(Araştırma)

AN EMPIRICAL STUDY OF TECHNOLOGY ACCEPTANCE IN HIGHER EDUCATION DURING COVID-19 PANDEMIC

Şafak ALTAY [1,3]

Güven Gürkan İNAN [2]

ABSTRACT

Information technologies provide various advantages to compete in global markets. More businesses adopt these technologies to gain competitive advantages such as quick market response, fast and reliable supply chains, quick decision based on big data. It is a challenging process to acquire a new technology and there are different factors that affect the acceptance speed of a technology. The effects of some factors may vary due to various reasons such as natural disasters, economic crises, market structure. Since the beginning of 2020, Covid-19 pandemic caused many different businesses and supply chain to adapt new conditions. Higher education industry is one of the profoundly affected sectors from pandemic and it is forced to shift rapidly from traditional teaching to online teaching. This study aims to investigate the possible effects of self-efficacy, user experience, innovativeness, usefulness, ease of use and intention on acceptance of distance education systems under Covid-19 pandemic conditions. The study is conducted at Ardahan University, Turkey with 598 of students. The hypotheses were tested using PLS-SEM (Partial Least Squares Structural Equation Modelling). Findings reveal that self-efficacy and innovativeness have effects on perceived ease of use while self-efficacy and user experience do not have positive impact on perceived usefulness. Results also revealed that perceived ease of use has positive impacts on perceived usefulness, and perceived usefulness has positive impact on intention.

Keywords: Self-efficacy, user experience, innovativeness, usefulness, ease of use, intention

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1 Assist.Prof. Dr, Ardahan University, Business Administration Department, safakaltay@ardahan.edu.tr, ORCID: 0000-0001-7035-0362

2 Assist.Prof. Dr., Samsun University, Industrial Engineering Department, ggurkan.inan@samsun.edu.tr, ORCID: 0000-0001-6891-6312

3 İletişim Yazarı / Corresponding Author: safakaltay@ardahan.edu.tr

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ÖZET

Bilişim teknolojileri, küresel pazarlarda rekabet edebilmek için çeşitli avantajlar sağlamaktadır. Çoğu işletme hızlı pazar tepkisi, hızlı ve güvenilir tedarik zincirleri, büyük verilere dayalı hızlı karar gibi rekabet avantajları elde etmek için bu teknolojileri benimsemektedir. Yeni bir teknoloji edinmek zorlu bir süreçtir ve bir teknolojinin kabul edilme hızını etkileyen çeşitli faktörler vardır. Doğal afetler, ekonomik krizler, piyasa yapısı gibi çeşitli nedenlerle bazı faktörlerin etkileri değişkenlik gösterebilmektedir. 2020 yılının başından itibaren Covid-19 pandemisi birçok işletmenin ve tedarik zincirinin yeni koşullara uyum sağlamasına neden olmuştur. Yükseköğretim sektörü, pandemiden en çok etkilenen sektörlerden biridir ve geleneksel öğretimden çevrimiçi öğretime hızla geçmek zorunda kalmıştır. Bu çalışma, Covid-19 pandemi koşullarında uzaktan eğitim sistemlerinin kabulüne yönelik öz-yeterlik, kullanıcı deneyimi, yenilikçilik, kullanışlılık, kullanım kolaylığı ve niyetin olası etkilerini araştırmayı amaçlamaktadır. Araştırma, Türkiye'de Ardahan Üniversitesi›nde 598 öğrenci ile gerçekleştirilmiştir. Hipotezler, PLS-SEM (Kısmi En Küçük Kareler Yapısal Eşitlik Modellemesi) kullanılarak test edilmiştir. Bulgular, öz yeterlik ve yenilikçiliğin algılanan kullanım kolaylığı üzerinde etkisi olduğunu ve öz yeterlik ile kullanıcı deneyiminin algılanan kullanışlılık üzerinde olumlu bir etkisi olmadığını göstermektedir. Sonuçlarda algılanan kullanım kolaylığının algılanan kullanışlılık üzerinde olumlu etkileri olduğunu ve algılanan kullanışlılığın niyet üzerinde olumlu etkisi olduğu bulunmuştur.

Anahtar Kelimeler: Öz yeterlilik, Kullanıcı Deneyimi, Yenilikçilik, Kullanışlılık, Kullanım Kolaylığı, Niyet

1.Introduction

The last few decades have witnessed a drastic improvement in technology/ have witnessed an exponential growth of technology use in every walk of life/ in every aspect of life. Rapidly growing new technological elements offer various contributions to the daily lives of individuals. The use of these technologies may be the result of individual preferences or due to inevitable conditions such as Covid-19 pandemic. Recent data reveal that more than 280 million people got infected and more than 5 million people lost their lives (WHO, 2020). Daily routines of individuals and businesses have transformed to minimize the negative impacts of pandemic. Thus, the demand on new technologies – especially IT (Information Technologies) – has increased dramatically worldwide (Deloitte, 2020). Many businesses have shifted their work paradigm to "work from office" rather than "work from home". It is reported that individuals are now able to fulfil their responsibilities with technology support (Ernst & Young, 2020). In this context, it is important to determine how individual users use relevant technologies, how individual users perceive existing technologies and what element/factor(s)can be effective in adopting these technologies under Covid-19 conditions.

A brief glance at the related literature displays that Technology Acceptance Model (TAM) is the mostly used framework to understand acceptance processes of technologies. Ease of use and usefulness are seen as main variables of Technology Acceptance Model. However, additional explanatory variables can be offerred depending on the context (Davis et al., 1989). Self-efficacy, innovativeness and experience as external variables are believed to have impact on technology acceptance (Salloum et al., 2019) and it iscrucial to understand how these variables have impact on technology acceptance during the Covid-19 period (Al-Maroof et al., 2020). Moreover, the hypothesis that Covid-19 pandemic might affect the individuals' behaviours on technology acceptance has been much debated recently. Thus, issues such as how Covid-19 pandemic affects individuals' behaviour on technology acceptance and whether self-efficacy, user experience, and innovativeness have impact on individuals' behaviour on technology acceptance have gained more significance. However, current literature does not provide insightful knowledge about Covid-19 pandemic period. Thus, this research aims to fulfil this research gap.

In this study, it is aimed to determine the factors that may affect undergraduate students' perceptions of distance education systems. In addition, there may be expected/unexpected changes in the behaviour and preferences of individuals during the pandemic period. The study also aims to identify how individuals' behaviours on technology acceptance shifted through conducting a research on higher education students who used or forced to use information technologies during Covid-19 pandemic. Therefore, this study examines the possible effects of self-efficacy, user experience, innovativeness, perceived usefulness and perceived ease of use on university students' intention to use distance education systems

during Covid-19 pandemic by using an extended TAM model. This study is believed to contribute to the literature by examining the factors affecting acceptance and adoption of distance education systems during Covid-19 pandemic.

2. Conceptual Framework

Technology Acceptance Model

Technology Acceptance Model (TAM) is developed by Davis (1989) based on Theory of Reasoned Action (TRA). The goal of TAM is "*to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behaviour across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified*" (Davis et al., 1989: 985). TAM is one of the widely used models that explains users' intention to use and acceptance of information technologies (Carter & Bélanger, 2005). Intention to use is affected by two constructs: perceived usefulness and perceived ease of use (Davis, 1989). Perceived Ease of Use (PEOU) refers to "*the degree to which the user expects the target system to be free of effort*" (Davis et al., 1989: 985). Perceived Usefulness (PU) is defined as the user's "subjective probability that using a specific application system will increase his or her job performance within an organizational context" (Davis et al., 1989: 985). Behavioural intentions (BI) are positive or negative feelings which affect technology use behaviour (Fishbein & Ajzen, 1977).

The original TAM model consists of some sub-constructs such as:–"perceived usefulness, perceived ease of use, attitude toward using, behavioral intention and actual use". External variables, which may have effects on perceived usefulness and perceived ease of use variables can also be added to the model. Furthermore, perceived usefulness and perceived ease of use variables was found to have an effect on attitudes in the original model, but this effect was limited (Davis et al., 1989). When attitudes are included in the model where their mediating effects are significant (Agarwal & Karahanna, 2000), it is seen that attitudes are not included in some versions of the model (Agarwal & Karahanna, 2000; Al-Maroof et al., 2020; Venkatesh & Davis, 2000).

While attitudes should be considered when their mediating effects are significant (Agarwal & Karahanna, 2000; Marangunić & Granić, 2015), some versions of the model do not appear to include attitudes (Agarwal & Karahanna, 2000; Al-Maroof et al., 2020; Venkatesh & Davis, 2000). Although external variables such as -subjective norm, image, job relevance, output quality, result demonstrability- are included in the extended versions of TAM, generally original version of the model is preserved.

For a theory to understand a difficult situation, and thus become widely used, it must have the characteristics of parsimony, verifiability, and generalizability (Chintalapati & Daruri, 2017). The TAM model for technology acceptance is

widely accepted because of its simplicity, adaptability, supportability with data, and predicting possible traits on technology acceptance behaviours (Marangunić & Granić, 2015; Rauniar et al., 2014). The widespread use of TAM in different IS fields and research groups shows that the results get to increase the validity and explanatory power of the model (Al-Emran et al., 2018; Venkatesh & Bala, 2008).

Perceived ease of use and perceived usefulness are main constructs of the Technology Acceptance Model which was developed for explaining computer-usage behaviour (Al-Qaysi et al., 2020; Legris et al., 2003; Moon & Kim, 2001). Perceived ease of use variable affects perceived usefulness. Perceived usefulness, another construct, is expressed as a variable that has effect on attitudes and intentions. It can be claimed that user intentions are shaped together with perceived usefulness and perceived ease of use variables, so that the effects specified in the model are determinant in the adoption of a new product or service (Davis et al., 1989). This situation expressed among model variables has been reported in some studies in which similar findings are observed (e.g. Gefen et al., 2003; S. H. Kim, 2008; Ngafeeson & Sun, 2015; Venkatesh & Morris, 2000; Yoon et al., 2015). In line with these results, the following hypotheses were proposed;

H1: Perceived ease of use has a positive effect on perceived usefulness.

H2: Perceived usefulness has a positive effect on intention to use.

Based on a literature review, Legris et al. (2003) state that most of the studies on technology acceptance do not have a simple model for the selection of exogenous variables. They also draw attention to the importance of examining some other exogenous variables. This indicates that it is beneficial to include exogenous variables in technology acceptance (Burton-Jones & Hubona, 2006; Chow et al., 2012). Belatedly, it can be seen that many studies on technology acceptance have changed TAM with the adaptations (Park et al., 2012) and adapted it to the Covid-19 period (Baber, 2021). Some of these variables stand out; self-efficacy, user-experience, and innovativeness.

Self-Efficacy

Perceived self-efficacy is defined as people's beliefs about their ability to produce specified performance levels that affect the events which affect their lives (Bandura,2010). Self-efficacy beliefs determine how people feel, think, motivate and act. Such beliefs produce these different effects through four main processes. They include cognitive, motivational, affective and selection processes (Bandura, 2010). Self-efficacy, along with the goals people set, is one of the strongest motivational premises of how well a person will perform in almost any endeavour. A person's self-efficacy is a strong determinant of their efforts, persistence, strategies as well as their further training and job performance. Since self-efficacy is more specific and limited than self-confidence or self-esteem, it is more easily developed than self-confidence or self-esteem. It can also provide a

stronger prediction of how effectively people will perform a task than their self-esteem or self-esteem (Heslin & Klehe, 2006). It can be stated that individuals with high level of self-efficacy in the field of technology may be more successful in accepting and using technologies, and otherwise, they may encounter problems in terms of technology use and acceptance (Holden & Rada, 2011).

In addition to the perceived usefulness and ease of use variables, external factors are effective in the acceptance of technologies (Burton-Jones & Hubona, 2006; Salloum et al., 2019). Self-efficacy is one of these external factors in technology acceptance (Ahmad et al., 2010; Cheng, 2011; Portz et al., 2019) This situation has been considered in many studies in the literature (Celuch et al., 2004; Chow et al., 2012; Ong et al., 2004) It is argued that the variable of self-efficacy is a strong determinant of the adoption of technological innovations related to education and affects technology acceptance (Albelbisi & Yusop, 2019; Patricia Aguilera-Hermida, 2020). Motivational self-assessment of individuals on the use and adoption of information technology products or services can positively contribute to the efforts to benefit and use information. As a matter of fact, the existing literature suggests that self-efficacy has impacts on adopting and using information technology products or services (e.g. Abdullah et al., 2016; Chang et al., 2017; Holden & Rada, 2011; Kwon et al., 2007). The following hypotheses were proposed in line with the results;

H3: Self-efficacy has a positive effect on perceived usefulness.

H4: Self-efficacy has a positive effect on perceived ease of use.

User Experience

User experience corresponds to a structure that is frequently used in the literature but can be difficult to define (Hart & Sutcliffe, 2019). User experience can be defined as immediate good or bad feelings towards primary evaluation when interacting with a product or service. It should be noted that good experience can occur as a result of meeting human needs by interacting with products or services (Hassenzahl, 2008). In line with this, Hassenzahl (2018) demonstrates experience in modelling the user experience, hedonic (e.g. is the experience stimulating or desirable) and utilitarian (e.g. does relevant experience effortlessly produce high quality results) approaches. Thus, these perceptions turn into an experiential evaluation in terms of attraction, pleasure and satisfaction. It should also be noted that user experience has impacts on the satisfaction level of individuals. Thus, similar technology experiences which are previously used may have an effect on the adoption of new technologies (Kim, 2008). Hornbæk and Hertzum (2017) suggest that user experience should be considered as an important part of the TAM.

Individuals with positive or negative experiences of IT products or services can be effective in adopting and using new IT products or services. It is expected to

observe individuals that have positive experience with IT products or services to use and adopt new IT products or services faster while individuals that have negative experiences struggle to use and adopt new IT products or services. This is suggested by literature (e.g. Abdullah et al., 2016; Chang et al., 2017; Stoel & Hye Lee, 2003). On the other hand, it is useful to state that the experience factor can have indirect effects on adopting and using new IT products or services (S. H. Kim, 2008; Venkatesh & Morris, 2000). The importance of the relationship between TAM and experience is has been consistently confirmed by research on the use of technology in education (Goh & Wen, 2021). As an external variable, user experience for the relevant technology positively affects the usability and ease of use of this technology (Hester et al., 2016; Li et al., 2008). In this direction, the following hypotheses were suggested;

H5: User experience has a positive effect on perceived usefulness.

H6: User experience has a positive effect on perceived ease of use.

Innovativeness

Innovativeness can be expressed as a willingness to change (Hurt et al., 1977). Being innovative in the field of information technologies can be defined as the willingness of an individual to try any new information technology. It should be noted that being innovative in this area has a significant impact on individuals' tendency to adopt new technologies (Agarwal & Prasad, 1998). It is worth considering that individuals with high levels of innovativeness may be more likely to adopt new products and services faster, and individuals who are identified as low innovative may have lower levels of adoption of new products and services (Midgley & Dowling, 1978 ; Kim et al., 2021). Although innovation is an important variable, its effects on TAM variables such as perceived usefulness and perceived ease of use should be considered (Agarwal & Prasad, 1998).

Innovative characteristics of individuals are expected to use and adopt new information technologies faster. Individual desires to continue using an innovative IT products or services can be related to innovative characteristics of individuals. Therefore, individuals who have innovative character can affect perceived usefulness and perceived ease of use (e.g. Hwang, 2014; Jackson et al., 2013; M. Kim et al., 2010; Kwon et al., 2007; Ngafeeson & Sun, 2015). There are several studies showing that being innovative as an external variable of TAM has effects on ease of use and usefulness (e.g. Castiblanco Jimenez et al., 2020; Chang et al., 2017; Jang & Lee, 2018; Joo et al., 2014). Innovativeness is characterized as a variable that has the greatest impact on learning on digital platforms (He & Zhu, 2017). The following hypotheses were proposed in line with the results;

H7: Innovativeness has a positive effect on perceived usefulness.

H8: Innovativeness has a positive effect on perceived ease of use.

3. Methodology

The aim of this research is to determine the effects of self-efficacy, experience and innovativeness on perceived ease of use, perceived usefulness and intention to use distance education?. Identifying affects is important as new consumer behaviors are likely to emerge during the Covid-19 Period (Alshurideh et al., 2021). The research was planned to be conducted on Ardahan University undergraduate students who use the university distance education systems with IT based products and services. In March 2020, all universities in Turkey have shifted traditional teaching to online teaching with legislation issued by Council of Higher Education. Therefore, Ardahan University established "Ardahan University Distance Education Research and Application Center (ARUZEM)" to develop distance education infrastructure by using university information management system (henceforth UBYS) (İKÇÜ, 2021).

Participants and Research Model

This study was conducted with university students from Ardahan University. There are several reasons why Ardahan University was selected for this study. First, regardless of whether there is a Covid-19 pandemic or not, Ardahan University should give importance to the development of distance education infrastructure in order not to interrupt educational activities due to adverse winter conditions. Second, , there are students from different regions of Turkey at Ardahan University who are believed to represent the university student population in Turkey.

Sample of the study was recruited from undergraduate students at Ardahan University which uses university distance education system - UBYS system. Convenience sampling method, one of the simple random sampling methods (Arıkan, 2004), is implemented to collect data and total of 598 participants participated in the study. This number was found to be sufficient for Partial Least Squares Structural Equation Modelling (PLS-SEM) analyses and recommended sample intervals (between 227-1713) according to observed and latent variables (Soper, 2021). PLS-SEM methodology provide accurate results at both high sample sizes and low sample sizes (Barclay et al., 1995; Rigdon, 2012; Hair et al., 2016; Hair et al., 2019). PLS-SEM is used with high sample sizes on research such as Yemez (2021). PLS-SEM methodology is considered suitable for this research as it enables researchers to identify changing individuals' behaviours under Covid-19 pandemic.

In this research, a TAM model consisting of perceived usefulness, perceived ease of use and intention to use variables was extended with external variables self-efficacy, innovativeness and experience.

The variables of attitude towards usage and actual usage in the original TAM model were not included to the research model. Attitude towards usage variable was not included in the research model as stated in the conceptual framework. Furthermore, the actual usage variable was not included in the research model since the users participating in the research necessarily use the existing UBYS system. Based on the existing literature, a research model is formulated as Figure 1.

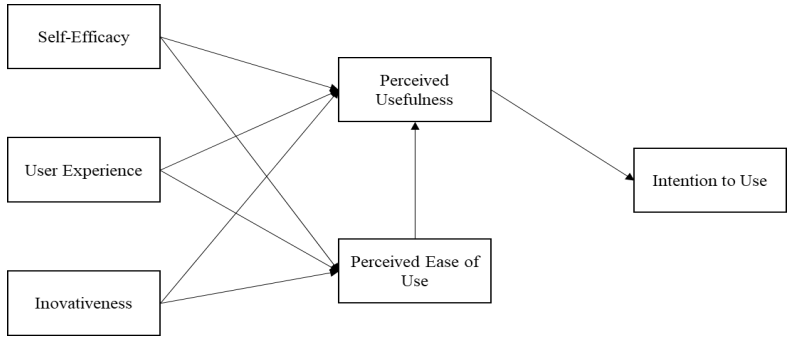


Figure 1.Research Model

Data Collection and Analysis

The scales used in the study were adapted from previously conducted scales with proven validity and reliability. The terms – perceived usefulness and perceived ease of use variables – are adopted from Davis's scale (1989) – intention of use variable – is adopted from Agarwal & Karahanna (2000), –self-efficacy and experience variables – are adopted from Abdullah et al. (2016), and finally, - innovativeness variable – is adopted from Ngafeeson and Sun (2015). Ethics committee approval (*Ardahan University Scientific Research and Publication Ethical Comittee, No:9, Date:10.06.2020*) was obtained for the scales used. A structured questionnaire is designed and developed based on the research model. It was tested with 40 randomly selected students to test structured questionnaire. The statements regarding the research variables in the model were arranged according to the 5-Likert Type ("*1-Strongly Disagree, 2-Disagree, 3-Neither Agree nor Disagree, 4-Agree, 5-Strongly Agree"*). The research also included questions to determine demographic characteristics. Data were obtained through online structured questionnaires between 19.06.2020-11.09.2020.

Structural Equation Modelling (SEM) was used to determine the effects of the variables in the research holistically. In the period when the data were collected, it can be seen that the effects of the variables in the research vary, since the participants in the research are likely to be affected by the pandemic conditions in various ways (e.g. psychological, economic, etc.). In this respect, due to the exploratory aspect of the study, the Partial Least Squares Structural Equation Modelling (PLS-SEM) analysis approach was used (Hair et al., 2016). In the study, IBM SPSS 25 statistical program was used for the analysis of demographic data and Smart PLS 3.3.3 analysis program was used to analyze the possible effects of variables.

4. Findings

Demographic Characteristics

According to the data, a total of 598 participants participated in the study, and most of the participants were women. 40.1% of the participants are between 20 and 22 years old. The majority of the participants (35.6%) are from Faculty of Humanities and Letters. Finally, it can be said that most of the participants reside in the provincial centres (46.8%). Although not with a significant difference, the participants have easy access to the internet connection (52.2%).

Validity and Reliability Analysis

Before the PLS-SEM analysis, the suitability of the variables and the indicators related to the variables to the analysis should be tested. For this reason, factor loadings, composite reliability values (CR), average variance extracted (AVE), reliability values (Cronbach Alpha) are tested for validity and reliability analysis. According to the results of the validity and reliability analyses as shown in Table 1, it is seen that (1) the factor loadings are greater than 0.7, (2) the composite reliability values (CR) are within the expected intervals (0.70-0.95), (3) the average variance extracted values (AVE) are at the required level (> 0.50), and (4) the reliability values are high (Bagozzi & Yi, 1988; Chin, 1998; Hair et al., 2016). In line with these results, it was seen that all indicators and variables provide construct validity and reliability.

Table 1. Structure Validity and Reliability Values

Factors	Items	Loadings	C. Alpha	CR	AVE
Self-Efficacy	S1	0.921	0.94	0.940	0.838
	S2	0.902			
	S3	0.923			
Experience	E1	0.893	0.93	0.930	0.817
	E2	0.898			
	E3	0.920			
Innovativeness	I1	0.853	0.86	0.864	0.679
	I2	0.791			
	I3	0.830			
Perceived Usefulness	PU1	0.880	0.94	0.945	0.851
	PU2	0.949			
	PU3	0.938			
Perceived Ease of Use	PEOU1	0.931	0.94	0.947	0.856
	PEOU2	0.920			
	PEOU3	0.924			
Behavioural Intention	BI1	0.945	0.93	0.938	0.883
	BI2	0.933			

Furthermore, the Fornell-Larcker criteria and the Heterotrait-Monotrait (HTMT) values were examined to test the discriminant validity showing that the? construct is distinct and uncorrelated with other variables (Fornell & Larcker, 1981; Hair et al., 2016; Henseler et al., 2015). In Fornell-Larcker criterion, diagonal values should be higher than other values. In HTMT values, the values should be below 0.85, while values up to 0.90 are also accepted (Franke & Sarstedt, 2019; Gold et al., 2001). Table – 2, shows that the innovativeness variable in the Fornell-Larcker Table was similar to the experience variable with a small difference, while the other variables were separated from each other. HTMT values, which is the second dissociation criterion, were examined due to similarity, and it was seen that the decomposition was achieved according to this criterion. According to some researchers, it can be said that the HTMT criterion is more inclusive (Voorhees et al., 2016). According to the results, it is possible to say that all variables in the research model provide the discrimination validity.

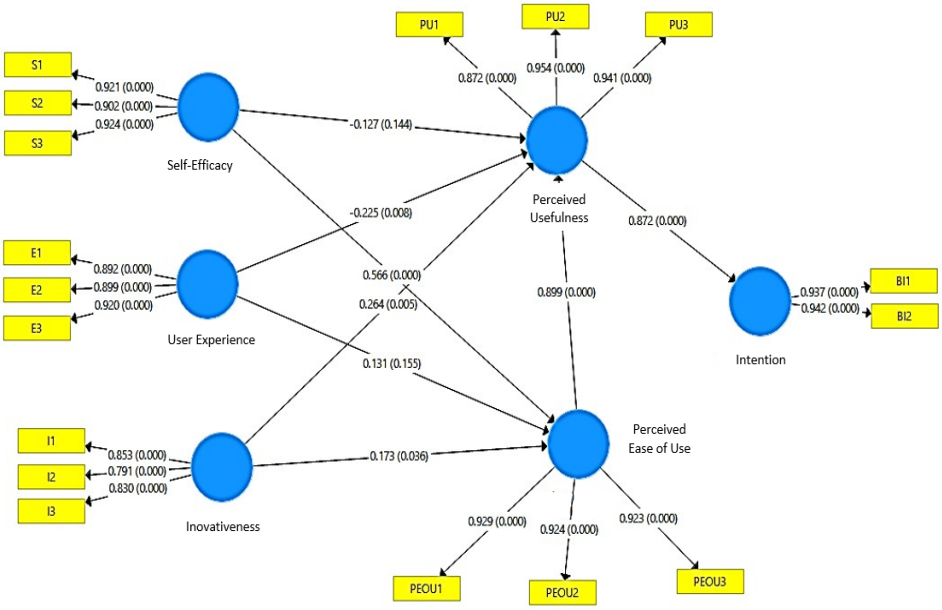
Table 2. Discriminant Validity

Variables	1	2	3	4	5	6
Fornell-Larcker Criteria						
1. Self-efficacy	0.916					
2. User Experience	0.828	0.904				
3. Innovation	0.806	0.853	0.824			
4. Perceived Usability	0.632	0.568	0.639	0.923		
5. Easy to Use Perceived	0.814	0.748	0.742	0.823	0.925	
6. Intention to Use	0.538	0.491	0.570	0.873	0.755	0.940
HTMT Criteria						
1. Self-efficacy	1					
2. User Experience	0.829	1				
3. Innovation	0.806	0.854	1			
4. Perceived Usability	0.632	0.568	0.639	1		
5. Easy to Use Perceived	0.814	0.747	0.742	0.823	1	
6. Intention to Use	0.539	0.490	0.571	0.873	0.756	1

Hypothesis Tests

Partial least squares structural equation modelling (PLS-SEM) was used to perform hypothesis tests in the study. In the analysis, the number of original samples was increased to 5000 with the derivative sampling method, and the significance of the variables in the model was tried to be tested. Prior to the analysis, attention was paid to ensure that the validity and reliability criteria were met as well as the linearity (VIF <5) and t values (t> 1.96) criteria (Hair et al., 2016). Accordingly, it was seen that VIF values (expected value: 3.19-1.00) and t values for accepted effects (2.10-36.97) were between the acceptable values. Test statistics and results regarding the hypotheses are shown in Figure 2 and Table 3.

Figure 2. Hypothesis Tests



Results of this study revealed that self-efficacy has a negative and insignificant effect on perceived usefulness (β = -0.127, p = 0.144) and a positive and significant effect (β = 0.566, p = 0.000) on perceived ease of use. It can be stated that user experience has a significant effect on perceived usefulness, but this effect resulted in the rejection of the related hypothesis due to its opposite direction (β = -0.225, p = 0.144). Moreover, findings also indicate that user experience does not have a significant effect on perceived ease of use (β = 0.131, p = 0.155). Being innovative, another independent variable, is found to have significant and positive effects on perceived usefulness (β = 0.264, p = 0.005) and perceived ease of use (β = 0.173, p = 0.036). When the effects of TAM variables are examined, it is seen that perceived ease of use has significant and positive effect on perceived usefulness (β = 0.899, p = 0.000), while perceived usefulness has significant and positive effect on the intention to use (β = 0.872, p = 0.000). Findings also revealed that 76% of the user intention, which is one of the dependent variables, is explained by perceived usefulness. Similarly, 69% of the perceived usefulness variable is explained by the perceived ease of use and being innovative variables. Finally, it was found that the perceived ease of use variable is explained by the variables of self-efficacy, user experience and being innovative with 68%. Accordingly, the H2, H5, H6, H7 and H8 hypotheses are accepted, and the H1, H3 and H4 hypotheses are rejected. According to the hypothesis test results, it can be said that the hypotheses determined in the research model are largely supported.

Table 3. Hypothesis Results

Hypotheses	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/ STDEV)	P Values
H1. Self-Efficacy-> Perceived Usefulness	-0.127	-0.131	0.087	1.461	0.144[n.s]
H2. Self-Efficacy-> Perceived Ease of Use	0.566	0.565	0.077	7.325	0.000[**]
H3. Experience-> Perceived Usefulness	-0.225	-0.228	0.085	2.653	0.008[n.s]
H4. Experience-> Perceived Ease of Use	0.131	0.129	0.092	1.423	0.155[n.s]
H5. Innovativeness-> Perceived Ease of Use	0.173	0.176	0.082	2.102	0.036[*]
H6. Innovativeness-> Perceived Usefulness	0.264	0.269	0.095	2.790	0.005[**]
H7. Perceived Ease of Use-> Perceived Usefulness	0.899	0.901	0.065	13.746	0.000[**]
H8. Perceived Usefulness-> Intention to Use	0.872	0.873	0.024	36.975	0.000[**]

*Significant at the 1% level, ** Significant at the 5% level, [n.s] Non-significant

5. Discussion

In this study, the effects of the variables of self-efficacy, experience, and being innovative on perceived usefulness and ease of use, and the effects of perceived usefulness and perceived ease of use variables on the intention of use were investigated. Since there is dearth of published work on TAM during Covid-19 pandemic, this study contributes to the literature by identifying the factors affecting the acceptance of distance education technology.

Consistent with studies in the literature, this study showed that perceived ease of use affects perceived usability and perceived usability have positive effect on intention to use technology? (e.g. Alshurideh et al., 2021, Gefen et al., 2003; S. H. Kim, 2008; Yoon et al., 2015; Kim et al., 2021; Noh et al., 2021; Al-Okaily et al., 2020; Baber, 2021; Elnagar et al., 2021; Ngafeeson & Sun, 2015; Sukendro et al., 2020; Utami, 2021). Thus, students consider that distance learning systems are user friendly. In line with the expectations, this situation has positive impacts on intention of use (Baber, 2021; J. Jang et al., 2021; Sprenger & Schwaninger, 2021). Although technological opportunities provide significant convenience under the conditions of the Covid-19 pandemic, the results show that the participants found the use of distant education technology easy and useful. This suggests that the current distance education system is evaluated as sufficient to provide the minimum requirements for distance education. The current technology may have been seen sufficient by the users. Risks arising from the pandemic conditions and the concerns of being deprived of education as there is no alternative to the current system can be cited as main reasons for this situation.

It is determined that the self-efficacy variable in the model has no effect on perceived usefulness, but has positive effect on perceived ease of use. In general, the usefulness of the distance education system can be explained by the fact that it may not be directly associated with individual motivations, but with the motivation to succeed for use. Indeed, some studies in the literature support this situation (e.g. Holden & Rada, 2011; Kwon et al., 2007; Syahruddin et al., 2021; Talsma et al., 2021; Patricia Aguilera-Hermida, 2020). The reason why self-efficacy does not have a direct effect on perceived usefulness may be that the distance education system was being used for the first time at the university when the data were collected. Furthermore, this result may be related to the fact that pandemic-related concerns affect individuals' self-efficacy perceptions and decrease their motivation to succeed (Arora et al., 2021). However, this requires further much detailed research. Furthermore, the self-efficacy perceptions of individuals who use systems from different settlements (village, city, etc.) may have affected their perceptions of the system's usefulness and ease of use (Syahruddin et al., 2021). It was observed that self-efficacy has different effects on individual behaviours during the Covid-19 period (Aguilera-Hermida et al., 2021; Pressley & Ha, 2021; Talsma et al., 2021; Tsai et al., 2021).

The results of this study show that the user experience in the research model has no positive and significant effect on perceived usefulness and perceived ease of use. This situation, as a result of the experience of individuals who have experienced similar and/or close distance education systems, may have led to the perception of usefulness and ease of use for existing distance education systems in a meaningless or opposite way. This result is in contradiction with some studies that were used in formulating this study's hypothesis (e.g. Abdullah et al., 2016; Chang et al., 2017; Hwang, 2014; Jackson et al., 2013). On the other hand, our findings corroborate the findings of a great deal of earlier studies (e.g. Horst et al., 2007; Syahruddin et al., 2021). This may be due to the fact that individuals who have used distance education systems before have used better systems compared to the current system. It is possible that individuals who use better systems may not consider a system that has been introduced for the first time as useful. Similarly, inexperienced individuals who have never used distance education systems before may not find distance education systems useful and easy.

Finally, it was observed that innovativeness has significant positive effects on perceived usefulness and perceived ease of use. This situation may stem from the predispositions of the individuals to use these technologies that are used in the field for the first time.. Users are likely to use information technologies more easily and evaluate the relevant elements as useful due to their innovative characteristic. As a matter of fact, some studies in the literature support our findings (e.g. Chen, 2019; Hwang, 2014; Mokhtar et al., 2018; Ngafeeson & Sun, 2015; Al-Maroof et al., 2021; Rini & Khasanah, 2021). A possible explanation for this might be that individual innovativeness might have positively affected technology acceptance and adoption during the pandemic (Kim et al., 2021). Therefore, during the

Covid-19 period, innovative individuals have adapted to innovations related to distance education more quickly and easily.

6. Implications and Limitations

Due to the Covid-19 pandemic, universities had to run their education programs with distance education systems instead of traditional face to face education. In this study, to determine the factors affecting university students' intention to use distance education systems, a TAM model extended with self-efficacy, innovativeness and user experience variables was developed. According to the results of the research, it has been observed that the TAM model still maintains its reliability, and there are some differences in the effects of the external variables.

Although the current results are generally compatible with the reference sources in determining the relationships between variables, it has been determined that some effects do not occur as expected (e.g. Cicha et al., 2021; Fauzi et al., 2021; Sidi Mohamed, 2021). It is also worth considering that this situation may have resulted from the unknown effects of the pandemic period. As a matter of fact, the lack of a significant effect of self-efficacy on perceived usefulness may stem from the negative impact of self-efficacy, which is considered to be the motivation to use some IT systems during the pandemic period. A similar situation can be attributed to the lack of effects of user experience on perceived usefulness and ease of use variables.

Even if the user has close / similar experiences to with the information systems such as distance education systems, even if it is expected to have positive effects on the use and adoption of existing systems, the experience variable may might also be have affected during the pandemic period, and systems that do not offer other usage alternatives due to compulsory reasons may require a completely new experience . It is possible that self-efficacy and user experience will be adversely affected during the pandemic process, and there is dire need for further studies on the subject in this field and similar pandemic process. User innovativeness is an influential external variable in technology adoption and it has not changed under Covid-19 conditions.

Finally, this study has various research limitations. First, Ardahan University established a new IT based distance teaching infrastructure and students can be considered inexperienced user of this system. Thus, there might be different user experiences based on students' individual capacities (Kobul, 2022). In addition, this new infrastructure has also lecturers who have different individual capacity for content creations which can cause different student experiences. On the other hand, this study can be extended to observe changes in system performance and user experiences over time. Moreover, further studies in different countries and different distance learning infrastructures would be of high value to this growing are of research.

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