Improving the results of mathematics learning of grade 1 elementary school Sebasang Ketanga 2 by utilizing magic stick

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Abstract. The purpose of this research is to know the success of learning mathematics in grade 1 SD Sebasang Ketanga 2 by utilizing magic stick, in terms of student's interest in learning. This study is a classroom action research, in the order of Plan-Act-Reflect and indicator has been achieved in 1 cycle. But, the teacher decided to continue the act into cycle number 2. The results, after 2 cycles finished, showed that the students' learning outcomes in the abatement materials had reached an average of 92.4 and 100% had met the KKM. In addition the magic stick has succeeded in making the students eager in learning reduction, shown by the spirit of students when delivering the results of calculations by using magic sticks.

1. Introduction

SDN Sebasang Ketanga 2 is located in the Moyo Hulu sub-district, which is 60 minutes away from the center of Sumbawa in NTB Province, Indonesia. The length of time shows that the school is far from the hustle of the city. There is a fairly extensive forest separating the city center from the location of the school.

Locations that are far from the city, do not discourage people's learning interest in the area. This is indicated by the number of grade 1 students who study in the area. There are more than 20 students in grade 1 in the SDN Sebasang Ketanga 2. Again, half the students said that the school was quite comfortable and safe for learning. Teachers also respond well when they have problems [1].

In learning activities, the teacher has implemented group learning. The teacher believes that group structuring will help students' confidence when they encounter problems. According to the teacher, in groups students should be able to easily understand the problem and discuss solving the problem. Primary school teachers provided learning environments conducive to self-regulation more often than secondary school teachers did [2].

In reality, students have not been able to learn independently and study in certain material. Students are still having difficulty mastering operating procedures on natural numbers. Grade 1 student, there are still difficulties in reducing two-digit numbers with saving techniques. At that age, students should be able thinking across four areas of mathematics: number facts, story problems, place value, and written calculation [3,4].

This is allegedly caused by: (a) Planting the concept of place values that are less than optimal; (b) Lack of learning media; (c) Teaching and learning strategies that cause students to get bored; and (d) Class arrangements that make students bored. Of the various allegations, it is suspected that the main
cause is a teaching and learning strategy that causes students to get bored. Bored students cannot reach their cognitive and metacognitive potential [5].

The teacher then thinks about how to make students not bored. In some opinions, multiplicative mini-games can be employed both in regular and special primary education [6]. In its implementation, these mini-games can be carried out comprehensively at home and strengthened by teachers at the school.

Based on the above problems, the teacher then looks for various alternative solutions. Alternative solutions are: Using fun cooperative learning methods or using learning media in the form of mini-games that can be operated by students. The teacher then chooses learning media in the form of mini-games.

The next problem arises due to the absence of computer devices that can be installed mini-games, both at school and at students' homes. The teacher then used the items in the school environment and made a magic stick instead of computer-based mini-games.

2. Methods

This research was classroom action research (CAR) with Ms. Hen as a research teacher at SDN Sebasang Ketanga 2. We used CAR because the problem was real problem, and she want to solve the problem soon. The subject of the research is class 1 students. The action chosen is to use magic stick media to increase students' ability to count the reduction of two-digit numbers with saving techniques.

The teacher believes that learning to count addition and subtraction will be effective if each group of students' works with their respective magic sticks. If each group works independently, it will lead to discussion and various alternative answers [7]. If later, the action is less successful, the teacher demonstrates the counting process with the media in front of the class, before students in the group work with the magic stick.

In the Classroom Action Research process, the Teacher feels his learning will be successful if all students get a score of 100 on the numeracy test done by the Teacher. The counting test is done in a straightforward and written manner. The designated student goes to the front of the class and works on the counting problem with the magic stick based on the questions given by the teacher. To support the results of the test, the teacher also makes written questions. The series of classroom action research designs conducted by the Teacher can be seen in the chart below.

![Figure 1. Classroom action research diagram [8]](image-url)
3. Result and Discussion

This research was part of the Guru BAIK project by INNOVATION. The project consists of 4 workshops, namely: problem discovery, solution finding, reflection, and presentation of results. The PLAN activities in this study were carried out in workshops 1 and 2. In the PLAN activities, all research teams were facilitated to meet and then found common problems. The research teacher also conducted a problem verification process. Verification of problems was done by discussion with colleagues and data on student learning outcomes.

There were four ways that the teacher does to find problems, namely: through observation and teaching experience of everyday teachers; through various cases given and compared to teacher experience; based on student homework; and from student aspirations [9]. The teacher then finds learning problems based on the fact that students in his class were always in trouble when counting the 2-digit numbers that require borrowing techniques.

Based on the causal analysis, the teacher suspected this because the teaching strategy and the media used were less attractive. Before this research, in teaching the concept of counting abatement, the teacher simply conveyed it in front of the class, using blackboard media. Usually, the teacher has also taught with group learning. The teacher then thinks what media I should do to help students. And at the end of workshop 1, the teacher then decided to try to use a magic stick to help grade 1 students learn to count the reduction of two-digit numbers with the save technique. The selection of a magic stick is not without reason. Sticks are objects that are easily obtained in a school environment and are cheap. Sticks can also be replaced with sticks, twigs, or other wood. This stick has also been known to grade 1 student in school.

There was a gap of around 2 weeks between workshop 1 and workshop 2. The time lag was used by the research teacher to ensure that the problems faced were truly learning problems that needed to be resolved immediately. The teacher observes that the results of student homework are quite good, but unfortunately when students are given questions in class, more than 70% of students fail to do the questions 34-16.

At workshop 2, in addition to formulating actions to solve problems, the teacher must also have prepared learning scenarios to implement actions. In formulating the learning scenario, the teacher was also asked to design the intended magic stick media and how to use it. In general, the learning scenarios for counting deduction using the magic stick are explained as follows.

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Line 1  33
Line 2  17
Line 3  __
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**Figure 2.** The sample problem of subtraction with two digit number in SDN Sebasang Ketanga 2

The subtracted processes were: (1) The teacher placed 3 sticks of sticks in dozens of bags and 3 sticks of sticks in the unit pockets in the first row; (2) The teacher places 1 bunch of sticks in the tens bag and 7 sticks in the unit pocket in the second row; (3) Line three to put results; (4) Subtraction starts from the unit column, 3 sticks compared to 7 sticks, found 3 are still less than 7 so borrow one stick from column tens in the first row. Now it becomes 1 bunch (10 sticks of sticks) plus 3 sticks of sticks with 13 sticks of sticks. 13 if compared with 7 still remaining 6 sticks of sticks. Then place 6 sticks of stick in the unit pocket in the third row; (5) Next, 3 sticks of string in the first row are left with 2 ties (because they have been borrowed) then 2 sticks of sticks in the first row compared to 1 tie stick on the second row, remaining 1 and keep 1 bunch of sticks in the tens bag in the third row. So that in the bag there are 1 bunch of sticks in dozens of bags, and 6 sticks of sticks in a bag of units equal to 10 + 6 = 16 sticks of sticks. Thus, 33-17 = 16 was obtained.

Workshop 3 activities were held not long ago. If at workshop 2, the teacher prepares an action plan that is owed in the lesson plan, then at the third workshop, the teacher prepares supporting instruments, namely observation sheet instruments, student worksheets, and formative assessment plans. Other instruments, such as magic stick media, are done outside the workshop time.
During the DO program, the Teacher began with a brief discussion with the research team and the Principal. Briefings are intended to convey the plan of action and attitudes of students in learning. This briefing is needed because the principal and observers outside the research team do not participate in planning the action. The teacher also presents technical matters such as the position of the observer, the division of student groups, and technical observations and what things need to be observed.

Figure 3. (From left) Briefing with school principal, magic stick, and student used magic stick

Grade 1 students seemed very happy to learn to use the magic stick media. In learning, the teacher does not only use one media in front of the class, however, each group gets the media. This is based on observations going well, because more than 80% of students actively work with the media in question.

In the REFLECTION activity, it appears that not all students have scored 100 in the count reduction activity. From the results of this reflection the research team decided to continue the process to cycle 2. The teacher felt it was necessary and important to continue because the counting material for reducing the number of two numbers by storing techniques is very important and must be mastered by all students in their class.

Figure 4. Student worksheet and teacher observation form

A variety of action evaluations have been carried out by the teacher using the Student Worksheet and Observation Sheet. From the results of the reflection of cycle 2, the results of all class 1 students of SDN Sebasang Ketanga 2 having mastered the counting material of reducing double digit numbers with saving techniques.

Based on the results of the above research, it appears that media utilization in learning mathematics was quite effective. This is corroborated by several previous studies, which stated that learning by using realistic media has a positive effect on students' cognitive abilities [10-12].

In terms of learning management, solving problems with the collaboration of Teachers, Lecturers, and Principals proved effective. In learning, the teacher certainly needs the equipment and materials needed to support the process. With the involvement of the principal, the teacher certainly benefits because it does not need to explain the need for the equipment. The presence of lecturers can be used as resource persons and experts who provide suggestions and solutions to the problems of the Teacher. This Classroom Action Research is essentially collaborative between Teachers, Lecturers, Principals, and Teacher Partners. This reinforces the results of previous studies which stated that collaboration between educational elements is effective in solving problems [13].

4. Conclusion

Based on the results of the study, it was clear that the results of mathematics learning of grade 1 SDN Sebasang Ketanga 2 increased with a learning using the magic stick and the collaboration of
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