Indonesian Journal of Informatics Education

Research Paper ISSN:2549-0389

The Influence of the Use of E-learning to Student Cognitive Performance and Motivation in Digital Simulation Course

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Abstract:

Currently the technology is growing and sophisticated. Technological advances have also entered the world of education. One of them their is online learning. Examples of learning that utilizes technology that is using Schoology and Edmodo. By using Schoology and Edmodo is expected to increase student motivation and learning outcomes. This study investigates whether the use of different learning management would affect (1) the student's cognitive achievement (2) student's motivation (3) the level motivation. This research method using mixed methods. The data collection technique using the test method to determine the cognitive performance. Questionnaires and interviews to find the motivation. The analysisof quantitative data using normality test, homogeneity test, tests of balance and hypothesis testing using independent t test, while the analysis of qualitative data using interactive models. Based on the results of the study (1) there are differences in the cognitive performance between classes that use e-learning based Schoology and e-learningbased Edmodo. The cognitive performance classes that use Schoology better than the class that uses Edmodo, becauseschoology easiness to access the students have a target value, better understand the lesson and more active in the study this may have an affect on cognitive performance.(2) there is a difference in motivation between classes that use e-learning based Schoology and e-learning based Edmodo. Motivation class with Schoologybased e-learning is better than classes with e-learningbased Edmodo, becauseschoology can interest in simulation course, more passion, make happy, easier to learn anywhere and more motivated to learn.(3) the level of motivation of students using e-learningbased Schoology and Edmodo included in the medium category

Keywords :E-Learning, Schoology, Edmodo,Cognitive Performance, Motivation

DOI: http://dx.doi.org/10.20961/ijie.v1i2.12812

Introduction

E-learning is electronic learning that uses technology and information.E-learningby (Michael, 2013) is organized with the purpose of learning to use an electronic system or computer also to be able to support a learning process. E-learning platform is an pplication that can connect to teachers and students in an online study space. E-learning is created to overcome the limitations between teachers and students, especially regarding space and time. Therefore teachers and students should not be in one dimension of space and time. The education process can run at anytime by ignoring the space and time (Kusmana, 2011). So e-learning can help conventional learning in the acceptance or delivery of learning materials. Schoology and edmodo can be used in learning. Schoology brings a positive impact on attitudes (Cepik, Gonen, & Sazak, 2016), helped the students to exercise autonomy in EAP class (Ardi, 2017) and enhance the college students' proficiency in Bussiness Writing (Sicat, 2015). Then edmodo improved self-regulated learning behaviours and learning performance of students (Charoenwet & Christensen, 2016) and provides the possibility of sharing knowledge, experiences and views in the practice of teaching and learning science (Ekici, 2017). So this study will look for the influences of the use of e-learning to student cognitive performance and motivation in Digital Simulation course that has not existed in previous research.

Motivation by Chua & Don in is the most important driving force to explain the ability of online students to pass the exam. Motivation is the only variable that showed the direct and significant effect on student achievement. And positive motivation is influenced only by the perception of the students themselves, that students who learn online more confident about his ability to learn and then more motivated to learn. Then Bloom et al believe that cognitive performance is learning outcomes that include mental activity. There are 6 levels of thought processes in the cognitive learning outcomes of knowledge, understanding, application, analysis, synthesis and evaluation(Sudijono, 2008).

In this study, the cognitive performance is assessed by providing learning materials first, practice questions in e-learning and examinations. Examinations are given before the implementation of e-learning and after the implementation of e-learning. There are multiple choice question consisting of several aspects of the cognitive domain. Motivation was measured using questionnaires and interviews. In the world of education alternatives e-learning platform can be used to help to learn, especially to increased the cognitive performance and motivation. In this study will be compared Schoology-based e-learning and e-learning-based Edmodo.This research investigates the contribution of the use of e-learning to the student' s cognitive performance, students motivation and the level of motivation.

Literature Review

E-learning has an impact on learning, there are cognitive performance and motivation. E-learning improves the cognitive skills of the learners (Songkram et al., 2015). Aminoto & Pathoni, (2014) that demonstrates the application of Schoology-based learning can provide an average increase learning. Sutadji and Widiyanti (2017) that schoology can increase the learning outcome. While the research by Sulistiani and Sukirno (2016) shows that the model of blended learning with Edmodo can improved performance in cognitive. Sudibjo (2013) that use Edmodo e-learning helps students to improve student learning outcomes in the cognitive aspects.

Harandi (2015) said there is a significant relationship between e-learning and students motivation. Research result show that when teachers apply e-learning students are more motivated and otherwise. (Rovai et al., 2007) proves that students who use e-learning are more intrinsically motivated than students in the traditional classroom. Conducted by Ibrahim & Suardiman (2014) that there is the influence of the use of e-learning on student motivation, student motivation tendency to use e-learning is higher than conventional learning.Swastika and Estiyanti (2015) with the results showed the use of Social Learning Network Schoology has a big role to provide motivation to learn followed by collaborative learning and influence learning achievements of learners. While the research conducted by Sudibjo & Wasis (2013) that the use of edmodo for students is strongly motivated to learn. Relevant with Sulistianti & Sukirno (2016) research that edmodo can increase students motivation.

Research methods

The research used mix methods. Mix methods reseach was conducted to delve deeper into the circumstance of e-learning implementation in a digital simulation course of a vacational education class. In this study, subjects were devide into two groups: the experimental group and control group. The treatment given to the experimental group that is with the use of e-learning based schoology while the control group used e-learning based edmodo.

The research was conducted at 1 Sukoharjo Vocational High School located at Jend. Sudirman street 151, Bendosari, Sukoharjo. The population in this study are students of X Accounting class consists of three classes, there are X AK 1, X AK 2 and X AK 3. Determination of the samples was done by random sampling, the sample used is a experimental class X AK 1 totaling 36 students and the control class X AK 3 amounted to 36 students. Data collection technique used tests, questionnaires and interviews. The test was utilized to assessing cognitive performance. Set of questionnaires was utilized to guide the inquiry. Further motivational aspects are explored through interview over 10 participants to confirm their behaviour.

Results and Discussion

Hypothesis Test Results

Balance test result, normality test and homogeneity test are the requirements analysis test result before hypothesis testing. The result of statistical calculations of research data are shown that experimental class (X AK 1) and control class (X AK 3) sig value >α (0.05). Because the sig value more than α (0.05), so can be said that the experimental class and control class are balanced, normal distribution and homogeneous.

First Hypothesis Testing

Ho : there are no differences in the use of e-learning based on schoology and edmodo on cognitive performances in digital simulation course

H_1 : there are differences in the use of e-learning based on schoology and edmodo on cognitive performances in digital simulation course

Table 1. Results of Analysis First Hypothesis

Variables	α = 5%	Sig	Criteria	Information
Cognitive Performance	0.05	0.008	0.008 <0.05	H_1 accepted

Based on table 1 can be viewed sig value 0.008 < 0.05, and H_0 rejected H_1 accepted. There are can be concluded a difference cognitive performance between the classes with e-learning based Schoology and e-learning based Edmodo. The average e-learning classes with Schoology is 80.08 higher than e-learning classes with Edmodo is 71.25. Because schoology easiness to acces, the students has a target value, better understand the lesson and more active in study this may have an effect on cognitive performance.

It supports research conducted by Aminoto and Pathoni (2014) that demonstrates the application of Schoology-based learning can provide an average increase learning. The result also suport Irawan, Sutadji and Widiyanti (2017) that schoology can increase the learning outcome. While the research conducted by Sulistiani and Sukirno (2016) shows that the model of blended learning with Edmodo can improved performance in cognitive.The results also supportSudibjo (2013) that use Edmodo e-learning helps students to improve student learning outcomes in the cognitive aspects.

Second Hypothesis Testing

Ho : there are no differences in the use of e-learning based on schoology and edmodo on student's motivation in digital simulation course

H_1 : there are differences in the use of e-learning based on schoology and edmodo on student's motivation in digital simulation course

Table 2. Results of the Second Hypothesis Analysis

Variables	α = 5%	Sig value	Criteria	Conclusion
Motivation	0.05	0.007	0.007 <0.05	H_1 accepted

According to the table 2 can be viewed sig value 0.007 <0.05, and H_0 rejected H_1 accepted. There are can be concluded there is a difference students motivation with e-learning based Schoology and e-learning based Edmodo.The average e-learning classes with Schoology is 98.94 higher than e-learning classes with Edmodo is 93.92. Because schoology can interested in simulation course, more passion, make happy, easier to learn anywhere and more motivated to learn.

Results above support research Joshua, Swastika and Estiyanti (2015) with the results showed the use of Social Learning Network Schoology has a big role to provide motivation to learn followed by collaborative learning and influence learning achievements of learners. While the research conducted by Sudibjo and Wasis (2013) that the use of edmodo for students is strongly motivated to learn. Relevant with Sulistianti and Sukirno (2016) research that edmodo can increase students motivation.

The level of motivation of students using e-learning and Edmodo Schoology based on the subjects of digital simulation

The level of motivation of students based on data obtained from the questionnaire scores are totaled experimental class of 36 students, a total of 7 students (19.5%) had a higher category, 20 students (55.5%) had moderate category and 9 students (25%) have low category. While the motivation control class numbering 36 students, 15 students (41.7%) had a lower category, a total of 21 students (58.3%) had moderate category and there are no students in the category of high motivation. So we can conclude that, the tendency motivation experimental class and control class in middle category.

Some evidence that e-learning can increase student motivation. According to Joanna Poon (2013) that the use of e-learning demonstrated the flexibility to accomplish tasks wherever and whenever, giving comfort and make responsible and competent. It also supports research conducted by (Ibrahim et al., 2014)that there is the influence of the use of e-learning on student motivation, student motivation tendency to use e-learning is higher than conventional learning.

Analysis Results Interviews

Results of interviews with respondents experimental class show e-elarning based Schoology create more interest in the learning for a number of reason.

- The first reason is the easiness to access learning material as it is suggested by student a. “it is easy to acces, increase knowledge”. According to the quote, the eassyness to acces in the main consideration for student to change their learning source.Coresponding with Ardi (2017) that schoology easy to use and user friendly.
- The second reason is make students more attentive in the lesson as it is suggested by student b “Schoology make more attention lesson” . According to the quote, schoology becomes learning that inspires students’ attention compared to conventional learning. Coresponding with Ardi (2017) that schoology makes interested for students and as well as triggers to be active.
- The third reason is easiness to do task as it is suggested by student f “It is easy to do task” .According to the quote, schoology makes it easy to do the task because in doing the task, and the collection does not need to come directly, because it can be uploaded. Coresponding with Sicat (2015) that schoology makes students more confident and responsible in the task.
- The fourth reason suggested by student b e and f “Easier to learn anywhere, more independent in learning, more active in study”. According to the quotes, by using schoology learning can be done outside of the school. Coresponding with Irawan, Sutardji and Widiyanti (2017) that schoology increase student activity beyond school hours, material exploration independently and enhance interaction in learning.

Results of interviews with respondents control class show e-learningbased Edmodo

- The first reason is more interesting learning as it is suggested by student a. “it is make lessons more interesting, create more enthusiasm ,be made happy because learning is not monotonous”.

According the quote, by using edmodo makes the lessons more varied. Coresponding with Watson (2007) that e-learning incorporating lessons into the standarized curiculum.

- The second reason is make student more attentive in the lesson as it is suggested by student d "students pay more attention to the lessons, better understand the lesson". According the quote, edmodo can make students' attention more focused. Coresponding with Watson (2007) that e-learning providing lessons based on the individual student's learning progress.
- The third reason is easiness to do the task as it is suggested by student a, b and c "easy to do task", there are coresponding with Said (2015) that edmodo is able to facilitate, improve learning effectiveness and saved time.
- The fourth reason is "more active in study" suggested by student b, c and f.Coresponding with Warawudhi (2017) that edmodo facilitates teacher and student interaction. "

Schoology and edmodo also have disadventages that "schoology make it less responsible because there is a collection time limit" (student f). Then edmodo "not happy, does not affect the spirit because it make lazy to browsing, typing and open the laptop" (student b), "edmodo does not affect the spirit because must open the internet first and make dizzy" (student d), "does not happy" (student e) and "does not make the spirit because having to connect to the internet" (student f).

Based on the comparison of the results of motivational interviewing between the experimental class and control class can be concluded that the use of e-learning Schoology better influence on student motivation. Although both e-learning can improve motivation but e-learning Schoology able to provide more improvement in terms of motivation for making students more motivated to learn.

Discussion

Based on previous data analysis, the result of this study show that e-learning based on schoology is better in terms of improving cognitive performance and students motivation. Result of cognitive performance experimental class (pretest) 69.17 and (posttest) 80.08 while cognitive performance control class (pretest) 64.19 and (posttest) 71.25. it can be concluded that schoologyprovide a higher cognitive performance than edmodo.

While in the student motivation schoology also showed higher value than edmodo. The result of the questionnaires showed average e-learning classses with schoology is 98.94 higher than e-learning classes with edmodo 93.92. In depth motivation investigation using interview with responden in experimental class and control class. The result concluded that the use of schoology better influenceon student motivation. Although both e-learning can improve motivation but e-learning Schoology able to provide more improvement in terms of motivation for making students more motivated to learn, students are more interested because of easy access, not boring, students are more active learning, students have a target value, more earnest in doing the task, more independent in learning, more interested in the subject, as well as to increase knowledge.

Both of them have postive impact on motivation, but the motivation of both classess is in the medium category. This is based on observations during the learning one of them is due to inadequate infrastructure. According (Hendrastomo, 2008 :34) there are four components of sustainability advocates of e-learning in terms of the infrastructure including internet access, hardware, system (software) and Internet access fees. At the time of the learning takes place in the classroom, relatively slow internet network conditions and not every student has a laptop. For those students who do not have a laptop to take turns with your seatmate who cause delays in learning to follow, so the impact on student motivation.

Conclusions and suggestions

Conclusion

Based on the discussion above, it could be concluded as follows :

1. There are differences in the use of e-learning based schoology and Edmodo on the cognitive performnce of Digital Simulation course. The cognitive performance classes that use e-learning-based Schoology higher than the class that uses e-learning-based Edmodo.

2. There are differences in the use of e-learning based Schoology and on the students motivation of Digital Simulation course. Motivation classes that use e-learning-based Schoology higher than the class that uses e-learning-based Edmodo.

3. The level of students motivation using e-learning-based Schoology and Edmodo classified in the category of medium motivation.

Suggestion

1. The use of e-learning can improved cognitive achievement and motivation because it is expected of teachers can take advantage of e-learning according to the learning needs

2. It should be held next research that utilizes e-learning to examine affective and psychomotor learning outcomes. So the use of e-learning to optimize learning, especially on the Digital Simulation course.

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