

# Implementation of Moodle as Teaching Tool in Learning Concept Science

Cartono Cartono  
 Department of Biology Education  
 Universitas Pasundan  
 Bandung, Indonesia  
 cartono@unpas.ac.id

Nurul Fazriyah, Sopyan Hendrayana  
 Department of Primary School Teacher Education  
 Universitas Pasundan  
 Bandung, Indonesia  
 nurulfazriyah@unpas.ac.id, sopyanhendrayana@unpas.ac.id

**Abstract**—The 21<sup>st</sup> century skill is set of skill that student need to develop to be successful in digital era. These skills are being capable for any change and innovative for every condition. The E-learning approach has accepted as one of the innovative strategy to improve the quality of education. Here, this study aims at quality of learning in concept of science using e-learning with Moodle platform. The subjects of this study are 41 students at the 2<sup>nd</sup> semester of primary school education at Universitas Pasundan. The research was conducted using the Elliot classroom action research model. The findings of the research are Moodle as teaching tool can be alternative for teaching to improve learning as outcomes and process. The achievements are; cycle I (45.40), cycle II (74.40), cycle III (86.59). The results of the study show that learning using Moodle can improve student learning outcomes in learning concept of science in primary school education at Universitas Pasundan. In addition, students found active and play an active and independent role in determining and completing their assignments.

**Keywords**—moodle; learning outcome; science learning

## I. INTRODUCTION

The paradigm of the education system which was originally based on traditional face-to-face, achieved an education system that was not limited to space and time with a touch of the world of information technology, especially the cyber world. Along with the need for education, the development of Information Technology (IT) is also increasing rapidly. Therefore, it needs a mutually supportive, especially in the concept and mechanism of IT-based lectures to be inevitable. The concept known as e-Learning has the effect of the transformation of conventional education into digital form, both in content and system [1]. Recently, the concept of e-Learning has been widely accepted by the world community, as evidenced by the widespread implementation of e-Learning in educational and industrial institutions [2].

As a high-school civil society education institution, primary education plays a role in the development of science. As a consequence of that, teacher training institution must be able to improve the quality and quality of education held [3]. Initial observation shows that almost all the lecturer is conducted using conventional method and face-to-face interaction. This situation sometimes left a problem in delaying of the meeting.

In addition, the process of transfer of knowledge is almost entirely carried out in the classroom which causes the transfer of knowledge to be delayed if the meeting does not occur. This situation can clearly hamper the lecture process, especially in Universitas Pasundan which can result in reduced student understanding the material.

On the other hand, it does not yet have a means to manage and facilitate the dissemination of articles, papers, and other knowledge, especially in the field of IT which is intended to provide free education for the general public. Then it is necessary to make a web-based e-Learning application that can be accessed anytime and anywhere so that it supports the educational process on campus and facilitates the dissemination of knowledge to the general public [4].

E-Learning is an education system that uses electronic applications to support the development of lecture activities with internet, intranet or other computer network media [3]. With e-Learning, it is possible to have an educational process without going through face to face and the development of knowledge to students can be done easily [5].

E-learning is the basis and logical consequence of the development of information and communication technology. With e-learning, teaching participants (learners or students) do not need to sit sweetly in the classroom to listen to each greeting from a lecturer directly [6].

As mentioned above, e-learning has shortened learning time and made the cost of study more economical. E-learning facilitates interaction between students with materials, students with teachers and fellow students. Students can share information and can access learning materials at any time and repeatedly, with such conditions that students can further strengthen their mastery of learning materials.

Moodle is a platform for learning (learning platform) specifically designed for educators, admins and students. Moodle actually stands for Modular Object-Oriented Dynamic Learning Environment. This platform is classified as a CMS but specifically for educational purposes [7]. This CMS is designed in such a way with a strong, safe and integrated system.

The basic concept of Natural Science is one of the disciplines that are still considered difficult to be mastered by

students in lectures, especially in primary teacher education and this is evidenced by the lack of interest of students to enter the science group. Science as an applicable science in everyday life must not only be mastered in the form of products (concepts, theories, facts, laws), but also in the form of steps or scientific work processes.

Donosepoetro defines science as a process, as a product, and as a procedure [8]. As a process, all scientific activities are interpreted to perfect knowledge about nature and to discover new knowledge. As a product it is interpreted as the result of a process, in the form of knowledge taught in school or outside of school or reading material for the spread or dominated of knowledge. As a procedure intended is a methodology or method used to find out something (research in general) which is commonly called the scientific method (scientific method).

## II. METHOD

Research conducted in the form of Classroom Action Research (CAR). CAR is a form of research conducted by teachers or lecturers in its efforts to improve and improve student learning outcomes carried out in the learning process through a series of actions. According to Corey, "Action is the process by which they study scientifically in order to guide, correct, and evaluate their decisions and actions" [9]. That class action research is a set of activities aimed at improving and evaluating decisions and actions taken.

The CAR model used in this study is referring to the John Elliot model. PT Elliot's CAR model describes the implementation consisting of three cycles with each cycle consisting of three actions, from each action will produce the next action when in the previous action there are weaknesses that must be reflected and evaluated, so that these steps will facilitate researchers in an effort improve rational thinking skills through student learning outcomes. Ire proceedings, and not as an independent document. Please do not revise any of the current designations.

The population that will be the object of this research are the 2016-2017 Academic Year department of Primary Teacher Education Universitas Pasundan Bandung, amounting to 41 students. This research was conducted starting in February 2017 in the 2016/2017 school year.

## III. RESULT AND DISCUSSION

Research on the use of Moodle e-learning in the Basic Concepts of Science uses the CAR method. Research results from each cycle and action are described, analyzed, and reflected to find out the advantages and disadvantages of learning activities aimed at improving the implementation of actions and subsequent learning. This study details the implementation of actions in each cycle can be described as follows.

Based on observations in learning using Moodle e-learning there is an increase in student learning outcomes and learning activities own. It can also be seen from the process tests obtained by students starting from cycle I, cycle II and cycle III.

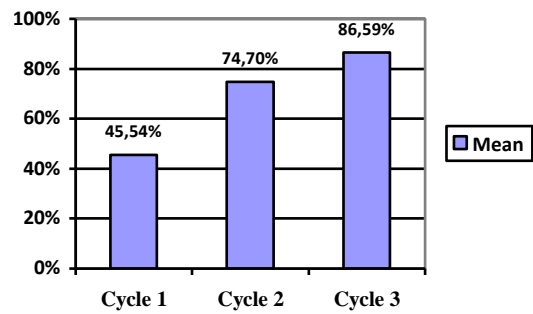


Fig. 1. Diagram of class average values in each cycle.

Based on the diagram above it can be seen that the average value of student learning outcomes in each cycle tends to increase. In the first cycle learning outcomes the average grade of the new class reaches 45.40 that value is still far from expectations. Learning activities in the first cycle were carried out with material about living things. The involvement of Moodle in the learning activities include in activities, materials, reporting up to the posttest using Moodle which is connected to the student's mobile device. Through interviews students claimed that they were still adaptable but were enthusiastic about learning with the new thing, Moodle. Learning outcomes in learning cycle I are still considered lacking, this situation is caused by several factors that influence learning activities which among them are students who feel insecure in demonstrating a simple simulation, students have not been so enthusiastic in participating in learning using Moodle, students find it difficult in technical use because it is still unfamiliar with the use of Moodle e-learning.

In the learning outcomes of cycle II the average grade score reached 74.70, the average value had experienced a pretty good improvement compared to the results of previous learning. This is due to several factors that influence the improvement of student learning outcomes themselves, among which students have started to feel confident in demonstrating the use of Moodle, students have begun to focus on learning, and students begin to antisip in following learning with the Moodle e-learning system. Where Moodle provides many advantages in learning, the results of Marikar and Jayarathne's study revealed that "the use of Moodle e-learning at General Sir John Kotelawela Defense University in Sri Lanka received positive responses from its users and could improve the learning achievement of their students" [6].

In addition, students can practically attend lectures on an ongoing basis which is not only face to face in the classroom, but can also attend at times not in college, such as accessing lecture material, receiving lecture assignments, collecting assignments, seeing the development of grades to chat discussions. In addition, it is in line with Coal, Hamdan "Moodle has a logical, simple, drag-and-drop feature, and the user tutorial is well documented on a website and there is a large community of Moodle users, and can arranged according to learning needs" [4]. In addition to the factors that influence the improvement of student learning outcomes, there are also

factors in terms of lecturers who are more cooperative in influencing the improvement of learning outcomes themselves.

In this second cycle learning the lecturer has taken corrective action from previous learning. These remedial actions among lecturers approach both individually and as a whole to students, lecturers provide learning motivation to students, and lecturers' package learning materials varied.

The average value of learning outcomes in cycle III reached 86.59. Based on the improvement of student learning outcomes in the third cycle learning, the researchers assumed that the learning outcomes of the third cycle were very satisfying, as for factors that support the increase in learning outcomes including student factors and the lecturers' own factors besides the environmental factors that could affect all improvements in student learning outcomes. Students' motivation also found higher by the existence of Moodle e-Learning to be more active in participating in learning with or without face-to-face lecturers. According to Sardiman motivation is a series of efforts to provide certain conditions, so that someone wants and wants to do something, and if he does not like it, it will try to negate or avoid the feeling of dislike [10]. Motivation can be stimulated by external factors, but motivation is to grow in a person. In learning activities, motivation can be said as the overall driving force in students that can lead to learning activities, which can guarantee the continuity of teaching and learning activities and provide direction to learning activities so that learning objectives can be achieved.

It is proven that learning using Moodle e-learning can improve student learning outcomes in the Elementary Teacher Education Universitas Pasundan. Of course this is based on the level of satisfaction of the students themselves in following the learning process using Moodle e-learning. This findings in line with the opinion of Batubara and Hamdan which stated "that the appearance of online examinations using LMS Moodle is interesting and easy to understand with a satisfaction level of 45% of respondents with a very good category" [4].

On the other hand, the important thing to note in the use of e-learning according to Darmawan is "the importance of analyzing various factors supporting the use of e-learning in planning activities. Such as: analysis of the needs and objectives of conducting online examinations, completeness of infrastructure (media), availability of internet networks,

availability of software, and implementing regulatory policies" [5].

#### IV. CONCLUSION

Based on the results of the study showed that learning using Moodle e-learning can improve student learning outcomes in the Basic Concepts Science in primary school teacher education Universitas Pasundan, and students can play an active and independent role in determining and completing their assignments. The achievements are; cycle I (45.40), cycle II (74.40), cycle III (86.59). Student activities towards learning basic concepts science using Moodle-based E-learning platform enable students to be actively involved in learning, both in terms of experiments, looking for data, even in learning evaluations. learning outcomes obtained also increased from Cycle I to cycle III.

#### ACKNOWLEDGMENT

This work was supported by Faculty of Teacher Training and Education Universitas Pasundan.

#### REFERENCES

- [1] S.M. Bullock, "Digital Technologies and Diverse Learning in Teacher Education: Reassembling the Social Perspective," 2015, pp. 5–23.
- [2] F. Paragina, S. Paragina, A. Jipa, T. Savu, and A. Dumitrescu, "The benefits of using MOODLE in teacher training in Romania," *Procedia - Soc. Behav. Sci.*, vol. 15, pp. 1135–1139, Jan. 2011.
- [3] Munir, *Kurikulum Berbasis Teknologi Informasi dan Komunikasi*. Bandung: Alfabeta, 2008.
- [4] H.H. Batubara, "Studi Implementasi Ujian Online Menggunakan LMS Moodle pada Mahasiswa PGMI UNISKA MAB Banjarmasin," *Pendidik. Guru MI*, vol. 4, pp. 201–216, 2017.
- [5] D. Darmawan, *Pengembangan E-Learning: Teori dan Desain*. Bandung: Remaja Rosda Karya, 2014.
- [6] M. dan Jayarathne, "Effectiveness of Moodle in Education System in Sri Lankan University," *J. Mod. Educ. Comput. Sci.*, vol. 8(2), p. 54, 2016.
- [7] C. Costa, H. Alvelos, and L. Teixeira, *The Use of Moodle e-learning Platform: A Study in a Portuguese University*, vol. 5. 2012.
- [8] Trianto, *Model Pembelajaran Terpadu*. Jakarta: Bumi Aksara, 2010.
- [9] Y. Abidin, *PEMBELAJARAN MULTILITERASI (Sebuah Jawaban atas Tantangan Pendidikan Abad 21)*. Bandung: Refika Aditama, 2015.
- [10] S.A.M, *Interaksi dan Motivasi Belajar Mengajar*. Jakarta: Rajawali Pers., 2010.