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The Development of Flat Shape Monopoly Game Project Innovation Based on PJBL Learning Model

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ABSTRACT: Mathematics learning is a type of learning that requires teachers to be able to act and think creatively and innovatively. For teachers to achieve success in a lesson, a learning innovation is needed that can increase student interest and motivation. This article discusses the innovative form of project-based mathematics learning and produces a monopoly board game with a focus on flat shape material. Activities carried out during learning are students in one group doing a project in the form of a monopoly board game with a flat shape. Then later, the finished monopoly game board will be exchanged with other groups and played together in one group. Several questions in the game will be discussed and answered on the assignment sheet. Writing this article aims to describe the development of abilities and understanding of children in elementary schools on the formula, characteristics, and characteristics of flat shape through the project of making a monopoly game of flat shape. The type of research we use is a qualitative research which is a literature study and is presented in the form of a description. The results obtained show that students are very enthusiastic about doing projects and carrying out monopoly flat shape. It is hoped that the interest that arises in students can increase student interest and motivation to learn. So that learning can be well received by students and learning objectives can be achieved optimally.

Keywords: project, monopoly game, flat shape

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INTRODUCTION

Mathematics is said to be a field of science that is taught in the world of education, starting from elementary school to university. The application of mathematics is intended to facilitate human life related to calculation problems. At present, we know that learning mathematics is also intended to develop self-potential through learning (Lestari, & SB. Nugraheti, 2022). Therefore, teachers need to have more creativity in creating interesting learning innovations. If learning can be packaged with innovation and interesting activities, it will foster enthusiasm for students to understand the material (Anggraini, & Antosa, 2022).

Success in learning mathematics can be seen in the students' mastery of good concepts. Because understanding the basic concept also affects other concepts. If students do not understand the concept at the beginning, it will be difficult in dealing with further material problems (Indriani, 2022). So that when students understand the basic concepts well, they can be a reference for steps in solving further problems. The most important goal of learning is to make students understand the material being taught. So that this understanding can bring up a new idea (Saprilia, 2022).

Regarding learning, the Minister of Research and Technology launched the independent curriculum as a substitute for the 2013 curriculum to improve the quality of learning. Schools that implement an independent curriculum are called driving schools. The independent curriculum also focuses on realizing the profile of Pancasila students (Wati, 2022). For these goals to be achieved, one of the learning methods

that can be used is project learning. According to Konrad, Wiek, and Barth, in (Sudibjo et al., 2020) the meaning of the project in question is to start with students thinking about what material will be studied to why such a design was made.

In a learning process, students are expected to be able to think critically, creatively, and innovatively in various activities in the learning process. Critical, creative, and innovative thinking in question is that students can create a new idea that has never existed before, and the teacher acts as a facilitator as well as guides students to be able to achieve the target learning objectives. Therefore, the teacher must also be able to determine the appropriate learning model for a learning activity. After knowing the learning model to be used, then the teacher must think about what innovations are suitable to be applied in learning.

One learning model that supports students in critical, creative, and innovative thinking is the project-based learning model. It is a learning process that produces a project or makes the project a learning medium to provide students with an understanding of concepts and principles regarding a problem and find solutions to these problems. PjBL focuses on students where students are equipped with the ability to be able to construct their thoughts through the learning process by producing a product. Students through project activities will lead a process of interest in being able to complete a targeted project through critical thinking creatively and innovatively.

In learning using the PjBL model or this project, students are given a time limit in the process. After students can complete the project assignments that have been given, the teacher is required to provide feedback in the form of project presentation activities that have been made. The advantage of this PjBL learning model if it is successful in achieving learning objectives is to improve communication skills between students. Because the activity is in the form of a group. Then train students in managing good time management, and skills in producing a product. Here the activeness of students determines the results of achieving successful learning.

Learning activities for this flat shape material use game-based learning methods or games that are arranged in such a way as to assist the learning process. Game-based learning is a learning method that uses the application of games to provide stimulus to students. Judging from the characteristics of students in elementary schools who are usually active, like to move from one place to another, like to work in groups, and like to play, it is necessary to have a learning innovation related to this. By knowing the characteristics of students, learning mathematics can be made as attractive as possible by combining learning with game activities. Combining learning activities with games will form an interesting learning innovation. However, the portion in-game activities must also be considered in such a way. That the focus in these activities remains on the learning process. So it doesn't obscure the intended material and doesn't just get stuck with the game. It is hoped that with the combination of games and learning activities, students can feel relaxed or comfortable. Then the material studied can be absorbed properly without any coercion.

In this article, we will discuss the form of applying flat wake learning using monopoly game media. Because students are certainly familiar with monopoly games. Therefore this monopoly game was chosen as an alternative to solving difficulties in learning mathematics in flat shape material. An understanding of the rules of the monopoly game can certainly make learning effective. Because it doesn't take long to explain the rules of the game. In monopoly game activities, of course, it is adjusted to the flat shape material. The monopoly game board shape consists of squares that represent a type of triangular flat shape. Then there is also a mystery card that contains questions that must be answered by students. Through the monopoly game, students are expected to be able to understand various flat shape and connect various spatial and visual experiences.

Based on the description that has been explained above, the formulation of the problem that the author will discuss in this article is about "What are the forms of difficulties experienced by students in understanding flat shape material in elementary school?" and "What teacher innovations can be developed in flat shape material in Project-based elementary schools?"

METHOD

This type of research is a qualitative research which is a literature study. Where, this literature review is obtained through the thoughts contained in articles, books, theses, and other people's research results. Then qualitative research in this article, using descriptive analysis. Namely by collecting various necessary data analyses, then presented in the form of a description. This research uses the library method in the form of data that has been selected, presented, and analyzed. Departing from the factor analysis of the difficulty of understanding the material, solutions will be sought in the form of learning innovations that can solve

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the problems contained in an analytical study. The steps that the writer carried out in compiling this article started from collecting various references, analyzing the object being discussed, finding solutions to these problems, and testing effectiveness through implementation in a learning activity.

RESULT AND DISCUSSION

The Difficulties Experienced by Students in Understanding The Flat Shape Material in Elementary School

In this article, the author first analyzes the forms of difficulties experienced by students in understanding the solid shape material through the literature review of several articles. Then found some difficulties experienced by students in understanding the flat shape material. And need to be completed or find the right solution. The results of the literature review found several difficulties experienced by students in flat shape material. Namely among them is the first, there are difficulties when using mathematical concepts. In the sense that students often make mistakes in the use of formulas. This was triggered by the low memory of students to remember and memorize the formula for flat shape. The second difficulty is the lack of accuracy of students in answering questions, namely in calculating multiplication. In this problem, students entered the formula correctly. but there was an error in the calculation process. The last difficulty is the lack of follow-up from students after learning is over. Students are not interested in repeating the learning that the teacher has given at school. There are even students who don't do homework. This can occur due to various factors, for example, family environmental factors. Parents of students who have different activities are the background to the lack of student learning assistance.

Student learning difficulties can occur because teachers do not provide interesting innovations in learning. Wina Sanjaya (2010: 317-318) defines learning innovation as an idea, idea, or certain actions in the field of curriculum and learning that are considered new to solve educational problems. Understanding teacher creativity in developing a learning innovation is very important. Because if the learning process is not going well, then the resulting output will not be optimal. This will affect the results of the learning. From the literature review regarding the analysis of students' difficulty articles in flat shape material, the author has an innovative learning idea using monopoly games. It is based on that learning mathematics often makes students bored and less desirable. This happens because in general the teacher only teaches material by writing on the blackboard and then students listen and then take notes. This is too monotonous to apply in learning. So a learning innovation is needed by combining play activities or games with learning activities through the PjBL learning model

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The independent curriculum, seen from its structure, is divided into 3 phases. Namely phase A for grades 1 and 2, phase B for grades 3 and 4, and phase c for grades 5 and 6. The material for flat shape in elementary school, especially in the independent curriculum, is in phase B for grade 3. The learning outcomes are at the end of phase B, students can describe the characteristics of various flat shape (rectangle, triangle, polygon). In the development of learning innovations using a flat shape monopoly, the focus is on the topic of triangle flat shape with a discussion of the characteristics, types, and formulas for triangles. The learning model that we use in the monopoly game learning innovation is using the PjBL (Project Based Learning) learning model. The Project Based Learning learning model is an innovative learning model that is based on constructivism and involves students in solving contextual problems. Learning uses the PjBL learning model, providing the final result in the form of a project. Because learning uses projects, of course, it will bring students to be active in learning activities. Therefore, the involvement of students makes one of the advantages of the PjBL learning model because it can increase student interest and motivation in learning.

In the application of learning activities on elementary flat shape with monopoly games, the authors use a project-based learning model, namely PjBL. In this monopoly game project, students not only carry out the game, but are also assigned to make monopoly game work projects, carry out monopoly games, and finally present the results. It is hoped that by participating in making the monopoly board game, students can find out the purpose, intent, and understanding of flat shape material. Considering that because it uses the PjBL learning model, the output produced is in the form of a flat shape monopoly game.

The stages of learning activities with monopoly flat learning innovations with the PjBL model include directing students to the project to be made, activities to design monopoly flat boards made by

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students, monopoly flat game activities, assessment of results, and reflection on learning. In carrying out learning with this flat shape material, it is also necessary to pay attention to the syntax of PjBL. Among them are setting the project theme, planning, processing, and producing work. In the second stage, namely, students were given directions that in this lesson, students were assigned to make a project in the form of a flat monopoly and play it like a monopoly game in general. Students have also previously been told to bring the tools and materials specified by the teacher to make the project at a predetermined meeting. In the third stage, students are divided into groups, each member consisting of 3-4 people to make a flat shapes monopoly board. Students are also instructed by the teacher, that making the monopoly board game contains several things. It can be conceptualized through the following picture.

Figure 1. Flat Shape Monopoly Board Game Concept

One board is divided into 12 small squares that surround one large square. And it contains a start, types of flat shape, and mystery cards. At this stage, students must understand the purpose of the project to be made. In the fourth stage, namely, students actively make flat-topped monopoly projects in groups. The tools and materials used in the manufacture are Scissors, Cardboard, Pencils, cutters, Markers, Folding paper, HVS Paper, and Glue. It is hoped that the manufacture of flat monopoly boards can make students feel proud of the results they have made, to increase student learning motivation. The steps for making the flat monopoly board are, first, cutting the cardboard with a size of 16 cm × 16 cm. Then, coat the cardboard that has been formed using HVS paper. Next, make 12 squares around the box with one large box in the middle. Then, make several types of flat triangular flat shape using folded paper. Cut and paste on the boxes that have been provided. In the middle is where the mystery card is placed. This mystery card contains a random question that must be answered later on the assignment sheet.

In the fifth stage, each group must have finished making their flat monopoly board. Then, the teacher directs students to exchange the monopoly board game with other groups. So in this case, each group member plays the monopoly board game made by the other group. The game begins with students throwing the dice. The student who gets the highest dice number has the right to move forward first. If students stop at one type of shape, then students are asked to explain the characteristics or characteristics of that shape. Then you can write it on the worksheet. For example, for students who get an equilateral triangle shape, it can be explained that the characteristics of an equilateral triangle are that the three sides are the same length, and the angles formed are also the same size. Then, if students get a mystery card, it contains several questions with a higher level of difficulty, for example, some questions contain questions about the formulas for the area and perimeter of a triangle. Then, students can calculate the area or circumference of flat shape through word problems. In the activity of answering questions on the monopoly game board, if students have difficulty they can look for references in books or ask the teacher. So the teacher's role in this learning activity is to guide the success of making projects and directing students in the game activities carried out. The situation in learning activities using this monopoly game is that students look enthusiastic about designing projects and playing them. This is evidenced by the participation of all members in completing the flat-build monopoly project. The discussion situation is presented in the following figure.

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Figure 2. Monopoly Board Game Creation

Figure 2. Each Group Member Plays Flat Shape Monopoly Board Game Concept

Figure 4. Group Members Write Answers On The Task Sheet

It can be seen that there are several groups in this monopoly learning activity using their respective strategies. For example, is the division of tasks within a group. The division of tasks includes, someone in charge of throwing the dice, someone stepping and placing their pieces, someone reading a mystery card, and someone in charge of writing answers to questions on the task sheet. In this case, it means that students are very enthusiastic about the learning activities that take place. And trying to maximize the implementation of learning. This is the first time students carry out learning activities using project and game models. However, the enthusiasm of students was high during this learning activity. With high enthusiasm, students will understand the material discussed. And learning objectives can be achieved according to plan.

CONCLUSION

It can be seen that there are several groups in this monopoly learning activity using their respective strategies. For example, is the division of tasks within a group. The division of tasks include, someone in charge of throwing the dice, someone stepping and placing their pieces, someone reading a mystery card, and someone in charge of writing answers to questions on the task sheet. In this case, it means that students are very enthusiastic about the learning activities that take place. And trying to maximize the implementation of learning. This is the first time students carry out learning activities using project and game models.

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The advice we give in this article is that the project-based learning model (PJBL) which produces an output in the form of a flat monopoly board game is an example of a learning innovation that can be developed by teachers. It can also be applied in other materials or subjects according to the teacher's creativity. The activeness of students determines the success of learning based on this flat monopoly project. Therefore, students must also really understand the learning activities that will be carried out and of course, be able to work well together in groups. We hope that this article can provide a new, more interesting idea and also hopefully the writing we make can be useful for readers.

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