Mathematics Learning with MMP Development

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Abstract. In this study, researchers used the Missouri Mathematics Project (MMP) method which was developed through technology. In general, MMP uses 5 stages using time in each process, namely Review (10 min), Development (35 min), Control Exercise (20 min), Seat Work (15 min) and Assignment (5 min). This method is applied to the subject of similarity in mathematics subjects at SMKN 5 Bengkulu City. Development of Missouri Mathematics Project (MMP) Method using Adobe Flash Professional CS.5 Application. This application is later expected to bring a more conducive learning atmosphere and can improve student learning outcomes on the subject of Congruence Mathematics. When the researcher made initial observations at SMKN 5 Bengkulu City, this research was well received and it was hoped that there would be changes to the results, especially similarity.

Keywords: Mathematics Learning · Missouri Mathematics Project (MMP) · *Adobe Flash Professional CS.5*

1 Introduction

Mathematics is one of the subjects that needs more attention compared to other subjects, because learning outcomes in mathematics are always low [1]. Why is mathematics education low? One of the causes of the low quality of our mathematics education, among others: the wrong view of the role of teachers, teachers generally dominate the process of learning mathematics in schools, lack of recognition and appreciation of individual student differences, learning that is less able to raise awareness of the meaning of learning, because students are forced to study the material to be taught by the teacher by applying various types of punishment and so on [2].

Mathematics is a difficult subject for most students [3]. Therefore, various methods and models of teaching approaches are needed to minimize students' difficulties in learning mathematics [4]. A teacher or prospective teacher needs to understand and understand about mathematics learning models that can increase the meaning and understanding of mathematics [5]. Teachers have a very important role in terms of fostering student interest in achieving learning outcomes in certain subject areas including mathematics [6]. For this reason, a teacher needs to look for alternative strategies in fostering student interest so that they want to learn happily (without feeling forced), so that it can

lead to self-confidence in students, which in the end they can develop existing abilities without them realizing it [7].

Given the importance of mathematics, it is necessary to improve the learning process carried out by teachers, namely by using a learning method that can improve students' ability to understand and master mathematical material [8]. One way to overcome this is through the Missouri Mathematics Project (MMP) method in the MMP method, teachers teach by involving students to switch from the lecture method to the Missouri Mathematics Project method [9]. This MMP method generally uses 5 stages by using time in each process, namely Review, Development, Control Exercise, Seat Work and Assignment [10]. This method usually This is done in the classroom, it's just that the researchers want to develop this technology-based method that students will learn in the computer laboratory and when starting the lesson students will be invited to review the material that has been delivered at the previous meeting so that before taking the next material students are reminded of the material that has been taught [11]. in the past, as well as discussing PR if it is given on a technology-based basis, in this case using Adobe Flash Professional CS.5 [12].

Why should Adobe Flash Professional CS.5? Adobe Flash Professional CS.5 is very useful to help design materials, give students quizzes, or collect easy information in an efficient way [7]. This website plugin system is very much liked and hunted by animation lovers around the world, including jobs in IT which are very closely related to plugins, especially website providers or builders, because of their very high benefits and usefulness in helping to activate moving images or animations. Only then discuss the material to be delivered but must expand the concepts being taught by linking concrete examples [13].

Researchers want to develop this MMP method which is planned to be implemented at SMKN 5 Bengkulu City with the Mathematics subject with the theme of Congruence, because there are some mathematics teachers at the SMK who complain about learning with the theme of similarity they do not find a suitable method and the number of school computers is quite adequate if Mathematics learning is carried out in a computer laboratory with a capacity of one student per computer. Based on this description, the author wants to conduct a research entitled "Development of Technology-Based Missouri Mathematics Project (MMP) Learning Method at SMKN 5 Bengkulu City".

2   Method

The type of research used is development research [14]. The research to be carried out is development research because the research is conducted to develop and improve its use in problem solving. The development design according to Plomp [15], consists of five phases, namely: 1. Initial investigation, 2. Design/design, 3. Construction/realization, 4. Test, evaluation & revision, 5. Implementation. The development process to obtain a valid technology-based Mathematics Learning method, then carried out validation activities on learning applications, learning tools, and research instruments needed [15].

The subjects of this study were students of SMKN 5 Bengkulu City Class X 2018/2019 Academic Year. The variables that will be observed are the learning outcomes on the theme of similarity, both class X DKV 1 which totals 25 people and XI

DKV 2 which amounts to 25 people. In class X DKV there is no superior class, making it easier for researchers to take the population.

This research was conducted at SMKN 5 Bengkulu City, which is located on the West Ring Road of Bengkulu City. While the time of this research lasted for one year, starting from February 2021 to July 2021. In this study the researchers had made initial observations of teachers and students of SMKN 5 Bengkulu City. In the initial observation, the researcher has obtained data in the form of Pre-Test and the results of interviews with both teachers and students.

3   Result and Discussion

3.1   Example of Figure (Put Subtitle of Your Research Results)

Within the framework of this research is to improve student learning outcomes by developing a technology-based MMP method in the subject of similarity in mathematics. Furthermore, the framework of this research is described in Fig. 1.

Data Reduction refers to the process of selcting, focusing, simplifying, abstracting and transforming the data that apeear in written up field notes or transcription.

3.2   Example of Table (Put Subtitle of Your Research Results)

Based on the results of data analysis, it was revealed that the subject of similarity between students who received MMP learning was better than students who received conventional learning. This is indicated by the post-test average of the MMP class reaching 90% of the ideal score when compared to the conventional class which only reached 78%. This is because students in conventional classes have not been skilled in solving the main questions of similarity. However, based on statistical tests, it was found that the
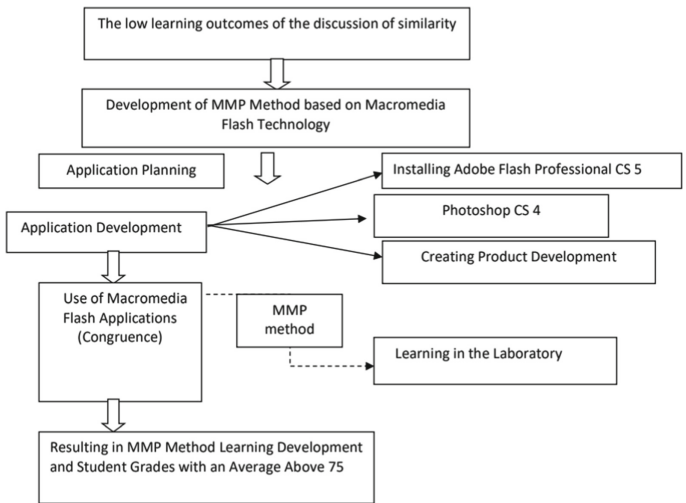

Fig. 1. Research framework

subject of similarity between students who received MMP learning was significantly better than students who received conventional learning. As for the pree test scores in the conventional class and MMP are not much different, XI DKV I 40% while for class XI DKV II 41%. As much 82% of MMP class students can rewrite what is known and asked from the questions while the conventional class only reaches 72%.

In each indicator with MMP learning, the results are also better than conventional learning. As many as 90% and 78% of MMP class students can write down the facts contained in the questions and write the path to the answers completely than conventional classes which cannot do it at all. At the development stage, the MMP learning method emphasizes applications where the learning is carried out in the computer lab, although it does not have to be used forever. Learning by finding a mathematical concept that is being studied gives the advantage that the mathematical concept is constructed by the students themselves, so that the concept is easy to understand and lasts longer in memory.

In the learning process that occurs in class XI DKV I for conventional development classes, both students and teachers benefit. The teacher for delivering material in class XI DKVI obtained a level of 80% better than class XI DKVII which was only 60% complete per indicator. Meanwhile, the students' level of achievement in learning outcomes was higher using the MMP method in class XI DKVI which was 90% compared to class XI DKVII which was only 78%.

In the use of the response method for the use of the MMP development method in class XI DKVI 100% stated that students liked the use of the MMP development method while for class XI DKVII only 55% stated that they liked the conventional method. The percentages obtained are based on questionnaires distributed by researchers to math teachers in class XI and for students in class XI and DKVII. In addition to providing data for achievement, the advantage for teachers is that the MMP learning model emphasizes student activities in learning, so that teachers act more as facilitators and motivators. With this, the teacher has more time to supervise the learning process, provide assistance to students who have difficulty in learning, and provide anticipation in case of misconceptions in learning.

This is what makes the similarity material for MMP class students better than conventional classes. Based on observations during learning, student activities during learning with MMP learning showed positive results.

4   Conclusion

The research that has been conducted on the development of the Missouri Mathematics Project (MMP) learning model on the similarity of students at SMKN 5 Bengkulu City concluded that the subject of the similarity of students who received learning through the Missouri Mathematics Project (MMP) learning model was better than conventional learning.

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