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Student Perception of Student Centered e-Learning Environment (SCeLE) as Media to Support Teaching and Learning Activities at the University of Indonesia

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Abstract. Student Centered e-Learning Environment (SCeLE) is a Learning Management System (LMS) owned and used by the University of Indonesia that functions as an extension or even substitute for a real class environment. This study aims to determine student perceptions of SCeLE as a medium to support teaching and learning activities at the University of Indonesia. The method used in this research is quantitative research methods by distributing questionnaires to 125 respondents. The data processing technique used is a structural equation model that is processed with SmartPLS software against the UTAUT Model. The results of the analysis obtained findings that Performance Expectation, Effort Expectation, and Social Influence have a significant effect on Intention Behavior using SCeLE, while Facilitating Condition has no effect on Intention Behavior; and Intention Behavior has a significant effect on Use Behavior from using SCeLE. The implication of this finding is that the university should make improvements to SCeLE, especially in terms of facility conditions that support its use. This is needed so that the use of SCeLE can be used optimally to support teaching and learning activities for both students and teaching staff.

1. Introduction

The University of Indonesia has a vision of being a center of excellence and competitiveness in science, technology and culture, through efforts to educate the nation's life to improve people's welfare, thus contributing to the development of Indonesian and world society. To achieve this vision, especially in an era where the development of information technology is very rapid, the university integrates the existence of information technology into the active learning process by implementing Electronic-Learning (E-Learning). E-Learning is defined as the delivery of material and methods of education online by using information technology for the purposes of learning, teaching, training or gaining knowledge anytime and anywhere [1]. E-Learning is made to facilitate students and lecturers in gaining knowledge or learning through the internet. E-Learning also functions as a tool to support learning management and make interaction between students and lecturers easier. By using E-Learning, students and lecturers can interact each other anytime and anywhere.

Information systems are a regular combination of human, hardware, communication network software and data resources, which collect, change, and disseminate information in an organization to support decision making and control of organizations [2]. The existence of information technology has changed many organizations, including educational institutions such as universities. In the learning process at the university level, UI has a Learning Management System (LMS) which is called the Student Centered e-Learning Environment (SCeLE). SCeLE is a web-based application that requires digital devices (computers or mobile phones) that are connected to the internet and have a web browser (Firefox, Google Chrome or other), with the address scele.ui.ac.id. From this web page students can access their respective SCELE faculties. Teaching and learning activities such as material presentations, discussions, questions and answers, submission assignments, doing quizzes or examinations, and uploading and downloading material. Like an LMS in general, SCeLE functions as an extension to even a substitute for a real class environment. Applying SCeLE brings various benefits to universities, such as flexible, independent, efficient (in terms of costs, paperless) that can improve student centered active learning (SCAL). In addition to the advantages, the shortcomings can be in the form of availability and proper devices, human resources, can minimize social interaction between lecturers and students.

The SCeLE application is built from an open source based application called Moodle. By using LMS, students and lecturers can interact with each other anytime and anywhere, the learning process and interaction between students and lecturers will be much easier and more useful. This happens because the basic definition of the LMS itself is a software application that automates the administration, documentation, tracking and reporting of training activities. Some organizations have succeeded in implementing E-Learning, but some have also failed to optimize the benefits of information technology. Some educational institutions that provide E-Learning experience difficulties in achieving successful E-Learning implementation, these difficulties include E-Learning delivery, E-

Learning effectiveness, and E-Learning acceptance. This also occurs in the use of SCeLE at UI that cannot be optimal yet in its utilization.

Based on the latest data provided by the Office of Learning Resources (KSDP) UI, only about 10% of courses at the university that use SCELE in 2016. This number still shows an insignificant number considering that from all courses, only 10% apply SCeLE use. The application of information technology is not always successful. One of the determinants of the successful application of technology is the attitude of users who use the technology. It can be explained by implementing UTAUT Model to understand acceptance and use of SCeLE. The purpose of this research is to examine student perception of SCeLE as media to support teaching and learning activities at the University of Indonesia (by implementing the Unified Theory of Acceptance and Use of Technology). The subject matter in this study consists of five research questions, namely: 1. How does the effect of Performance Expectance on Behavioral Intention use SCeLE; 2. How does Effort Expectancy affect Behavioral Intention using SCeLE; 3. How does Social Influence affect Behavioral Intention using SCeLE; 4. How does the influence of Facilitating Condition on Behavioral Intention use SCeLE; and 5. How does Behavior Intention affect Use Behavior on SCeLE. With the rapid development of technology in the world of education, identifying factors that influence the acceptance of technology users is still an important topic. The failure of the application of information technology systems in organizations can be caused by several factors both internal and external. The decision to adopt an information technology system is in the manager, but the success of using the technology depends on the acceptance and use of each individual user, which in this case are students and lecturers. System user behavior is formed from user attitudes and perceptions of the information system.

In order for information technology to improve organizational performance, the technology must be accepted and used by users, which in this case are students, staff, and lecturers. The level of acceptance of information systems by users can be a benchmark for assessing the acceptance of information technology by users. One method that can be used to measure acceptance and use of technology is the unified theory of acceptance and use of technology (UTAUT) [3]. Verkantesh, et al. (2003) developed a theory about the acceptance of technology by system users, known as the unified theory of acceptance and use of technology (UTAUT). UTAUT is a model to explain user behavior towards information technology [3]. This model is a combination of eight models that have been successfully developed before. The UTAUT model shows that the intention to behave (behavioral intention) and the behavior to use a technology (use behavior) is influenced by expectations of performance (performance expectancy), business expectations (effort expectancy), social influence (social influence), and supporting conditions (facilitating conditions) [3]. Fourth these factors are moderated by gender (gender), age (age), experience (voluntariness of use) [3].

Performance expectancy (PE) describes how high a person believes that using a system will help someone to get performance benefits at his job; Effort expectancy (EE) is defined as the level of convenience associated with the use of a system, if the system is easy to use, then the business carried out will not be too high, and vice versa; Social influence (SI) describes the extent to which an individual perceives interests that are

trusted by others who will influence them using a new system; and Facilitating conditions (FC) are defined as to what extent one believes that organizational and technical infrastructure is available to support the system [4].

The results of empirical studies regarding the application of UTAUT to e-learning have had mixed results. Previous studies found that technological expectancy (which is influenced by PE, EE, SI, and FC) is one of important determinant of e-learning acceptance [5]. While other factors that also influence e-learning acceptance are educational compatibility [5]. In the study, it was found that PE and FC had a significant effect on technological expectancy, while EE and SI had no significant effect [5]. Acceptance of e-learning research in the higher education environment was also carried out and it was found that PE and SI had a significant effect on the intention to use e-learning, whereas previous education and gender had no significant effect [6].

Research on the acceptance of Moodle was also carried out by applying the UTAUT model [7]. The results found are PE, EE, and SI are the main determinant factors for assessing the acceptance of Moodle [7]. Another study examined the continued use of e-learning context [8] and found that PE had a significant effect on the intention to use e-learning, whereas EE and SI had no significant effect [8]. Meanwhile, other studies that examined behavioral intention, use of behavioral and acceptance of electronic learning systems, found that FC had no effect on the use of e-learning [9]. This is contrary to other results, namely FC has a significant impact on BI and UB of the e-learning system [10]. The study of factors influencing students' adoption of e-learning was also conducted in England and found that the results of PE, EE, SI had a significant effect on BI, while FC did not affect BI [11]. This result is similar to findings that state that SI influences BI, while FC has no effect at all [12].

2. Method

Research data is primary data by distributing questionnaires to respondents. Sampling data was taken randomly with a sample of 125 student respondents. Data processing techniques in this study consisted of descriptive statistics and Structural Equation Model (SEM) in the form of Partial Least Square assisted by SmartPLS software. SEM is one method of analysis that is very widely used in describing models that include relationships between several variables. One of the advantages of SEM is its ability to analyze the pattern of direct relationships between latent variables and indicators, latent latent, and calculating the level of measurement errors that occur. The confidence level used in this study is 95%. The stages in doing PLS are as follows: Evaluation of the measurement model (outer model), Convergent Validity, Discriminant Validity, Composite Reliability; Evaluation of the structural model (inner model), R-Square Test, Q-Square Test; Designing a path diagram, drawing a Full Structural Model; and Creating a system of model equations (table and model equations).

To answer the research question, the following five hypotheses are constructed:

H1: Performance Expectancy (PE) has effect on Behavioral Intention (BI)

H2: Effort Expectancy (EE) has effect on Behavioral Intention (BI)

H3: Social Influence (SI) has effect on Behavioral Intention (BI)

H4: Facilitating Condition (FC) has effect on Use Behavior (UB)

H5: Behavioral Intention (BI) has an effect on Use Behavior (UB)

Flowchart and research model using UTAUT as follows.
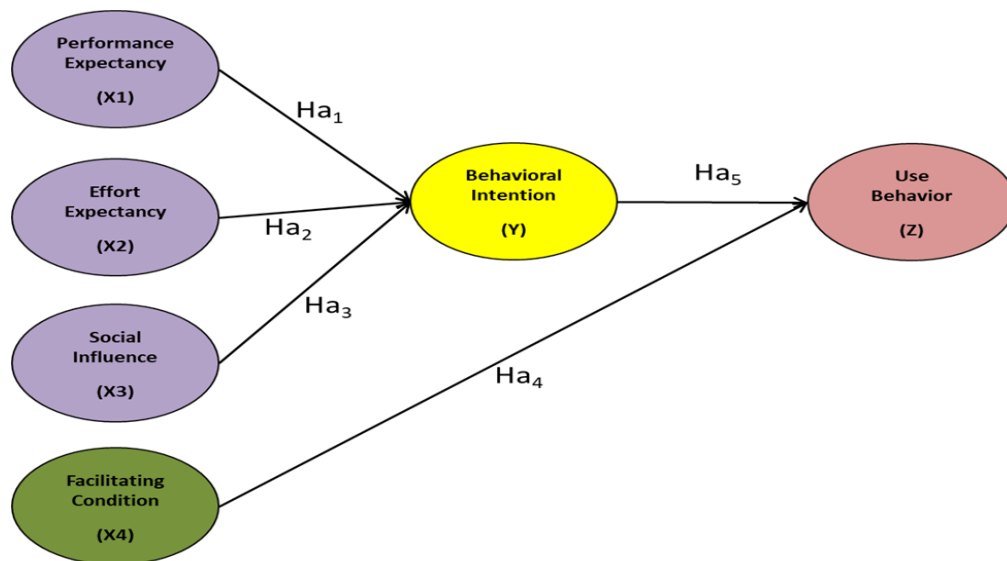
Figure 1. Study Model

In the UTAUT model above, each variable can be explained as follows. Expectance performance is an individual's level of trust in the extent to which the use of the system will help him to get performance benefits at his job. Effort Expectance is the level of ease associated with using the system. Social Influence is the level at which an individual feels that people who are important to him believe he should use a new system. While Facilitating Condition is the level where an individual is sure of the availability of technical and organizational infrastructure to support the use of the system. The four determinants have an important role and have a direct influence on the intention to behave (behavioral intention) and the behavior to use a technology (use behavior). Each question item in the questionnaire was assessed using a 6 point Likert scale, namely: 1) Strongly Disagree, 2) Disagree, 3) Somewhat Disagree, 4) Somewhat Agree, 5) Agree, 6) Strongly Agree.

Table 1. Research Variables

Independent Variabel (X)	Dependent Variabel (Y)	Hypothesis	Code/Path	Description
PE	BI	PE → BI	H1	Performance Expectancy has an effect on Behavioral Intention
EE	BI	EE → BI	H2	Effort Expectancy has an effect on Behavioral Intention
SI	BI	SI → BI	H3	Social Influence has an effect on Behavioral Intention
FC	UB	FC → UB	H4	Facilitating Condition has an effect on Use Behavior
BI	UB	BI → UB	H5	Behavioral Intention has an effect on Use Behavior

3. Result

Primary data in this study were obtained from distributing questionnaires to SCeLE user students. The characteristic sample data is shown in Table 2.

Table 2. Sample Characteristics

Characteristics	Frequency	Percentage
Gender		
Male	43	34.4%
Female	82	65.6%
Age		
15-17	2	1.60%
18-20	118	94.4%
21-23	3	2.4%
24 years and more	2	1.6%
GPA		
2.00-3.00	3	2.4%
3.01-3.50	41	32.8%
3.51-3.70	45	36.0%
3.71-4.00	36	28.8%
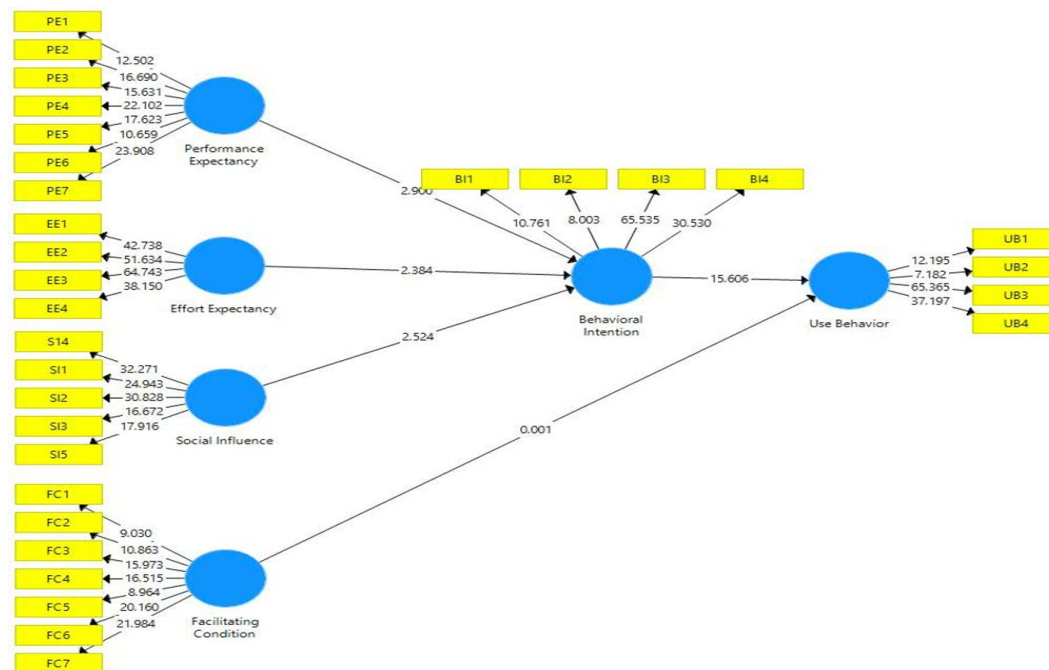
Figure 2. Structural model results

Based on the results of data processing with SmartPLS software, the results obtained as shown in Figure 2 and Table 3. From Figure 2, the Equation Model can be made as follows: Use Behavior = Behavioral Intention * 0.915 + Performance Expectation * 0.363 + Effort Expectation * 0.181 + Social Influence * 0,327 + Facilitating Condition * 0,000 + Error. The value of Adjusted R Square for the model of the influence of PE, EE, SI, on BI was 62.30%, while for the model of the influence of FC, BI, on UB was 83.80%. This indicates that BI for SCeLE use can be explained by 62.30% by PE, EE, and SI. Meanwhile, UB for the use of SCeLE can be explained at 83.80% by FC and BI. The results of the effect of data processing between independent variables on the dependent variable can be seen in Table 3. Of the five hypotheses developed, H1, H2, H3, and H5 were supported, while H4 was not supported.

Table 3. Direct and indirect effects of independent variables

Independent Variable	Dependent Variable	Hypothesis	Path	Original Sample	t-Statistic	t-Table	Result
PE	BI	PE → BI	H1	0,363	2,900	1.96	Supported
EE	BI	EE → BI	H2	0,181	2,384	1.96	Supported
SI	BI	SI→ BI	H3	0,327	2,524	1.96	Supported
FC	UB	FC → UB	H4	0,000	0,001	1.96	Rejected
BI	UB	BI → UB	H5	0,915	15,606	1.96	Supported

4. Discussion

The effect of performance expectancy on behavioral intention (H1). Based on the results of data processing, the results obtained that the first hypothesis is supported, PE has a significant influence on BI using SCeLE. This can occur because the average respondent believes that using SCeLE has many benefits for their studies, including useful in terms of downloading lecture material, can collect assignments online that save costs and time, and can support active learning methods. The results of this study are similar to the results obtained in previous studies [5] [6] [8] [11].

The effect of effort expectancy on behavioral intention (H2). EE also proved to have a significant effect on BI using SCeLE. This indicates that the average respondent agrees that they understand how to use SCeLE well, it is easy to operate and use it. This gives a positive signal to the university that SCeLE developed can be well received in terms of ease of use. The results of this study are in line with previous studies that found EE had a significant impact on BI [5] [7] [11].

The effect of social influence expectancy on behavioral intention (H3). The third hypothesis also proved that SI has a significant positive effect on BI using SCeLE. In this case, the social environment such as lecturers has a strategic role to encourage the use of SCeLE in the campus environment. Lecturers can introduce (SCeLE) as one of the modern learning management systems and encourage students to actively use SCeLE as an active learning media. On average the respondents also gave good responses to the lecturers who encouraged them to gather assignments through SCeLE because they made them more timely, systemic, digital, and paperless. The results of this study are in line with previous studies that found EE had a significant impact on BI [5] [6] [7] [11] [12].

The effect of facilitating condition on use behavior (H4). The only hypothesis that is not supported in this study is the fourth hypothesis, where FC does not affect UB using SCeLE. Possible causes are instability in internet access on campus, if the connection is disrupted, then access to use SCeLE will be constrained as well. In addition, the server has also been down several times if SCeLE is jointly accessed by students in large numbers, for example to carry out quizzes or exams online using SCeLE by parallel classes. This causes no significant effect of FC on UB. The next cause is the lack of availability of special e-Learning (SCeLE) services in the Faculty which helps students if they have difficulty using SCeLE. SCeLE display is also not good when accessed via a smartphone. These various causes can be input for the university to make improvements in facilitating condition SCeLE in order to encourage the actual use of the UI academic community. This finding is in line with the results of the study [9] [11] [12].

The effect of the behavioral intention on use behavior (H5). In this study, BI has significant influence on UB using SCeLE. This is in line with previous studies [8] [9]. The intention of students to use SCeLE has a positive effect on the actual use of SCeLE to support active learning methods for students by utilizing existing information technology. This gives a positive signal because the respondents in this study gave a positive response to the use of SCeLE in the courses taken by the students.

5. Conclusion

This study examines five hypotheses regarding the use of SCeLE by applying the UTAUT model. The results of this research show that Performance Expectation, Effort

Expectation, and Social Influence have a significant effect on Intention Behavior using SCELE, while Facilitating Condition has no effect on Intention Behavior; and Intention Behavior has a significant effect on Use Behavior from using SCeLE. The implication of this finding is that the university should make improvements to SCeLE, especially in terms of facility conditions that support its use, such as the stability of the internet connection to minimize errors, upgrading the server to prevent down time, improving the layout of SCeLE, providing supporting staff in sufficient quantities to be able to help students who have difficulty using SCeLE, and better availability in mobile version (compatible with smartphones). In addition, the user of SCELE (lecturer and students) should also improve their knowledge about features in SCeLE to explore the benefits of using SCeLE. This is needed so that the use of SCeLE can be used optimally to support teaching and learning activities for both students and teaching staff.

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