virtual based learning

by Jun Surjanti

Submission date: 22-Jan-2022 12:29PM (UTC+0700)
Submission ID: 1745849116
File name: 12421_Surjanti_2020_E_R.pdf (768.89K)
Word count: 7409
Character count: 39556

International Journal of Innovation, Creativity and Change. www.ijicc.net
Volume 12, Issue 4, 2020

Virtual-Based Learning Attitude: The Mediator of Individual Factors on Intention to Use

Jun Surjanti[a], Norida Canda Sakti[b], Dhiah Fitrayati[c], [a,b,c]Universitas Negeri Surabaya, Email: [a]junsurjanti@unesa.ac.id, [b]noridacanda@unesa.ac.id, [c]dhiahfitrayati@unesa.ac.id

The industrial revolution development 4.0 requires universities to implement Virtual-based Learning (VL). Hence, the Intention to Use Virtual-based Learning (IUVL) on college students needs to be examined as it is possibly affected by Resistance to Change (RCVL), Perceived Usefulness (PUVL), Perceived Ease of Use (PEUVL), and Self-Efficacy (SEVL). Meanwhile, the Attitude to Use Virtual-based Learning (ATVL) in Economics learning possibly serves as a mediator to build the Intention to Use. This study examines the role of Attitude toward Virtual-based Learning in Economics learning especially for the individual dimension of the Intention to Use/Adopt Virtual-based Learning in classroom activity. This study is quantitative research with Economics department students participating in Virtual-based Learning program as the population. The respondents were 169 students who were determined through Simple Random Sampling. Data were obtained using questionnaires and were analysed using Structural Equation Modelling (SEM) with AMOS as the analysis method. The results indicate that Resistance to Change, Perceived Usefulness, Perceived Ease of Use, and Self-Efficacy significantly affected the Attitude to Use Virtual-based Learning. Furthermore, the Attitude toward Virtual-based Learning is provably able in mediating the relationship of Perceived Usefulness, Perceived Ease of Use, and Self-Efficacy on the Intention to Use the Virtual-based Learning. However, it cannot mediate the relationship of the Resistances to Change to the Intention to Use.

Key words: *Intention to Use (IUVL), Resistance to Change (RCVL), Perceived Usefulness (PUVL), Perceived Ease of Use (PEUVL), Self-Efficacy (SEVL), Attitude to Use (ATVL).*

Introduction

Nowadays, the e-learning development in universities grows rapidly. Many universities design a learning web referring to the importance of the current educational program. This is in line with the industrial revolution 4.0 or the fourth world industrial revolution stage which is based on real life. Similarly, the educational world takes its part in this advanced condition where everything leads to information technology, so it makes the educational world become borderless where most of the learning process can access unlimited data from the internet and digital technology. To employ science and technology, the educational system needs support. The Ministry of Research, Technology, and Higher Education stated that the industrial revolution 4.0 challenges require immediate and appropriate responses from all related parties in order to improve the competitiveness of Indonesia in global competition. An important point in higher education especially related to e-learning is the need to prepare more innovative learning systems such as adjusting the learning curriculum and increasing students' skills, especially in Data Information Technology, Operational Technology, Internet of Things, Big Data Analysis, physical integration, and digital data. There is also the need to improve individual skills (as objects) to produce competitive and skilled graduates, especially in data literacy, technological literacy, and human literacy (Ristekdikti, 2018). Furthermore, both trans-disciplinary knowledge and study programs need to be further developed. By developing Cyber University programs such as distance learning lecture systems, universities reduce the face-to-face class. This program is expected to solve the problem for those who live in remote areas and who have hardly any exposure to higher education.

This study implicates how e-mobile can be utilised as learning media and method optimally. According to Surjanti et.al. (2018), m-learning (especially Virtual Learning) has significant and positive effect in learning activities. This is in line with Han & Shin (2016) who found the use of e-mobile in Learning Management System (LMS) positively influences academic achievement in universities. Supported by Makoe (2012), he stated that cellular technology has a major impact on university's pedagogy. Kenny, Neste-kenny, Park, Burton, & Meiers (2009) proved that institutions and students are ready to engage in cellular learning. In addition, Hilao (2017) stated that cell phone technology significantly impacts the students' lives. Quinn (n.d.) expected the synergy formed by both learning concept mobile devices enabling to create m-learning, considering that this activity involve students intellectually and emotionally in completing the tasks (M. Wang, Shen, Novak, & Pan, 2009). Moreover, Ferdousi, Carolina, & Levy (2010) mentioned that e-learning becomes an increasingly important part of university institutions. (Matandare, 2018).

Muafi (2015) stated that the innovation complexity includes the complexity of ideas related to the ease of understanding. Despite all the positiveness, technology adoption behaviour produces negative behaviours as well. Sugandini, et al. (2018) argued that there are pros and

cons regarding the use of technology-based learning. Waely & Aburezeq (2013) found some challenges and weaknesses in learning using blogs. Although Zhang et al.(2018) mentioned that Virtual Reality (VR) proved useful in various fields, many disadvantages in using VR prevent it from being widely used in the educational area.

Human social behaviour is guided by belief that generates positive and negative behaviours (Moss, 2009). Ajzen (1991) cited by Hussein & Zolait (2014) defined the theory of planned behaviour in the decision making process. There are three constructs determining user intentions, namely attitudes, subject norms, and behaviour control. In addition, Press (2008) explained that Broadband technology also discusses behaviour, namely attitude inclusion, normative, control, behavioural adoption, and usage behavior. Silimarly, a study conducted in Korea found that many universities recommend using m-learning (Park, Nam, & Cha, 2012). From their study, Park, Nam, & Cha agreed that technology adoption is followed by both acceptance and rejection. The success in adopting the modern education system requires better understanding and more values including emotional, social, cognitive, and academic development (Orientations, Beliefs, Students, & Learning, 2017). Other studies such as Fokides & Author (2017) who assessed the intention of practical teaching using Multi-User 3D Virtual Environment (MUVE) and Alnabhan & Aljaraideh (2014) who found the behavioural intention in collaborative m-learning service further prove that using technology adaptation becomes increasingly rising.

Ferdousi et al. (2010) found the resistance model toward change, perceived value from e-learning system, self-efficacy of computer, and attitude toward e-learning. This theoretical model can predict instructors' intention to use e-learning systems. Tang, Tang, & Chiang (2014) stated that blog-based learning can effectively increase the intention of continuous learning. Huang & Chiu (2016) found the positive correlation of attitude, value, and perception on knowledge enrichment and improvement of individual thinking. While Şahİn & Mcilroy (2014) found the 11 determinant factors of the acceptance and use of individual technology, namely perceived benefits, perceived ease of use, attitudes toward use, subjective norms, self-efficacy, facilitating conditions, technological complexity, anxiety, perceived enjoyment, compatibility, and behavioural intentions. Technology, Tam, & Study (2010) found that awareness of the benefits of digital library systems, social influence, comported self-efficacy and self-efficacy, perceived usefulness (PU), and perceived ease of use (PEOU) have significant effect on attitude to use.

This study referred to Fokides & Author (2017) and Ferdousi et al. (2010) especially their perception of individual factors of VL to be adopted in Economics learning at the Universitas Negeri Surabaya. This study supports the study conducted by Azjen (1991) in (Ferreira, Raposo, Rodrigues, Dinis, & Paço, 2012) on the theory of planned behaviour (TPB) which proves that attitude can be a mediator of the intention to use.

Literature Review

Virtual Learning Technology (VL)

Kavanagh, Luxton-Reilly, Wüensche, & Plimmer (2017) stated that virtual reality has existed in education for more than fifty years. The application of virtual reality (VR) system was first appeared in 1966. Another study on Multi-User 3D Virtual Environment (MUVE) was provably able to provide qualitative learning experience similar to those found in the real world (Parson & Bignell, 2017). The MUVE offers learning that is more cost effective and fun. In addition it can also be used to investigate the implementation of Problem-based Learning (PBL) tasks. The depth of learning has the potential to increase when traditional methods are accompanied by technology, and it seems to be an effective tool to help learning. While in his study, Cliffe (2017) demonstrates the benefits of virtual learning in geo-science by providing more inclusive learning that possibly builds students' skills and confidence and increasing involvement in the topics being studied. However, VL has challenges in its application such as how to create a valuable independent educational tool. F. Wang (2018) stated that VR has certain practical significance in improving the modes of computer distance teaching and promoting the smooth development of computer distance teaching.

Intention to Use Virtual-Based Learning (IU-VL)

The word 'adopts' in English is the same as 'adopt', equal with 'use'. In this study, the term 'Intention to Use the Virtual-based Learning' (IUVL)' is determined to depict how students' are using/adopting the virtual-based learning. Ajzen (2001) in (Ferdousi et al., 2010) stated that intention plays an important role in guiding human behaviour. The intention encourages a deeper empirical study on factors influenced. According to Ferdousi et al. (2010), there are four intentions to use virtual-based learning, namely Resistance to Change (RC), Perceived Value of E-Learning Systems (PV), Computer Self-Efficacy (CSE), and Attitude toward E-Learning Systems (ATES). While Vilkonis, Bakanovienė, & Turskienė (2013) explained that the use of e-learning, m-learning, and t-learning requires a readiness to participate in the lifelong learning process. However, in their article, Sugandini et al. (2018) stated that not all technological innovations can be easily adopted by users. Further, Fokides & Author (2017); Alnabhan & Aljaraideh (2014); and Ferdousi et al. (2010) found the theoretical models for behavioural intentions influenced by the use of e-learning.

Huang & Chiu (2016) found positive correlation of attitude, value, and perception intentions about knowledge enrichment and improvement of their own thinking skills as a result of participating in GreenMech. The finding also shows that this perceived advantage positively influences the intention to participate in future contests. Şahİn & Mcilroy (2014) investigated the determinants of the acceptance and use of individual technology, which have 11 factors:

perceived benefits, perceived ease of use, attitudes toward use, subjective norms, self-efficacy, facilitating conditions, technological complexity, anxiety, perceived enjoyment, compatibility, and behavioural intentions. This description shows that at the end this adoption intention determines whether or not a technology is adopted.

Behavioural intention in this study is an indicator of factors that influence desirable behaviour in the utilization of virtual-based learning. This study combines behavioural measures of intention to use virtual-based learning (IUVL) which developed from (Ferdousi et al., 2010) and (Fokides & Author, 2017) Moreover, this study is expected to solidify the use of virtual-based learning for learning, considering the many pros and cons opinions of the use of technology-based learning.

Resistance to Change to Virtual-Based Learning (RC-VL)

Şahİn & Mcilroy (2014) stated that the acceptance of teachers toward technology is rather limited. Sugandini, et al. (2018) added that not all technological innovations can be easily adopted by users. The results are expected to reduce the bias of pro innovation that exists in the adoption of previous research innovations. Adoption of rejection is an active process in which an individual decides to avoid or fight innovation. Ferdousi et al.(2010) adopted from Hultman (2003) defined resistance as "a state of mind that reflects an aversion or acceptance of changes in the way people think or behave" (p. 693). Ferdousi et al. (2010) discovered that their resistance model to change can predict instructors' intention to use e-learning systems. This study uses RC measurements developed from the study from Şahİn & Mcilroy (2014) who stated that the acceptance of teacher technology is somewhat assumed to be very relevant to this study, which is applied to students' opinion about virtual-based learning in lectures. This study refers that resistance to change is an acceptance of changes in the way people think or behave (Ferdousi et al., 2010). Resistance to Change (RC) is the reluctance to use virtual-based learning on economic learning.

Perceived Usefulness of Virtual-Based Learning

Ifinedo (2009) examined the antecedents of the continuous intention in the use of technology, and the results offer the following insight: when computer anxiety is low, students can use the system without much difficulty, and will likely continue to use CMS in the future. Likewise, students will continue the tool as long as they find it easy to navigate. Perhaps due to contextual factors, the data do not support the relationship between benefits and perceived use. The researcher found that some researchers differentiated perceived usefulness (PU) and perceived ease of use (PEU) in the use of technology, namely from the perspective of TAM (Allameh & Abbasi, 2010); D. Wang, Xu, & Chuan (2015); (Lee et al., 2013). The implications of these findings are discussed and suggestions for future research are presented. The results of this

study is strengthened by Park et al.(2012); Fokides & Author (2017); Alnabhan & Aljaraideh (2014); Ferdousi et al. (2010); Şahİn & Mcilroy(2014).Technology et al.(2010) found a model which stated that the use of e-learning intentions affects e-learning behavioural intention. This study uses the measurement of the value of virtual-based learning usage developed from the research from Fokides& Author(2017). Perceived usefulness refers to the extent to which a person believes that using this special tool will increase their productivity and performance (Davis et al., 1989).

Perceived Ease of Use of Virtual-Based Learning (PEU-VL)

Park et al.(2012) stated that perception of ease affects tousem-learning learning intentions. Fokides& Author (2017); Ferdousi et al. (2010); (Şahİn & Mcilroy, 2014); (Allameh & Abbasi, 2010) also tested the behavioural intention by involving the perception of ease of use. Alnabhan & Aljaraideh (2014)also showed behavioural intention to use collaborative e-learning affected by perceived ease of use. However, Ferdousi et al. (2010) did not test the ease of use. This study will use the measurement of ease of use of virtual-based learning from Fokides & Author(2017) who stated that perceived ease of use refers to the level at which a person believes that the use of a given tool will be free of effort (Davis et al., 1989)

Self-Efficacy toward Virtual-Based Learning (SE-VL)

Razzaq, Samiha, & Anshari (n.d.) understood that students' self-efficacy is an important factor to provide an effective way to support mobile learning activities. However, Lynch (2004) stated that there are 5 (five) factors of internet usage of self-efficacy, it accounts for 7 percent of the variance for learning and performance. Therefore, it is important to investigate the unique characteristics from these various mixed learning models using a mixture of technologies. The study from Ferdousi et al.(2010); Lee et al.(2013); Technology et al. (2010) found a technology acceptance model for e-learning systems in the organisations and Ferdousi et al. (2010) developed a theoretical model that can predict instructors' intention to use e-learning systems. Wang, et al. (2015); Park et al., 2012); (Fokides, 2017); Alnabhan & Aljaraideh (2014) explained that the Technology Acceptance Model showed that self-efficacy in computers (CSE) affects sustainable intentions. Likewise, Higgins, Locke, & James (n.d.) added that in self-efficacy theory, self-efficacy beliefs are the most important determinant of behaviour. All researchers refer to the concept of self-efficacy. According to Bandura (1986), Resistance to Change (RCVL), Perceived Usefulness (PUVL), Self-Efficacy (SEVL), Attitude toward Using Virtual-Based Learning (ATVL) in economic learning, and Behavioural Intention Use (BIUVL) on economic learning. This study uses the arguments from Fokides & Author (2017) who stated that self-efficacy is an assessment of someone's ability to perform certain tasks in accordance with the desired goals (Bandura, 1986). This study develops the measurement of self-efficacy in the use of virtual-based learning.

Attitude toward Using Virtual-Based Learning (AT-VL)

Attitude is a key construction that seems to influence an individual's intention to use IT in an organisation (Bhattacherjee & Premkumar, 2004). He argues that attitude can predict behavioural intentions that affect individual behaviour on the use of technology, though the criteria are sufficient. Individual attitudes are assumed to affect behavioural intentions to use IT, which in turn affects the actual use of IT. Park et al. (2012) stated that attitude affects learning intention, and this argument is supported by Fokides & Author (2017); Ferdousi et al. (2010); (Şahİn & Mcilroy, 2014). Technology et al. (2010) also tested the intention of practical teachers to use virtual environments by involving attitudes and is expected to be able to predict instructors' intention to use e-learning system. This study will be part of the attitude that mediates the behaviour of the intention to use virtual-based learning. Fokides & Author (2017) stated that attitude is a very influential factor, and it is someone's perception to like or dislike using certain technological tools, just like opinion (Ajzen&Fishbein, 1977). This study will develop the implications on the attitude of using virtual-based learning as described.

Hypothesis

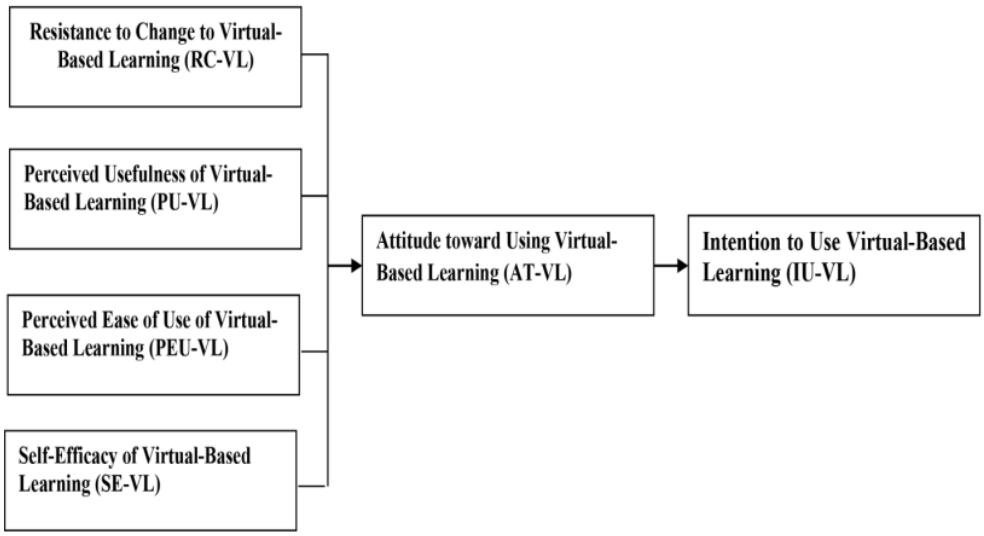
1. RC-VL has a significant effect on AT-VL
2. PU-VL has a significant effect onAT-VL
3. PEU-VLhas a significant effect onAT-VL
4. SE-VL has a significant effect onAT-VL
5. AT-VL has a significant effect onIU-VL
6. AT-VL mediates the relationship between RC-VLtowardIU-VL
7. AT-VL mediates the relationship betweenPU-VL towardIU-VL
8. AT-VL mediates the relationship betweenPE-VL towardIU-VL
9. AT-VL mediates the relationship betweenSE-VL towardIU-VL

Research Method

This study uses a quantitative approach with explanatory research type. Explanatory research intends to examine factors that influence the intention to adopt virtual-based learning (IUVL) with independent variables which consists of Resistance to Change in Virtual-based Learning (RCVL), Perceived Usefulness of Virtual-based Learning (PUVL), Perceived Ease of Use (PEUVL), and Self-Efficacy of Virtual-based Learning (SEVL), and mediation variable namely Attitude Toward Using in Virtual-based Learning (ATUVL). The population of this study consisted of students from 2015, 2016, 2017, who had programmed the courses in Microeconomic Theory Introduction, amounting to 307 people. The sample is then taken by Simple Random Sampling method. The number of samples used is determined through the Kritje Table with a 5% error margin for a population of 300, which is 169. Considering that

the class of 2015 has passed the graduation process, the population is reduced by 83 people, so that the population is currently only 217 people. Only 72 questionnaires were returned and this become the limitations of this study. The data is obtained through questionnaire and observation sheets. The questionnaire in this study was used to explore the data for Resistance to Change (RCVL) (Ferdousi et al., 2010; Fokides & Author, 2017), Perceived Usefulness (5 items), Perceived Ease of Use (5 items), Self-Efficacy (4 items) (Fokides & Author, 2017), Attitude toward Using (6 items) (Ferdousi et al., 2010; Fokides & Author, 2017).The technique of this study uses Structural Equation Modelling (SEM) using AMOS 24 software.

Figure 1 - Research Model Design



Results and Discussion

Respondents' Characteristics

The data of respondents' characteristics in this study is based on 3 aspects, including gender, ages, and year of class. The detailed characteristics of the respondents' data are as follows:

Table 1: Respondents' Characteristic

Gender	**Frequency**	**Percentage**
Male	77	45.5%
Female	92	54.4%
Ages		
19-30 years old	75	44.3%
31-40 years old	44	26%
41-50 years old	50	29.7%
Year of Class		
2015	55	32.5%
2016	56	33.2%
2017	57	33.8%
Total Respondent	**169**	**100%**

Normality Test and Outlier

Normality test is conducted to test whether the data is distributed normally. The data is said to be normal if the CR value is within the range of +/- 2.58. From the data analysis results, it is found that there is no CR that exceeds +/- 2.58, so that the data is normal. Whereas, the outlier test is conducted using the Mahalanobis Distance Test benchmarks that were calculated using the chi-square value at the degree of freedom of 34 indicators at the level of $p < 0.001$ using the formula of X2 (34;0,001) = 56,06. The result of the outlier test can be seen in the table below:

Table 2: Outlier Test

Observation number	Mahalanobis d-squared	p1	p2
78	56.809	.008	.759
102	56.302	.009	.475
135	55.140	.012	.348
132	55.043	.013	.167
140	53.909	.016	.145

In the outlier test table, it is found that there are values greater than 54.06, namely data no. 78, 102, 135, and 132. After the data is removed, it can be concluded that there are no outliers.

Confirmatory Analysis

In confirmatory analysis, two aspects of the model testing are carried out, which is the loading factor test and the goodness of fit test. Loading factor is said to be good if it has a value greater

than 0.5, while goodness of fit model will be met if several criteria are met, which includes Chi-Square, RMSEA, GFI, CFI, and TLI. From the loading factor test, it is found that there are 3 indicators that are still below 0.5, namely the PE6 indicator, so it must be removed from the research model. After the indicator that is still below 0.5 is removed, the value of loading factor in this study can be said to be valid and it can be concluded that all indicators can explain the variables in this study. After the analysis of goodness of fit is done, it is found the value of goodness of fit as follows:

Table 3: Early Stage of Goodness of Fit Test

Goodness of Fit	Criteria	Cut-off value	Information
Chi-Square (X^2)	Expected to be small	923.057	Marginal Fit
Significance			Fit
RMSEA	≤ 0.08	0.069	Not Fit
GFI	≥ 0.90	0.759	Marginal Fit
TLI	≥ 0.90	0.844	Marginal Fit
CFI	≥ 0.90	0.858	

From the analysis result of goodness of fit, the criteria that has not met are from GFI and TLI, while CFI and Chi Square are still marginal fit. Therefore, it needs to be modified based on modification index. After the modification is done, the results of goodness of fit test have meet all the criteria of goodness of fit. The goodness of fit test results are as follows:

Figure 2: Goodness of Fit Test

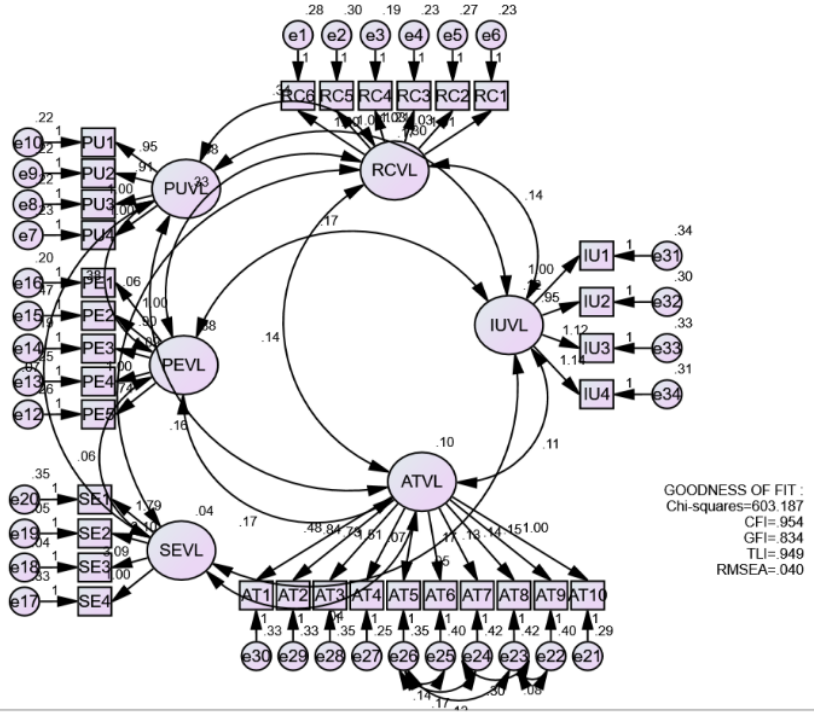


Table 4: Final Stage of Goodness of Fit

Goodness of Fit	Criteria	Cut-off value	Information
Chi-Square (X^2)	Expected to be small	603.187	Fit
Significance			Fit
RMSEA	≤ 0.08	0.040	Marginal Fit
GFI	≥ 0.90	0.834	Fit
TLI	≥ 0.90	0.949	Fit
CFI	≥ 0.90	0.954	

Reliability Test

Reliability construct is considered good if the value is > 0.7 and the variance extracted value is> 0.5. The results of reliability test in this study is shown in this table below:

Table 5: Reliability Test

Variable	Indicator	Standard Loading	Standard Loading²	Measurement Error	Construct Reliability	Variance Extracted
RCVL	RC6	0.8	0.6	0.4	0.8	0.4
	RC5	0.7	0.5	0.5		
	RC4	0.6	0.3	0.7		
	RC3	0.7	0.5	0.5		
	RC2	0.6	0.4	0.6		
	RC1	0.5	0.2	0.8		
PUVL	PU4	0.7	0.5	0.5	0.7	0.4
	PU3	0.5	0.3	0.7		
	PU2	0.7	0.4	0.6		
	PU1	0.6	0.4	0.6		
PEUVL	PE5	0.6	0.3	0.7	0.7	0.4
	PE4	0.6	0.3	0.7		
	PE3	0.6	0.4	0.6		
	PE2	0.6	0.4	0.6		
	PE1	0.6	0.3	0.7		
SEVL	SE4	0.6	0.4	0.6	0.8	0.5
	SE3	0.8	0.7	0.3		
	SE2	0.5	0.2	0.8		
	SE1	0.9	0.7	0.3		
ATVL	AT10	0.7	0.5	0.5	0.9	0.5
	AT9	0.8	0.6	0.4		
	AT8	0.7	0.5	0.5		
	AT7	0.7	0.5	0.5		
	AT6	0.7	0.4	0.6		
	AT5	0.6	0.4	0.6		
	AT4	0.7	0.5	0.5		
	AT3	0.7	0.5	0.5		
	AT2	0.6	0.3	0.7		
	AT1	0.7	0.5	0.5		
IUVL	IU1	0.7	0.5	0.5	0.8	0.6
	IU2	0.9	0.8	0.2		
	IU3	0.9	0.8	0.2		
	IU4	0.5	0.3	0.7		

From the table above, it is known that the construct reliability of all variables already shows ≥ 0.7. As for the variance extracted in this study, each variable already has a value above 0.5,

except for RCVL and PUCL which are still worth 0.4, but according to Hatcher in Longino (2007), variance extracted test is conservative, and reliability is acceptable even if the variance extracted value is less than0.50. Thus, it can be concluded that the questionnaire used in this study is said to be reliable.

Hypothesis Test

The next analysis is Structural Equation Modelling (SEM) in full model to test the hypotheses developed in this study. The results of regression weight test in this study are as follows:

Figure 3: Regression Weight Test

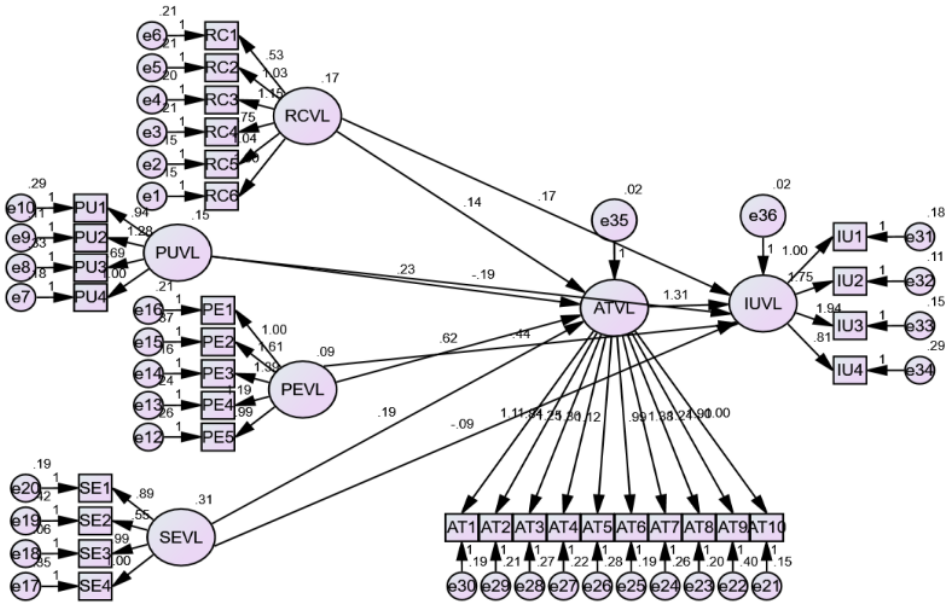


Table 6: Hypothesis Test

			Estimate	S.E.	C.R.	P	Label
ATVL	<---	RCVL	.138	.051	2.726	.006	
ATVL	<---	PUVL	.232	.060	3.846	***	
ATVL	<---	PEUVL	.617	.122	5.075	***	
ATVL	<---	SEVL	.191	.043	4.490	***	
IUVL	<---	ATVL	1.305	.294	4.445	***	

In order to see that the hypothesis is accepted or rejected, it can be done by looking at the value of Critical Ratio (CR) and the probability (P) value from the results of data processing. If the test results show a CR value above 1.96 and P value below 0.05/5%, then the research hypotheses that is proposed is accepted. The research hypothesis testing will be discussed in stages according to the hypothesis that has been proposed. In this study, there are 9 hypotheses that are proposed, and the discussion will be elaborated as follows:

H1: RCVL has a significant effect on ATVL

Based on the data processing, it is known that the CR value is 2,726 and the P value is 0.006. These results show that the CR value is above 1.96 and the P value is below 0.05. Therefore, it can be concluded that there is a significant effect of RCVL on ATVL.

H2: PUVL has a significant effect on ATVL

Based on the data processing, it is known that the CR value is 3.846 and the P value is0.000. These results show that the CR value is above 1.96 and the P value is below 0.05. Therefore, it can be concluded that there is a significant effect of PUVL on ATVL

H3: PEUVL has a significant effect on ATVL

Based on the data processing, it is known that the CR value is 5.075 and the P value is 0.000. These results show that the CR value is above 1.96 and the P value is below 0.05. Therefore, it can be concluded that there is a significant effect of PEUVL on ATVL

H4: SEVL has a significant effect on ATVL

Based on the data processing, it is known that the CR value is 4.490 and the P value is 0.000. These results show that the CR value is above 1.96 and the P value is below 0.05. Therefore, it can be concluded that there is a significant effect of SEVL on ATVL

H5: ATVL has a significant effect on IUVL

Based on the data processing, it is known that the CR value is 4.445 and the P value is 0.000. These results show that the CR value is above 1.96 and the P value is below 0.05. Therefore, it can be concluded that there is a significant effect of ATVL on IUVL.

Mediation Test

The mediation test is seen through the indirect effect between variables. The analysis results of the indirect effect are shown in the table as follows:

Table 7: The Effect of Mediation Variable

	SEVL	PEUVL	PUVL	RCVL	ATVL	IUVL
ATVL	...	...	...	...	...	...
IUVL	.019	.012	.035	.139	...	...

This table shows the significance of the effect of RCVL, PUVL, PEUVL and SEVL on IUVL mediated by ATVL. Whereas, the magnitude of the effect given to the variable is shown in the following table:

Table 8: Magnitude of Indirect Effect

	SEVL	PEUVL	PUVL	RCVL	ATVL	IUVL
ATVL	.000	.000	.000	.000	.000	.000
IUVL	.432	.767	.370	.231	.000	.000

From the table above, it can be concluded that:

H6: ATVL can mediate the relationship between RCVL and IUVL

Based on the data processing, it is found that the relationship value of RCVL on IUVL mediated by ATVL has the significance value of 0.139, so it can be said that it is insignificant. Whereas, the magnitude of the relationship between RCVL on IUVL mediated by ATVL is 0.231.

H7: ATVL can mediate the relationship between PUVL and IUVL

Based on the data processing, it is found that the relationship value of PUVL on IUVL mediated by ATVL has the significance value of 0.035, so it can be said that it is significant. Whereas, the magnitude of the relationship between PUVL on IUVL mediated by ATVL is 0.370.

H8: ATVL can mediate the relationship between PEUVL and IUVL

Based on the data processing, it is found that the relationship value of PEUVL on IUVL mediated by ATVL has the significance value of 0.012 so it can be said that it is significant. Whereas, the magnitude of the relationship between PEUVL on IUVL mediated by ATVL is 0.767.

H9: ATVL can mediate the relationship between SEVL and IUVL

Based on the data processing, it is found that the relationship value of SEVL on IUVL mediated by ATVL has the significance value of 0.019 so it can be said that it is significant. Whereas, the magnitude of the relationship between SEVL on IUVL mediated by ATVL is 0.432.

Discussion

Higher education or university has a major role in improving the quality of the nation's generation. Improving the learning system is an important topic to be discussed and given special attention, especially by the government and managers of higher education or university. One of the important factors to improve the quality of education nowadays is technology. Several prior researches stated that cellular technology has a major impact on pedagogy in universities (Han & Shin, 2016; Makoe, 2012). Kenny, Neste-kenny, Park, Burton, & Meiers (2009) showed the readiness of institutions and students in cellular learning. Hilao, (2017) added that cell phone technology that has a major impact on students' lives in the digital age can offer a new type of learning. Quinn (n.d.) expected that the learning concept can synergise with mobile devices to create m-learning. It is because m-learning activities can involve students more intellectually and emotionally in their learning tasks (M. Wang et al., 2009).

The results of this study show that Resistance to Change Virtual Learning (RTVL) has a significant effect on Attitude toward Using Virtual-based Learning (ATVL). This supports previous result conducted by Ferdousi et al. (2010) and Şahİn & Mcilroy (2014). From these results, it can be known that higher education or universities need to increase Resistance to Change of Virtual-based Learning (RTVL) in order to build the attitude of using Virtual-based Learning (IUVL).

The results of this study also show that Perceived Usefulness of Virtual Learning (PUVL) has a significant effect on the Attitude toward Using Virtual-based Learning (ATVL). This study supports the previous research conducted by Park et al., (2012); Fokides & Author (2017); Alnabhan & Aljaraideh (2014); Ferdousi et al. (2010); (Şahİn & Mcilroy, 2014); (Allameh & Abbasi, 2010)who found the model which stated that the use of e-learning affects the behavioural intention of e-learning.

On the other hand, this study also shows the effect from Perceived Ease of Use of Virtual-based Learning (PUEVL). This result support the study carried out by Fokides & Author (2017); Ferdousi et al. (2010); (Şahİn & Mcilroy, 2014); (Allameh & Abbasi, 2010); who also examine intention behaviour by involving perceived ease of use. Alnabhan & Aljaraideh (2014) also showed that the behavioural intention of using collaborative m-learning service is influenced by perceived ease of use. However, Ferdousi et al. (2010) did not test the ease of use of the e-

learning. This study uses the measurement of ease of use of virtual learning from the study conducted by Fokides & Author(2017) who stated that perceived ease of use refers to the level in which someone believes that the use of tool that is given will be free from any efforts (Davis et al., 1989).

Moreover, this study proves that Self-Efficacy of Virtual-based Learning (SEVL) has a significant effect on Attitude Toward Using Virtual-based Learning (ATVL). This result supports the previous study conducted by Razzaq, Samiha, & Anshari (n.d.) that understanding students' self-efficacy is an important factor to provide an effective way in supporting mobile learning activities. The study from Ferdousi et al. (2010); Lee et al. (2013); Technology et al. (2010) found a technology acceptance model for e-learning system in the organisation and Ferdousi et al. (2010) developed a theoretical model that can predict instructors' intention to use an e-learning system. D. Wang, Xu, & Chuan (2015); Park et al., 2012); (Fokides, 2017); Alnabhan & Aljaraideh (2014) in Technology Acceptance Model (TAM) stated that computer self-efficacy affects the intention continuously. Likewise, Higgins, Locke, & James (n.d.) stated that self-efficacy theory is the most important determinant factor of behaviour.

The results of this study also showed that Attitude Toward Using Virtual Learning (ATVL) has a significant effect on the Intention to Use Virtual-based Learning (IUVL). Park et al.(2012) stated that attitude affects learning intention, and it is supported by Fokides & Author (2017); Ferdousi et al. (2010). Şahİn & Mcilroy (2014), Technology et al. (2010) explained that the intention of practical teachers to use a virtual environment by involving attitude is expected to be able to predict instructors' intention to use an e-learning system. Fokides & Author (2017) added that attitude is a very influential factor, since attitude is someone's perception to like or dislike using certain technological tools such as opinions (Ajzen&Fishbein, 1977).

Attitude Toward Using Virtual-based Learning (ATVL) also has a role in mediating the relationship between some of the variables discussed earlier. This study found that Attitude Toward Using Virtual-based Learning (ATVL) can mediate the relationship between PUVL, PUEVL, and SEVL toward IUVL, but has not been able to significantly mediate the relationship between RCVL and IUVL. The results of this study show that Attitude Toward Using Virtual-based Learning (ATVL) needs to improve in order to be able to build the intention of the adoption of virtual-based learning in universities in Surabaya. This is possible because there are policies that have not become an obligation for lecturers to utilize virtual-based learning, so it is possible for students to have the choice not to use virtual-based learning optimally in economic learning.

Conclusion

This study shows some conclusions as follows:

1. RC-VL has a significant effect on AT-VL
2. PU-VL has a significant effect on AT-VL
3. PEU-VL has a significant effect on AT-VL
4. SE-VL has a significant effect on AT-VL
5. AT-VL has a significant effect on IU-VL
6. AT-VL does not significantly mediate the relationship RC-VL toward IU-VL
7. AT-VL significantly mediates the relationship PU-VL toward IU-VL
8. AT-VL significantly mediates the relationship PE-VL toward IU-VL
9. AT-VL significantly mediates the relationship SE-VL toward IU-VL

Managerial Implication

This study shows that Resistance to Change (RCVL), Perceived Usefulness (PUVL), Perceived Ease of Use (PEUVL), and Self-Efficacy (SEVL) has a significant effect on Attitude toward Virtual-Based Learning (ATVL). Furthermore, it is also proved that Attitude toward Virtual-Based Learning (ATVL) has a significant effect on Intention to Use Virtual-based Learning (IUVL). On the other hand, this study also shows that ATVL can significantly mediate the relationship between PUVL, PUEVL, and SEVL on IUVL, but it has not been able to significantly mediate the relationship between RCVL and IUVL. From these results, in forming the intention and attitude of implementing virtual-based learning, universities is recommended to increase Resistance to Change (RCVL), Perceived Usefulness (PUVL), Perceived Ease of Use (PEUVL), and Self-Efficacy (SEVL). This study also suggests higher education or universities to pay attention and try to continue to improve the attitude toward the use of virtual-based learning (ATVL) since it is proven to be able to significantly affect the intention to adopt virtual-based learning while also being able to strengthen or mediate the relationship between Perceived Usefulness (PUVL), Perceived Ease of Use (PEUVL), and Self-Efficacy (SEVL) on the intention to adopt or use virtual-based learning.

REFERENCES

Allameh, S. M., & Abbasi, R. (2010). Investigating Students ' Behavioral Intention to use. The International Journal of Learning, 17(1).

Alnabhan, M., & Aljaraideh, Y. (2014). [JOURNAL BI] Collaborative M-Learning Adoption Model: A Case Study for Jordan. International Journal of Emerging Technologies in Learning (iJET), 9(8), 4. https://doi.org/10.3991/ijet.v9i8.3639

Cliffe, A. D. (2017). A review of the benefits and drawbacks to virtual field guides in today's Geoscience higher education environment. International Journal of Educational Technology in Higher Education, 14(1). https://doi.org/10.1186/s41239-017-0066-x

Dr. Simon Moss. (2009). Theory of planned behavior Theory of planned behavior. 1–8. https://doi.org/10.1037/t15668-000

Ferdousi, B., Carolina, S., & Levy, Y. (2010). Development and Validation of a Model to Investigate the Impact of Individual Factors on Instructors ' Intention to Use E-learning Systems. 6(2006).

Ferreira, J. J., Raposo, M. L., Rodrigues, R. G., Dinis, A., & Paço, A. Do. (2012). A model of entrepreneurial intention: An application of the psychological and behavioral approaches. Journal of Small Business and Enterprise Development, 19(3), 424–440. https://doi.org/10.1108/14626001211250144

Fokides, E. (2017). Greek Pre- service Teachers ' In tentions to Use Computers as In-service Teachers. 8(1), 56–75.

Fokides, E., & Author, C. (2017). P RE -S ERVICE T EACHERS ' I NTENTION TO U SE MUVE S AS P RACTITIONERS – A S TRUCTURAL E QUATION M ODELING A PPROACH, 16, 47–68.

Han, I., & Shin, W. S. (2016). The use of a mobile learning management system and academic achievement of online students. Computers & Education, 102, 79–89. https://doi.org/10.1016/j.compedu.2016.07.003

Higgins, E. T., Locke, J., & James, W. (n.d.). Elf fficacy. 814–817.

Hilao, M. P. (2017). GENDER DIFFERENCES IN MOBILE PHONE USAGE FOR LANGUAGE LEARNING , ATTITUDE , AND PERFORMANCE. (April), 68–80.

Huang, N. N., & Chiu, L. (2016). Relationship Among Students ' Problem-Solving Attitude , Perceived Value, Behavioral Attitude, and Intention to Participate in a Science and Technology Contest, 1419–1435. https://doi.org/10.1007/s10763-015-9665-y

Hussein, A., & Zolait, S. (2014). The nature and components of perceived behavioural control as an element of theory of planned behaviour. 33(1), 65–84.

Ifinedo, P. (2009). The Technology Acceptance Model (TAM) and the Continuance Intention of Using WebCT : A Case of College Students in Estonia. Information Communication Technologies for Enhanced Education and Learning: Advanced Applications and Developments, 29–44. https://doi.org/10.4018/978-1-60566-150-6.ch003

Kavanagh, S., Luxton-Reilly, A., Wüensche, B., & Plimmer, B. (2017). A Systematic Review of Virtual Reality in Education. Themes in Science and Technology Education, 10(2), 85–119.

Kenny, R. F., Neste-kenny, J. M. C. Van, Park, C. L., Burton, P. A., & Meiers, J. (2009). Mobile Learning in Nursing Practice Education : Applying Koole â€™ s FRAME Model. 23(3), 75–96.

Lee, Y., Hsieh, Y., & Chen, Y. (2013). An investigation of employees ' use of e-learning systems : applying the technology acceptance model. 32(2), 173–189.

Lynch, R. (2004). International Review of Research in Open and Distance Learning ISSN : 1492-3831 The Relationship Between Self-Regulation and Online Learning in a Blended Learning Context Self-Regulatory Attributes Predictive of Distance Learner Success. 1–14.

Makoe, M. (2012). Teaching digital natives: Identifying competencies for mobile learning facilitators in distance education. 26(1), 91–104.

Matandare, M. A. (2018). Botswana Unemployment Rate Trends by Gender: Relative Analysis with Upper Middle Income Southern African Countries (2000-2016). *Dutch Journal of Finance and Management*, *2*(2), 04.

Orientations, M., Beliefs, E., Students, T., & Learning, E. F. L. (2017). Eurasian Journal of Educational Research. 67, 251–267.

Park, S. Y., Nam, M.-W., & Cha, S.-B. (2012). University students' behavioral intention to use mobile learning: Evaluating the technology acceptance model. British Journal of Educational Technology, 43(4), 592–605. https://doi.org/10.1111/j.1467-8535.2011.01229.x

Parson, V., & Bignell, S. (2017). An Investigation into Cooperative Learning in a Virtual World using Problem-Based Learning. Online Learning, 21(2). https://doi.org/10.24059/olj.v21i2.796

Press, I. R. M. (2008). Examining . Consumer Broadband . Adoption ,. Usage ,. and . Impact.

Quinn, B. C. N. (n.d.). LEARNING ABOUT There seems to be little doubt that the introduction of smartphones and handheld devices have ushered in a new age of mobility that will have profound implications on how people interact with the world and with each other . In his book , De.

Razzaq, A., Samiha, Y. T., & Anshari, M. (n.d.). Smartphone Habits and Behaviors in Supporting Students Self-Efficacy. 94–110.

Ristekdikti. (2018). Vol.8.I.2018 1. Media Pustakawan, 8, 1–56.

Şahİn, S., & Mcilroy, D. (2014). TECHNOLOGY ACCEPTANCE MEASURE FOR TEACHERS : T-TAM. 10(4), 885–917.

Sugandini, D., Sudiyarto, Surjanti, J., Maroah, S., & Muafi. (2018). Intention to delay: The context of technology adoption based on android. International Journal of Civil Engineering and Technology, 9(3), 736–746. Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-85044533062&partnerID=40&md5=b423970bc549f8bbe770c64b9995d400

Surjanti, J., Seno, D. N., Hadi, H. K., Maroah, S., Siswanti, Y., Muafi, & Isfianadewi, D. (2018). The role of M-learning on effective learning media in higher education. International Journal of Civil Engineering and Technology, 9(4), 77–85.

Tang, J. E., Tang, T., & Chiang, C. (2014). Blog learning : effects of users ' usefulness and efficiency towards continuance intention. 33(1), 36–50.

Vilkonis, R., Bakanovienė, T., & Turskienė, S. (2013). Readiness of Adults to Learn Using E-learning , M-learning and T-learning Technologies. 12(2), 181–190.

Waely, S. A., & Aburezeq, I. M. (2013). Using Blogs to Facilitate Interactive and Effective Learning: Perceptions of Pre-service Arabic Teachers. Journal of Language Teaching and Research, 4(5), 975–985. https://doi.org/10.4304/jltr.4.5.975-985

Wang, D., Xu, L., & Chuan, H. (2015). Understanding the continuance use of social network sites : a computer self-efficacy perspective. 34(2), 204–216.

Wang, F. (2018). Computer Distance Virtual Experiment Teaching Application Based on Virtual Reality Technology. 13(4), 83–95.

Wang, M., Shen, R., Novak, D., & Pan, X. (2009). blended classroom. 40(4), 673–696. https://doi.org/10.1111/j.1467-8535.2008.00846.x

Zhang, M., Zhang, Z., Chang, Y., Aziz, E.-S., Esche, S., & Chassapis, C. (2018). Paper—Recent Developments in Game-Based Virtual Reality Educational Laboratories Using the … Recent Developments in Game-Based Virtual Reality Educational Laboratories Using the Microsoft Kinect. 13, 138–159. https://doi.org/10.3991/ijet.v13i01.7773

virtual based learning

ORIGINALITY REPORT

5%	2%	4%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Princely Ifinedo. "Investigating the Antecedents of Continuance Intention of Course Management Systems Use among Estonian Undergraduates", International Journal of Information and Communication Technology Education, 2007 Publication	1%
2	toubkal.imist.ma Internet Source	1%
3	Deliang Wang, Lingling Xu, Hock Chuan Chan. "Understanding the continuance use of social network sites: a computer self-efficacy perspective", Behaviour & Information Technology, 2014 Publication	1%
4	T Rahajoeningroem, A Rufiyanto. "Strategies and Policies to Dealing the Challenges and Use of Industry Based on IT in Indonesia", IOP Conference Series: Materials Science and Engineering, 2018 Publication	<1%

5	Marlya Fatira, Anriza WitI Nasution, Ismi Affandi. "Preparing Islamic Human Resources Competencies as Generation of Digital Bankers in Polytechnics Vocational Education", AJIS: Academic Journal of Islamic Studies, 2019 Publication	<1 %
6	www.icommercecentral.com Internet Source	<1 %
7	sure.sunderland.ac.uk Internet Source	<1 %
8	Marketing Intelligence & Planning, Volume 30, Issue 4 (2012-07-14) Publication	<1 %
9	Adhi Prasetio, Grisna Anggadwita, Rina D. Pasaribu. "chapter 4 Digital Learning Challenge in Indonesia", IGI Global, 2021 Publication	<1 %
10	International Journal of Social Economics, Volume 40, Issue 1 (2013-01-12) Publication	<1 %
11	N P S R Dewi, P B Adnyana, D M Citrawathi. "The Validity of Tri Hita Karana (THK) Oriented Blended Learning Tools to Improve Student's Critical Thinking Ability", Journal of Physics: Conference Series, 2020 Publication	<1 %

12	ancilia.rajce.idnes.cz Internet Source	<1%
13	jurnal.um-tapsel.ac.id Internet Source	<1%
14	scholarworks.waldenu.edu Internet Source	<1%
15	Samar Mouakket. "Information self-disclosure on mobile instant messaging applications", Journal of Enterprise Information Management, 2019 Publication	<1%

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		