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The Effectiveness of The Application of The Drill Method and the Contextual Approach of Teaching at the Right Level to Improve Mathematics Division Skills in Mathematics Class V Saoraja at UPT SPF SDN Pilot PAM Makassar City

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Article

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Abstract

Math division skills are challenging for students because these concepts require a deep understanding and basic operation skills. The low learning outcomes in the distribution material indicate the need for a more adaptive and contextual approach. This research aims to improve students' division skills through the application of drill methods and contextual approaches based on Teaching at the Right Level (TaRL), which adjusts learning materials to students' ability levels. This research is a class action research (PTK) in three cycles. Each cycle involves four stages: planning, action, observation, and reflection. The drill method is used to strengthen numeracy skills, while a contextual approach is applied to help students understand the concept of division through real-life situations. Data was collected through math comprehension tests, observation of the learning process, and interviews with students and teachers. The results of the study showed that the TaRL method significantly improved students' understanding of division. At the end of the third cycle, the average test score of students increased by 20% compared to the initial test, with more than 90% of students achieving the Minimum Completeness Criteria (KKM). In addition, students become more active and confident in solving division problems. Based on these findings, it is concluded that the drill method combined with a TaRL-based contextual approach is effective in improving the mathematics division ability of grade V students and provides implications for the development of adaptive and relevant mathematics learning strategies.

INTRODUCTION

Mathematics is one of the most important subjects in primary education, as it provides a solid foundation for learning other sciences. One of the basic concepts taught in mathematics is division. Divisions are one of the basic operations in mathematics that are indispensable in everyday life. However, sharing learning is often a challenge for many students, especially in grade V elementary school students who are still at certain stages of cognitive development. Many students have difficulty understanding the concept of division, so they find it difficult to apply this concept in more complex problems.

One of the causes of this difficulty is the students' lack of understanding of the basic concepts underlying division, such as the relationship between multiplication and division, as well as the more abstract concept of profit sharing. In addition, the teaching methods used are often not able to adjust to the level of ability of each student, causing a gap in understanding between one student and another. This phenomenon requires special attention from educators, as students' low understanding of division can affect their performance in overall math subjects.

To address these issues, *the Teaching at the Right Level* (TaRL) approach can be an effective solution. TaRL is an approach that emphasizes providing material that is in accordance with the level of understanding and ability of students. This approach focuses on teaching that is more relevant to the individual needs of students, and aims to address the comprehension gap between students who are faster and slower in understanding the material. In the context of division learning, TaRL can help break down difficult concepts into more understandable parts, so that each student can learn according to their level of understanding.

Through the TaRL approach, teachers can recognize students' initial abilities, provide materials that are appropriate to their level of cognitive development, and use various techniques that can strengthen students' understanding. One of the main advantages of this approach is its flexibility in tailoring the learning process to the needs of students, allowing each student to learn to the maximum without feeling left behind. Thus, it is expected that students can more easily understand and master the concepts of division, which in turn can improve their achievement in mathematics.

This study aims to examine the application of *the Teaching at the Right Level approach* in improving the understanding of mathematics division in grade V elementary school students. This research was carried out in the form of class action research, which involved two cycles of planning, action, observation, and reflection. Through this study, it is hoped that empirical evidence can be found

regarding the effectiveness of the TaRL approach in overcoming students' learning difficulties and improving their understanding of division. In addition, this research also aims to provide practical contributions for teachers in developing teaching methods that are more in line with the needs of students.
Thus, this research is expected to provide solutions that can be applied in mathematics learning practices in elementary schools, especially in overcoming students' difficulties in understanding division and improving the overall quality of mathematics learning.

METHOD

This research is a classroom *action research* that is carried out in two cycles. Each cycle consists of four stages, namely: planning, action, observation, and reflection. This study aims to improve the mathematics division ability of grade V elementary school students by using drill methods and contextual approaches based on *Teaching at the Right Level* (TaRL).

1. Research Subject

The subjects of the study were class V students consisting of 30 students, with varying levels of ability. The selection of subjects was carried out based on the results of the initial diagnostic test to identify the level of students' understanding of the concept of division.

2. Research Procedure

This research was carried out in two cycles, each of which included:

- Planning: Preparation of lesson plans, materials, Student Worksheets (LKPD), and evaluation instruments relevant to the TaRL approach. The distribution material is presented in stages according to the student's ability level, starting from simple operations to context-based questions.
- Action: Implementation of drill methods to train numeracy skills and contextual approaches to deepen understanding. Students are divided into groups based on ability level (low, medium, high) to facilitate differentiated learning.
- Observation: Observations are made during the learning process to record student participation, difficulty levels, and responses to the methods applied. Observations also include documentation of the results of group discussions and student interactions.
- Reflection: Analyze student learning outcomes based on evaluation tests at the end of the cycle and input from teachers and students to determine improvements in the next cycle.

3. Research Instruments

The instruments used in this study include:

- Math Comprehension Test: A written test that includes simple division problems to context-based questions, given before and after each cycle to measure the improvement in student learning outcomes.
- Observation Sheets: Used to record student activities during the learning process, such as involvement in group discussions and success in completing assignments.
- Structured Interviews: Conducted with several students and teachers to get an idea of their perception of the learning methods used.

4. Data Analysis Techniques

The data were analyzed descriptively, quantitatively, and qualitatively:

- Quantitative: Analyze student test results to measure the increase in average scores and percentage of learning completeness in each cycle.
- Qualitative: Analyze observation and interview records to identify aspects that support or hinder learning.

5. Success Indicators

The success of this study is measured based on:

- An increase in the average score of students' math comprehension test scores of at least 15% from the initial score.
- At least 85% of students achieve the Minimum Completeness Criteria (KKM) that have been set, which is 70.
- Increased active participation of students in learning based on observation results.

This research was conducted systematically to ensure valid results and have a real impact on improving students' math division skills. An appendix of the test instrument grid and LKPD samples are provided to support the research..

RESULTS AND DISCUSSION

Results

This research was carried out in three cycles, each cycle consisted of four stages, namely planning, implementation, observation, and reflection. This research is a classroom action research carried out using the *Teaching at the Right Level* (TaRL) approach, which is to provide material according to the level of students' ability, both in terms of understanding concepts and skills in arithmetic.

Cycle 1

1. Planning Stage

In the first cycle planning stage, teachers prepare a learning plan that includes learning objectives, learning strategies, and evaluation instruments. This plan was made by referring to a problem found in the previous class mathematics lesson, namely the difficulty of students in understanding the concept of division.

The teacher compiles the material which is divided into several topics, including:

1) Basic Understanding of Division: Introduces the basic concept of division as the opposite of multiplication and connects it to the context of everyday life. For example, divide apples into parts to share with friends.
2) Simple Divisions Exercises: Divisional exercises that use small numbers to help students understand how to divide appropriately.
3) Divisional Story Questions: Create simple story problems that connect division with real life so that students can more easily understand the application of division in daily life.

The method used in learning is drill or repetitive exercise. This drill aims to help students understand and remember the steps in division through consistent, gradual exercises. For a contextual approach, teachers prepare sample questions that are relevant to students' daily lives. Using this approach, students can see the connection between the material they are studying and the real situation around them, thus improving their understanding of the division.

The evaluation instruments prepared are pre-test and post-test questions, as well as observation sheets to record student progress during learning. This assessment is used to measure the extent of students' understanding of mathematical divisions, both before and after the application of the drill method and contextual approaches.

2. Implementation Stage

In the first cycle, the implementation of learning is carried out in accordance with the plan that has been prepared. Learning begins by identifying students' initial abilities through pre-learning tests. Students are divided into groups based on their initial ability to understand the concept of division. Each group received material tailored to their ability level, namely:

- High group: Gets more complex division problems and heavier challenges, such as longer story questions.
- Medium group: Get a division problem with a larger number, but keep it simple.
- Low group: Get a division problem with small numbers and a step-by-step explanation.

The teacher provides drills that are tailored to these groups. This exercise aims to strengthen the skills of calculating divisions and improve understanding of the concept of division. In addition, students are also asked to solve story problems that are relevant to daily life, such as dividing food or dividing pocket money.

In this implementation, the teacher takes a contextual approach by providing examples of problems that are close to students' lives, such as calculating the distribution of cakes that are shared among friends. This is expected to make learning more enjoyable and easy to understand.

3. Observation Stage

In the observation stage, the teacher observes the activities and responses of students during the learning process. Observations were made to see if the drill method and contextual approach were effective in improving students' understanding of mathematics division material.

Some of the things observed in the first cycle are:

- Can students follow the instructions given in the division questions?
- Do students show improvement in solving division problems independently?
- Do students better understand the concept of division through the application of contextual story problems?

From the observations made, it was found that most students still had difficulty in understanding the story of division. Some students still find division confusing, especially when it comes to dividing larger numbers. However, there are also students who show progress in solving division problems after being given repeated exercises.

4. Reflection Stage

In the first cycle of reflection, the teacher evaluates the learning results that have been carried out. Based on the results of observation and post-test assessment, the teacher concluded that although there was an improvement in some students, there were still many students who had difficulty in understanding the concept of division and solving division problems correctly.

This reflection resulted in several findings that need to be improved in the next cycle, including:

- The need for more intensive assistance for low-income groups.
- Increase the variety of story questions to make them more interesting and relevant to students' lives.
- There needs to be additional practice for students who have not completed understanding division.

The teacher decided to revise the lesson plan in the second cycle with a focus on more mentoring for students who struggled and providing a more contextual and challenging variety of questions.

Table 1 Learning Outcomes Cycle 1

Assessment Aspects	**Average value before cycle**	**Cycle Average Value 1**	**Completion Percentage**
Concept Understanding	55	65	50%
Counting Skills	60	68	55%.
Overall Average	**57,5**	**66,5**	**52,5%**

Cycle 2

1. Planning Stage

In the second cycle, teachers revise the learning plan based on the results of reflection from the first cycle. The learning plan in the second cycle emphasizes more on story questions that are more varied and relevant to the context of students' lives. In addition, the teacher also decided to give more practice questions and give more detailed explanations to the lower group.

The drill method is still used, but with a variety of more interesting questions, such as distribution questions related to daily activities, such as the distribution of shopping money, the distribution of tasks, and the distribution of gifts. In addition, teachers decide to implement group-based learning techniques, where students who are better able to help their friends who are struggling.

The evaluation instrument was also updated with the addition of more challenging and context-based story questions that were more varied. The pre-test and post-test questions were updated with the aim of measuring student understanding more comprehensively.

2. Implementation Stage

In the second cycle, the implementation of learning was carried out with more emphasis on group activities. Students who are better able to help students who have difficulty in solving division problems. The lower group received more intensive assistance from their teachers and groupmates.

The practice questions given are more varied and challenging, including longer story questions and involving real-life contexts. The teacher also gave a more detailed explanation of the steps in completing the division, especially for the lower group. In addition, the high group gets a challenge in the form of more complex story problems and requires a deeper understanding of the concept of division.

3. Observation Stage

During the observation stage in the second cycle, the teacher recorded the students' progress in understanding the division of mathematics. There was a significant increase, especially in the lower group who began to show a better understanding of solving division problems. The high group is also more confident in working on more complex story problems.

Some students show significant improvements in their abilities, especially in connecting the concept of division to everyday life. However, some students still need further practice to be able to solve the story problems smoothly.

4. Reflection Stage

In the second cycle of reflection, teachers evaluate student achievements based on observation and post-test results. Reflection showed a significant improvement in the understanding of the concept of division, especially in the low group. However, there are still some students who have difficulty in working on longer division story questions.

The teacher decided to move on to the third cycle by giving more practice and introducing a more challenging variety of story questions for students. In the third cycle, the teacher also decided to focus more on giving direct feedback after students worked on the questions.

Table 2 Learning Outcomes Cycle 2

Assessment Aspects	**Average value of cycle 1**	**Cycle Average Score 2**	**Completion Percentage**
Concept Understanding	65	75	70%
Counting Skills	68	78	75%.
Overall Average	**66,5**	**76,5**	**72,5 %**

Cycle 3

1. Planning Stage

In the third cycle, teachers prepare a more challenging learning plan. Teachers plan to increase the variety of story questions and provide more practice for more complex questions. In addition, teachers also plan to provide feedback directly after students complete the questions.

The learning plan in the third cycle is more oriented towards the application of the concept of division in real life, such as calculating grocery costs, dividing gifts, or calculating the time needed to do certain activities, as well as introducing more complex story questions with more diverse contexts. Teachers also prepare more questions that connect the concept of division with daily activities so that students feel more connected to the material being studied.

In this cycle, teachers also plan for more structured group-based learning, where each group is expected to collaborate to solve more complex problems. The teacher decides to provide feedback as soon as the students complete the practice questions, either individually or in groups. This aims to give students the opportunity to correct their mistakes immediately and strengthen their understanding of the concept of division.

In addition, teachers plan to use more interesting learning media, such as question cards, pictures, and sharing aids (e.g. the division of concrete objects such as fruit or cake) to visually clarify the process of sharing.

2. Implementation Stage

In the third cycle, the implementation of learning begins by giving a pre-test to evaluate students' initial understanding of mathematics division before the cycle begins. Students were again divided into groups based on their abilities, but in the third cycle, the focus was more on collaboration between groups. The more capable group was given greater challenges, while the group that needed more intensive assistance received more assistance from their teachers and peers.

The drill method is still used, but this time with a more diverse and more difficult story. The questions given involve not only large numbers, but also questions that require a deeper understanding of the concept of division, such as questions that involve time, resource allocation, and more complex real-life scenarios.

Teachers also emphasize direct feedback after students have worked on the problem, either in the form of group discussions or direct questions and answers. Students are asked to discuss their answers with their group mates and provide explanations of how they solved the division problem. This aims to encourage critical thinking and improve their understanding of the concepts taught.

At the end of the lesson, the teacher gives students the opportunity to do a post-test to assess the extent of their understanding of the math division material.

3. Observation Stage

In the observation stage in the third cycle, teachers recorded a significant increase in students' ability to solve division problems, both individually and in groups. Students are more active in discussing and showing a better understanding of division, especially in the context of more challenging story questions. Some students who previously had difficulty working on story problems are now able to solve more complex problems with confidence.

Observations also show that the more capable group can now help the weaker group in a more effective way. Students who are more advanced in learning not only show their own understanding but are also able to explain the steps they take in solving the problem to their peers. This increases student involvement in the teaching and learning process, while strengthening their understanding.

This increase is also seen in the results of the practice questions that students do. Students start faster in solving division problems, and they are able to explain the reasons behind the steps they take. Low groups, which previously needed more help, can now solve problems with the help of their peers and feedback from teachers.

However, there are still some students who need additional practice, especially when it comes to the application of division in the context of more complex story problems. The teacher noted that despite the significant improvement, some students still had difficulty in solving story problems that involved several steps of division.

4. Reflection Stage

In the third cycle of reflection, the teacher evaluates the entire learning process based on the results of observation and post-test. Reflections show that the drill method and contextual approach, implemented with great attention to the individual needs of students, have brought very positive results. Most students show significant improvements in their ability to understand the concept of division and solve division problems.

In terms of understanding the concept, the majority of students have been able to understand division with larger numbers and can explain the steps they take in solving division problems. In addition, students can also connect sharing with their daily lives through context-based story questions. They not only know how to do divisions, but they also understand why divisions are used in real-life situations.

While there has been significant improvement, reflection also suggests that some students still need further practice, especially when it comes to the application of division in story questions that involve multiple steps. The teacher noted that questions involving the concept of time or resource allocation were challenging for some students. Therefore, in the next cycle, the teacher plans to provide further training related to these more complex problems.

Overall, reflections in the third cycle show that *the Teaching at the Right Level* (TaRL) approach has succeeded in improving students' understanding of mathematical divisions. This approach allows students to learn according to their ability level, so they can understand concepts more easily and confidently. In addition, the drill method applied repeatedly provides an opportunity for students to hone their skills in doing divisions.

Table 3 Learning Outcomes Cycle 3

Assessment Aspects	**Average value of cycle 1**	**Cycle Average Score 2**	**Completion Percentage**
Concept Understanding	75	85	90%
Counting Skills	78	88	92%.
Overall Average	**76,5**	**86,5**	**91%**

Discussion

Overall, the application of drill methods and contextual approaches in mathematics division learning in grade V elementary school students has been proven to be effective in improving student understanding. Based on the post-test results that show a significant improvement in each cycle, it can be concluded that these two approaches contribute greatly to improving students' ability to understand mathematical divisions.

In the first cycle, despite the improvement, there were still many students who had difficulty understanding the concept of division and solving story problems. This suggests that the repetitive exercises given in the drill method need to be reinforced with a more tangible context so that students can relate learning to their everyday experiences. The second cycle showed a more significant improvement, especially in terms of understanding the story, thanks to the use of a more in-depth contextual approach.

In the third cycle, student learning outcomes show that with the right combination of repetitive exercises and relevant contexts, students can achieve better and faster understanding. Collaboration between groups has also proven effective in improving students' abilities, as more capable students can help their friends who are struggling. Giving feedback directly after practice questions also speeds up students' understanding process and strengthens their skills.

A significant improvement in student comprehension is seen not only from test results, but also from increased involvement and active participation of students in the learning process. They are more confident in solving division problems and can explain the steps they take more clearly.

However, despite significant improvements, there are still some aspects that need improvement, such as the application of story questions that involve more complex division steps. Some students still need further practice in this regard. Therefore, the next step is to continue to enrich the variety of story questions and provide further exercises that challenge students to apply division in a variety of real-life contexts.

The results of the study show that the application of the drill method and the contextual approach based on *Teaching at the Right Level* (TaRL) gradually increases the mathematics division ability of grade V students.

1. Improving Understanding of the Concept of Distribution through the Drill Method

The drill method applied in this study proved to be effective in improving counting skills and understanding of the basic concept of division. Drill is a learning method that emphasizes repetitive practice, so that students can achieve a certain level of mastery of the material being taught. This theory is in line with Thorndike's view in the law of exercise, which states that the repetition of exercise can strengthen the association between stimulus and response (Santrock, 2011).

In the first cycle, this method helps students memorize and understand the mechanical steps in completing division operations. However, the observation results show that some students, especially the lower group, still have difficulty applying the concept of division in the context of story problems. This is consistent with the findings of Retnowati *et al.* (2018), which states that regular practice without attribution to real-life contexts often makes students only understand mechanical procedures without understanding concepts in depth.

To overcome these limitations, in the second cycle, adjustments were made through a contextual approach, which placed learning in real situations. This theory is supported by Vygotsky (1978), who states that learning is more effective when it is associated with students' daily experiences.

2. Contextual Approaches to Improving Learning Relevance

The contextual approach used in the second and third cycles succeeded in improving students' understanding of story-based division problems. Using contexts such as dividing things or money, students can relate abstract concepts of division to concrete situations in their lives. This finding supports the view of Johnson (2002), who states that contextual learning can create a connection between the subject matter and real-world applications, making it easier for students to understand concepts. The increase in the average value of concept comprehension from 65 (cycle 1) to 75 (cycle 2) demonstrates the effectiveness of this approach. The results of this study are in line with the findings of Nurgiyantoro and Efendi (2017:144-146), who show that contextual-based learning can improve students' understanding because the subject matter feels more relevant and meaningful.

However, the challenge faced is the difference in students' ability to understand the context. Low groups need more time and mentoring to understand the relationship between real situations and the concept of division. This emphasizes the importance of differentiated learning, as proposed by Tomlinson (2001), to meet the needs of students of different skill levels.

3. Collaboration in Groups as Strengthening Understanding

In the third cycle, a collaborative learning strategy between groups was applied to encourage student interaction and build deeper understanding. The results showed a significant improvement, with the average overall score reaching 86.5 and the student completion rate increasing to 91%. This strategy is in line with Vygotsky's (1978) theory of social constructivism, which emphasizes that social interaction can accelerate the learning process through scaffolding.

High group students act as facilitators for their peers in the middle and low groups, which creates a supportive learning environment. Janssen *et al.* (2010) found that collaboration-based learning allows students to share problem-solving strategies, deepen their understanding, and improve learning outcomes collectively. In addition, project-based activities, such as dividing tasks into groups, also help students understand that division is part of daily life. These findings support the research of Retnowati (2018), who suggests that project-based learning strategies can motivate students to be more involved in the learning process.

4. Effectiveness of the *Teaching at the Right Level* (TaRL) Approach

The TaRL approach, which is the basis for the application of this method, has proven to be effective in improving the abilities of students at various skill levels. Dividing students into groups based on their level of understanding allows teachers to provide materials and exercises that suit their individual needs. These findings are in line with the research of Banerjee *et al.* (2016), which shows that TaRL can improve student learning outcomes because this approach reduces learning gaps in the classroom.

In the first cycle, low-group students showed a small improvement as they were still adapting to group-based learning. However, in the second and third cycles, with more intensive mentoring and the use of context-based materials, low-group students began to catch up with them.

5. Research Implications

The results of this study make an important contribution in understanding how drill methods and contextual approaches can be combined to improve students' math division skills. In addition, the implementation of TaRL ensures that the learning needs of students with different levels of ability can be met. This study supports the findings of Nurgiyantoro and Efendi (2017) and Janssen *et al.* (2010), which shows that an approach focused on individual student needs can result in significant improvements in learning outcomes.

However, this study also shows that the success of this approach requires the active involvement of teachers in observing and evaluating student development on an ongoing basis. Thus, teachers must have skills in implementing data-based and reflection-based learning strategies.

Thus, the results of this study confirm that learning that combines drill methods, contextual approaches, and collaboration within the framework of TaRL can significantly improve student understanding, in accordance with educational theories and supported by previous research.

CONCLUSION

This study concludes that the application of drill methods and contextual approaches based on *Teaching at the Right Level* (TaRL) effectively improves the mathematical division ability of grade V students.

The results of the study show that:

1. The drill method provides a solid foundation for students to master counting skills, in accordance with the principles *of the law of exercise* from Thorndike.
2. A contextual approach helps students connect the division to real situations, making learning more meaningful and relevant.

3. The strategy of collaboration between students, implemented in the third cycle, encourages social interaction that supports learning in accordance with Vygotsky's theory of social constructivism.

Substantially, this study confirms that TaRL-based learning is effective in answering the challenge of student ability heterogeneity in the classroom. This proves that learning differentiation that is adaptive to individual needs can produce a significant improvement in learning outcomes, both in students with low, medium, and high abilities. Furthermore, these findings provide an idea that a combination of drill methods, contextual approaches, and collaboration can be applied in a sustainable manner to strengthen students' basic competencies, especially in mathematics subjects.

Suggestions

Based on the results of the research, there are several suggestions that can be submitted for further development:

1. For Teachers:
    - Teachers are advised to consistently apply *the Teaching at the Right Level* method in learning to accommodate the learning needs of students with different skill levels.
    - The use of contextual media and visual aids can be optimized to reinforce understanding of concepts, especially for students with low abilities.
    - Teachers need to improve their skills in conducting continuous reflection and evaluation to adjust learning approaches based on student needs.
2. For Schools:
    - Schools are advised to provide training to teachers regarding the application of drill methods and contextual approaches based on TaRL.
    - Learning facilities, such as teaching aids and interactive media, need to be provided to support the implementation of more varied learning.
3. For further research:
    - This research can be developed by applying similar methods to other mathematical materials, such as fractions or multiplication, to evaluate its effectiveness on various topics.
    - Further studies can be conducted by involving more subjects or learning contexts at a higher level, such as junior high or high school, to test the generalization of the TaRL approach.

- Other research may explore the integration of technology in drill methods and contextual approaches to create more interactive and engaging learning.

The future prospect of the results of this study is to create a more inclusive and adaptive learning, where the needs of all students can be accommodated. With widespread and sustained application, this approach has the potential to be an effective solution to improve the quality of education, particularly in mathematics learning in primary schools.

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Hopefully the results of this research can provide benefits for the world of education, especially in improving mathematics learning in elementary schools. The author realizes that this research still has limitations, so constructive suggestions and criticisms are highly anticipated for future research development.

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