Students Satisfaction in using Mobile Learning at Higher Educational Institution

Asri Safrinawati, Mega Mayasari

Department of Business Management, Batam State Polytechnic, Batam, Indonesia

Abstract: This study aims to examine the factors that influence student satisfaction in using mobile learning. This study also examines whether there were differences in satisfaction between students from public and private college. Data collection techniques used were survey to participant. The sampling technique uses purposive sampling. The research took sample from 186 students from Batam State Polytechnic and Putera Batam University. The analytical tool used is multiple regression and Independent sample t-Test. The results show that ease of use, internet speed and layout design affect to student satisfaction. Smartphone portability does not affect student satisfaction. The results indicate there is not any difference in satisfaction between state and private college students in using mobile learning. The results of this study are expected to provide input and evaluation to faculty to improve e-learning systems and appearance. These will increase student satisfaction of e-learning use by smartphone.

1 INTRODUCTION

Nowadays the development of technology is rapidly change. The rapid development of technology has made the learning system in Higher Education significantly changed. Learning system is not only done manually, but it can perform using technology. This learning system is also called E- learning. Learning management system (LMS) with moodle can be accessed via personal computer and the laptop. Currently E learning can be accessed from mobile. E learning is a web-based learning ecosystem for the dissemination of information, communication, and knowledge for education and training, Cidral, Oliveira, Felice, & Aparicio, (2018). E-learning has many benefits in the world of education. Students can access E-learning with their mobile without having to be on campus. E-learning access that can be reached anywhere makes it easier for students to get information about courses materials. Satisfaction is inseparable from the expectations, desires and needs. The Reaserch of Eliyanora, Andriani, & Zahara (2010) proved that the level of student satisfaction with educational services can be known by comparing expectations with the reality they get.

In an era of rapidly developing technology like today, research is needed on students who have used their smartphones to access e-learning. Whether there is learning using mobile learning students feel satisfaction. There are currently many colleges that use E-learning as a tool for teaching and learning. The Ministry of Research, Technology and Higher Education (Menristekdikti) explained that tertiary institutions are targeted to conduct learning in accordance with technological developments. An online learning system is needed for students' readiness to face technology that is developing so quickly.

Advances in E-learning technology have also made Batam State Polytechnic implement electronic-based learning since 2007. Students use E-learning to get material from lecturers, do quizzes and examinations using E-learning, and can upload assignments on E-learning. The existence of this facility makes it easier for students to learn without having to meet face to face in class. Not only in Batam State Polytechnic, several private colleges in Batam use E-learning for teaching and learning but also the Putera Batam University. Students Batam State Polytechnic and Putera Batam University always access e-learning using smartphones to get information about their learning. No need to come to campus, students can immediately see the latest information from the lecturer for learning. Students

also enjoy learning through e-learning without having to face to face in class.

The prior research related to the technology in education has been studied are Basidious & Lange (2009) examined the impact and use of information and communication technology on accounting student learning outcomes. The results of the research that the existence of information and communication technology makes accounting students do not understand well. Dimitrios, Labros, Nikolaos, Maria, & Athanasios (2013) their research about identifies and presents views about teaching accounting internationally using information and communication technology. The results of the studies are students prefer teaching methods that are centered by personalized instructors. Students recommend that the internet and various computer programs, simulations, case studies in real and virtual work environments become tools supporting traditional methods rather than being the main tool.

Research related to the topic in Indonesia has been discussed, the results show that E-learning has a significant and positive effect on the quality of student learning, Karwati, (2014). Faoziah & Sembiring (2017) shows that learning using E-learning with Ease of Use, form, accuracy, speed of responding and privacy security has a positive effect on student satisfaction, and a significant effect on the speed of responding and privacy security variables.

Research on E-learning using mobile is not new research but research related to this topic continues to be developed using different variables. Alqahtani & Mohammad (2015). The results of the study indicate that there is a positive relationship between mobile applications and perceptions of the performance, satisfaction and behavior of the students involved. Paricio, Bacao, & Oliveira (2017) proposes a theoretical model of learning grit as a determinant of the success of E-learning systems. The results of the study indicate that grit has a positive effect on individual student satisfaction and performance, enhance E-learning strategies and understand E-learning success. Sulaiman & Dashti (2018), their research about satisfaction and factors in using Mobile Learning (ML). The findings of the research show that female students and Kuwaiti Nationality students were more satisfied with their ML compared to students who were not Kuwaiti nationals. The factors used to Internet speed, smartphone portability, smartphone skills, screen size, gender, nationality, and college.

Result of the research performed by Cidral, Oliveira, Felice, & Aparicio (2018) shows that the use and satisfaction of E-learning users are interdependent, and both have a significant effect on individual performance. The success of E-learning in Brazil has a positive impact. Sarker, Mahmud, Islam, & Islam (2019) examine the suitability of implementing effective E-learning through learning management system (LMS) at the private university in Bangladesh. The findings of the research reveal that E-learning has been well accepted by most of the students as they are found routinely spending time on the LMS on a regular basis for watching lecture videos, viewing course information, reading postings of the fellow students in the forum. However, there are constraints as well since the learning materials are poorly designed that do not allow much interaction between students and lecturers. There are also some technical problems such as poor internet connection which restrict access to E-learning platforms.

This research idea came from Sulaiman & Dashti (2018) The difference between this research and the prior research such as samples and variable used. Previous studies used a sample of general students and Informatics majors in Banglades and Kuwait. Sample in this research are business student at the Batam State and Private Higher Educational Institution. Variable ease of use obtained from Theory Acceptance Model (TAM) internet speed, layout design, smartphone portability from Sulaiman & Dashti (2018). Based on previous research comparing public and private universities, the researcher also compared two groups of universities but used a sample of business accounting students. To measure the level of satisfaction between two different universities, are there differences in satisfaction. The purpose of this study is the first, to examine the factors that influence satisfaction of using mobile learning. Second, to consider whether there is a difference between the use of mobile learning between students at State and Private Higher Educational Institution.

2 LITERATURE REVIEW AND HYPOTHESIS

2.1 Theory

2.1.1 Technology Acceptance Model

Davis (1986) describing usability and ease of use is a significant determinant of technology acceptance or adoption. Technology Acceptance Model (TAM) can explain the main factors of information technology user information on the acceptance of information technology users. This theory explains if the use of

information systems will be influenced by the benefits and ease of use variables, both of which have high determinants and empirically tested validity. TAM believes that the use of information systems can improve the performance of individuals or organization, in addition, the use of information systems is easier to use. According to the TAM model, perceived benefits and perceived ease of use determine an individual's attitude, which will determine an individual's intention to use a system.

2.1.2 The Counstructivsm Learning Theory

Brune (1966) states that the concept of the theory of constructivism is an active process of students in building new ideas according to present and past knowledge. Constructivism is an extremely broad theory, has aspects such as social, physical, evolutionary, information, processing, Murphy (1997). Constructivism theory focuses on creating a learning environment that is centred on students in what they learn. Learners are actively involved in the learning process supported by existing infrastructure. One of the main features of the theory of constructivism is motivation and satisfaction in learning, Hein, (1991). This research is also based on constructivism learning theory, how students have knowledge by using a system and can feel satisfaction with the system.

2.2 Literature Review

Research on the use of e-learning and mobile learning has been widely studied before. An explanation of the previous research will be discussed in the literature review. Previous research, Basidious & Lange, (2009) examined the impact and use of information and communication technology on accounting student learning outcomes. The results of this research that the existence of information and communication technology makes accounting students do not understand well.

Dimitrios, Labros, Nikolaos, Maria, & Athanasios (2013) which identifies and presents views on the teaching of accounting internationally using information and communication technology (ICT). The results of these studies are students prefer teaching methods that are centered by personalized instructors. Students recommend that the internet and various computer programs, simulations, case studies in real and virtual work environments become tools supporting traditional methods rather than being the main tool.

Research Tîrziua & Vrabie, (2015) aims to provide a framework for teachers to interact with electronic good to students. The results of the study are effective for presenting face-to-face material in an online environment that makes students achieve higher levels of learning satisfaction and more understanding of the subject matter.

Research on e-learning using mobile researched by Alqahtani & Mohammad, (2015). The research sample used 118 students from Computer Science and Information Systems in Higher Education at Al Imam Muhammed Bin Saud Islamic University. The results of this study indicate there is a positive relationship between mobile applications and perceptions of performance, satisfaction and behavior of students involved.

Research Aparicio, Bacao, & Oliveira, (2017) proposes a theoretical model of learning grit as a determinant of the success of e-learning systems. The results of the study indicate that grit has a positive effect on individual student satisfaction and performance, enhance e-learning strategies and understand e-learning success. Research Cidral, Oliveira, Felice, & Aparicio, (2018) that shows understanding of satisfaction, use, and success in e-learning at universities in Brazil. The results of the study indicate that the use and satisfaction of e-learning users are interdependent, and both have a significant effect on individual performance. The success of e-learning in Brazil has a positive impact.

Research Sulaiman & Dashti, (2018) regarding satisfaction and factors of using Mobile Learning (ML), shows the results that female students and Kuwaiti nationality students are more satisfied with ML for education compared to students who are not Kuwaiti nationals. The factors used to predict student satisfaction are user convenience, internet speed, smartphone portability and layout design. Research Sarker, Mahmud, Islam, & Islam, (2019) critically examines the appropriateness of the application of effective e-learning through Learning Management Systems (LMS) in Bangladeshi educational institutions. The results of the study showed that most students were very enthusiastic about e-learning.

Research related to the topic of e-learning in Indonesia was conducted by Karwati, (2014) who analyzed how electronic learning in FKIP UNINUS, how the quality of learning in FKIP UNINUS, and to find out whether electronic learning affects the quality of student learning in FKIP UNINUS. The results showed that e-learning had a significant and positive effect on the quality of student learning. Research Fauziah & Sembiring, (2017) shows that learning using e-learning with user convenience,

form, accuracy, speed of responding and privacy security has a positive effect on student satisfaction, and significantly influences the speed of responding and privacy security variables.

2.3 Hypothesis

2.3.1 User Ease Influences Satisfaction

Davis (1986) explain the benefits obtained and facilitate the use determined by determining the individual, which will determine the individual's intention to use a system. System users who do not need a burden and easily use this system, including those involving Ease of Use Faoziah & Sembiring, (2017). Previous research explains user ease influences student satisfaction, Faoziah & Sembiring, (2017). Systems that are easy to use by users will continue to be used so that the creation of satisfaction in using the system. Based on the explanation, the hypothesis is:

H1: Ease of use influences satisfaction

2.3.2 Internet Speed Has an Effect on Satisfaction

Davis (1986) explain TAM can explain the main factors of information technology user behavior towards the acceptance of information technology users. Internet speed is one of the factors of user satisfaction in using mobile learning Sulaiman & Dashti, (2018). The satisfaction of using mobile learning is inseparable external supporting factors, one of which is internet speed. Internet speed will affect the satisfaction of mobile learning users. Based on the explanation, the hypothesis is:

H2: Internet Speed influences satisfaction

2.3.3 Smartphone Portability Influences Satisfaction

Davis (1986) explains that TAM can explain the main factors of information technology user behavior towards the acceptance of information technology users. Smartphone portability is a factor of user satisfaction in using mobile learning Sulaiman & Dashti, (2018). Satisfaction of the use of mobile learning is inseparable from the facilities that support mobile learning facilities and external supporting factors, one of which is smartphone portability. Smartphone portability will affect the satisfaction of mobile learning users. Based on the explanation, the hypothesis is:

H3: Smartphone portability has an effect on satisfaction

2.3.4 Layout Design Has an Effect on Satisfaction

Davis (1986) explains that usability and ease of use are significant determinants of technology acceptance or adoption. TAM can explain the main factors of information technology user behaviour towards the acceptance of information technology users. Interesting useruser interestinseparable from the design that has been created to attract the attention of users. Technology can be accepted if it is interesting and easy to understand Alqahtani & Mohammad, (2015). The layout design will affect the satisfaction behaviour of mobile learning users. Based on the explanation, the hypothesis is:

H4: Layout design influences satisfaction

2.3.5 The Difference in Satisfaction of the Use of Mobile Learning between Students in Public and Private College in Batam

Brune (1966) explained that motivation in sample according to learning by using the system will cause users to feel satisfaction with the system. The satisfaction of using mobile learning is inseparable from the facilities that support mobile learning facilities. That students in public and private universities were satisfied using mobile learning, that female students were more satisfied with ML than male students. Moreover, Kuwaiti students were more satisfied than non-Kuwaitis Sulaiman & Dashti, (2018). The difference in satisfaction is inseparable from the factors that influence the use of the mobile learning Based on the explanation, the hypothesis is:

H5: There is difference in satisfaction of the use of mobile learning between students in public and private college in Batam. Based on the hypotheses that have been presented, the research model is obtained as follows:
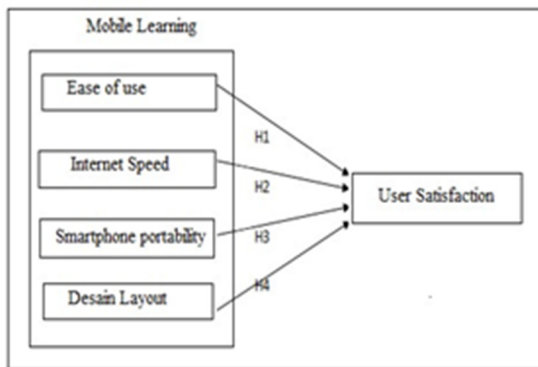
Figure 1: Research model

3 METHOD

The research method used in this study is a quantitative approach to testing hypotheses. Sample in this research are student from Batam State Polytechnic the Number of samples in this study use the Slovin formula with an error level of 10%. The minimum sample is 184 respondents

Table 1: Data Questionnaires

Information	Batam State Polytechnic	Putera Batam University
Total student population is based on forlap Dikti Data	1266	1015
Sample according to slovin formula	93	91
Questionnaires are filled out via google form	105	66
The questionnaire is filled in throught print out	8	33
Questionnaire that did not return	(2)	(17)
Inappropriate respondents	(19)	(7)
Questionnaire that can be processed	94	92

Source: Processed data

Sampling in this study uses purposive sampling judgment with the criteria of students who have been studying for at least one year and who frequently access E-learning through smartphones. The questionnaire in this study consisted of two parts. The first part is the contents of the questionnaire which contained 21 question items about student satisfaction using mobile learning. The second part contains the

general data of respondents. In accordance with the research variables, the source of the contents of the questionnaire was adapted from Alqahtani & Mohammad, (2015) and Sulaiman & Dashti, (2018).

3.1 Independent Variable

Mobile learning is an electronic technology that is used to send, support, assess, and improve teaching and learning or learning Faoziah & Sembiring, (2017). The definition of mobile learning in this study refers to e-learning accessed through student smartphones, so it is referred to as mobile learning. There are 4 dimensions in measuring satisfaction in using mobile learning. Ease of use, internet speed, smartphone portability and layout design.

3.1.1 Ease of Use

User Ease is a belief about new technology that affects personal attitudes towards using that technology Alqahtani & Mohammad, (2015). Ease of use is related to how users can easily accept the new technology provided to improve performance. The ease of use in this study is related to the ease of users in using E-learning. Criteria that need to be considered in measuring Ease of Use are usability, attitudes, interests and behavior Faoziah & Sembiring, (2017). Measuring using five items of questions were adapted from Alqahtani & Mohammad, (2015).

3.1.2 Internet Speed

Internet speed is the speed of accessing data using the internet. Internet speed in this study is related to speed in accessing mobile learning. Internet speed is an external factor that can affect the satisfaction of using mobile learning. Internet speed is also related to the signal from WIFI and the availability of WIFI networks Sulaiman & Dashti, (2018). Criteria that need to be considered in measuring internet speed are the availability of WIFI, speed in accessing information and speed in doing things with mobile learning. Measuring using three question items in the questionnaire were adapted from Sulaiman & Dashti, (2018).

3.1.3 Smartphone Portability

Smartphone portability is the convenience of users in bringing smartphones anywhere Sulaiman & Dashti, (2018). Smartphone portability is also inseparable from the user's skills in using the smartphone. Indicators that measure smartphone portability are the

ease of carrying a smartphone, the ability to use a smartphone, and the ease of students charging. Measuring using three question items in the questionnaire were adapted from Sulaiman & Dashti, (2018). There is one question has a negative statement, so the likert scale used on the smartphone portability variable in the question is reversed to 1-5

3.1.4 Layout Design

Layout design can incorporate typographic elements, which can connect meaning Alqahtani & Mohammad, (2015). Layout design is related to how things look that can make technology users comfortable and easy to use. The layout design in this study is related to the layout design and appearance of the mobile which can make it easy for users to use it. Indicators that measure layout design are user preferences with user friendly appearance and applications. There are five question items on the questionnaire to measure layout design variables adapted from Alqahtani & Mohammad, (2015).

3.2 Dependent Variable

Table 3 show that Responden Characteristics.

Table 3: Responden Characteristics

Responden Characteristics	F	%
Gender		
Male	47	25.3
Female	139	74.7
College		
Politeknik Negeri Batam	94	50.5
Universitas Putera Batam	92	49.5

Source: Processed data

3.2.1 User Satisfaction

User satisfaction refers to the extent to which users feel comfortable with the system to achieve their goals Sulaiman & Dashti, (2018). User satisfaction of human-computer interaction refers to the expression of affection obtained from interacting with the system. User satisfaction is related to the convenience of users in interacting with the system. Indicators that measure user satisfaction are user satisfaction, repeated use, and recommendations that users give to others to use technology or systems. There are five question items on the satisfaction variable adapted from Sulaiman & Dashti, (2018) and Alqahtani & Mohammad, (2015) which will be used to measure satisfaction from the use of mobile learning.

4 RESULTS AND DISCUSSION

4.1 Result

4.1.2 Variable Validity and Reliability

The question items that represent the variables in this research is stated to be exceptionally reliable reliable based on the value of Cronbach Alpha> 0.7. The result displayed in table 2.

Table 2: Analysis Reliability Variabel

Item	Cronbarch Alpha	N	decision
User Ease	0. 768	5	
Internet Speed	0. 745	3	
Smartphone Portability	0.737	3	Reliable
Layout Design	0.871	5	
User Satisfaction	0.911	5	

Source: Processed Data

About their validity. Question items to be valid if r count> r table, with the number n = 30 respondents, then obtained degree of freedom (df) = 28 and r table = 0.4629 at alpha = 0.01. So that the item is said to be valid if r count> 0.4629. The question items in this study represent variables of Ease of Use, internet speed, smartphone portability, layouts design and user satisfaction expressed as valid with a value of rcount> 0.4629.

4.2 Result and Discussion

Data in this research processed using SPSS. Data were analyzed using multiple linear regression analysis to test first hypothesis to the hypothesis. The fifth hypothesis used independent sample t-test analysis to find differences in satisfaction between students in public and private college in Batam. Table 4 show that the result of the hypothesis testing.

Table 4: The Result of Multiple Regression.

Variable	Regression Coefficient	t count	Sig.
Konstanta	2.629	1.76	0.080
Ease of Use	0.207	2.87	0.005**
Internet Speed	0.334	3.73	0.000**
Smartphone Portability	0.098	1.02	0.308
Layout Design	0.385	6.15	0.000**
F count = 43.007			
R^2 = 0.487			

Sig α ** = 5%   Source: Processed data

From table 4, obtained the multiple linear regression equation is as follows.

$$Y = 2.629 + 0.207X_1 + 0.334X_2 + 0.098X_3 + 0.385X_4$$

The multiple regression test produced an R**2** value of 0.487 which showed that the independent variables of Ease of Use, internet speed, smartphone portability, and layout design simultaneously formed 48.7% of the variations in student satisfaction. That a positive constant value of 2,629 shows the positive influence of the independent variables of Ease of Use, internet speed, smartphone portability and layout design. If the independent variable goes up, the user satisfaction variable will also go up.

The value of the regression coefficient on the user ease variable on user satisfaction is 20.7% which means, if the user ease variable has increased by one unit, then user satisfaction will increase by 20.7%. The results of the multiple regression test in the table 3 show that the Ease of Use variable has a t value of 2.866 with a significant value of 0.005 which is below 0.05 so it can be concluded that **H1 is supported**. The results of this study indicate that ease of use influences student satisfaction in using mobile learning. Davis (1986) explains that the right benefits and proper use determine individual attitudes, which will determine the individual's intention to use a system. Ease of use of good mobile learning will increase student satisfaction. Students also find it easier to learn and more efficient by using smartphones, coupled with easy-to-use mobile learning.

The regression coefficient on the internet speed variable to user satisfaction is 33.4% which means, if the internet speed variable has increased by one unit, then user satisfaction will increase by 33.4%. The results of the multiple regression test in the table show that the internet speed variable has a t-value of 3,734 with a significance value of 0,000 which is below 0.05 so it can be concluded that H2 is supported. This study also found that internet speed affects student satisfaction. Davis (1986) explains that TAM can explain the main factors of information technology user behavior on the acceptance of information technology users. Internet speed is one of the factors for user satisfaction in using mobile learning, Sulaiman & Dashti, (2018).

The regression coefficient on the internet speed variable to user satisfaction is 33.4% which means, if the internet speed variable has increased by one unit, then user satisfaction will increase by 33.4%. The results of the multiple regression test in the table

show that the internet speed variable has a t-value of 3,734 with a significance value of 0,000 which is below 0.05 so it can be concluded that H2 is supported. This study also found that internet speed affects student satisfaction. Davis (1986) explains that TAM can explain the main factors of information technology user behavior on the acceptance of information technology users. Internet speed is one of the factors for user satisfaction in using mobile learning, Sulaiman & Dashti, (2018).

The regression coefficient on the smartphone portability variable to user satisfaction is 9.8%, which means that if the smartphone portability variable increases by one unit, user satisfaction will increase by 9.8%. The results of the multiple regression test in the table indicate that the smartphone portability variable has a calculated value of 1.022 with a significance value of 0.308 which is above 0.05 so it can be concluded that H3 is not supported. In addition, this study also proves that smartphone portability does not affect student satisfaction. Causing that smartphone portability variable is not a factor that can affect student satisfaction in using mobile learning. This is because in the indicators of students' ease of charging, students state that they feel they disagree with statements if they have problems charging their smartphones on campus. From the answers of students who often access e-learning, they have no problems when charging their smartphone on campus. Students can still access e-learning easily without having problems with charging on campus. Research using smartphone portability variables was first investigated by Sulaiman & Dashti, (2018). Research by them which states that smartphone portability affects student satisfaction. The satisfaction of using mobile learning is inseparable from the facilities that support mobile learning facilities as well as external supporting factors, one of which is smartphone portability. Smartphone portability will affect mobile learning user satisfaction.

The regression coefficient on the layout design variable to the user's decision is 38.5% which means, if the layout design variable has increased by one unit, the user satisfaction will increase by 38.5%. The results of the multiple regression test in the table above show that the layout design variable has a calculated value of 6,153 with a significance value below 0.05 so it can be concluded that H4 is Supported. Layout design affects student satisfaction. The better the layout design of the mobile learning display, it will increase the satisfaction of students who use mobile learning.

Davis (1986) explains that usability and ease of use are significant determinants of technology acceptance or adoption. TAM can explain the main factors of information technology user behavior towards acceptance of information technology users. Attracting user interest cannot be separated from the design that has been made to attract the attention of users.

The results of the free sample t-test to test the fifth hypothesis are listed in table 5, as follows:

Table 5: The Result of Independent sample t-test

	Levene's Test for Equality of Variances	
Equal variances assumed	F	Sig.
	2.671	0.113

Source: Processed data

The fifth hypothesis states that there is difference in satisfaction of the use of mobile learning between state and private tertiary education students in Batam. The results of data processing are in table 5. To test the fifth hypothesis, an independent sample t-test was used with a significance <0.05. From table 5, it can be explained that the test results not significance value of 0.113 which can be concluded that there is not any difference in satisfaction between state college students and private college students which means H5 is not supported. Brune (1966) explained that motivation in learning using the system will result in users feeling satisfaction with the system. Currently the use of a smartphone is a necessity so that it is inherent in students. Students feel ease of use the mobile learning and is not related to the facilities provided by the campus. this has caused not any difference in satisfaction between public or private campuses. The summary hypothesis testing show in table 6.

Table 6: Hypothesis testing result summary

Hypothesis	Result
H1: Ease of use has an effect on satisfaction	Supported
H2: Internet Speed has an effect on satisfaction	Supported
H3: Smartphone portability has an effect on satisfaction	not supported
H4: Layout design has an effect on satisfaction	Supported
H5: There is difference in satisfaction of the use of mobile learning between students in public and private college in Batam	not supported

5 CONCLUSIONS

The main objective of this study is to determine the factors that influence student satisfaction in using mobile learning with ease of use, internet speed, smartphone portability and layout design to the satisfaction of students of states and private colleges in Batam and examine the diferrences between the two groups.This study also found that there were not any differences in satisfaction between students of state and private college in Batam. So, it can be said that state and private college students feel the same satisfaction in using mobile learning. Implication of the current research as an evaluation material to colleges to continues improvement the system, the appearance of e- learning so that users are satisfied with the use of e- learning through smartphones Future studies are recommended to increase the number of samples in the study. Reducing the standard of error in determining the number of samples. In addition, further research is expected to add other college to be used as research samples. And the next research should involve other factors that can affect student satisfaction in using mobile learning.

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