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The Influence of the Picture and Picture Model Assisted by Video Media on the Problem Solving Ability and Mathematics Learning Motivation of Students at SDN 100312 Pargarutan Jae South Tapanuli

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ABSTRACT

The research aims to analyze differences in students' mathematical problem solving abilities through the picture and picture learning model assisted by media and given regular learning, analyze differences in students' mathematics learning motivation through the picture and picture learning model assisted by video media and given regular learning, analyze the interaction between learning and ability students' initial abilities on students' mathematical problem solving abilities, and analyzing the interaction between learning and students' initial abilities on students' mathematics learning motivation at SDN 100312 Pargarutan Jae Tapanuli Selatan. The sample was determined as 62 people consisting of 2 (two) classes. The research design used in this research is an experimental design with a 2x3 factorial. The results of the research concluded that students' mathematical problem-solving abilities through the picture and picture learning model assisted by video media were better than if they were given regular learning at SD Negeri 100312 Pargarut.an Jae Tapanuli Selatan. Students' motivation to learn mathematics through the picture and picture learning model assisted by video media is better than being given regular learning at SD Negeri 100312 Pargarutan Jae Tapanuli Selatan. There is an interaction between learning and students' initial abilities on students' mathematical problem-solving abilities at SD Negeri 100312 Pargarutan Jae Tapanuli Selatan. There is an interaction between learning and students' initial abilities on students' mathematics learning motivation at SD Negeri 100312 Pargarutan Jae Tapanuli Selatan.

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INTRODUCTION

Mathematics education has undergone significant transformation along with the times, following the progress of science and technology. The learning approach that was previously conventional has now shifted to a more

interactive and technology-based method, such as the use of educational applications and software. The mathematics curriculum has also been updated to include concepts that are relevant to the needs of the modern world, such as data analysis and programming.

The purpose of learning mathematics in elementary school is very important to build a solid foundation for students. First, the main goal is for students to be able to understand basic mathematical concepts, such as numbers, arithmetic operations, and geometry, which will be the foundation for further learning. In addition, learning mathematics aims to develop logical and critical thinking skills, so that students can solve problems effectively. (BNSP, 2006).

Mathematics plays a very important role in everyday life, because it is used in various aspects, from simple to complex activities. In everyday activities, such as shopping, managing a budget, and cooking, mathematical skills help individuals make the right and efficient decisions. In addition, mathematics also functions as a tool for analyzing data, which is very necessary in the world of business, research, and technology. In the field of science, mathematics is a universal language used to explain natural phenomena and solve complex problems (Rahma and Rahaju, 2020; Lubis, *et.al.,* 2022).

Mathematics serves as a means to develop systematic and analytical thinking patterns. Through learning mathematics, students are taught to think logically, construct arguments, and solve problems in a structured manner. This process involves identifying patterns, testing hypotheses, and evaluating solutions, all of which strengthen critical thinking skills. In addition, mathematics encourages students to not only seek answers, but also understand the processes behind them, so that they can apply these skills in real-life situations (Safitri, Syamsuri and Jaenudin, 2021).

Based on preliminary research and interviews with researchers with Mrs. Hafsah Rangkuti as a fifth grade teacher at Pargarutan Jae Elementary School, South Tapanuli Regency, many students are less interested in learning mathematics, and this is often caused by several factors. First, a teaching approach that is too theoretical and rigid can make this subject feel boring and difficult to understand. In addition, if students do not see the relevance of mathematics to their daily lives, their interest tends to decrease. Lack of understanding of basic concepts can also cause frustration, so that they are reluctant to study the material further. To overcome this problem, it is important for educators to apply more interactive and contextual teaching methods, as well as use teaching aids or technology that can make learning mathematics more interesting and enjoyable. By creating a positive learning

experience, it is hoped that students can rediscover their interest and motivation to learn mathematics.

Teachers must pay attention to the learning model used, because the choice of the right method can have a big impact on the effectiveness of the student's learning process. Every student has a different way of learning, so it is important for teachers to choose a model that suits their characteristics and needs. Teachers must also choose media that supports learning, because choosing the right media can increase student understanding and engagement. Learning media, such as teaching aids, videos, and interactive software, can help explain difficult concepts in a more interesting and easy-to-understand way. The use of varied media can meet the various learning styles of students, so that all students can learn in the way that is most effective for them.

The picture and picture learning model emphasizes the importance of cooperation among students, which is one of its advantages. In this model, students work in groups to analyze and discuss the pictures or illustrations given. This collaborative process encourages them to exchange ideas, strengthen understanding, and build social skills. By discussing with each other, students learn to appreciate their friends' points of view and develop critical thinking skills (Rosidah & Setiabudi, 2024).

The function of media in learning is very important to improve the effectiveness and quality of the teaching and learning process. Learning media functions as a tool that can convey information in a more interesting and easy-to-understand way, helping students understand complex concepts. Media can also facilitate interaction between teachers and students, as well as between students with each other, thus creating a more dynamic and collaborative learning atmosphere (Rosadi & Zaqiah, 2023).

Learning media must be adjusted to the subject matter to achieve optimal learning outcomes. When the media used is relevant to the content being taught, students will find it easier to understand and remember the information. For example, the use of videos or animations can be very effective in explaining complex science concepts, while props or 3D models can help students understand math and geometry concepts. By adjusting the media to the material, teachers can also create a more engaging and interactive learning experience.

The results of Zulfadli et al., (2020) research on The Effect of Picture and Picture Learning Models on Elementary School Student Learning Outcomes (2020) concluded that the Picture and Picture learning model has a significant effect on student learning outcomes, because this method integrates

visualization with collaboration. By using relevant images or illustrations, students can more easily understand and organize complex information.

The results of Yusal & Namul (2022) research on The Effect of Picture and Picture Learning Model on Learning Outcomes of Junior High School Madani Makassar Students concluded that the Picture and Picture learning model has a significant effect on student learning outcomes, because this method integrates visualization with collaboration. By using relevant images or illustrations, students can more easily understand and organize complex information.

The results of Nur Cahyono *et al.*, (2021) study on The Impact of Audio-Visual Media toward Learning Result in the Subject of Seizing Picture show that media plays an important role in learning because it can increase the effectiveness and quality of the teaching and learning process. With the use of appropriate media, information can be conveyed in a more interesting and easy-to-understand way, helping students to associate abstract concepts with concrete examples. Media such as videos, images, and props not only enrich the learning experience but also meet the various learning styles of students.

The results of Suryani & Utaminingsih (2022) study on The Effect of Media Picture and Video on Mathematics Learning Outcomes of Fifth Grade Elementary School Students in Sayung District, Demak Regency prove that children tend to be more interested in learning when supported by relevant and interesting media. The use of media such as videos, educational games, and visual aids can bring the subject matter to life, making it more interesting and easier to understand.

The results of Fitriyani & Solihati (2022) research on The Effect of Powtoon-Based Audiovisual Media on Indonesian Language Learning Outcomes prove that media support in learning has a significant positive impact on improving student learning outcomes. The right media, such as videos, interactive applications, and teaching aids, can help students understand complex concepts in a more visual and engaging way. With clear visualizations, students tend to capture information more easily, thereby improving their memory and understanding.

Models and media in learning make it easier for teachers to deliver materials and manage the teaching and learning process. By using the right learning model, such as project-based learning or group discussions, teachers can create an interactive and dynamic classroom atmosphere, so that students are more involved in the learning process. Media support, such as videos, teaching aids, and educational applications, help teachers explain complex concepts in a clearer and more interesting way.

RESEARCH METHOD

The purpose of this study was to evaluate the improvement of mathematical problem solving ability and learning motivation of students at SD Negeri 100312 Pargarutan Jae, South Tapanuli Regency, by comparing the effectiveness of the picture and picture learning model and regular learning. This study was conducted in an existing class, so it used a quasi-experimental design.

The research method used is quasi-experimental. This type of research was chosen because the population in this study was confirmed to be heterogeneous and did not form new groups. Quasi-experimental research also cannot control all external variables that can affect the implementation of the experiment. Opinion by Sugiyono (2020) states that in this quasi-experiment, subjects are not grouped randomly but researchers accept the conditions of the subjects as they are.

The population in this study consisted of students at SD Negeri 100312 Pargarutan Jae, South Tapanuli Regency. The sample is part of the population that is considered to be able to represent the population as a source of information or data in the study. The sampling technique used was total sampling, where all students from two classes were taken as research samples. Furthermore, a random drawing was carried out between classes V-1 and V-2. The results of the drawing showed that class V-1 was designated as the experimental class, while class V-2 was designated as the control class.

The instruments used were students' mathematics learning achievement test and learning motivation questionnaire. The problem-solving ability test is used to measure a person's mastery and ability in various knowledge. This student learning motivation questionnaire was given to students in the experimental and control groups. The learning motivation questionnaire in this study consisted of statements with 5 answer choices, namely SS (Strongly Agree), S (Agree), R (Undecided), TS (Disagree), and STS (Strongly Disagree).

The analysis technique with ANOVA is an inferential technique used to test the difference in mean values. ANOVA can be used to determine whether the mean values of two or more samples differ significantly or not.

RESULTS AND DISCUSION

Results

The results of the 2x3 ANOVA test calculations on the data from students' mathematical problem-solving ability tests are presented in Table 1 below.

Table 1.
Results of ANOVA Test of Problem Solving Ability

Tests of Between-Subjects Effects					
Dependent Variable: Test results					
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	4059.280[a]	5	811.856	10.512	.000
Intercept	233456.885	1	233456.885	3.02303	.000
Model	1079.585	1	1079.585	13.978	.000
KAM	1452.959	2	726.479	9.406	.000
Model * KAM	701.125	2	350.562	4.539	.015
Error	4324.994	56	77.232		
Total	345975.000	62			
Corrected Total	8384.274	61			
a. R Squared = ,484 (Adjusted R Squared = ,438)					

Based on Table 1, it can be explained that there is an influence of the picture and picture learning model on students' mathematical problem solving abilities as evidenced by the calculation results of 0.000 <0.05. There is an interaction between learning and initial abilities on students' mathematical problem solving abilities as evidenced by the calculation results of 0.015 <0.05.

The results of the 2x3 ANOVA test calculations on student learning motivation data are presented in Table 2 below.

Table 2.
Results of ANOVA Test of Learning Motivation

Tests of Between-Subjects Effects					
Dependent Variable: Motivation					
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	2028.276[a]	5	405.655	6.493	.000
Intercept	203802.042	1	203802.042	3.26203	.000
Model	266.879	1	266.879	4.272	.043
KAM	796.740	2	398.370	6.377	.003

Model * KAM	527.682	2	263.841	4.223	.020
Error	3498.434	56	62.472		
Total	304030.000	62			
Corrected Total	5526.710	61			
a. R Squared = ,367 (Adjusted R Squared = ,310)					

Based on Table 2, it can be stated that there is an influence of the picture and picture learning model on students' learning motivation as evidenced by the calculation results of 0.043 <0.05. There is an interaction between learning and initial abilities on students' learning motivation as evidenced by the calculation results of 0.020 <0.05.

Mathematics learning must be supported by appropriate models to ensure effectiveness and deep understanding for students. The right learning model can make complex mathematical concepts easier to understand and relevant for students. By implementing interactive and interesting methods, such as the picture and picture model, students can be actively involved in the learning process, thereby increasing their motivation and interest. In addition, the right model can also adjust to the various learning styles of students, providing opportunities for each individual to learn in the most effective way (Wulandari, Sahabuddin and Muslan, 2024).

Innovative models, such as picture and picture, can be used effectively in mathematics learning to increase student engagement and conceptual understanding. This method utilizes interesting visualizations, allowing students to associate images with the material being taught, thus helping them understand abstract concepts more easily. By involving students in interactive activities, this model also encourages collaboration and discussion among them, which can enrich the learning experience. In addition, the application of the picture and picture model in mathematics learning can increase student motivation, making them more enthusiastic to learn and explore new ideas. Thus, the use of this innovative model is very relevant to create a fun and effective learning atmosphere in the classroom (Rosidah, Humaeroh and Setiabudi, 2024).

Effective learning models, such as picture and picture, greatly support increasing student motivation in learning. With an interactive and visual approach, students become more involved in the learning process, so they feel more enthusiastic and excited to learn. When students actively participate in activities, such as group discussions or collaborative problem solving, they feel satisfaction and achievement that can increase their intrinsic motivation. In

addition, this model provides space for student creativity, which makes the learning experience more fun and interesting (Pradnya and Suniasih, 2024).

Learning motivation is a key factor that influences student success in the educational process. When students are highly motivated, they tend to be more active and involved in learning activities, and are better prepared to face academic challenges. Learning motivation can come from various sources, such as personal interest in the material, support from teachers and peers, and an understanding of the importance of education for the future. Motivated students are usually more creative in finding solutions, willing to try harder, and more resilient to difficulties. Therefore, it is important for educators to create a learning environment that supports and facilitates student motivation, through an interactive, relevant approach, and appreciates their achievements. Thus, positive learning motivation can contribute greatly to students' academic achievement and character development (Arsilawita and Suhaili, 2020).

Discussion

Problem Solving in Student Learning Process

A common problem in the learning process is the way to achieve unclear goals, which can hinder student progress. When learning goals are not well defined, both by teachers and students, it will be difficult to determine the steps needed to achieve them. This can lead to confusion, lack of focus, and even demotivation among students (Siswanto & Meiliasari, 2024).

Problems in mathematics often present themselves as challenges that require logical and analytical thinking to solve. These types of problems can range from simple arithmetic problems to more complex problems in geometry or algebra. Students often struggle to understand the underlying concepts of a problem, which affects their ability to find a solution (Inayah and Arief, 2023).

Problems in mathematics can be categorized into several types, namely translation problems, application problems, process problems, and puzzle problems. Translation problems involve translation, application problems relate mathematical concepts to real-world contexts, process problems emphasize steps in solving, puzzle problems provide fun challenges and trigger students' curiosity (Alifa & Dewi, 2023)

Problem solving is very important in education, especially in the context of learning mathematics, because it is a basic skill needed to face various challenges in everyday life. Through problem solving, students not only learn to find answers, but also to analyze situations, formulate strategies, and apply the knowledge they have learned. These skills help students develop critical and creative thinking, which is very valuable in decision making and conflict resolution (Mardika & Maulidya, 2023).

Problem solving is an endeavor that involves applying knowledge to find solutions to challenges faced. When students are faced with a problem, they need to activate the knowledge they have previously learned and relate it to the situation at hand. This process not only tests conceptual understanding, but also encourages students to think critically and creatively in finding solutions. For example, in solving a math problem, students must choose the right formula, perform calculations, and interpret the results (Saodah & Wijayanti, 2024).

Students' problem-solving skills are essential to their learning and personal development. These skills not only help students face academic challenges but also prepare them for everyday life situations. With these skills, students learn to analyze situations, identify possible solutions, and evaluate the consequences of each choice made. In addition, problem-solving teaches students to think critically and creatively, which is very much needed in today's changing world (Nurmilah & Rahmat, 2023)

Problem-solving skills are essential skills for every individual, as they encompass various aspects of critical and creative thinking. These skills involve the process of identifying problems, analyzing information, and developing effective solutions. In an educational context, students who have these skills are better able to cope with academic challenges, adapt to new situations, and make informed decisions (Holidun *et al.*, 2020).

The Urgency of Learning Motivation to Improve the Quality of Student Learning

Motivation in certain circumstances often serves as the primary driver for carrying out activities. When a person is faced with a challenge or situation that requires action, internal or external drives can trigger the spirit to move forward. For example, a pressing situation or the need to achieve a certain goal can create a sense of urgency that drives an individual to try harder (Purba & Rangkuti, 2022).

Motivation acts as a primary driver of action, motivating individuals to take action and achieve goals. When a person is strongly motivated, they are more likely to be committed and work hard, despite challenges. Motivation can come from a variety of sources, such as a desire to succeed, a need to meet the expectations of others, or even a drive to improve themselves. By understanding what motivates them, individuals can direct their energy and focus toward doing worthwhile things. Motivation can also influence how a person responds to difficult situations, encouraging them to persist and keep fighting (Elvira & Neni Z, 2022).

Motivation represents a complex psychological process in which various internal and external factors interact to encourage individuals to take action. This process involves setting goals, recognizing needs and wants, and responding to challenges. Motivation can be influenced by past experiences, personal values, and social and cultural contexts. In many cases, motivation serves as a driving force that helps a person maintain focus and persistence in achieving goals (Shihabudin, 2022).

Motivation is closely related to the desire to do something, functioning as a fuel that drives individuals to act. When someone has a strong desire to achieve a goal, motivation becomes the main driver that directs their efforts and commitment. This desire can arise from various sources, such as the desire to achieve a dream, the need to fulfill expectations, or the urge to improve oneself.

Motivation is a source of energy within oneself that drives individuals to move forward and achieve goals. When a person feels motivated, their enthusiasm and drive increase, allowing them to face challenges with more confidence. This energy not only helps in carrying out daily tasks, but also provides perseverance in the face of obstacles. Factors such as a clear vision, social support, and small achievements can strengthen motivation, making individuals feel more empowered and inspired (Sari & Kusdiyanto, 2023).

Motivation is a crucial foundation for moving oneself to achieve goals and face challenges. Without clear motivation, individuals may feel confused and disoriented, making it difficult to take the necessary steps. When motivation is strong, it serves as a driving force that triggers action, encouraging one to stay focused and strive despite obstacles. Motivation also provides an important emotional boost, helping one stay enthusiastic and optimistic on their journey. By understanding the importance of motivation as a foundation, individuals can more easily design strategies and set realistic goals, creating a path to desired achievement.

Picture and Picture Model as an Alternative for Active Student Learning

Picture and picture models are very effective learning methods in prioritizing group work. In this approach, students are invited to work together in analyzing the images or illustrations provided. Through group discussions, they can share views, explore ideas, and solve problems collectively (Ismai et al., 2023).

The picture and picture model emphasizes the importance of cooperation in learning. In this method, students are invited to work in small groups, where they must discuss and collaborate with each other to analyze the images presented. This process encourages students to share opinions, listen to each other, and build shared understanding (Ulfaa et.al., 2022).

The picture and picture model systematically describes the learning process involving visual analysis. In this approach, images are presented sequentially, helping students to understand more complex steps or concepts. Students are invited to examine each image, discussing the meaning and relationship between images in groups. In this way, they can organize information in a structured way, which facilitates deeper understanding. This systematic approach not only makes the material easier to understand, but also helps students develop critical and analytical thinking skills (Sundari et al., 2022).

The picture and picture model is a learning method that relies on images to help students understand certain concepts or materials. In this approach, students are presented with a series of interrelated images, which encourage them to analyze, discuss, and draw conclusions together. This method is effective because it uses visuals as a tool, making it easier for students to understand complex information. In addition, this model also encourages interaction and collaboration between students, increasing their involvement in the learning process.

CONCLUSION

Students' mathematical problem-solving ability through the picture and picture learning model assisted by video media is better than being given regular learning at SD Negeri 100312 Pargarut.an Jae Tapanuli Selatan. Students' mathematics learning motivation through the picture and picture learning model assisted by video media is better than being given regular learning at SD Negeri 100312 Pargarutan Jae Tapanuli Selatan. There is an interaction between learning and students' initial abilities on mathematical problem-solving abilities at SD Negeri 100312 Pargarutan Jae Tapanuli Selatan. This interaction shows that the effectiveness of the learning model in improving problem-solving abilities is greatly influenced by the level of students' initial abilities. Students with high initial abilities tend to find it easier to understand the material and apply problem-solving strategies, while students with low initial abilities require a more adaptive approach and intensive guidance in order to achieve optimal results. There is a significant interaction between learning and students' initial abilities on mathematics learning motivation at SD Negeri 100312 Pargarutan Jae, Tapanuli Selatan. This interaction shows that the learning model applied can affect the level of students' motivation in learning mathematics, depending on their initial abilities. Students with high initial abilities are usually more motivated when given challenges that match their

level of understanding, while students with low initial abilities require a more supportive and motivating approach to stay enthusiastic about learning.

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