Journal of Physics: Conference Series

PAPER • **OPEN ACCESS**

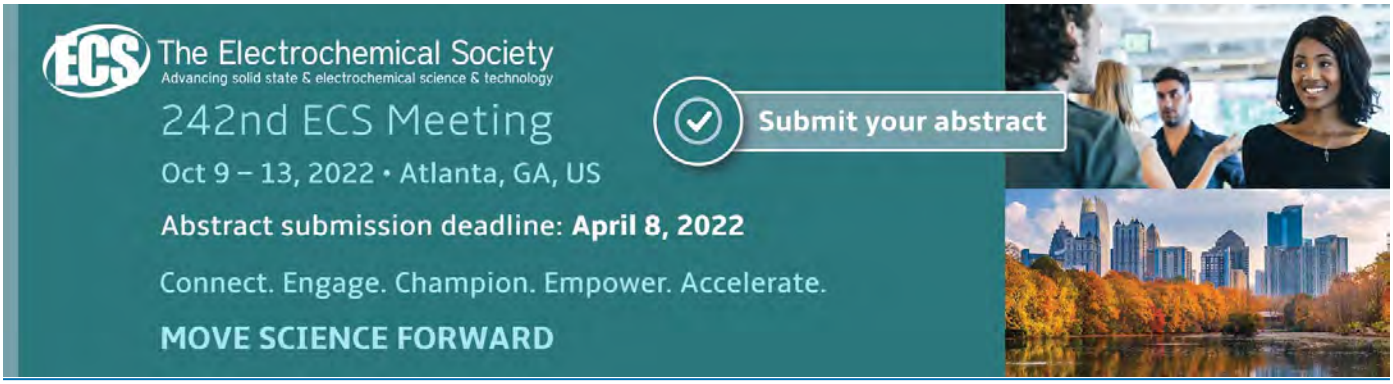
Utilization of Moodle in Learning

To cite this article: S Frisnoiry and MB Darari 2020 *J. Phys.: Conf. Ser.* **1462** 012031

View the article online for updates and enhancements.

You may also like

- Fault tolerance strategy to increase Moodle service reliability
A Zaini, H Santoso and M P T Sulistyanto
- Teaching using moodle in mathematics education
A Handayanto, S Supandi and L Ariyanto
- Study of the use and application of the moodle e-learning platform in high school
Harry Dhika, Fitriana Destiawati, Michael Sonny et al.



This content was downloaded from IP address 103.242.233.3 on 08/02/2022 at 04:46

IOP Conf. Series: Journal of Physics: Conf. Series **1462** (2020) 012031 doi:10.1088/1742-6596/1462/1/012031

Utilization of Moodle in Learning

S Frisnoiry, MB Darari

Universitas Negeri Medan

sucifrisnoiry@gmail.com

Abstract. The purpose of this study was to determine the effect of Moodle on student learning motivation as well as to find out the result of learning improvement of students who were learned using Moodle. This research was conducting by experimental study which using the Descent Nonequivalent Control Group Design using two groups, the experimental group, and the control group. This research used test and questionnaire (non-test) to collect the data. Based on the result of the study it showed that by using Moodle learning significantly affect motivation of the students. Also, based on the test description it was found that the average score of learning outcomes was increased. Students' average score on pretest was 67.6 while on posttest the average score was 92.3. it means that there was an average increase of 24.6.therefore it may be concluded that the use of Moodle in learning can improve students 'motivation and learning outcomes. Keywords: Moodle, motivation, and learning outcomes.

1. Introduction

2019 belongs to the digital development, commonly referred to as the digital 4.0 era. This era also has influence on education. An educator must be able to adjust to the development brought about by the era. Many ways can be done to meet these needs but they must be done with good preparation to be able to run effectively and efficiently.

Based on the survey results, Franedya (2019) states that internet users in Indonesia reached 171.17 million people. This figure is equivalent to 64.8% of the total population of Indonesia. This means that more than half of Indonesia's population has been actively using the Internet. The use of the Internet today is not just secondary needs but has become a primary need. Whereat present, all data or information can be obtained easily with the help of the Internet because all of these human needs products are already in digital form. This is also inseparable from the influence of the development of The Digital Age of 4.0.

In connection with education in this digital era, it is necessary to adjust the learning process to avoid unwanted differences learning. Therefore, innovation must be held in the learning process. Technological developments and the growth of internet usage in Indonesia in recent years are thought to have a positive contribution, especially in the area of using internet media for learning.

E-learning is one of the implementation of the use of the internet for learning. . A simple understanding of e-learning is online access to learning resources anywhere and anytime. E-learning offers new opportunities for teachers and students to enrich teaching and learning experiences through virtual environments that support not only the delivery of material but also the exploration and application of information and understanding of new knowledge (Holmes et al., 2006).

Nowadays, E-learning is easy to use. There are many helpful online features in e-learning development. One of them is Moodle. Features that important to support learning are available in moodle, such as assignments, quizzes, communication, collaboration, and key features that can upload various

Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence. Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.
Published under licence by IOP Publishing Ltd

formats of learning material. With these various supporting features, the teacher can create an effective, innovative, and enjoyable learning environment.

Through the use of e-learning in the learning process, it is hoped that it can improve student motivation and learning outcomes. The flow of the learning process does not have to be from lecturers to students, but students can also learn from one another.

Learning success is influenced by many factors. High learning achievement can be achieved thanks to the synergy of all components that build learning itself. According to Gulo (2002), the teaching and learning component consists of teaching objectives, instructors, students, subject matter, teaching methods, teaching media, and administrative and financial factors.

Facts in the field show that the learning outcomes of Differential Calculus courses tend to below, there are even some students who do not have enough grades to be able to graduate. Students are also less motivated in learning because students feel this course is a subject that is difficult to understand. The use of e-learning in learning is expected to increase student motivation for learning because, in e-learning, there is a direct interaction of students with the material, assignments, and evaluations. This direct interaction is an active learning activity of students, so the instructor in learning functions as a facilitator only. Students are also trained to be independent in learning. Therefore through this research, it is hoped that it can improve student motivation and learning outcomes in Differential Calculus courses.

2. Research Methods

This research was conducted at the Faculty of Mathematics and Natural Sciences, Medan State University. This research is a quasi-experimental study that has the objective of determining the effect of the use of e-learning moodle in the learning process. The quasi-experimental design uses Nonequivalent Control Group Design that uses two groups, namely the experimental group and the control group (Campbell et al., 1966).

The population in this study are students who study Differential Calculus courses. This study requires 2 group units for the experimental group and the control group. Then the group sample is represented by the Biology Education class C and Biology Education B. The sample selection for the control group and the experimental group is made by cluster sampling, which is to draw the class so that 2 classes are sampled, then the 2 classes are drawn again to determine which class is the control group and which class is the experimental group.

Data collection techniques in the form of tests and non-tests in which the test in the form of written tests in the form of a description of the material that aims to collect learning outcomes data before treatment through pretest and learning outcome data after treatment through posttest. Learning outcomes data before treatment and after treatment are used to determine the dependent variable mathematics learning outcomes. Non-test tests are using a questionnaire. The aim is to collect data on learner motivation variables. Questionnaires were given to both groups twice, namely before and after treatment. It aims to determine the learning motivation of students during the learning process. Questionnaire results data before and after treatment were used to determine the dependent variables of learning motivation. The data analysis technique used is the test requirements analysis with the normality test and homogeneity test data and hypothesis testing

3. Results and Discussion

This research was conducted in August 2019 to October 2019 at the Faculty of Mathematics and Natural Sciences, Medan State University. Sampling with cluster sampling obtained the results of the Biology Education class B as a control group and Biology Education C as an experimental group.

The written test instrument and the Non-test test in the form of a questionnaire were validated before being used in this study. Initial motivational and pretest questionnaires were given before the implementation of learning, namely at the first meeting after the lecture contract was given. For the experimental group was given on August 21, 2019, and for the control group on August 22, 2019.

Furthermore, the two groups were given learning with Differential Calculus material as many as six meetings, and each week the meeting was as much as two credits (2 x 50 minutes). For the experimental

group, learning is given by using e-learning moodle while for the control group is given learning by using the LCD projector.

After learning is completed, namely, at the 7th meeting, students are given a final motivation questionnaire and posttest. The final motivation and posttest motivation questionnaire were held on October 2, 2019, in the experimental group, while in the group on October 3, 2019.

In the analysis of data for normality, all the experimental group and control group data were normally distributed after passing the one sample Kolmogorov-Smirnov-test SPSS with p> α results or output greater than the 0.05 error level then Ho was rejected. For homogeneity of data, the motivation score in the form of a questionnaire is the variance of each group equally (homogeneous) after passing the SPSS Levene-test with p> α or output greater than the error level of 0.05. Whereas the score of learning outcomes with the test has the variance of each group is not the same (not homogeneous) after passing the test SPSS Levene-test with the results of p <α or the output is smaller than the error level of 0.05.

According to the hypothesis 1 testing using the output independent samples t-test, with a 0.05 error level, it can be concluded that Ho is rejected because a p-value of 0.006 is obtained, which is smaller than α, or p < 0.05. This means that at the error level of 0.05, it is significantly Ha (accepted), that is, there is a positive influence on the use of e-learning moodle on learning motivation in Differential Calculus courses at the Faculty of Mathematics and Natural Sciences, Medan State University.

Hypothesis 2 test was based on the output independent samples t-test; using an error level of 0.05, it can be concluded that Ho is rejected because a p-value of 0.008 is obtained, which is smaller than α, or in other words p <0.05. This means that at the error level of 0.05, it is significantly Ha (accepted), that is, there is a positive influence on the use of e-learning moodle on the learning outcomes of Differential Calculus lectures at the Faculty of Mathematics and Natural Sciences, Medan State University.

Hypothesis 3 test was based on the pretest and posttest data of the experimental group above, using a 0.05 error level, it can be concluded that Ho was rejected, because it obtained p <0.05. While the initial questionnaire data and the final questionnaire in the experimental group
above, by using a 0.05 error level, it can be concluded that Ho is rejected because a p-value of 0.015 is obtained, which is smaller than α, or p <0.05. This means that at the error level of 0.05 Ha (accepted), there is a significant influence of e-learning moodle through motivation towards the learning outcomes of Differential Calculus lectures at the Faculty of Mathematics and Natural Sciences, Medan State University.

After testing the research hypothesis, the research facts are obtained, namely; the positive influence in the form of an increase in the motivation of learning experimental groups that do learning by utilizing e-learning moodle is higher than the motivation of learning control groups who do learning by presenting material using LCD projectors. The following data presents the average score of learning motivation in the control group and the experimental group.

Table 1. Differences in Average Learning Motivation.

Group		Average Score
Experiment	Control	
2,30	-1,20	3,50

Based on table 1 above, the average score of learning motivation of the experimental group after learning is higher than the average score of learning motivation before learning. The difference in the average score of the experimental group's learning motivation was 2.30. The difference in the average score of the learning motivation of the control group was -1.20. The negative sign indicates that the average score of learning motivation in the control group has decreased rather than increased, or the average score of learning motivation after learning is smaller than the average score of learning motivation before learning. The difference in the average increase in learning motivation scores between the experimental and control groups was 3.50.

Table 2. The difference in Average Improvement in Learning Outcome Scores

Group		Average Score
Experiment	Control	
24,6	17,6	7,1

Based on table 2 above, it can be seen that the average score of the experimental group learning outcomes after getting moodle e-learning learning is higher than the average score of learning outcomes before learning. In the experimental class increased the average score of learning outcomes by 24.6, while in the control class increased the score of learning outcomes by 17.6. Furthermore, it can be seen the difference in the average increase in learning outcomes between the two groups of 7.1.

Table 3. Average Increased Learning Outcomes Through Motivation

Group		Average Score
Pretest	*Posttest*	
67,6	92,3	24,6

Based on table 3 above, it can be seen an increase in learning outcomes through motivation in the Differential Calculus course at the Faculty of Mathematics and Natural Sciences, Medan State University before learning by using e-learning moodle. Data obtained from the results of the pretest score and posttest score of the experimental group. Pretest scores measured before learning by using w-learning moodle was 67.6 and after learning by using e-learning moodle for six meetings, learning outcomes were measured again and an average posttest score of 92.3, which means there is an average increase of 24.6.

The overall results of this study can show the success of a media that is used in learning, especially in e-learning. Moodle media assistance for e-learning provides many new experiences for students so that they are more motivating for students to learn. These impacts can be seen from the results of an increase in learning outcomes scores in the experimental class that uses moodle assisted e-learning.

The use of e-learning in learning also greatly helps improve student learning outcomes. It is not difficult to make learning using e-learning because everything that uses digital products is included in e-learning. As revealed by Prawiradilaga (2012: 277), the presentation of video programs, including digital media groups, is already included in the scope of e-learning. Likewise, the presentation of teachers who deliver some of the material in slide presentations, including e-learning. Essentially e-learning is a learning process that uses electronic, digital media such as multimedia.

Rahmatia (2017: 220) states E-learning as computer-based learning both the internet as the main instrument or electronic media as the instrument. So it can be concluded that e-learning is learning by utilizing information and communication technology, especially electronic devices.

From all the explanations of the analysis process above, it can be seen that the findings in this study confirm that learning that pays attention to all aspects, especially aspects of the process of delivering the material well, will also obtain learning that runs successfully. This means that by preparing the learning process well, more effective learning is obtained. As has been done by researchers, by utilizing e-learning moodle can improve student motivation and learning outcomes in Differential Calculus courses.

4. Conclusion

Based on the results of hypothesis testing, there are several conclusions produced in this study, (i) learning by utilizing moodle learning has a significant effect in increasing students 'motivation to study; (ii) learning using e-learning moodle has a significant positive effect in increasing students 'learning outcomes. It means that there was an influence of e-learning using moodle students' motivation learning outcomes in Differential Calculus course at the faculty of Mathematics and Natural Sciences, Medan State University. The result may be used as reference for other teachers or researchers who are interested in use of e-learning moodle in learning.

5. References

[1] Campbell, D.T. & Stanley, J.C. 1966. Experimental and Quasi-Experimental Designs for Research.Rand McNally & Company: Chicago.
[2] Djamarah, S. B., dan Aswan Z. (2002). *Strategi Belajar Mengajar*. Rineka Cipta. Jakarta
[3] Gulo, W. 2002. Strategi Belajar Mengajar. Grasindo: Jakarta.
[4] Harjanto. (2005). *Perencanaan Pengajaran*. Rineka Cipta. Jakarta
[5] Holmes, B. & Gardner, J., 2006. E-Learning Concepts and Practice.SAGE Publications Ltd: London.
[6] Nursalam, MN. (2005). *Pendidikan Dalam Keperawatan*. Salemba Medika. Jakarta
[7] Prawiradilaga. 2012. Wawasan Teknologi Pendidikan. Jakarta: Kencana Prenada Media Group.
[8] Purwanto. (2004). *Prinsip dan Evaluasi Pengajaran*. Rosda Karya. Bandung
[9] Rahmatia, Maya, dkk. 2017. Pengaruh Media E-Learning Terhadap Hasil Belajar Matematika Siswa Kelas Iv Sdn 20 Banda Aceh. Jurnal Ilmiah Pendidikan Guru Sekolah Dasar. Volume 2 Nomor 1. 212 – 227.
[10] Saptono, S. (2003). *Strategi Belajar Mengajar*. Sinar Baru Algensindo. Bandung.