innovative technologies is UTAUT. It was made by synthesizing eight theories. It is known that UTAUT has about 60 to 80% explanatory power. There are four independent variables namely expectancy, effort expectancy, social influence, and facilitating conditions. Parameters and dependent variables have use intention and use behavior, Gender, age, experience, and voluntariness of use are suggested as modulating variables.

2.5. UTAUT2

The expanded integrated technology acceptance model (UTAUT2) was proposed by Venkatesh (2012), and was modified to faithfully understand the use of the existing integrated technology acceptance model (UTAUT) by consumers (Choi et al., 2017). UTAUT is mainly a study on the context of compulsory technology use for performance improvement within an organization, while UTAUT2 can be viewed as a theory explaining the autonomous technology use of individual consumers (Kang et al., 2020).

Research has been conducted in various fields for new technology systems and services using the UTAUT model. The UTAUT model mainly studied the effects that occur in the process of accepting information technology introduced inside the organization to improve business performance. Therefore, the UTAUT model also lacked the influence of the existing four variables to explain the intention and behavior of general consumers to use technology. Later, based on the UTAUT model, the explanatory power of the UTAUT2 model began to be verified by adding price value, recreational motivation, and habits as factors that consumers use information technology. The factors constituting the UTAUT2 model are as follows.

Performance expectation is a concept similar to the perceived usefulness of TAM, and is the degree to which consumers believe that they can benefit from improving work performance by using a technology or system. When users encounter a new technology, they think about whether it will benefit their work or life. After that, the more you perceive that it is helpful to you, the higher your intention to use the technology. Expectation of effort includes the meaning of integrating the variables of the three theories in addition to the perceived ease of TAM. It refers to the degree to which a system or service is easy to use. High performance can be expected when customers use new technologies. Even if it is a useful technology, if the actual use is

inconvenient or difficult to apply, the customer may not easily show intention to use it. Technologies with similar conditions are more likely to accept technologies that require less effort to use. Effort expectations are related to how intuitive and easily the system is to consumers. Social influence is a variable composed of subjective norms, social factors, and images. If people who think that the user has an important influence on them should use the service, the user will have an intention to use the new service even if there are inconveniences and difficulties. In particular, mobile technology and ubiquitous-based information technology have a great influence on the formation and maintenance of social relationships. The facilitating condition is the degree to which users believe that the organizational and technical infrastructure is in place when using new technologies. In the UTAUT model, the accelerating condition was a variable that directly affects the use of technology, but in the UTAUT2 model, it affects not only the technology acceptance, but also the intention to use. In general, when a new information technology has been introduced, it can have a greater impact on the intention of users to use it.

In this study, facilitating conditions, hedonistic motivations, and habits of the UTAUT2 model were removed, and the perceived risk was added. Facilitation condition was excluded because in the basic theory, it was not applied to influence the relationship on use intention, but to the effect relationship on behaviour. Online learning platforms pursue practical value, so hedonic motivation factors are excluded. Now online teaching is not a new teaching method, and has been used in various fields for many years, but still lacks proficiency in practice, so habit factors are excluded. Finally, the use behaviour of variables for online learning platforms are performance expectancy (PE), effort expectancy (EE), social influence (SI), price value (PV), perceived risk (PR), and use intention (UI).

3. Research Design

3.1. Research Model

This study aimed to construct a research model by focusing on the use intention of the online learning platform to predict the actual use. Based on the UTAUT2 model, the purpose of this study is to examine the effects of performance expectancy (PE), effort expectancy (EE), social influence (SI), price value (PV) on use intention (UI), and perceived risk (PR) on the use behavior (UB) (Chung et al., 2018; Choi, 2018). The research model of this study is shown in Fig. 1.

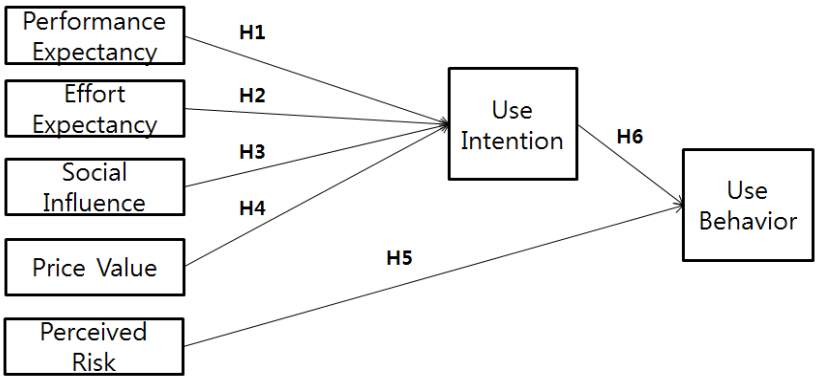

Fig. 1: Research model.

3.2. Research Hypothesis

3.2.1 Performance Expectancy

Performance expectations refer to the degree to which the use of new information technology will help improve job performance (Venkatesh et al., 2012). When users encounter a new technology, they think about whether this technology will help their work or life, and the more they perceive that it is helpful to them, the higher their use intention on the technology (Venkatesh et al., 2012, 2003).

Hypothesis H1: Performance expectancy (PE) will have a positive effect on use intention (UI) of online learning platform.

3.2.2. Effort Expectancy

Effort Expectancy is the degree to which the technology can be easily used (Venkatesh et al., 2003). The more convenient or easy to use a new technology is perceived, the higher its use intention (Venkatesh et al., 2012, 2003).

Hypothesis H2: Effort expectancy (EE) will have a positive effect on use intention (UI) of online learning platform.

3.2.3. Social Influence

Social Influence can be defined as how well others perceive their use of the new system (Venkatesh et al., 2012). When it comes to new technology, the more important people around you perceive that the new technology will be used, the higher use intention is (Venkatesh et al., 2012, 2003).

Hypothesis H3: Social influence (SI) will have a positive effect on use intention (UI) of online learning platform.

3.2.4. Price Value

Price value is the consumer's perceived tradeoff between the perceived benefit and the monetary cost paid. It has been confirmed in previous studies that price value is also a variable that has an influence on explaining the use intention a new

technology (Venkatesh et al., 2003).

Hypothesis H4: Price value (PV) will have a positive effect on use intention (UI) of online learning platform.

3.2.5. Perceived Risk

In general, perceived risk refers to uncertainty related to use, that is, the result of undesirable decision-making, and refers to a user's subjective perception that is not probabilistic or objective. It has been revealed in many studies that the perceived risk-related aspect is a variable that negatively affects consumers' use intention technology (Featherman and Pavlou, 2003).

Hypothesis H5: Perceived risk (PR) will have a negative effect on use behavior (UB) of online learning platform.

3.2.6. Use Intention

Use intention was defined as the tendency of consumers to use technology (Venkatesh et al., 2012, 2003). Use intention is a variable that has been continuously tested as a key factor that determines the behavior of consumers in using technology (Venkatesh et al., 2012, 2003).

Hypothesis H6: Use intention (UI) will have a positive effect on use behavior (UB) of online learning platform.

3.3. Survey Design

This study conducted a survey to explain the effect of the online learning platform on the intention and behavior of users. The online questionnaire was administered to 60 students from August 18 to August 20, 2020. The survey results of the demographic characteristics are shown in Table 1.

Table 1: Demographic characteristics

Item		Frequency	PERCENT
Gender	Male	25	41.67
	Female	35	58.33
Age	10-20	25	41.67
	20-30	25	41.67
	30-40	10	16.67
Education	Junior high school	2	3.33
	High school	6	10
	Undergraduate	29	48.33
	Postgraduate	23	38.33

In this study, a total of seven variables were used based on the model. There are performance expectancy (PE), effort expectancy (EE), social influence (SI), price value (PV), perceived risk (PR), use intention (UI), and use behaviour (UB), as

shown in Table 2.

Table 2: Metrics by variable

Variable name	Detail	Prior research
Performance expectancy	- Online learning platforms are helpful for daily life - Using online learning platform can increase production speed - Using online learning platforms can increase productivity	(Venkatesh et al. 2003)
Effort expectancy	- Learning how to use the online learning platform will be very easy - Learning how to use the online learning platform will be fast - It will be easy to use an online learning platform - You will easily use the online learning platform proficiently	(Venkatesh et al. 2003)
Social influence	- People around me use online learning platforms a lot - Important people want me to use online learning platform - If people around me use the online learning platform a lot, I will use it too	(Venkatesh et al. 2003)
Price value	- The price of the online learning platform is reasonable - Online learning platform is worth having - Online learning platform is great value for money	(Featherman and Pavlou, 2003)
Perceived risk	- There is a risk of infringement such as time and finances when using an online learning platform - There is a risk of privacy invasion when using an online learning platform - There are security issues when using the online learning platform	(Venkatesh et al. 2003)
Use intention	- I plan to use an online learning platform - I will continue to use the online learning platform - I plan to use the online learning platform frequently	(Venkatesh et al. 2003)
Use behaviour	- I am willing to use an online learning platform - I am actually using the online learning platform and want to continue to use it - I use the online learning platform whenever I need it	(Venkatesh et al. 2003)

4. Research Results and Discussion

4.1. Reliability and Validity of Measurement Tools

Also, in this study, for reliability measurement, it was confirmed through Cronbach's Alpha coefficient, the composite reliability and average variance extracted values verify the internal consistency between measurement items. In general, the factor loading value is 0.6 or more, the composition reliability value is 0.7 or more, and the variance extraction index value is 0.5 or more. As a result of comparing the square root of the variance extraction index value with the correlation coefficient, the variance extraction index value is greater than the vertical and horizontal correlation coefficient values, so there is no problem in the discriminant validity. The survey results are shown in Table 3 and Table 4.

Table 3: Internal consistency and reliability

Variable		Factor loading	C.R	AVE	Cronbach's α
PE	A1	0.785	0.886	0.722	0.808
	A2	0.919			
	A3	0.841			
EE	B1	0.880	0.892	0.674	0.838
	B2	0.879			
	B3	0.760			
	B4	0.757			
SI	C1	0.785	0.868	0.688	0.774
	C2	0.851			
	C3	0.885			
PV	D1	0.896	0.892	0.734	0.820
	D2	0.829			
	D3	0.844			
PR	E1	0.836	0.900	0.750	0.833
	E2	0.898			
	E3	0.863			
UI	F1	0.888	0.873	0.698	0.783
	F2	0.866			
	F3	0.745			
UB	G1	0.916	0.922	0.797	0.872
	G2	0.922			
	G3	0.839			

Table 4: Discriminant validity and correlation

Variable	AVE	1	2	3	4	5	6	7
PE	0.722	0.850						
EE	0.674	0.705	0.821					
SI	0.688	0.597	0.712	0.829				
PV	0.734	0.509	0.695	0.718	0.857			
PR	0.750	-0.234	-0.064	-0.011	-0.075	0.866		
UI	0.698	0.715	0.802	0.765	0.748	-0.157	0.835	
UB	0.797	0.623	0.626	0.576	0.519	-0.425	0.722	0.893

4.2. Test Hypothesis

The PLS analysis has the advantage of being able to analyze with a smaller number of samples compared to the structural equation because it is possible to analyze with a sample number of about 10 times that of the largest number of observed variables measuring each latent variable. Therefore, in this study, PLS was adopted as the data analysis method in consideration of the characteristics of the study such as theoretical robustness, number of samples, and self-development of questionnaires. If the R2 value is 0.26 or more, the degree of fitness can be expressed as 'high', if it is 0.26 to 0.13, the degree of fitness is expressed as 'medium', and if it is less than 0.13, the degree of fitness can be expressed as 'lower' (Cohen, 1988). Use intention (0.774) and use behavior (0.621) for component values can be evaluated as 'good'.

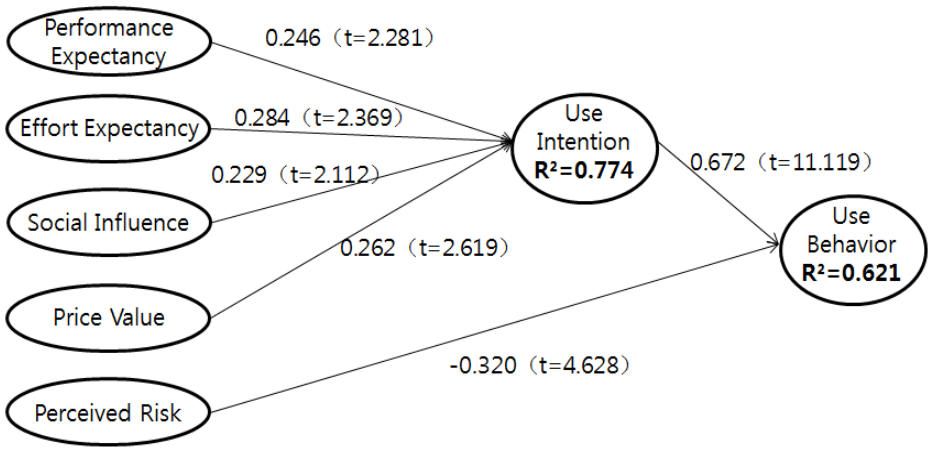

Fig. 2 Results of research model

4.3. Analysis of Test Results

Hypothesis H1: "Performance expectation (PE) will have a positive effect on use intention (UI) of online learning platform" is statistically significant at the

significance level of 95% (H1; β=0.246, t=2.281, p<0.05). Therefore, hypothesis H1 was adopted. The performance expectation is that it pays attention to use intention of online learning platform.

Hypothesis H2: "Effort expectation (EE) will have a positive effect on use intention (UI) of online learning platform" is statistically significant at the significance level of 95% (H2; β=0.284, t=2.369, p<0.05). Therefore, hypothesis H2 was adopted. Effort expects to pay attention to use intention of online learning platform.

Hypothesis H3: "Social influence (SI) will have a positive effect on use intention (UI) of online learning platform" is statistically significant at the significance level of 95% (H3; β=0.229, t=2.112, p<0.05). Therefore, hypothesis H3 was adopted. The social impact pays attention to use intention of online learning platform.

Hypothesis H4: "Price value (PV) will have a positive effect on use intention (UI) of online learning platform" is statistically significant at the significance level of 95% (H4; β=0.262, t=2.619, p<0.05). Therefore, hypothesis H4 was adopted. The price value pays attention to use intention of online learning platform.

Hypothesis H5: "Perceived risk (PR) will have a negative effect on use behavior (UB) of online learning platform " is statistically significant at the significance level of 95% (H5; β=-0.320, t=4.628, p< 0.05). Therefore, hypothesis H5 was adopted. The perceived risk pays attention to use behavior of online learning platform.

Hypothesis H6: "Use intention (UI) will have a positive effect on use behavior (UB) of online learning platform" was statistically significant at the significance level of 95% (H6; β=0.672, t=11.119, p<0.05). So he hypothesis H6 was adopted, the use intention pays attention to use behavior of online learning platform. These are listed in Table 5.

Table 5: Hypothesis test result summary

	cause variable	**result variable**	**path coefficient**	**t-value**	**result**
H1	PE	UI	0.246	2.821	Accept
H2	EE	UI	0.284	2.369	Accept
H3	SI	UI	0.229	2.112	Accept
H4	PV	UI	0.262	2.619	Accept
H5	PR	UI	-0.320	4.628	Accept
H6	UI	UB	0.672	11.119	Accept
t=1.960** (p<0.05)					

5. Conclusions

This study combines the variables of online learning platform with the factors that affect the willingness and behavior of the online learning platform to analyze which

variables have an impact on it. Specifically, there are many uncertain factors and certain risks in the performance expectancy, effort expectancy, social influence, price value, and use behavior in the integrated technology acceptance model, so the perceived risk is considered an important influence factors and was newly introduced as a key variable in the research model. We used the structural equation of PLS to analyze the causal relationship between variables.

The summary of the research results of this study is as follows. Performance expectancy (PE), effort expectancy (EE), social influence (SI), and price value (PV) have a positive (+) effect on the use intention (UI); the perceived risk (PR) has a negatively (-) effect on the use intention (UI); and the use intention (UI) has a positive (+) effect on the use behavior (UB). In the paper, it was found that the perceived risk of users of the online learning platform affects their use intention. That is, the higher the perceived risk, the lower the use behavior.

This study conducted an empirical analysis of the online learning platform. Users' participation and use are essential for new technologies to grow and spread in the market. Under the conditions of a market economy, the company's production and business activities must directly or indirectly revolve around the behavior of consumers, with consumers as the starting point and ultimate goal, and in order to satisfy consumers by providing satisfactory products and comprehensive services, and winning more Market share and create a unique competitive advantage (Zhang et al. 2021). Although various Internet services as well as online learning platforms using mobile technology are rapidly developing, security accidents such as personal information leakage were frequently occurring. Once the customer is aware of the existence of risk, he will do everything possible to eliminate or reduce the risk. The company can reduce the customer's perceived risk by satisfying the certainty of the purchase purpose or reducing the degree of loss of the result. When the perceived risk completely disappears or the customer can reduce it. The customer will decide to buy the product. Therefore, the research on the perceived risk of customers is the basis for the company to formulate marketing strategies and activities (Wu and Lee, 2020).

At the same time, understanding the perceived risks of customers is also an important entry point for the company to explore business opportunities and expand the market. Therefore, it is necessary to protect information and grow together through the development of security technology to reduce the perceived risk of security perceived by consumers. By grasping the needs of users for online learning platforms and suggesting a direction to find a strategy that suits the users, it will be a foundation for basic research to promote an industry with a competitive edge in the field of security (Tian and Lee, 2020).

The subject of analysis in this study is focused on students. This survey was conducted by selecting subjects who knew about the online learning platform and judged that it would be okay to use it. There are many real users, including not only

students but also individuals watching classes and corporate employees conducting online meetings. In future research, we intend to reduce bias and generalize research by extracting samples of the subject in advance. Also, there was a limitation in that the number of questionnaires was not large. It is necessary to elaborate the study by presenting the preceding variables of the independent variables of this research model, additional consideration of variables that influence the intention and behavior of using the online learning platform, and the application of the controlling variables suggested in the UTAUT2 model.

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