

Elementary Students' Mathematics Learning Activities and Outcomes through the Application of the Problem Solving Method

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Keywords

Aktivitas Siswa, Hasil Belajar, Problem Solving.

Student Activities, Learning Outcomes, Problem Solving.

ABSTRACT

Pada SDN Payaman, pembelajaran di kelas V masih terpusat pada guru, siswa kurang aktif, dan mengalami kesulitan dalam menyelesaikan soal cerita pada materi Satuan Kecepatan dan Debit. Tujuan dari penelitian ini melihat peningkatan aktivitas dan hasil belajar siswa kelas V SDN Payaman dengan diterapkannya media Roda Satuan dengan metode Problem Solving untuk membuat siswa lebih mudah memahami materi dan penyelesaian soal yang diberikan. Penelitian Tindakan ini dilakukan dalam 2 kali, dengan jumlah siswa kelas V sebanyak 34 siswa. Metode pengumpulan data dengan menggunakan observasi untuk melihat aktivitas siswa dan metode tes. Hasil penelitian menunjukkan terjadi peningkatan 24% partisipasi siswa dari 64 % pada Tindakan I menjadi 80 % pada tindakan II, peningkatan hasil belajar siswa sebesar 41,2%, dari 44,1% pada tindakan I menjadi 85,3% pada Tindakan II. Adanya peningkatan yang terjadi menunjukkan penerapan Metode Problem Solving dengan Media Roda Satuan dapat digunakan guru untuk membuat situasi pembelajaran menjadi lebih antusias dan siswa lebih aktif dalam proses penyelesaian soal. Hasil belajar siswa juga telah memenuhi kriteria ketuntasan klasikal.

At SDN Payaman, the learning activities in class V are still predominantly teacher-centered, with students being less active and facing difficulties in solving story problems related to the topics of Speed and Discharge Units. This study aimed to see an increase in activity and learning outcomes for fifth-grade students at SDN Payaman by implementing the Roda Unit media with the Problem-Solving method to make it easier for students to understand the material and solve the problems given. This class action research was carried out in 2 times, with 34 students in class V. The data collection method uses observation to see student activities and test methods. The results showed an increase of 24 %. Student participation from

64 % in action I to 80 % in action II increased student learning outcomes by 41.2 %, from 44.1% in action I to 85.3% in action II. The increase shows that the teacher can use the Problem Solving Method with Unit Wheel Media to make the learning situation more enthusiastic and students more active in problem-solving. Student learning outcomes have also fulfilled the classical completeness criteria.



INTRODUCTION

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Technological advances have had a significant influence on education, information, and communication technology has brought significant changes in the way people learn, teach and access information in the educational environment. *Mathematics* is a scientific discipline closely related to everyday life situations and circumstances. Therefore, it is essential to teach Mathematics from the

early stages of education, such as elementary education, and continue up to the tertiary level (Hartiningrum & Nugroho, 2020). It emphasizes that understanding and applying Mathematics can provide broad and relevant benefits for human life and thinking at various stages of development. Mathematics is not just a branch of science but also positively impacts an individual's thinking ability. Apart from that, Mathematics also plays a role in formulating solutions to various everyday problems and professional situations (Susanto, 2013). Advancing thinking skills in mathematics learning requires applying approaches that involve everyday situations. (Fridanianti et al., 2018; Hartiningrum et al., 2020). In line with this view, Suyono & Hariyanto (2015) state that Mathematics is a meaningful tool for

training and honing human thinking abilities. Learning Mathematics means memorizing formulas and methods and practising critical, analytical, logical and problem-solving thinking skills (Gunantara et al., 2014). Ejin (2017) conveyed a similar opinion, explaining that mathematics learning is characterized by being tiered (progressive), following a spiral pattern in its approach, encouraging a deductive mindset, and prioritizing the principles of truth and consistency. This is because there are still many students who find it difficult to solve mathematics problems because the concept of mathematics is abstract. (Sugiarni & Durri, 2022)

According to Zulfah (2017), student participation must be realized in the context of teaching and learning activities because, in essence, learning involves action to change behaviour, so the essence is the existence of activity. This opinion is supported by Wardika et al. (2017), who suggest that students should be actively involved in the learning process. It means that within the scope of classroom learning, the role of the teacher is more likely to be a facilitator, while students are expected to be able to construct and build their understanding and knowledge. Teachers must strive to use various teaching styles and methods to facilitate students in

absorbing information and strengthening their understanding (Yaqin & Pramukantoro, 2013). Success in implementing mathematics learning is closely related to teacher readiness. Teachers, as agents of change, have a dual role, namely as absorbers of knowledge and technology, as well as transmitters of their knowledge, technology and innovative ideas (Widiawati & Fajaroh, 2015)

The learning process in the classroom by the teacher is expected to be appropriate to the conditions of the class (Fu'ad et al., 2019). Careful planning in the learning process is essential in maintaining smoothness and achieving expected results. This planning stage involves action strategies that the teacher will implement during the learning process. Essential components in this planning include determining learning objectives, the material to be delivered, the choice of learning methods, and the strategies chosen (Sanjaya, 2018). Through an appropriate learning approach, students can feel the relevance of Mathematics to life, resulting in greater motivation to learn. As a teaching approach, learning methods become instruments that enable teachers to convey material to students effectively. The importance of this method lies in its role in encouraging students' active

involvement during the learning process, with the ultimate goal of achieving optimal learning outcomes.

The impact of learning includes what students have achieved after receiving instruction from the teacher. It means that teachers play a role in conveying information and skills to students, and ultimately, students show results through the understanding and abilities they acquire. Learning impact also shows how teaching and learning are interconnected and influence each other in achieving learning goals (Wardika et al., 2017). Learning outcomes are about what students learn and understand after following lessons from the teacher. It can be in the form of numbers or letters that show the extent of their understanding of the lesson, or it can also be in the form of words such as "good", "fair", or "poor" that describe how well they understand the material (Rusmiati et al., 2023).

In conclusion, learning outcomes in mathematics indicate a measure of the success of the learning process in the school environment, which is expressed through the scores obtained from evaluations. Based on the findings from interviews and observations made on teachers and the atmosphere of mathematics learning in class V at SDN

Payaman, the learning process in class tends to have more of a teacher role. This is because the dominant teaching method used is lecture. Meanwhile, students tend to be passive. When the learning process occurs, most students need more involvement. Student learning activities are limited to listening to the teacher's explanation and recording information on the blackboard. This pattern of passive student involvement could hinder their progress in following the learning process.

The consequences of passive student involvement in the learning process are reflected in students' academic achievements in material related to speed and discharge units. As many as 60% of students have yet to be able to reach the Minimum Completeness Standard (KKM), which is set at 70. In a group of 34 students, only 40% have succeeded in meeting the KKM, while the other students still need to catch up to that figure. The results of questions and answers with class V students showed that most still needed clarification about how to solve problems related to discharge, a unit of speed. This obstacle arises because students still need help understanding the teacher's explanation and the right strategy for solving the types of questions given.

The solution to these obstacles is encouraging students to ask questions and stimulate active involvement. Success in overcoming student difficulties can be achieved by being critical, that is, asking questions if something is not understood so that the difficulties students face do not drag on. So that this can be minimized, the choice of problem-solving method can be used according to the conditions existing in class V students. This approach involves students in problem-solving as part of achieving learning goals. The steps of a problem-solving approach include understanding the problem, planning a solution, implementing the solution correctly, and evaluating the results. The advantage of this method is that it trains students to face challenges or situations spontaneously and encourages active involvement and student responsibility (Hidjrawan & Khaldun, 2016). Teachers should provide varied problems so that students can hone their thinking skills, and this ability can be developed from the elementary school level (Hartiningrum et al., 2022).

Problem solving ability is an ability that students must have in studying mathematics (Dewi, 2022). The problem-solving approach will achieve more effective results if it is supported by using

unit wheel media to understand concepts. The research conducted by Marta (2017) only uses problem-solving without any learning media. The use of media will help students understand the concept of Debit. The Unit Wheel is a tool or physical object used to send messages to make it easier for students to understand. According to Pangestu and Rahmi (2022), learning media includes physical components such as tools or materials used to support the learning process in the classroom. Media visually represents complex concepts to explain through certain words or sentences (Bito & Masaong, 2023). Media can concretize abstract material. Therefore, the presence of media helps students understand the material better than without the help of media (Setiawan et al., 2023). The choice of unit wheel media was chosen because it has several advantages. This learning media has the ability to encourage active participation and positive responses from students in learning mathematics. Using this "unit wheel" media assists in smoothing the teaching process more efficiently and quickly.

METHODS

The research method used is action research (action research) following the

views of Arikunto (2013). Action research is a type of research that adopts a reflective nature with a series of action steps, intending to overcome, improve and enhance the learning process following the objectives set in class. The actions taken include problem-solving methods, which are applied with the help of learning media in the form of Unit Wheels, focused on material related to speed and discharge units. The steps in designing this research

action were driven collaboratively. Namely, the researcher worked with the mathematics teacher in class V at SDN Payaman according to the flow starting from planning, implementation, observation and reflection of the learning process and involved repeated cycles. This effort is directed at stimulating increased student activity and improving learning outcomes.

Table 1.
Student Zctivities

No	Observed Activity
1	Students pay attention to the teacher's explanation
2	Students are grouped according to those distributed by the teacher.
3	Students listen to the teacher's explanation of how to use the Unit Wheel learning media.
4	Students solve problems and students solve problems using the unit wheel media learning media
5	Students compare and discuss with groups to collect data or information by sharing ways to find various alternative solutions to problems.
6	Students compare the results of group discussions to class discussions
7	Students conclude the problem solving process carried out.

The subjects in this research, with a total of 34 students, consisted of 14 male and 20 female students. This research occurred at Payaman Elementary School in the Pringan sub-district, Kediri Regency. This instrument is in the form of a learning activity, which is equipped with an assessment guide. The activity component instrument was created based on steps in problem-solving validated by 2 mathematics lecturers. This activity sheet

was used to observe various forms of student activity in applying problem-solving.

The second instrument used is the learning outcomes test sheet, a research instrument in the form of a written test consisting of 5 questions describing discharge and speed units. The written test is validated by a mathematics lecturer who teaches school mathematics courses. Giving written tests is intended to evaluate

the extent of students' understanding after following the learning process by applying problem-solving methods and utilizing unit wheel learning media on the topic of speed and discharge units. The test is designed as essay questions and given at the end of each lesson. Analysis of student activity is calculated by dividing the score obtained by the student by the maximum score in the questionnaire and then multiplying it by one hundred per cent to obtain the activity score in percent form. Observation results are measured using the criteria Very Good to Not Good following the student activity criteria, namely Less if the average percentage of activity, adequate if the average percentage of activity, Good if the average percentage of activity, Excellent if the average percentage of activity. It is said that action will not continue if the percentage of student activity reaches a minimum with a good predicate (Purwanto, 2020). Analysis of learning outcomes using the Completion Percentage, which reaches more than 70%.

RESULT AND DISCUSSION

The activity of class V students at SDN Payaman in action I, using the problem-solving method with the help of unit wheel media, reached 64% on the classical scale, which can be assessed as

quite reasonable. However, the average student learning outcome score in this cycle only reached 44.12% on the classical scale. However, the results of this achievement have yet to reach the standard set at 76% in the percentage of classical completion.

The results of the first action have not met the desired standards, where learning completion has not reached more than 70%, and student activity has not reached the "Good" criteria. Factors cause students to joke around and need to pay more attention to the studied material. Students still like to see their friends' answers. Students still need to be more open about presenting the results of discussions. Corrective and enhanced actions are needed based on the factors described to achieve better results.

The corrective actions taken include the following steps: (a) individual teachers recognize and call students by name when there is interaction in class. Teachers provide direct guidance as students answer questions or participate in class discussions. It can help build more intense relationships. (b) The teacher helps students form groups for group work or discussions. It can include how to organize groups, choose roles in groups, and communicate effectively in groups, (c)

provide detailed explanations and guidance to students, and teachers help them understand how to use the Unit Wheel learning media correctly. It teaches students about the tool and helps them see how the medium can help them understand math concepts better. This guidance also directs students on how to relate media use to the lesson content they are studying. The aim is so that students can understand and use the media effectively. (d) The teacher provides students with an understanding of the consequences of cheating or taking answers from other sources without independent effort. The teacher motivates students to do the task with their efforts and better understand the material. (e) The teacher gives instructions to students when they discuss in small groups. It can include how to carry out discussions, share opinions, listen actively, and participate in constructive discussions. (f) The teacher provides opportunities for each group to make presentations about their work in front of the class. The teacher helps by providing support, listening, and providing positive feedback. (g) The teacher chooses a representative student from each group to summarize the solution to the problem that the group has worked on. By asking students to come up with solutions and

write conclusions in their own words, this approach invites students to process and organize the information they receive from learning. It helps them to truly understand the concept and its application, as they have to reformulate it in their own words. This action also stimulates them to think critically, process information, and summarize what they have learned. The impact of action II shows significant improvement.

The percentage of student activity using the problem-solving method with the help of unit wheel media increased to 79.93% on the classical scale with criteria considered good. The average student learning test scores in cycle II also showed a significant increase, reaching 85.29% on the classical scale. By achieving a classical completion percentage of 76%, the standard of success was set by researchers. The result of cycle I and cycle II shown in Table 2 and Table 3.

Student activity that is considered suitable means being well involved in learning, interacting with the material, and contributing to the class. In addition, students' learning achievements that reach standards of success indicate that they have fully understood and mastered the learning material. These results indicate

that the teaching steps have successfully increased student participation and learning outcomes. It follows research (Damayanti, 2014; Marta, 2017; Sanjaya, 2018), which explains that applying problem-solving has positive results. The

positive impact is that students are more active in problem-solving discussions, encouraging collaboration and effective communication, and students are more skilled in problem-solving (Sanjaya, 2018).

Tabel 2.
Hasil Observasi Aktivitas Siswa pada Tindakan I dan II

	I	II	III	IV	V	VI	VII	Rata-rata persentase total aktivitas	Kriteria
T1	59,9%	72,1%	64,4%	65,8%	54,8%	69,5%	66,2%	64%	Cukup Baik
T2	73,6%	79,8%	78,3%	80,5%	83,5%	80,5%	83,5%	80%	Baik

Tabel 3.
Nilai Tes Hasil Belajar pada Tindakan I dan II

	Rata-rata nilai	Jumlah siswa yang tuntas	Jumlah siswa yang tidak tuntas	Presentase ketuntasan Klasikal
T1	64,6%	15	19	44,1%
T2	77,3%	29	5	85,3%

CONCLUSION

The research results showed an increase in student participation from Actions I and II, an increase of 24%, and an increase in student learning outcomes of 41.2%. The increase shows that teachers can apply the Problem-Solving Method using Unit Wheel Media to make the learning situation more enthusiastic and students more active in the solving process. As a suggestion or suggestion given, students are advised to obtain suitable material. Students may be more motivated

to learn and develop mathematics skills by understanding how relevant mathematics is. Students are also expected to be more active in communicating with teachers regarding learning material. If they need help understanding a math concept, talking to a teacher will help them get the help they need. It also creates an environment where students feel comfortable asking for help and clarifying things they do not understand. By coordinating and communicating with teachers, students can

get the help they need to overcome obstacles in understanding lesson material.

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