



The Application the Drill Method as an Effort in Improving Mathematics Learning Outcomes of Elementary Level Students

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Abstract

Learning mathematics is essentially doing mental activities. In mathematics learning, students are required to prepare mentally in the process of receiving new knowledge. Facts in the field show that the lack of use of creative and innovative learning methods in the mathematics learning process has an impact on the low mathematics learning outcomes of grade V elementary school students. Therefore, this research aims to apply the drill method as one of the creative and innovative methods to improve student learning outcomes. This research is a quantity research by applying pre-experimental design. Using one group pre-test and post-test, this study was conducted on grade V students of SD Negeri 2 Merauke in the 2022/2023 academic year. The total sample in this study was 32 students with the data collection method being a test. The results showed that there was a very significant improvement in student learning outcomes. The increase in the percentage of the average score of student learning outcomes from the previous pre-test of 56.78 increased in the post-test of 84.65. However, we cannot ignore the obstacles that occur. Some obstacles when implementing the drill method are inhibiting the development of students' initiative abilities, the formation of rigid and inflexible habits, the emergence of verbalism, and the emergence of boredom and boredom. For this reason, teachers must implement the drill method in a fun way, for example through games or combined with other methods.

Keywords: Drill Methods, Creative and Innovative Teaching, Elementary School, Mathematics

Introduction

Educational activities take place both formally and informally (Liando et al., 2022); (Liando et al., 2021); (Tatipang et al., 2021). Both formal and informal education have the same goal that is in accordance with the philosophy of life of society. The recognition of education as a cultural phenomenon does not distinguish between formal, informal and formal education, all of which are educational activities that should have the same goal. From the other side, it can be stated that education does not

only take place in the school environment, but also directly in the family and community. Learning is a daily event that generally takes place at school (Lengkoan et al., 2022); (Lengkoan et al., 2019); (Lengkoan & Rombeapung, 2022).

Education is very important and influential on human life, because with education humans can be effective and independent. Tatipang et al., (2022) stated that education is a means to prepare

present and future generations. This means that the educational process carried out today is not solely for today, but for the future. Because students need to equip themselves with various competencies that will be needed in the future.

Learning is the process of interaction between students and educators and learning resources in a learning environment (Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System, 2003) (Lumentut & Lengkoan, 2021); (Liando et al., 2023); (Maru et al., 2020). In order for a learning goal to be achieved optimally, teachers must prepare the right media, teaching materials, and methods to be used in the teaching and learning process. The achievement of learning objectives is seen from learning outcomes. Learning outcomes are results obtained by students after carrying out a learning activity, as well as evidence of success that has been achieved by students (Lestari et al., 2023). This means that learning success is influenced by the learning process.

Learning is complex. The complexity of learning can be viewed from two subjects, namely from teachers and students. In terms of students, learning is experienced as a mental process in dealing with learning materials presented by teachers at school. Through teachers, students gain a variety of abilities, skills, and attitudes that can be measured through changes and increases in these three abilities. Learning is a daily event that generally takes place at school (Nurlaini, 2022). Learning is complex. The complexity of learning can be viewed from two subjects, namely from teachers and students. In terms of students, learning is experienced as a mental process in dealing with learning materials presented by teachers at school. Through teachers, students gain a variety of abilities, skills, and attitudes that can be measured through changes and increases in these three abilities.

Learning outcomes are changes in behavior as learning outcomes that occur

after following learning, in a broad sense covering the cognitive, affective and psychomotor fields (Nurhayati, 2018). In other words, learning outcomes are changes in overall behavior obtained by students after doing learning activities. Learning outcomes are successes achieved by students in the process of learning activities by bringing a change, namely student learning achievement at school. The achievement of learning outcomes is not only determined by the students themselves after following the learning process, but there is an important role of a teacher in it. This is inseparable from the quality of teaching and teacher effort in delivering subject matter.

Mathematics has prerequisite topics or concepts as a basis for understanding the next topic or concept (Tutik et al., 2020). Thus, in studying mathematics, previous concepts must be really mastered to be able to understand the next concepts (Primayanti et al., 2018); (Gani et al., 2020); (Tatipang, Wuntu, et al., 2022). This of course has an impact on the occurrence of the teaching-learning process or mathematics learning. Therefore, in learning mathematics can not be done in leaps and bounds. The learning must be step by step starting from the understanding of simple ideas and concepts to more complex levels. A person is unlikely to learn a higher concept before he has mastered a lower concept (Manuas et al., 2022). This is a challenge faced by teachers to make mathematics something interesting. For this reason, teachers are required to create activities that cause students to be happy and engrossed in learning mathematics. Creating a relaxed atmosphere while learning can be done to improve student learning outcomes. One of the activities that makes students behave and be in the atmosphere above is through the application of innovative learning models (Kandati & Tatipang, 2021).

Mathematics is a universal science that underlies the development of modern technology, has an important role in various disciplines and advances human thinking. Rapid developments in the field of information and communication technology today are based on mathematical developments in the fields of number theory, algebra, analysis, probability theory and discrete mathematics (Afriani, 2019). To master and create technology in the future requires a strong mastery of mathematics from an early age. In addition, mathematics is a subject that has a considerable role in human life, especially in the world of education so that mathematics is a compulsory subject taught from elementary school to college level to help humans to have the ability to solve problems critically, carefully, effectively and efficiently.

The reality in the field shows that mathematics learning in elementary schools is still conventional (Anggini Saputri et al., 2020); (Fakhiroh, 2021); (Lestari et al., 2023). Teachers lack motivation, so students do not understand the material presented. So that students are less active, in following learning, less maximizing the study group, and less painstaking practice repeatedly and choosing inappropriate methods. Thus resulting in low understanding of students in digesting in mathematics subjects, the material converts ordinary fractions into decimal fractions and percent and vice versa. In line with that, Made & Ardani, (2019) found another reality in the field that shows that students' interest in learning mathematics is still very low, this is because many students think that learning mathematics is a difficult and scary learning. The negative response arises because of the lack of teacher creativity in realizing students' pleasure in learning mathematics.

According to Ginanjar et al., (2022) Method is a procedure chosen to help students understand the content or message to be conveyed. One method that is suitable for training procedural material is the drill method. The drill method is a

method that encourages students to carry out practice activities repeatedly and continuously to master a certain ability or skill (Neli Kismiati et al., 2021). According to Desvitha & Rakhmawati, (2023) the Drill Method is a teaching technique that encourages students to carry out practice activities in order to have agility or skills higher than what is learned. According to (Hartati, 2019), the drill method is learning that carries out activities repeatedly, which aims to strengthen skills so that they become permanent. This Learning Method is a teaching method that has a method of giving questions repeatedly to gain mathematical skills and memory (Lestari et al., 2023). Based on the above opinion, we can understand that the drill method or practice is a method that in learning performs repetitive and continuous training activities to master certain memory abilities or skills.

The drill method in mathematics learning is used to improve student learning outcomes. The drill method is in the form of questions from the teacher that students must answer quickly, precisely and correctly (Nurlaini, 2022). But still look at the process of students themselves learning so that students can know how to learn for themselves. This drill method is very helpful for students in understanding mathematics lessons, especially if they teach multiplication and fraction division material. And if the bond between stimulus and response occurs more often, then the bond will form stronger.

Several studies that have been conducted previously revealed that there is an increase in student mathematics learning outcomes by applying interactive strategies using the drill learning method (Ginanjar et al., 2022). Other studies have also revealed that the application of the drill-based mind map method can increase student activeness and learning outcomes (Nurlaini, 2022). Further research revealed that the drill method affects problem-

solving abilities in grade VII students (Tutik et al., 2020). Based on some of the results of this research, it can be said that the drill method applied in the learning process has been able to improve learning outcomes as well as students' problem-solving abilities. It's just that in previous studies there have been no studies that specifically discuss the application of the drill method to improve mathematics learning outcomes of grade V elementary school students. So this research is focused on these studies with the aim of improving the mathematics learning outcomes of grade V students through the use of the drill method.

Method

This research was a quantitative research. This study was conducted with a pre-experimental design method using one group pretest and posttest, which aimed to see the effect of using the drill method on student learning outcomes. In this study the population is SD Negeri 2 Merauke, South Papua with a sample of grade V and a total of 32 students.

Measurements in this study were carried out using test techniques. In this study tests were used to measure students' abilities both initial, developmental and at the end of meetings. The test is conducted to determine the impact of changes that occur in students' abilities after the application of the drill method as a treatment.

Findings and Discussion

The data analysis technique used for hypothesis testing is the mean score analysis technique by interpreting the values of student test results, this is done to determine the difference in conditions before and after treatment. There are several data presented in this study. The data contained in this study are data on pretest results and post-test (the ability of mathematics learning outcomes).

In this section, we will discuss the results of our research systematically. We will present our main findings based on the research

questions that have been asked and relate them to the relevant literature. We will also provide an in-depth interpretation and analysis of our findings, as well as discuss their implications and relevance in a wider context.

In addition, through this section, we hope to provide a clear and comprehensive understanding of the results of our research. We also hope that our findings will make a meaningful contribution to the development of knowledge in this area and lay the foundation for future research. Therefore, without further ado, let's step into the results of our research and gain valuable new insights in this area. At the initial stage of presenting the data, there is an interpretation of data regarding the results of the drill method on student achievement in mathematics, student pre-test results are presented in table 1 below:

Table 1. Pre-test Results

No	Students	Pre-test Score
1	S1	56
2	S2	50
3	S3	60
4	S4	55
5	S5	50
6	S6	65
7	S7	65
8	S8	60
9	S9	60
10	S10	48
11	S11	45
12	S12	64
13	S13	55
14	S14	55
15	S15	60
16	S16	55
17	S17	55
18	S18	55
19	S19	60
20	S20	60
21	S21	60
22	S22	55
23	S23	55
24	S24	50

25	S25	45
26	S26	64
27	S27	60
28	S28	58
29	S29	56
30	S30	58
31	S31	65
32	S32	58
Total/Mean		1817/56.78

Referring to table 1 above, it can be seen that each student's score is still below the average. Where it is known that the passing score for mathematics is 70, but each student's pre-test results are still below the passing score of 70. In addition, the graduation criterion of this study is the achievement of a mean value / percentage of total graduation of 75% for all students. Meanwhile, the mean result / percentage of passing from the pre-test students is still below the criteria, which is 56.78.

The results of this pre-test indicate several things such as: lack of teacher attention to the learning methods used, provision of inappropriate material, teacher teaching methods that are not suitable for the application of methods, learning focus not on students, and also lack of creativity in learning applied by teachers. This is in line with research from (Kurnia Restu et al., 2020); (Santi & Prihatnani, 2018); (Ineke, 2021) which said that the selection of methods, teacher creativity in learning, material and teaching styles affect the absorption of material and student learning outcomes. Therefore, in this study after the results of the pre-test are known, the application of treatment, namely learning using the drill method.

As is known that, the drill method is a learning method that is suitable for use in learning calculation material because it provides repeated practice to acquire certain skills (Sukarsana, 2023). In line with what Cahyawati

& Eminita said, (2021) that in mathematics lessons this method can develop students' intellectual skills, such as adding, subtracting, multiplying, dividing, drawing roots in calculations about shapes and so on. Question practice will make students accustomed to doing questions quickly, especially if students already understand the working procedure (Redasi, 2021). This method can be said to be a good learning to get used to certain habits. With continuous practice, it will get used to it and then it will become a habit (Artiasih, 2022). In addition, this method can also increase speed, accuracy, perfection in doing something and can also be used as a way to repeat the training material that has been presented, it can also increase speed (Muharram et al., 2022).

Because of this, to see whether this drill method is successful or not in improving student learning outcomes in mathematics subjects, a post-test is given. Post-test is a test given after giving treatment during learning, post-test provides information about whether or not the treatment is applied, in this case the drill method. The application of this post-test is given at the end of the meeting, and the results of the students' post-test can be seen in table 2 below:

Table 2. Post-test Results

No	Students	Post-test Score
1	S1	80
2	S2	85
3	S3	80
4	S4	80
5	S5	85
6	S6	86
7	S7	88
8	S8	88
9	S9	80
10	S10	79
11	S11	90
12	S12	90
13	S13	90
14	S14	90

15	S15	79
16	S16	78
17	S17	80
18	S18	80
19	S19	80
20	S20	80
21	S21	88
22	S22	89
23	S23	89
24	S24	88
25	S25	87
26	S26	90
27	S27	85
28	S28	85
29	S29	85
30	S30	85
31	S31	85
32	S32	85
Total		2709/84.65

From the results of table 2 above, it can be clearly seen that there is a very significant improvement in student learning outcomes after treatment in this case the drill method. This gives a claim again that the drill method is indeed very suitable for improving student learning outcomes in mathematics subjects. In addition, according to the opinion (Sutarni & Saptana, 2020), Drill is a method aimed at training students to quickly and meticulously solve problems. In addition, it is also in line with the opinion (Suardiana, 2021), that this method is used as a means to teach and perfect skills or procedures. With this method, students become skilled in doing procedural questions. In addition, the presentation of questions that are structured from simple to difficult can make students more challenged to do it.

From the results of the student post-test in table 2, it can be clearly seen that a very significant improvement occurred in students after the provision of drill as a method in

learning mathematics. Where, it can be seen that the score achieved by each student is far from the completeness criterion, which is 70. In addition, the total mean / percentage for post-test has increased very significantly from the pre-test which only obtained a score of 56.78 and increased to 84.65 in the post-test.

In line with the findings of this study, Fahrurrozi et al., (2022) stated that the factor that affects learning outcomes is learning facilities. Learning facilities aim to accommodate student learning activities, direct tools to achieve educational goals. In the facility, there is also infrastructure where infrastructure is an indirect tool to achieve educational goals, such as space, books, libraries, laboratories and so on (Ginanjar et al., 2022). The second factor is the teacher's learning method, the teaching method is a knowledge of the teaching methods used by the teacher or instructor. The teaching method is a presentation technique mastered by the teacher to teach or present the learning material can be captured, understood, and applied by students well (Neli Kismiati et al., 2021). The use of appropriate learning media can also affect student learning outcomes, the selection of learning media that is suitable for student cognitive development and understanding will facilitate student learning so that it can make good student learning outcomes.

Because in learning, relevant methods are needed to improve student learning outcomes. (Desvitha & Rakhmawati, 2023) claim that the drill method is an activity of doing the same thing, repetitive earnestly with the aim of strengthening an association or perfecting a skill to become a permanent trait. According to (Sukarsana, 2023), the repetitive training method (drill) is a routine activity carried out to gain an advantage compared to others, so that better results will be obtained than before doing a routine or exercise. According to (Neli Kismiati et al., 2021), the drill method is a systematic training process that is carried out repeatedly, and the number of training loads increases day by day in order to have higher agility and skills. This method is based on the fact that work that is done repeatedly produces more maximum results when compared to a job that is done occasionally (Fakhroh, 2021). By carrying out

regular exercises provided by the teacher, it is hoped that learning objectives can be achieved and students can be more skilled in learning (Ginancar et al., 2022). This is done because the drill approach is iterative learning, so that the learning process will be carried out optimally and learning objectives will be achieved.

The content of mathematics learning from elementary to college levels indicates that mathematics is one of the most important sciences. According to Law of the Republic of Indonesia No. 20 concerning the National Education System in 2003, basic education is the level that underlies the secondary education level. For this reason, mathematics learning must have been mastered since elementary school age. Because Mathematics for elementary school students is useful for the benefit of living in their environment, to develop their mindset, and to learn other sciences (Gani et al., 2020). In order for the given material to receive easily, certain methods are needed that are appropriate and in accordance with the demands of the characteristics of elementary school students. One method that is suitable for learning mathematics is the drill method. The drill method is suitable to be applied to materials that aim to equip students with knowledge and skills, such as multiplication and division of fractional numbers (Anggini Saputri et al., 2020).

This is in line with what Fakhroh said, (2021) that the Drill and Practice method in its application is very suitable in learning counting, foreign languages and increasing vocabulary. This method is one of the methods applied to students because with drills or exercises, students will do an activity repeatedly and with the repetition, students can easily work on problems or solve math problems quickly and precisely (Made & Ardani, 2019). The advantages of this drill method in mathematics lessons students will have good thinking skills in the form of understanding and strengthening of concepts because with teaching in this method

students will be more directed and careful in carrying out exercises.

In its implementation, before the lesson is carried out first with the provision of basic understanding, it is necessary for the practice period to be carried out with a short duration, so as not to bring boredom to students (Ginancar et al., 2022). At the beginning of learning, material is given followed by working on questions in order and systematically done by students independently or in groups so that they become proficient and skilled. Here are the steps to use the drill method so that it is more optimal according to (Fakhroh, 2021); a. Teacher activities (1) The teacher provides an explanation to the students about the material to be taught; (2) Teachers set examples for learners; (3) The teacher intersperses with flipping to give questions to students if no one dares to ask questions with the aim of stimulating students to ask; (4) The teacher provides opportunities for students to ask questions if there is something they do not understand; (5) Teachers give questions to train students; (6) Teachers provide opportunities to students independently; (7) The teacher guides students in doing their practice questions; (8) The teacher examines the work of the students and then provides correction and re-explanation of the wrong parts; (9) Give back practice to learners in a consistent and targeted manner; b. Student Activities; (1) Students pay attention to what is explained by the teacher; (2) Students question what they do not understand; (3) Students do assignments in accordance with teacher instructions.

Thus, referring to the results of the study, from the data analysis that has been carried out it can be concluded that using the drill method can have an influence and improve mathematics learning outcomes on the material "Operation of Fractional Numbers" in grade V students of SD Negeri 2 Merauke, South Papua.

Where it can be seen that student learning results from the pre-test research are the percentage of average scores after being converted of 56.78, but these results have not met the expected classical completeness criteria of 75%. Because there are several factors that these students have not been able to achieve the level of learning completeness, namely the lack of understanding of students with the material "Operation of Fractional Numbers" in Mathematics lessons well and students do not repeat the learning that has been given, as well as less active students in learning activities, in addition, the selection of less effective methods, lack of teacher creativity and teacher teaching methods are also reasons for low student learning outcomes in the pre-test.

In the learning process, there must be a lot of evaluation in improving maximum learning outcomes. So that teacher creativity is needed in developing the learning they carry out. Various ways for learning to increase, one of which is the delivery of material with learning methods (teaching styles). Teaching style is needed in the teaching and learning process as a way of delivering learning. The lecture method tends to be boring when it is always applied. However, the Practice method is very suitable if applied to Mathematics learning. In the course of learning, teachers hold variations to attract students' attention. And in this study, it is enough to influence the progress of student learning outcomes.

The drill method or exercise is a method that in learning carries out repetitive and continuous practice activities with the aim of mastering certain memory abilities or skills, so that learning objectives will be achieved. In its implementation, the drill method with its advantages makes students get a better influence to improve their abilities so that students become more skilled both in terms of cognitive, affective and psychomotor (Desvitha & Rakhmawati, 2023). Some of these advantages include, acquiring motor, mental, or association skills, increasing accuracy and speed,

mastering the skills learned, having ready-to-use knowledge, having regular and disciplined study habits, gaining agility and proficiency, and growing self-confidence. In addition, implementing the drill method can also improve mathematics learning outcomes in several elementary schools in Indonesia, both in low and high grades.

Then in learning after the pre-test, namely in the application of treatment, it can be seen that there has been an increase in student activity from the previous learning process. From the test results of the analysis carried out, it was concluded that there had been an increase in students' abilities. This increase occurs after learning using the drill method. In the test of student learning outcomes in the post-test, the results of the study were obtained, namely the percentage of average scores after the conference of 84.65. This means that there is a very significant improvement in student learning outcomes. The increase in the percentage of the average score of student learning outcomes from the previous pre-test of 56.78 increased in the post-test of 84.65.

From this description, it proves that the drill method students apply as a treatment for students is successful in improving student learning outcomes in mathematics subjects, especially in the material "Fractional Number Operations". The results of the pre-test and post-test mean score showed a significant increase from 56.78 to 84.65. Thus, it can be concluded that there is a very large difference in students' mathematics learning outcomes from pretest to posttest. Thus, it can be concluded that the drill method can improve the mathematics learning outcomes of students in grade V SD Negeri 2 Merauke, South Papua.

Conclusion

The application of the drill method can improve mathematics learning outcomes in

grade V students of SD Negeri 2 Merauke, South Papua. The drill method can help teachers overcome learning difficulties encountered in the classroom. The Drill method can be used as an alternative in the teaching and learning process and subsequent research, namely in order to be able to study problems with a wider range and try to use other learning models to maximize various aspects of mathematics learning

Based on the purpose of the research and the description of the discussion and research results, with the Drill method and the Study Group can be concluded In learning activities often arise various problems, one of the problems that is often faced is the low level of understanding and mastery of the material received by students. Therefore, it should be: 1). Teachers pay more attention to the Learning Implementation Plan that will be given to students. 2). Teachers should develop learning programs that are tailored to student learning materials and provide evaluations of both classical and individual evaluations. 3). Teachers should provide more opportunities for students to solve learning problems, this will indirectly open students' mindsets.

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