



Improving Learning Achievement of Plane Materials Through Tangram Media Using the Project Based Learning Model

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ABSTRACT

Learning mathematics that emphasizes understanding concepts and solving problems requires learning media. The use of learning media is still low, so learning outcomes are far from the minimum completeness criteria (the student's lowest score), apart from learning media. Besides the media, learning models are essential to discover fun and not dull mathematics. This study aimed to improve learning achievement in data-building material through tangram media with the PjBL model for class IV at SD Negeri Gerih 7, East Java, Indonesia. The research method used was Collaborative Classroom Action Research. The subjects of this study were 23 students in grade IV at SD Negeri Gerih 7, East Java, Indonesia, in the 2022/2023 academic year. The test results obtained were in the form of pre-cycle class average values of 59.13, 64.78 in the results of the first cycle, and 77.82 in the results of the second cycle. It can be concluded that the PjBL learning model and the tangram media effectively improve the achievement results of fourth-grade students at SD Negeri Gerih 7, East Java, Indonesia.

Keywords: Plane, Project Based Learning (PjBL), Tangram Media

ABSTRAK

Pembelajaran matematika yang menekankan pada pemahaman konsep dan pemecahan masalah membutuhkan media pembelajaran. Penggunaan media pembelajaran masih rendah sehingga hasil belajar jauh dari kriteria ketuntasan minimum (batas nilai siswa paling rendah). Selain media, model pembelajaran juga penting untuk diterapkan dalam pembelajaran matematika agar menyenangkan dan tidak membosankan. Tujuan penelitian ini yaitu untuk meningkatkan prestasi belajar materi bangun datar melalui media tangram dengan model PjBL kelas IV di SD Negeri Gerih 7, Jawa Timur, Indonesia. Metode penelitian yang digunakan yaitu Penelitian Tindakan Kelas (CAR) Kolaboratif. Subjek penelitian ini adalah siswa kelas IV di SD Negeri Gerih 7, Jawa timur, Indonesia pada tahun ajaran 2022/2023 berjumlah 23 siswa. Hasil tes yang diperoleh berupa nilai rata-rata kelas prasiklus 59,13; 64,78 pada hasil siklus I dan 77,82 pada hasil siklus II. Dapat disimpulkan bahwa model pembelajaran PjBL dan media tangram efektif dalam meningkatkan hasil prestasi siswa kelas IV SD Negeri Gerih 7, Jawa Timur, Indonesia.

Kata Kunci: Bangun Datar, Project Based Learning (PjBL), Media Tangram.



INTRODUCTION

Mathematics is a universal science that has an essential role in various disciplines, develops human thinking power, and underlies the development of modern technology (Mashuri, 2019). The importance of mathematics in both human life and the development of science and technology, so from elementary education to tertiary institutions, mathematics is made a compulsory subject. This aims to foster the ability to think critically, systematically, logically, and creatively and cooperate effectively (Mustopo, 2019). However, learning mathematics is still often considered a complex subject by some students at the elementary school level. Elementary school children generally experience difficulties in understanding abstract mathematics. Because of its abstractness, mathematics is complicated for students to understand (Assingkily et al., 2019).

Abstraction ability is also the ability to describe and imagine objects that are not physically there. This ability is essential for students to visualize and manipulate a virtual thing, especially in mathematics lessons (Nurhikmayati, 2017). This ability is necessary so that students can visualize and manipulate something unreal. In line with this statement, the ability to think abstractly cannot be separated from understanding concepts because thinking activities are inseparable from the ability to describe or imagine natural objects that do not always exist (Nuswantari & Murtiyasa, 2015). One mathematical material not always tangible is the material for flat shapes in elementary schools. In flat material, students encounter things that are not physically present in front of them. Students must be able to imagine and describe every component or feature of a flat shape that doesn't exist. Therefore, in practice, students experience great difficulty in solving problems related to balanced conditions.

Judging from Piaget's theory of cognitive development, elementary school children enter the concrete operational stage (Syahrizal et al., 2022). The characteristics of the product of the concrete active stage are as follows: 1) the stages that occur at the age of 7-11 years, 2) starting to be able to understand the cumulative aspects of the material, 3) being able to think systematically about various concrete objects and events (Muri'ah & Wardan, 2020). Difficulties in understanding abstract concepts lead to fewer learning activities. This low understanding of the concept will affect the ability to solve problems. Ebbutt and Straker explain that mathematics is an activity and creativity that requires imagination, intuition, and discovery (Ariani et al., 2014). In mathematics, problem-solving is solving word problems, non-routine questions, and applying mathematics in everyday life or other situations. If students' problem-solving skills are not at a high enough level, students will have difficulty using math skills. So, the low problem-solving abilities of students are closely related to the low achievements of students in Mathematics. This needs to get special attention for teachers by implementing various appropriate models and strategies to improve student achievement.

The low quality of mathematics learning outcomes is inseparable from the models and media used in the learning process. The learning model is the design of learning activities so that the implementation of the teaching and learning activities can run well, be attractive, easy to understand, and be in a precise sequence (Octavia, 2020). The learning model effectively improves the quality of teaching and learning activities because students must play an active role in learning

activities, have good thinking abilities, and cooperate with groups. Meanwhile, according to Teni Nurrita, learning media is a tool that can help the teaching and learning process so that the message's meaning becomes more transparent and educational or learning goals can be created (Nurrita, 2018). The benefits of using media are 1) the learning process becomes more precise and more enjoyable, 2) the learning process becomes more interactive, 3) efficiency in time and effort, 4) it improves the quality of learning (Falahudin, 2014)

The results of observations made in class IV in the even-semester mathematics subject were the Independent Curriculum Learning Outcomes. Namely, at the end of phase B, students could describe the characteristics of various shapes (rectangle, triangle, polygon). They can arrange (compose) and decompose (decompose) different forms in more than one way if possible (Sutama et al., 2022). It was found that many students still had difficulty understanding the concept and calculating the area and perimeter of flat shapes. In addition, students are less active in learning, and some are still afraid to ask questions and express opinions. Thus, the teaching and learning process, which should be student-centered, is controlled by the teacher, who acts as a conduit of information. No project-based learning emphasizes research activities based on the topics or themes set in education. Due to these students' condition, many students are less enthusiastic about learning because teachers still do not use learning models that emphasize student activity, making children less critical in accepting. Think about the material offered impacts students' low grades in class. Not a few students got less than the minimum completeness criteria (the lowest score of the student), namely 70. The teacher explained more about the material. Then students were asked to work on the questions, so they did not have the opportunity to experience learning directly how to use the media. One way that can be applied is to use models and media appropriately. The selection of models and media should be adjusted to the characteristics of students and the subjects to be taught.

Based on the explanation of the problems above, an alternative solution is given as an effort to improve student learning outcomes in mathematics, especially the flat shape material for class IV at SD Negeri Gerih 7, namely by using tangram media through the model of *Project Based Learning* (PjBL). Tangram is an educational game originating from China. The game is a fair puzzle game cut into seven parts (2 large triangles, 1 square, 1 parallelogram, 1 medium triangle, and 2 small triangles) (Kurniawan, 2014). Tangram is suitable for elementary school children to form triangles, squares, isosceles, trapezoids, etc. Learning using the tangram method can provide opportunities for players (of all ages, both children and adults) to use this game as a teaching aid (Berutu, 2013). Moving the seven parts can create various shapes, which form the basis for understanding area and perimeter.

Meanwhile, the learning model considered suitable for learning flat shape material for class IV at SD Negeri Gerih 7 is project-based. Project-Based Learning (PjBL) is a systematic learning approach in which students acquire information and skills by engaging in a long and organized process of inquiry directed at real and challenging topics, as well as actual tasks and results (Sunisme et al., 2022). Model PjBL is a learning model that uses the project (activity) as the core learning (Furi et al., 2018). Project-based learning (PjBL) focuses on student activities by collecting

information and using it to produce something useful for the lives of the students and others but still related to SK, KD curriculum (Nurhadiyati et al., 2021). A project-based learning method involves students working in groups to compile a report (Mudlofir & Rusydiyah, 2017). The PjBL model requires students to actively solve problems by initiating an idea that can be generalized into a product due to project activities. Students can practice higher-order thinking skills (Fitri et al., 2018). The PjBL model facilitates students to solve problems through project work (Winarni et al., 2022). Through this project-based model, students get material and can practice directly and solve problems so students can think critically.

Educators must view children with respect, care for, and guide children sincerely according to the Ki Hajar Dewantara system. These include a fun learning process and choosing learning methods while carrying out meaningful games (Gani et al., 2021). Using project-based learning models makes learning more exciting and memorable for students, which aims to help students better understand concepts and make learning more meaningful, which is expected so that student achievement scores can increase. Based on the background, the researcher is interested in conducting classroom action research titled "Increasing Learning Achievement in Flat Shape Materials Through Tangram Media with Class IV PjBL Models at SD Negeri Gerih 7". The objectives of this study are: 1) to improve learning achievement in flat material through the tangram media and 2) to improve learning achievement in flat material using the PjBL model.

METHOD

The research method used is classroom action research, or what is known as Classroom Action Research (CAR) is carried out in stages called cycles so that each step is carried out repeatedly. Action research (action research) is a study developed jointly between researchers and decision-makers regarding variables that can be manipulated and immediately used to determine policy and development (Zohrahayaty et al., 2019). CAR is action research carried out in the classroom when learning occurs (Salim et al., 2019). According to Ana Widayanti (2008), Classroom Action Research (CAR) is a research activity in a classroom context that is carried out to solve learning problems faced by teachers, improve the quality and learning outcomes and try out new things in learning for the sake of enhancing the quality and learning outcomes. CAR is a research activity that can be carried out individually or collaboratively (Widayati, 2008). CAR is collaborative, meaning researchers work with tutors and field supervisors (Rahayu & Hidayati, 2018). In this research, collaborative CAR was carried out with collaboration between students, practitioners, and researchers.

In action research, the teacher is the most crucial factor that must be sensitive to problems in the teaching and learning process. Without this sensitivity, it is difficult for teachers to find problems worth investigating or correcting. And if this is the case, it will be difficult for teachers to improve their performance, let alone improve the existing system. The CAR cycle includes four stages: planning, acting, observing, and reflecting (Kurniawan, 2017).

This research was conducted at Gerih 7 Public Elementary School, which is located in Tegalsari 004/008 Hamlet, Gerih Village, Gerih District, Ngawi Regency, East Java, in the even

semester of the 2022/2023 school year, which was held around March to April. The subjects of this study were the fourth-grade students at SD Negeri Gerih 7, totaling 23 students, namely 13 male students and ten female students.

This study uses data collection techniques through observation, tests, and documentation. In observation or observation, the researcher observes directly and actively obtains the desired information. Sometimes researchers also direct the topics studied into action. This is done so that the data leads to learning objectives. According to Arikunto (2008), a class can be seen as a single unit of interrelated elements that work towards a specific goal. The components of a class are 1) the students themselves, 2) the teacher who is teaching, 3) the learning materials, 4) the equipment used, 5) learning outcomes, 6) the learning environment, and 7) the management/setting that carried out by the school principal, whether ongoing or not (Gigit, 2019). The test is written by giving questions to the subject whose data is needed. Then the documentation in this study is a data collection technique in the form of a student media creation project. Based on this data, it can be seen whether the media is effective or vice versa. The instruments used were observation sheets and evaluation questions.

This study's success indicators were conducted by interviewing grade 4 teachers at SDN Gerih 7, Ngawi. They had set minimum completeness criteria (the lowest student score) standards for each subject. In grade 4 mathematics, if the number of students achieves learning mastery of $\geq 75\%$, students are said to have completed learning if they obtain an outcome value of ≥ 70 based on the minimum completeness criteria that have been determined. If the increase in the multiplication arithmetic ability test results meets the indicator of success, then the cycle will be stopped.

RESULT AND DISCUSSION

This research was conducted in class IV at Gerih 7 Public Elementary School, where in the observation process, several problems were found, so research on flat shape material used tangram as a medium and Project Based Learning (PjBL) as a learning model. This study consisted of pre-cycle, cycle one, and cycle 2.

Pre-cycle

This pre-cycle activity involves interviewing the class teacher and observing the learning course. The ability to understand flat shapes is relatively low in line with the learning outcomes obtained in learning mathematics. In this study, a written test was given at the beginning of the lesson with basic questions on flat shape material to determine students' initial understanding of the material. The results of the initial written test are obtained results in Table 1.

Table 1. Pre-cycle Learning Outcomes

Mark	The number of students	Category
90	1	Very good
80	1	Good
70	6	Enough
60	2	Less
<60	13	Very less

Mark	The number of students	Category
1360	-	Total value
59,13	-	Rate-rate
53,67%	-	Complete
46,32%	-	Not completed

The data in Table 1, shows that the learning outcomes of class IV flat shapes material at SD Negeri Gerih 7 are still low. The results obtained at the pre-cycle stage, namely, 8 out of 23 students met the completion criteria of 53.67%. At the same time, 15 out of 23 students did not meet the complete standards of 46.32%. The average result obtained from this pre-cycle is 59.13% in the inferior category. The average effect of this pre-cycle class is still far from the school's minimum completeness criteria, which is 70. The following is a graph of cycle I in Figure 1.

Table 2. Value Description

Mark	Category
90-100	Very good
80-89	Good
70-79	Enough
60-69	Less
<60	Very less

The problem is that applied learning is still conventional, where the teacher only uses the lecture method and is the only source of knowledge. This research by Choiroh (2018) states that in the mathematics learning process that has taken place, teachers use more of the lecture method (Choiroh, 2018). This was also reinforced by research conducted by Ekandari Rusmini Astuti, namely the teacher had not used the media in explaining the material, and learning appeared verbal, so students had difficulty understanding the material presented (Astuti, 2019). Learning media helps students to think concretely, not just think abstractly. There is also research from Adilah Utami (2016). The results of this study explained that material regarding flat shapes includes abstract concepts, so teachers need media to convey material. This tangram media has attractive colors for students, increasing children's creativity and imagination and making them more active (Utami, 2016). Learning media helps students to think concretely, not just believe abstractly (Al-Fanie et al., 2020). Using learning media for children in the concrete operational stage is essential. In the pre-cycle location, before using tangram media and project-based models.

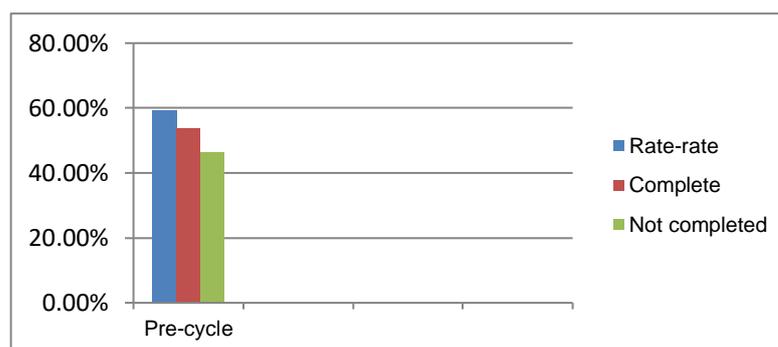


Figure 1. Pre-cycle results

Implementing the PjBL model adapted to the online learning design emphasizes the principle that teachers can take on the role of facilitator, not dominate learning. The PjBL model provides opportunities for students to start selecting and planning their projects, developing instruments, implementing plans, and evaluating the achievements of the projects implemented. The application of project-based learning is expected so that education is student-centered and not teacher center so that students can be fully active in learning (Syawaludin et al., 2022). Next, the researcher provides a test in the form of a description of the basic geometric shapes. The results obtained by most of the students have not reached the minimum completeness criteria (the lowest score of the student), which is a score of 70 in the mathematics lesson on flat construction material.

Cycle I

This problem is caused because, in the cognitive aspect, students experience difficulties in understanding various shapes of flat shapes and their properties. In the psychomotor part, students have difficulty differentiating flat forms. In the affective aspect, many students still lack discipline and cooperation in completing discussion assignments given by the teacher, and many students talk alone with their friends. This is because applied learning is still conventional, where the teacher only uses the lecture method and is the only source of knowledge. A previous study also reinforced this. The teacher had not used the media to explain the material, and learning appeared verbal, so students had difficulty understanding the material presented (Astuti, 2019). Learning media helps students to think concretely, not just think abstractly. There is also research from Utami (2016). The results of this study explained that material regarding flat shapes includes abstract concepts, so teachers need media to convey material. This tangram media has attractive colors for students, increasing children's creativity and imagination and making them more active (Utami, 2016). Using learning media for children in the concrete operational stage is essential. In the pre-cycle stage, before using tangram media and project-based models, the researcher gave a test in the form of a description of the basic geometric shapes. The results obtained by most of the students have not reached the minimum completeness criteria (the lowest score of the student), which is a score of 70 in the mathematics lesson on flat construction material.

Table 3. Learning Outcomes of Cycle I

Mark	The number of students	Category
100	2	Very good
90	1	Very good
80	2	Good
70	7	Enough
60	2	Less
<60	9	Very less
1490	-	Total value
64,79	-	Rate-rate
63,08%	-	Complete
36,91%	-	Not completed

Based on this table, the class average is 64.78 in the less category. The number of students who have completed or have reached the minimum completeness criteria (the lowest score of the student) is 12 out of 23 students, with a percentage of 63.08%. Meanwhile, 11 out of 23 students had not completed or had not reached the minimum completeness criteria (the lowest score of the student), with a percentage of 36.91%. Based on these data, by applying the tangram media with the PjBL model, there is an increase from pre-cycle to cycle I. This increase can be seen in Figure 2.

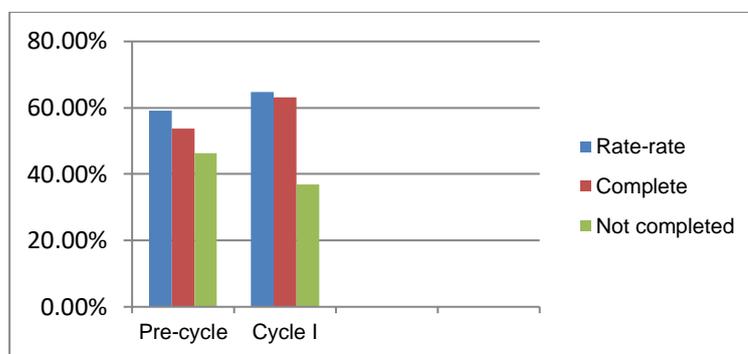


Figure 2. Comparison of Precycle and Cycle I

The graph above shows that the average value has increased from the pre-cycle average value of 59.13% to 64.78% in the results of cycle I. The number of students who got minimum completeness criteria scores or completed increased, initially 53.67% to 63.08% after cycle I, and conversely, students who have not reached the minimum completeness criteria (the lowest score of the student), namely not completed, have decreased, which was initially 46.32% to 36.91%.

Based on these initial conditions (pre-cycle), improvements were made in cycle I was using tangram media in collaboration with the PjBL model in learning mathematics in flat shape material. It can be said that the learning outcomes of fourth-grade students at SD Negeri Gerih 7 Ngawi Regency have increased. The increase in student learning outcomes in mathematics learning on flat shapes in cycle I was due to tangram media and the PjBL model, although they had not achieved the desired mastery. There is relevant research related to the use of tangram media, namely a study conducted by Risa, namely through the tangram media, students are more enthusiastic, and learning is not boring because it has colors that attract students (Utami, 2016). This tangram media has attractive colors in various forms so that students are more enthusiastic and learning is not dull, coupled with project-based models so that this tangram can be created according to students' imaginations. Other research also states that marionette tangram as an educational teaching medium was considered valid and visible for the thematic learning process. The media can be used to teach geometry, especially on the topic of plane characteristics (Zuliana et al., 2020).

Applying this tangram media also instills student characteristics such as discipline, responsibility, creativity, cooperation, and others. The teacher's role can be to encourage students to invent problems and not only solve given problems. An exciting activity in a class might be to

classify these different problems. Organizing principles for such a classification arise from considerations of shape resulting from values of lengths, angles, and areas (Pluvinage, 2013). In addition to forming the tangram character, the teacher as a facilitator encourages problem-solving and development by determining the size and circumference of the flat shape. As for previous research related to the use of the PjBL model, namely the study conducted by Mustopo (2019) with the conclusion from this research, namely learning using the Project Based Learning (PjBL) model can improve student learning outcomes as seen from individual completeness and classical completeness (Mustopo, 2019). Media and the learning model of the tangram at SDN Gerih 7 have increased even though they have not achieved the desired results. Namely, there is a score above the minimum completeness criteria (the lowest score of the student), which is 63.08% in the complete category, and the class average increase is 64.78%.

The students' learning mastery has not been achieved due to not being maximal in the learning process. The results of the reflection carried out by the researcher show that there are still students who are released from their responsibilities, namely being busy alone and not paying attention. Likewise, researchers are still not maximal in motivating students. So, there are two students in the less category and nine in the significantly less class with a score of less than 60.

Cycle II

In cycle II, continue cycle I with the learning achievements of grade 4 mathematics, which have been mentioned above, namely composition (combination). Design is combining several flat shapes into one new flat form. Learning is carried out in the same way as in cycle I using tagram media with a project-based model. At the end of the lesson, the teacher gives a test as an evaluation question. Students work individually on the evaluation questions. The following cycle II test results are presented in Table 4.

Table 4. Learning Outcomes of Cycle II

Mark	The number of students	Category
100	3	Very good
90	5	Very good
80	6	Good
70	5	Enough
60	1	Less
<60	3	Very less
1790	-	Total value
77,82	-	Rate-rate
88,26%	-	Complete
11,73%	-	Not completed

Based on the table above, the class average score is 77.82 in the excellent category. Students who reached minimum completeness criteria (the lowest score of the student) or completed as much as 88.26%, namely 19 students. While those who had not reached the minimum completeness criteria (the lowest score of the student) or had not completed it were 11.73% or four students. Based on these data, it is known that there is a significant increase in flat wake material

from cycle I to cycle II. The following is a comparison graph of student learning outcomes starting from pre-cycle, cycle I, and cycle II.

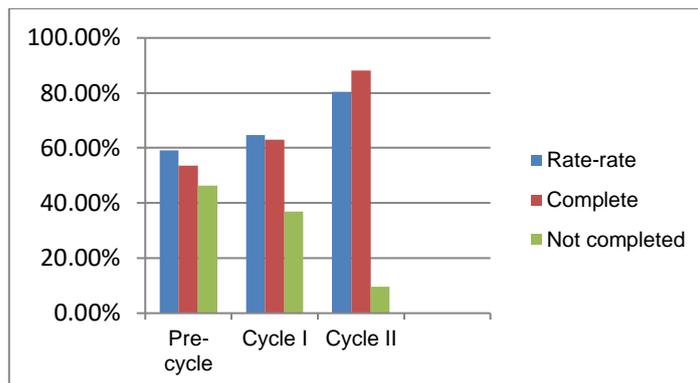


Figure 3. Comparison of Pracycle, Cycle I, and Cycle II

Based on these data, it is known that there was an increase in the class average, which was initially pre-cycle, namely 59.13. It increased to 64.78 in cycle I, and in cycle ii to 80.43. students who fulfilled the minimum completeness criteria (the lowest score of the student) or completed also experienced an increase of 53.67% to 63.08% in cycle I and experienced a significant increase of 88.26% in cycle II. this increase was triggered because students often practiced and understood the concept of flat shapes. Students who did not complete or had not reached the minimum completeness criteria (the lowest score of the student) experienced a decrease from 46.32% to 36.91% and experienced a drastic reduction of 9.72% in cycle II.

After conducting a more in-depth reflection on the results of the first cycle of actions in learning Mathematics on flat shapes using tangram media, it can be said that the learning outcomes of class IV students at SDN Gerih 7, Ngawi Regency, East Java Province, have experienced significant increase learning outcomes in the pre-cycle average of 59.13 or significantly less category. Cycle I averaged 64.79 or good variety, and cycle II averaged 77.82 or sufficient. Classically, the percentage of completeness in the pre-cycle was 53.67%, cycle I was 63.08%, and cycle II was 88.26%. It is proven that there is an increase in the completeness of the learning outcomes of the flat shape material.

The increase in student learning outcomes in learning Mathematics on flat shapes in cycle II is due to tangram media. Through tangram media, students are more enthusiastic, and learning is not boring because it has colors that attract students. The research conducted by Ema Srinina with the title "Development of Mathematical Learning Media Material Circumference and Area of Flat Shapes to Improve Cognitive Abilities and Interests of Class V Students of SD Margoyasan Yogyakarta" states that the product developed, namely tangram board media is feasible for use as a learning medium in circumference and area of flat shapes for fifth-grade elementary school influential choir students (Barus, 2018). This study uses research procedures from Borg and Gall, where there are nine steps in its preparation that the tangram media is feasible and successful for media learning materials around an area of flat shapes. While at SDN Gerih 7, the research used

was Classroom Action Research (CAR) which consisted of 4 stages, namely planning, action, observation, and reflection also experienced an increase in learning outcomes where completeness in cycle II was 88.26% in the excellent category. It is relevant to previous research explaining that the learning model talking *stick* and tangram media can improve student learning achievement (Sholeha et al., 2019). The tangram media is used because students still have difficulty understanding the flat shape material, whereas the tangram media has never been used in the school. In class IV at SDN Gerih 7, they have never used tangram as a learning medium in collaboration with a project-based learning model.

Previous research explained differences in critical thinking skills between students taught using the Project Based Learning (PjBL) model and those trained using conventional models. The Project Based Learning (PjBL) model effectively improves critical thinking skills and student learning outcomes. Students are more active in the learning process because this model makes a product from an object that matches the character of students who still like to play and are curious (Kristiyanto, 2020). In learning with a project, students are more interested in the products they make themselves in solving problems, so learning is student-centered. The successful implementation of PjBL in class can increase student motivation by being fully involved in classroom activities (Wardani et al., 2020). In learning with a project, students are more interested in the products they make themselves in solving problems so that students form their motivation to learn.

The increase in cycle II was because, in cycle II, the teacher had carried out the reflection results of cycle I. In cycle II, the researcher guided students experiencing difficulties and motivated students more. This is evidenced by the feedback from students who are more responsive and proactive in completing assignments. It was proven that 15 children in the pre-cycle scored below 70, decreasing to 11 in cycle I and four in cycle II. Values below 70 are in the category of less and significantly less. In cycle II, students can make their tangrams to find concepts and calculate plane shapes in the operation of tangram media with the Project Based Learning model. Using tangram media is effective for students in getting to know various forms of flat bodies by combining multiple other balanced arrangements. This is the opinion of the Ministry of Education and Culture, which suggests that the tangram benefits from understanding the properties of various plane shapes (Kemendikbud, 2012). In addition, the use of tangram media affects student learning outcomes, marked by an increase in mathematics learning outcomes in flat shape material. This follows Sholeha et al.'s (2019) statement explaining that the learning model talking *stick* and tangram media can improve student learning achievement. In connection with previous research, SD Negeri Gerih 7 class IV has never used tangram media as a learning medium, so this class action research uses tangram media with the PjBL model to improve student achievement and a means of overcoming problems that occur.

Based on the research and discussion above shows that the use of tangram media with the Project Based Learning (PjBL) model is proven to improve learning outcomes in mathematics in class IV SD Negeri Gerih 7, Ngawi Regency. Based on the results of this study, it can be said that this research was successful because the effects of learning mathematics in the learning

evaluation given to students in each cycle showed a significant increase and exceeded the desired completeness.

CONCLUSION

Results of Classroom Action Research (CAR) conducted using models Project-based learning (PjBL) and Tangram media can effectively improve learning achievement in class IV mathematics at SD Negeri Gerih 7. The data obtained prove that the pre-cycle class average was 59.13, then 64.78 in the results of cycle I and 80.43 in the results of first cycle II. The number of students who reached minimum completeness criteria (the lowest score of the student) or completed also increased from 53.67% in pre-cycle to 63.08% after cycle I and to 88.26% in cycle II. Meanwhile, the number of students who did not fulfill the minimum completeness criteria (the lowest score of the student) or did not complete it decreased from 46.32% in the pre-cycle stage to 36.91% in cycle I and 11.73% in cycle II. The media and learning model developed are expected to be used by teachers in elementary schools to support classroom learning. In addition, further researchers can analyze the effectiveness of tangram media in introducing the types of plane shapes and the properties of plane shapes in classes III and IV.

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