Moodle as e-learning media in physics class

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Abstract. The 21st century is characterized by technological developments. This has an impact on all aspects of life including education. At this time, technology is one component in education that cannot be ignored. The purpose of this study was to map the student response to e-learning moodle after using it in class physics. Experimental research model with a one-shot case study designed use in this study. Data collection through a questionnaire at the end of learning. The results show that students have a good response to e-learning, with an average mark of perceived usefulness to e-learning is good, e-learning self-efficacy is good, perceived ease to use to e-learning is good, attitude to e-learning is good, and e-learning system usage is good. To better understand moodle as e-learning in physics study, advantages and obstacles are explained in the discussion.

1. Introduction

In today's current trend of our age, digital and technology usually integrated into education. Technology gives a way to spread the information and knowledge easily, give innovation in leading material study, and as learning media which can help both teachers and students.

Electronic learning or called e-learning is using electronic learning in process learning, where e-learning is online access to the source of study[1]. The online learning gives the best choice for support learning. Online learning support student to get information quickly. The most principal point of using e-learning that students have so many opportunities to access the material study everywhere they go, and anytime they have. That is can do as long as they have electronic gadgets or other electronic devices[2].

The existence of e-learning as being one of the important support in education based on the latest learning curriculum is a must. Teachers must be able to provide learning facilities for students so the students can participate in active learning. Teachers should have knowledge about the type of e-learning, how to use that, and how to facilitate the learning process environment to design their e-learning that will be used in their class. The observation result showed that some teachers still have difficult so they were reluctant to use e-learning media in the classroom. Based on the results of interviews with teachers it is known that the teacher does not have the knowledge and skills enough that support them in using e-learning media so they are feeling uneasy in using that. Therefore, there needs to be training and guidance to teachers about how to use e-learning in the learning process.

In this day, there are much e-learning media that can be legal using and free by user. One of technology such as the so-called modular object-oriented dynamic learning environment (Moodle). Moodle as one of the leading open-source learning management systems can be used in learning study. In the physics area, teachers and students can get many benefit from moodle where moodle with virtual space can help the teacher to share material and students can learn with different kinds of activity. Based on research before that is known that students give very good response to online learning physics where
online learning can help the student in reinforcing their knowledge and abilities [3]. This research aimed to map the student response to e-learning moodle after using it in class physics. To better understand moodle as e-learning in physics study, advantages and obstacles are explained in the discussion.

Learning media is an important element in achieving systematic learning. Right now, one of the important media learning is media ICT. ICT integrated into all levels of school and in all course curriculum in an inappropriate way. Informal and non-formal education, technology be one important component that supports learning and help to prepare student with skills and knowledge. The role of technology in active learning, helps in building interactions between learners meaningfully and provides convenience in accessing information, with communication and ease of access to information, it can make learners more involved in the learning process [4]. ICT or technology integrated in class called e-learning.

Electronic learning or called as E-learning, provides a wide range of learning with technology-based learning, which includes a number of applications and processes. The advantages of e-learning include: a) Generating teacher enthusiasm to introduce more complex learning tasks and materials; b) Can support the teacher to be a guide rather than a conveyer of knowledge; c) Provide a safe state for teachers to become students again and share their ideas about the curriculum and method; d) Can motivate students to do tasks that are more difficult and more responsible in doing their tasks; e) Add significant values and culture to school assignments [5]

E-learning in physics courses is an important component that support the traditional learning process. The use of e-learning in relevant physics material allows the teacher to give more effective material learning to student, manage the learning process and give support to student to find various sources of information they are needed. E-learning allows the teacher in know how good each student in learning material and how long they are spend their time in learning the material study. In addition, the teacher can provide the electronic module for students and deliver to student through the e-learning; the teacher can get information of students through test, intermediate and final test they was did, and other forms of feedback that prepare through e-learning, after that teacher can control what the knowledge they want to share to student [6].

E-learning environment maybe contributes to the way the teachers teach and learning process if e-learning can be integrated with the framework of proper pedagogy. The construction of e-learning can now be built with Learning Management System (LMS) software called moodle. Moodle is an open-source project and has no licensing cost software [7] that supports to provide e-learning, and have many features that can download easily and accommodated by teacher to support various learning activities in e-learning portal [1]. Important features that support learning include tasks, module, discussion, quizzes, communication, collaboration, and key features that can upload various formats of material study. Moodle installation is done on a computer that is used as an e-learning server. Learning materials in digital form or files are uploaded to the e-learning server. Students can access learning materials from other computers. This Moodle e-learning system can be accessed locally or online via the internet, so access to learning resources can be done anytime and anywhere [1].

In physics study, moodle in class can use to reduce misconceptions from the material study. The teacher can get the student to video or picture about material which could help them in understanding material study. There is a student can improve their performance and conceptual understanding when using e-learning in topic electricity after they study with moodle [8]. In addition, using moodle, allow the teacher to deep explanation with video or representation that in creative way, foster student in an experimental study, and allowing to create various activities or models of learning [9].

There are five aspects of using moodle as e-learning by students, there are: the support of technical, usefulness of e-learning, ease of use of e-learning, system usage, and attitude. Among other of that have related to one other where all of that variable supports one other. Perceived ease of use and usefulness of e-learning influenced by support of technical. While from research, it is known that perceived ease of use and attitude has a direct effect on using moodle [10].

The use of learning resources on web-based learning can be seen from the viewpoint of students and the teacher's point of view [11]. Web-based learning can provide various sources and content of
education, create various activities to the learning process in many ways and provide the needed information about the student, result of test and assessment of student [12]. There are for using e-learning, that is need to do base training so the staff or teacher realize the function and technical support and material base, how method to use electronic for education usage, the way to make a various electronic module and multimedia textbooks [13].

2. Methods
This research is experimental research with a one-shot case study design. When research did to one class to know the response about e-learning after process learning physics. The subject of this study included 27 students in physics lessons in class X IPA 6 SMAN 1 Sungai Penuh City, Jambi Province. The mapping of students’ responses is done after the implementation of moodle in study of one chapter material study. The test is a questionnaire consisting of 22 items. Where the questionnaire can be seen in Table 1.

| Table 1. Questionnaire of students response to using moodle after study |
|-------------------------------------------------|
| Aspect Measurement | Nomor of Expression | Score |
| Perceived usefulness | 1, 2, 3, 4, 5, 6 |  |  |
| Computer self-efficacy | 7, 8, 9, 10, 11, 12 |  |  |
| Perceived ease of use | 13, 14, 15, 16 |  |  |
| Attitude | 17, 18, 19, 20 |  |  |
| System usage | 21, 22 |  |  |

With: 5 = Very Agreed; 4 = Agree; 3 = Sufficient; 2 = Not Agree; 1 = Very not agreed

Data that was obtained, then analyzed using the formula:

\[ P = \frac{X}{N} \]  

Information: P = Score of item; X = Sum of scores, and N = Amount of students

The results obtained are divided into each aspect measurement, then interpreted in a qualitative range, as shown in Table 2.

| Table 2. The average score of student response in each aspect measurement |
|-------------------------------------------------|
| No. | Score | Mark Interpretation |
| 1 | Xi + 1.80 Sdi <X | 4.206<X | Well |
| 2 | Xi + 0.60 Sdi < X ) Xi + 1.80 Sdi | 3.402<X≤4.206 | Good |
| 3 | Xi - 0.60 Sdi < Xi + 0.60 Sdi | 1.598<X≤3.402 | Pretty well |
| 4 | Xi - 1.80 Sdi < Xi - 0.60 Sdi | 1.794<X≤2.598 | Poor |
| 5 | X ≤ Xi - 1.80 Sdi | X≤1.794 | Too poor |

In addition, the advantage and obstacle in using moodle in class is explained in a qualitative descriptive manner.

3. Results and Discussion

3.1. Response students to e-learning
Implementation of moodle as e-learning in class conducted by steps i.e; 1) the teacher teach how to use and steps to use e-learning moodle, 2) the teacher give the username and password to students so they can login to e-learning moodle, 3) the students follow the steps of learning through the e-learning, based on teacher guide. In this learning, the teacher uses e-learning in blended learning model, where e-learning
moodle combined with face-to-face learning. Some of the material is delivered through e-learning moodle, and partly through face-to-face. After one chapter of learning in topic work and energy, the teacher gives a questionnaire to students to collect students’ responses about e-learning that was using before.

The result of the questionnaire about the response of student about e-learning moodle after using for learning purpose are presented in table 3.

| Aspect measurement   | Average Score | Criteria |
|----------------------|---------------|----------|
| Perceived usefulness | 4.04          | Good     |
| Computer self-efficacy| 3.77          | Good     |
| Perceived ease of use| 3.96          | Good     |
| Attitude             | 4.04          | Good     |
| System usage         | 3.50          | Good     |

Based on data conducted, known that is in the aspect of system usage have low value than other aspects. System usage used to explain how much time that students use in e-learning. [14] Explain that to use e-learning needs training and frequently so the e-learning is getting to implement effectively. Student time in using e-learning needs to improve so student can gain the benefit of e-learning. Base on data we do know that system usage value do not influence perceived usefulness, self-efficacy of computer, ease of use of moodle, and attitude to moodle. On the other hand, the student comment about the network is not good in the district area make students difficult to access e-learning. That is can be the reason why the system usage has low value than others.

3.2. Advantage of Moodle as e-learning media

Through process learning that did with e-learning before, there are some potentials of e-learning:
1. The teacher can give material study for student in various types, and various activities. Research before explains that moodle offers teachers some opportunities to share various and present material studies that maybe could not be got through the traditional learning environment [8].
2. Moodle prepares students with pre-knowledge about the topic study. That is because e-learning allows students to access e-learning every time and everywhere with the technology they have. The research before explains that moodle e-learning platforms give opportunities to students to enhance their knowledge in pre-class preparation and improve their motivation to learn. After that, the moodle platforms has friendly to use and offers various teaching strategies that can be used by the teacher to improve motivation, enhancement, and students’ self-direct learning [15].
3. Moodle gains students’ motivation to study in an individual or group.

3.3. Consideration in using moodle as e-learning media

Some obstacles that should be considered by the teacher while using e-learning i.e:
1. Students that new with using e-learning have not to know about the benefit of using e-learning, and sometimes got forget about how to use e-learning and need a guide of the teacher. The research before explains that lacking technical skills wasn’t a problem for most students because the student in this time really close with technology. But still, an explanation about how to use moodle needs to do in the first meeting in class to keep. That is because not all student has sufficient literature about use technology. If the student finds moodle as an advantageous tool for them to get a right answer for the question, advantageous of forum discussion, and the accurate data for answer their question without need cross-check data from other resources, so the student would consider that moodle usefulness and would start to use it more often [16].
2. E-learning should have good internet networking. There is in district area with electric problems (electric come down with random day or electricity break off because of a broken machine) effect on bed internet networking that made students cannot access e-learning.
3.4. Teacher challenge in using e-learning
There are challenges of the teacher in using e-learning among others:
1. The teacher needs to always motivate and guide the student to use e-learning in initial learning because many students still unfamiliar with using e-learning. The research before explains that learning style [17], and student’s motivation [18] in using moodle can be the factor in learning result. In fulfill learning styles, the teacher needs to have adequate skills for creating various activities in e-learning and use e-learning [17]. Firstly, the teacher needs to detect motivational problem for particular student in using moodle, so the teacher can give solution to improve motivation for that student.
2. The teacher has to consistent in using e-learning, not just in one chapter of learning but continuously. The research before explains that agreement with needed and focus on using e-learning in an organization or group was a factor in the success of e-learning implementation [19].
3. The teacher should be willing to prepare their time to study better about e-learning moodle, how to use, how to develop, and how to implement it in class. The research before explains that in building moodle as e-learning, instructors need a true understanding about moodle as e-learning. The teacher who uses moodle as e-learning will assist to manage an online course, create some task, add discussion part, modify the moodle, customize the moodle, and fill the content and create various activities for achieving learning objectivities. That is the reason why the teacher must have a good knowledge of learning management systems [20].

4. Conclusion
The result of mapping students’ responses to moodle as e-learning is good where the average mark of perceived usefulness to e-learning is good, e-learning self-efficacy is good, perceived ease to use to e-learning is good, attitude to e-learning is good, and e-learning system usage is good. There are students who welcome moodle as e-learning in class in a good way. The teacher who feels reluctant to use e-learning in class needs to try using moodle as e-learning. The teacher should willing to prepare their time to learn about moodle so they can be using moodle in class. That is because moodle can help them in transfer and present material of study in various ways and more advantage can teacher and students get from moodle as e-learning. Further research needs to introduce moodle as e-learning to teachers so teachers can use in class, give their training and conduct teacher response about moodle as e-learning in class.

Acknowledgments
The research is funded by the Ministry of Research, Technology, and Higher Education.

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