INNOVATIVE MATHEMATICS LEARNING TRAINING PRIMARY SCHOOL

Abdul Wahab[1]
Junaedi[2]
[1] Universitas Muslim Indonesia
[2] Institut Agama Islam DDI Polewali Mandar
[1] abdulwahab79@umi.ac.id [2]junaedi@ddipolman.ac.id

Abstract

Community service activities in the form of elementary mathematics learning training. This activity was carried out at SDN 032 Kebun Sari, Wonomulyo District, Polman Regency, West Sulawesi, Indonesia. Participants in the service activity were elementary school mathematics teachers who were members of the Wonomulyo Subdistrict Teacher Working Group, Polewali Mandar Regency. The objectives of the community service activities are: (1) Increase knowledge of innovative mathematics learning strategies for elementary school teachers; and (2) Increase elementary teachers' knowledge of elementary school mathematics concepts. Community service activities have increased the understanding of elementary mathematics teachers about learning strategies and knowledge of elementary mathematics concepts in mathematics teachers in Wonomulyo sub-district.

Keywords:

Mathematics learning strategy media, elementary mathematics concepts.

Preliminary

Learning mathematics must go through a gradual process from simple concepts to more complex concepts. Any mathematical concept can best be understood if it is first presented in concrete form. According to Dienes (Hudojo, 1998) it is said that every concept or principle of mathematics can be perfectly understood only if it is first presented to students in concrete forms. Thus, it is very important for mathematics teachers to manipulate abstract mathematical objects into concrete ones. (Russeffendi, 1992) states that props are a tool to explain or realize mathematical concepts so that the subject matter presented is easily understood by students (Fadillah et al., 2017).

Elementary school children aged between seven and 12 years basically have their intellectual development included in the concrete operational stage, because their logical thinking is based on the physical manipulation of objects. In other words, the use of media (including teaching aids) in mathematics learning in Elementary school is indeed necessary, because it is in accordance with the child's thinking stage. By using these media or teaching aids, children will appreciate mathematics in real terms based on clear and visible facts. So that children more easily understand the topics presented.

Based on the results of interviews with several mathematics teachers and primary school principals at Wonomulyo Polman, information was obtained that the mathematics learning carried out was still conventional. Students learn more mathematics through direct explanations by the teacher, which is dominated by lectures. In fact, elementary school children really need learning to use concrete media to better understand mathematics material because students are only just starting to think about concrete. Elementary school age children also still need fun learning, monotonous learning makes students bored and not interested in learning (Lathiifah et al., 2019).

The skills of teachers in designing mathematics lessons are also very lacking. As a result, students learn mathematics in ways that are less meaningful. Students tend to memorize certain mathematical concepts or procedures and learn mathematics more mechanically. This has an impact on the low achievement of learning mathematics (Nugrahini et al., 2015).

The objectives of the community service activities are: (1) Identifying elementary mathematics concepts that require innovative mathematics learning; and (2) Increase the knowledge of teachers about innovative mathematics learning and have the ability to implement it in classroom learning activities (Susanah et al., 2020).

Method

Community service activities in the form of mathematics learning training for elementary school mathematics teachers. The activity was carried out at SDN 032 Kebunsari, Wonomulyo District as a partner in community service activities. Participants in the community service activity were elementary school math teachers from Wonomulyo sub-district, Polewali Mandar district, West Sulawesi province, Indonesia.

The method of implementing community service activities is carried out by adopting action research steps which consist of 4 (four) stages, namely planning, acting, observing, and reflecting. The activities carried out at the planning stage are: (1) Socialization of community service programs to partner schools, namely SDN 032 Kebunsari; (2) The meeting of the community service implementation team with the Elementary school mathematics teacher team in the Wonomulyo sub-district; and (3) Formulation of training programs.

Furthermore, actions were taken in the form of implementing a training program. During the implementation of the action, observations were made. Observations were made during the learning process using mathematics learning by partner teachers. The instrument used was in the form of field notes. Some things that are observed are the constraints and weaknesses that appear in the process of using learning media in the classroom.

The last stage is reflection. The things that are done in the reflection stage are: (1) Evaluating the constraints and weaknesses that arise in learning mathematics in the application of learning in class; and (2) the results of the evaluation are used to correct deficiencies in the learning media.

Discussion

The stages of service activities consist of four stages, namely planning, acting, observing, and reflecting.

1. Planning Stage

The first activity carried out at the planning stage was the socialization of the Community Service program at partner schools, namely SDN 032 Kebunsari. The socialization was carried out in the form of coordination by inviting the principal of the partner school and teachers of SDN 032 Kebunsari regarding the planning of the program to be implemented.

The second activity in planning is a meeting of the Community Service implementation team with elementary school math teachers in Wonomulyo sub-district. The meeting aims to identify any subject matter that elementary mathematics teachers find difficult in learning mathematics and the teacher does not know the appropriate teaching aids to be used in learning. Based on the identification results, the results of the analysis of existing problems, the results of the needs analysis, and the results of the analysis of the school's potential, a training program is then prepared.

2. The Action Stage

After planning is done well, then action is taken. Actions in service activities in the form of program implementation. The activities carried out in the implementation of the program are training activities and practical use of mathematics learning. The training activity was attended by elementary school math teachers from Wonomulyo sub-district, Polewali Mandar Regency. Activities carried out in the service are: (1) Informing or introducing teachers to innovative mathematics learning; (2) demonstrate innovative mathematics learning; and (3) innovative mathematics learning training. After the training activities ended, then several teachers carried out innovative mathematics learning practices in classrooms at partner schools with other teachers as observers.

Some of the props used in the service are: (1) Construct blocks, cubes, prisms, tubes, spheres, and cones to teach the concepts of volume and surface area of a shape; (2) Number scales to teach the concepts of addition, subtraction, multiplication, and division operations on natural numbers; and (3) a number line to teach the concept of addition and subtraction operations for integers (Sukiyanto et al., 2021).

3. Observation Stage

The next action activity after the training by the service team was an innovative mathematics learning practice activity by several partner teachers in the class. During the implementation of the practice of using mathematics learning media, the community service team conducted observations with several other partner teachers who served as observers. In the observations, the constraints and weaknesses that arise in the process of using learning media in the classroom are observed.

In the implementation of learning practices, there are several weaknesses, including learning with teaching aids that are still managed classically, meaning that the use of teaching aids is still dominated by teachers. In general, only a small proportion of students can use these teaching aids. Classical learning is learning that is most liked by teachers because it is easy to implement. In classical learning, communication generally occurs unidirectional, that is, from teacher to student, and almost does not happen the other way around. To minimize the dominance of teachers in the use of teaching aids, it is necessary to plan and develop teaching aids for groups or individuals. There are several advantages when using props for groups, including: (1) Having peer tutors in the group, will be able to help the teacher explain the use of teaching aids to his friends; (2) The cooperation that occurs in the use of group teaching aids will make the classroom atmosphere more pleasant; (3) The relatively small number of group members will make it easier for students to discuss and cooperate in the use of tools (Sukayati & Suharjana, 2009).

4. Reflection Stage

From these weaknesses, the community service team reflected that some teaching aids can be made simple to reduce the costs required in making teaching aids, so that more props can be made and can be used by most students. (Sukayati & Suharjana, 2009) stated that there are several requirements that teaching aids must have so that the function or benefits of these teaching aids are as expected in learning, namely: (1) in accordance with mathematical concepts; (2) Can clarify mathematical concepts, either in the form of real, pictures, or diagrams and not the other way around (makes it difficult to understand mathematical concepts); (3) Durable (made from materials that are strong enough); (4) The shape and color are attractive; (5) From materials that are safe for the health of students; (6) Simple and easy to manage; (7) The size is appropriate or balanced with the physical size of the learners; (8) Props are expected to be the basis for the growth of abstract thinking concepts for students, because these props can be manipulated (can be touched, held, moved, paired, etc.) so that students can learn actively both individually and in groups; and (9) if possible these props can be of great use.

Based on this opinion, the props made by the service team have considered the aspect of being durable or made of materials that are strong enough, but in reality, making props as intended requires quite expensive costs. Another aspect that turns out to also be material for evaluation is the use of teaching aids in classroom learning, teaching aids must be used directly by students to learn, therefore the quantity of teaching aids also needs to be considered, so that learning is not dominated by teachers (Junaedi et al., 2021).

Another thing that becomes material for reflection for the service team is the use of learning models in the use of teaching aids in learning mathematics in the classroom, which also needs to be considered. The use of classical learning is less effective in increasing student understanding. In classical learning, teachers practice the use of teaching aids, students do not work with teaching aids until students understand for themselves which mathematical concepts are being taught. The use of teaching aids will be effective if with these teaching aids students can understand a mathematical concept through observation and working with these props. (Ratumanan, 2000) suggested that in learning mathematics, the teacher should view mathematics as a process, so that teaching mathematics is an attempt to help students construct knowledge on their own through an internalization process so that knowledge is reconstructed. Thus mathematics learning is not a transfer of knowledge, but emphasizes how students build their understanding with the help of the teacher.

Conclusion

The conclusions of the PKM activities are as follows: (1) Training activities on the use of innovative mathematics learning are very beneficial for elementary mathematics teachers in Wonomulyo Polewali Mandar District. This is because it can increase the understanding of mathematics teachers regarding the use of teaching aids in classroom learning to improve students' understanding of mathematical concepts; and (2) Training activities need to be held again for other teaching aids so that they can add more knowledge and increase teacher professionalism.

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