Edmodo social learning network for elementary school mathematics learning

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Abstract. A developed instructional media can be as printed media, visual media, audio media, and multimedia. The development of instructional media can also take advantage of technological development by utilizing Edmodo social network. This research aims to develop a digital classroom learning model using Edmodo social learning network for elementary school mathematics learning which is practical, valid and effective in order to improve the quality of learning activities. The result of this research showed that the prototype of mathematics learning device for elementary school students using Edmodo was in good category. There were 72% of students passed the assessment as a result of Edmodo learning. Edmodo has become a promising way to engage students in a collaborative learning process.

1. Introduction

The ways on how learning is implemented are remarkably developed along with the development of information technology [1]. Learning, which is defined as an activity such that students can achieve educational purposes, has adopted these technologies in a form of e-learning [1] and integration with mobile technology [2]. The education purpose itself cannot be separated from intellectual, behavioral, spiritual, attitude, moral, and social changing for the students to be independent in society life [3]. In order to achieve the purpose, learning concept and environment need to be designed such that the interaction between students and the learning environment could benefit their learning result [4, 5].

Teaching in elementary school need a well preparation [6] including the objectives, materials, methods, models, media, and assessment of learning [7]. All them need to be designed carefully in order to successfully reach the learning objectives. In the mathematics learning process for elementary school level, instructional media (e.g. manipulatives, virtual web-based manipulative) is one of the necessary components in supporting students' understanding of mathematical thinking [8-10]. Instructional media is a tool designed, planned, and regulated by the educators as an introduction in delivering materials to improve the quality of the learning process and learning outcomes of students [11]. The educators must be able to use the learning media that has been available in the school according to the needs of the learning process. In addition, the educators must also be skilled and innovative in creating and developing instructional media so that the learning process is more meaningful for the students.

A professional educator must be able to deal with various different types of students [12]. Various types of students can be found in our learning in terms of their behavioral engagement, which means how the students participate in the classroom. Behavioral engagement is the students’ participation in
the classroom discussion, academic task, and listening to teacher instruction. Some students may be active during the learning, but the others may appear passive and inattentive [13].

Based on the above opinion, we can see that a classroom can be regarded as a community. Classroom is a means of training the students to become good classroom members. The mathematics teacher has to be creative in managing the classroom, because not all students like to learn mathematics. Teacher needs to utilize the instructional media such that the students engage effectively [14]. The development of instructional media can also take advantage of technological developments by utilizing social networks such as Facebook, Edmodo, Schoology, and so on. The utilization aims to support the learning process and ease the students to access the material information quickly.

Our team tried to observe and to conduct an interview with the mathematics teacher of SD N 4 Birugo. It is a public elementary school in Bukittinggi, Indonesia, which has adequate facilities to support e-learning. The school has utilized social networking such as Edmodo as a means for educators and students in the learning process as seen in Figure 1.

In the Figure 1, we can see that the school has been supported by e-learning facilities. One teacher at the school had an opportunity to join short course and comparative studies in Australia, through the cooperation between the Education Department of Bukittinggi and the Australian government, studying how the digital class was developed there. Then the Australian government provided guide and help to model schools that used digital class. It was not only using equipment such as gadgets, laptops, and projector but also the existing digital class comes with applications and media needed to support learning. Though the learning has been supported with information technology, the use of social network such as Edmodo was still less optimal since the material was limited. The adequate information and materials provided by teacher will greatly assist the students in understanding the material provided.
Mathematics is regarded as the basic foundation of the development of other science lessons and it is compulsory in Indonesian elementary school curriculum. Basically, learning mathematics is challenging for the students. Therefore, mathematics learning at the elementary school level should be fun and exciting for students. This demand requires an innovation in the learning process, one of them is the utilization of Edmodo. Thus, development of sophisticated digital class by utilizing Edmodo in elementary school mathematics learning process is needed to increase the interest of the students and the quality of learning process.

2. Method
The research was part of a developmental research with the aim of producing and developing new products in learning. The research and development stage used refers to the ADDIE development model which consists of 5 stages: analyses, design, develop, implement, and evaluate [15]. ADDIE is a generating process because it applies concepts and theories to specific contexts. ADDIE is used in an educational setting to facilitate the formation of knowledge and skills during the learning coaching stage. The basic principle of ADDIE is all planning activities on coaching or building knowledge in some learning spaces [15]. This paper focuses on the result of product testing as an impact towards the students achievement which is in the evaluation stage.

In this research, after the implementation of Edmodo learning, the implementation stage was conducted to test the success of the development. We provide a percentage of the students who passed the test after the Edmodo learning.

3. Results and Discussion
Learning by using Edmodo platform is a learning that can be done anywhere, anytime and can be done from any device that supports. This provides considerable benefits for the students, the educators, the school, and the parents of the students themselves. The result of the fourth grade students’ learning achievement of SD N 4 Birugo can be seen in table 1.

| Score (x)     | Frequency |
|---------------|-----------|
| 80 ≤ x ≤ 100  | 9         |
| 66 ≤ x < 80   | 14        |
| 56 ≤ x < 66   | 4         |
| 40 ≤ x < 56   | 5         |
| 0 ≤ x < 40    | 0         |
| **Average Score** | **71**    |

Table 1 summarizes the student learning outcomes using Edmodo with the category of Very Good 30%, Good category 42%, Fair 16% and Poor 12%. In the test prototype 3, there were no students whose learning results fall into Fail category. If the percentage of students viewed from the completeness of the learning outcomes set by math teachers was 71, then 72% of the students passes in understanding the material of cubes and cuboids which the learning activities were using Edmodo. Based on the results of the average score of learning outcomes, it can be concluded that prototype 3 was being developed categorized in good category.

Edmodo is a social media platform that can be used as a tool in the learning process. Edmodo is an app that appeals to the teachers and students with social elements that resemble Facebook, but there is actually a greater value in this social-based educational app. Through this platform, it will be easier to monitor the interaction of students in the Edmodo learning environment [14]. Edmodo is an interactive platform that allows users to upload and share links to websites and an array of digital files not permitted in some platforms. Further, it also allows students to form groups to work on projects collaboratively. Edmodo is a micro blog that is similar in appearance to Facebook. By using Edmodo, the students
perceive it as a clearly academic platform, which is not the case with Facebook, which is mostly used for non-educational purposes. Edmodo allows for bi-directional teacher-student interaction. The teacher can communicate to the class or to any individual student. Likewise, a student can communicate to the class or send a private message to the teacher [16].

Edmodo is a learning tool in the form of an online platform to encourage teacher in teaching learning process, or it can be a more creative way to engage students in collaborative learning and distributed cognition. This platform provides student pathways to interact with fellow students and teachers in an academic setting. Furthermore, the use of this platform can teach the students how to behave online and be responsible for organizing their learning activities with their secure system. Edmodo provides an environment with teaching and learning atmosphere that can generate students' joy, the students become more independent, without forgetting the standard of measuring the success of students. Edmodo is a secure learning platform for the teachers, students, and schools based on social media. Edmodo provides a safe and easy way for the class to connect and collaborate, share content and work access, grades and school notifications. The goal of Edmodo is to help the educators harness the power of social media to tailor the class to each student. Edmodo can help the teachers build a virtual classroom based on classroom real-life at school, where there are assignments, quizzes, and grades at the end of each lesson. On the other hands, some research already documented that explain about mathematics learning process supported the Edmodo instruction learning research result [17-20].

4. Conclusion
Edmodo is a learning tool in the form of an online platform to encourage teacher in teaching learning process, or it can be a more creative way to engage students in collaborative learning and distributed cognition. If the percentage of students viewed from the completeness of the learning outcomes set by the math teachers were 71, then 72% of students passed in understanding the material of cubes and cuboids which used Edmodo in the learning activities. Based on the results of the average score of the math teachers were 71, then 72% of students passed in understanding the material of cubes and cuboids which used Edmodo in the learning activities. Based on the results of the average score of learning outcomes, it can be concluded that prototype 3 was being developed categorized in good category.

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