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OPEN EDUCATIONAL RESOURCES IN FLIPPED CLASSROOM MATHEMATICS

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Abstract

Open Education Resources (OER) as an open source of learning is getting more and more qualified in line with the development of learning media in the modern era. OER has the potential to facilitate the learning process and improve the quality of education. OER is available in various media openly (implementing an open license) and free of charge to be accessed, reused, or adapted, and redistributed by its users. The use of OER in the flipped classroom ensures that the implementation of learning in the classroom is varied and interesting for students. Flipped classroom learning gives students the opportunity, before studying in class, to study the material first at home according to the assignments given by the teacher. The method works very well when there are students who are not present in class for some reason. The teacher gives a video of the material being taught to those who do not enter the class so that students do not miss the lesson. This article reveals how mathematics teachers perceive the benefits of OER in flipped classroom learning and its effect on the quality of student learning.

Keywords: flipped classroom, mathematics, open education resources

1 INTRODUCTION

Technological developments have a strong influence on business processes in various sectors including education, thereby changing the old pattern of implementing education. Globalization has shifted the world of education from face-to-face education which has been going on for a long time to open education. Education that takes place synchronously (at the same time between teachers and students) and asynchronously (Romisky & Mason, 1996). Synchronous and asynchronous education is highly used in the use of Computer-Based Multimedia Communication. The use of technology in learning is called electronic learning or e-learning. E-Learning is a learning method by utilizing electronic tools in a network or online.

E-learning has the potential to provide a teaching and learning process that can be done by anyone without being constrained by distance and time. Distance and time are no longer a barrier to doing activities, including in this case learning. Almost all schools and colleges have utilized e-learning. The changing times that have become completely digital, coupled with the global Covid-19 pandemic, have motivated educators to carry out their business processes online.

One form of the use of e-learning and the use of technological developments is the flipped classroom learning method. Flipped classroom (Brigman & Sam, 2012) is a learning model that combines various learning methods by providing online material outside the classroom and doing assignments in the classroom.

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Learning in the new normal era after the covid pandemic gets an alternative learning strategy that is in great demand by teachers, namely Flipped Classroom learning. Flipped classroom allows students to access a variety of subject matter more flexibly. Student involvement in learning can be more active. The thing that makes the Flipped classroom more chosen by teachers in carrying out their learning is because the flipped classroom provides opportunities for teachers to assist students better and is more accommodating for students with different needs and characteristics to be able to learn well.

There are many kinds of learning resources that can be used by teachers for the learning process in the classroom, without exception for Flipped Classroom learning, such as ranging from printed textbooks to digital books, pictures, videos, infographics, video games, and other media. The development of internet technology allows these learning resources to be easily accessed online because of their wide and fast distribution. Teachers can take advantage of learning resources with much lower production and distribution costs.

Although not all learning resources in cyberspace are freely accessible, because some learning resource providers charge fees to users, there are still many options that allow teachers to take advantage of online and free learning resources in cyberspace. Even some owners of learning resources allow their users to send them to partners, of course with direct permission by the creator with a license provision so that there is legal certainty. These learning resources are called open learning resources or Open Educational Resources (OER).

This paper is a descriptive study of the use of Open Educational Resources in Flipped Classroom Mathematics by mathematics teachers in Indonesia. This study illustrates the implementation of Flipped Classroom learning that utilizes Open Educational Resources, including its advantages and disadvantages.

2 METHODOLOGY

This qualitative study was conducted to understand the use of Open Educational Resources by teachers in implementing Flipped Classroom learning. This study describes teachers' perceptions of the advantages of using Open Educational Resources, and what obstacles are experienced by teachers in obtaining and utilizing them. Regarding the implementation of Flipped Classroom learning by teachers, this study also describes the teacher's own perceptions about Flipped Classroom learning and the obstacles in implementing it.

3 FINDINGS AND DISCUSSION

Why do teachers in the global era need to develop learning that is accommodating to technological developments, not just relying on textbooks? The main thing, which needs to be considered is that

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textbooks have weaknesses and are less accommodating to student learning styles in the global era. One of the weaknesses is, as stated by Schramm (1984:386) that the textbook media has several shortcomings, for example, not "live", only presents a passive image, can't present sound, and tends to lag era.

Many teachers have made learning innovations, especially during the pandemic, teachers are more challenged to organize lessons that can ensure students continue to study even though they must stay at home. Learning that is accommodative to these conditions is flipped classroom learning. In fact, after the relatively recent pandemic has passed, many teachers are still using flipped classroom learning.

In flipped classroom learning, the teacher, before discussing the material that will be taught in class, provides learning media to students, which contains materials and assignments, so that students first learn the material in the learning media. Flipped classroom learning requires students to be more independent because students must study the material first before there is a meeting in class. Flipped classroom learning also makes students more active because students' curiosity is higher.

OER has attracted the attention of teachers and has become an alternative source of learning in delivering material to students, because, according to Alnatheer and Assiri (2019), the important role of OER is in providing flexible learning opportunities. Dutta (2016) report that OER provides many educational opportunities for teachers, students, and the education process.

OER strengthens individual learning and teaching and improves the quality of general education and higher education. OER also has the potential to create intellectual capital for innovation and creativity in various fields.

In the flipped classroom approach, what used to be homework is now done in the classroom, after students have studied the instructional content at home (Heo & Choi, 2014). The subject matter learned is packaged as a video that is easy for students to use. Many OERs are also produced commercially, obtained through Open Educational Resources (OER), or directly (locally) produced by teachers.

Following is some of the implementations of Flipped Classroom by several teachers, which provide an opportunity for readers to find out more about how Flipped Classroom is implemented and how teachers perceive the advantages and disadvantages. Implementation of flipped classroom learning that utilizes Open Educational Resources.

Flipped classroom learning provides an opportunity for students to study the subject matter at home according to the assignments given by the teacher before student’s study in class. Flipped

classroom learning is very useful for students when there are students who are not present in class for some reason, by the way, the teacher provides videos that he developed about the material to be taught to students who are not in the class. The video is also used by students who have studied in class to re-learn to deepen the material they have learned.

The results of the research by Alnatheer and Assiri (2019) aim to determine the extent to which OER is used in learning mathematics in high school at a transitional stage characterized by abstraction and complexity in the subject matter, it can be concluded that the teacher encounters a constant challenge of developing educational practices inside and outside the classroom. OER affect the students, change their attitudes, and increase their achievements. Because they take a long time to implement, they raise the teacher's concern about the utilization of instructions. It is suggested that evaluation tools should be developed to highlight the mechanism for utilizing OER.

Rahmah and Ikashaum (2021) state that in carrying out Flipped Classroom learning, learning videos can be downloaded from various educational service providers such as Educational TV and Learning Houses or can also be downloaded for free from private education service providers. In his research conducted in the Way Tenong area, West Lampung, Sumatra Island, it was found that students' understanding of mathematical concepts using the Flipped Classroom model had better conceptual understanding skills than students' conceptual understanding skills using the lecture model. The superiority of the learning he carried out was that the learning videos used provided more opportunities for students to learn anytime and anywhere. The video provided can be played repeatedly until students understand the material given.

Meanwhile, Kurniawati, et al. (2019), their research in Banjarmasin, South Kalimantan, concludes the results of their research that the blended learning process with the Flipped Classroom model assisted by Google Classroom is in the very good category. Student responses to the model used are also in the good category. This is because the media used involves technology, so it attracts greater student interest than face-to-face learning or online learning only.

Widyastuti, et al. (2018), the results of their research in Yogyakarta, Central Java, show that the Flipped Classroom model can improve students' creativity and mathematics learning outcomes. When playing the learning video, students look active so that students can answer the questions given because they understand the material given. Creativity in answering questions is also seen when students work in groups.

The results of Saputra and Mujib's research (2018) show that students' understanding of mathematical concepts using the Flipped Classroom model is better. The learning videos used

provide more opportunities for students to learn anytime and anywhere. The video provided can be played repeatedly until students understand the material given.

4 CONCLUSION

The teachers who carry out learning with the Flipped Classroom by utilizing open learning resources, state that flipped classroom learning is very effective and increases activities and better learning outcomes. Open learning resources used are very easy to obtain and quite useful in teaching concepts to students.

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