

IMPLEMENTATION OF GAME-BASED LEARNING METHODS ON MULTIPLE AND DIVISION COUNTING OPERATIONS IN CLASS VII SMP PLUS RAUDLATUL MUQORROBIN KALISAT

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Abstract: The purpose of this study was to describe and examine the application of game-based learning methods to multiplication and division arithmetic operations. The research was conducted at SMP Plus Raudlatul Muqorrobin Kalisat, Kalisat District, Jember Regency. This type of research is exploratory and qualitative approach. The subjects of this research were class VII students of junior high school. Data collection techniques used interviews with mathematics teachers, observations related to learning activities from mathematics learning materials, multiplication and division operations, and documentation in the form of photographs. The data analysis technique used in this study uses Miles and Huberman's steps, namely data reduction, presentation, and conclusion. The results of the study showed a positive change in the use of game-based learning methods in multiplication and division arithmetic operations. These changes are reflected in the enthusiasm of students while playing, increased student interest in learning, and student learning outcomes. By applying appropriate learning methods, it is necessary to create solutions for students and teachers to facilitate the achievement of learning objectives.

Keywords: Learning Methods, Games, Multiplication, Division.

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INTRODUCTION

Basic academic skills must develop several very important skills including reading, writing, and arithmetic. In learning that includes these three aspects, one of them is mathematics which is closely related to basic numeracy skills (Panglipur & Rosita, 2023). Mathematics is a comprehensive (general) science that is beneficial to human life and forms the basis for the development of modern technology. Mathematics is a scientific discipline that can help solve everyday problems and develop thinking and thinking skills (Susanto in Karim, 2011). Mathematics is knowledge related to all abstract forms and more structured forms (Halyadi, 2016). Mathematics is related to principles, ideas, and processes, so the focus should be on thinking and not on memorizing the relationships between aspects (Mentari, 2021).

Content standards (SI) cover various materials and competency levels to enable graduates to become competent at certain levels and types of education. SI includes the basic framework and curriculum structure, the number of courses and curriculum at the education unit level (KTSP), and the pedagogic/academic calendar (Government Regulation (PP) 19 of 2005 § 5). Graduate Competency Standards (SKL) are used as assessment guidelines in determining student graduation in educational units. SKL contains qualifications for all majors or subject groups (25 PP no.19 of 2005). The contents of SI and SKL were compiled by the National Education Standards Agency (BSNP) and approved by the Minister of National Education (Permendiknas) of the Republic of Indonesia through Decree no. 22 of 2006 (by SI) and No. 23 of 2006 (through SKL). The implementation of SI and SKL is regulated in Permendiknas No. 24 of 2006.

According to Article 38 of Law Number 20 of 2003 concerning the National Education System (Sisdiknas), each school/madrasah develops its school curriculum (KTSP). The preparation of KTSP for primary and secondary education is guided by the BSNP guidelines, and

KTSP and curriculum are produced within the curriculum framework (which is contained in the SI) and SKL (articles 16 and 17) Government Decree No. 19 of 2005.

Based on the mandate of Article 38 of Law Number 20 of 2003 concerning the National Education System (Sisdiknas), each school/madrasah develops an SI mathematics subject for all features of primary and secondary education. It is stated that the purpose of mathematics in schools is for students to: (a) understand mathematical concepts that explain relationships between concepts and apply concepts or algorithms flexibly, accurately, efficiently, and accurately to solve problems, (b) use arguments about formulas and properties, perform solutions mathematics about generalizations, compiling proofs or explanations of insights into mathematical ideas and statements, (c) solving problems involving the ability to understand problems, draw mathematical models, complete models and interpret solutions obtained, (d) ideas using symbols, tables, diagrams or other communication tools to explain conditions or problems, (e) attitudes that value the usefulness of mathematics in life, namely curiosity, perseverance and interest in learning mathematics, as well as determination and confidence in solving problems. School Curriculum (KTSP) or the preparation of KTSP for primary and secondary education is guided by the BSNP Instructions, and KTSP and the curriculum are placed in the Curriculum (which is contained in the SI) and SKL (Articles 16 and 17) made in Government Decree No. 19 of 2005.

This goal can be achieved properly if every element related to the management of learning mathematics in schools understands the importance of the SI and SKL of mathematics about the objectives of the subject of mathematics.

Mathematics teachers for junior high schools (SMP)/Madrasah Tsanawiyah (MTs) guide student achievement in learning mathematics at SMP/MTs. Therefore, SMP/MTs mathematics teachers must carry out an analysis of SI and SKL in mathematics related to the goals to be achieved by these mathematics subjects. This is to ensure that the direction of learning does not deviate from the goals to be achieved and the goals can be achieved optimally. In this case, the relevant analysis connects (maps) the competence of computer science students with the goals to be achieved in the mathematics department.

Every student must experience difficulties in learning. (Mazroza, 2013) Learning disabilities are diseases related to general and specific tasks that occur in children which are thought to be caused by neurological diseases, psychological processes, or other reasons so that children with learning disabilities perform poorly in class. success in learning lessons here is defined as the inability to control learning in certain subjects, one of which is mathematics. In learning mathematics, learning difficulties are considered normal by students because mathematics is considered a scary subject and difficult to understand. Not only for elementary school students but also for university students. One of the problems that often occur in learning mathematics in this field is the difficulty in forbidding students from continuing the material and dividing arithmetic. It is difficult for students to understand and accept the mathematics lessons given by the teacher, and it is difficult to teach them to understand the basics of addition and division. They only remember development and division and don't understand the concept properly. On the other hand, students need to know how to multiply, because addition material is used repeatedly in other lessons, not only at the basic level of mathematics, but even at higher levels and in everyday life. Multiplication is a type of basic arithmetic operation and is defined as repeated addition (West and Belleuve in Halyadi, (2016)). An example of addition and division is where 2×2 is defined as $2+2$ and $4:1$ is defined as 4×1 . Students must have a high interest in and mastery of material development. Because everyday school life cannot be

separated from the addition and distribution of material. According to Himmah (2021), counting has benefits including: 1) so that students can deepen and understand the laws that apply in the universe, 2) so that students can understand future planning and evaluation, and 3) so that students can design and build properly. true, 4) so that children can act fairly, 5) minimize fraud, 6) and others.

Based on the explanation above, increasing students' interest and mastery of adding material and dividing it is necessary. Heruma in Tetiwar & Appulembang (2018) argues that learning basic mathematical concepts is based on activities that can connect students' real-world knowledge skills with abstract mathematical concepts. Thus it is hoped that in learning basic concepts media and/or methods can be created that can support students' thinking, developing skills, and understanding concepts. Learning through media and/or learning methods can support teachers to provide practical, creative, and innovative materials. The material for arithmetic addition operations is an abstraction. Therefore, we need something that can connect the process between students' abstract thinking and concrete thinking. One of them is to provide concrete mathematical concepts by applying appropriate and easy-to-understand learning methods.

Teachers usually do not involve students in defining and discovering concepts or patterns. There are still many teachers who do not use the right method when learning mathematics. As a result, direct learning does not provide space for students to think critically. One way to overcome these problems is through interactive learning methods, namely games. The game is a work of art in which players decide to manage their resources and achieve their goals. Games are designed to attract interest so they don't get bored easily during student learning activities (Candra & Rahayu, 2021).

Based on the background of the problems above, the purpose of this study was to determine the application of learning methods based on arithmetic operations game on addition and division in class VII students of SMP Plus Raudlatul Muqorrobin Kalisat Jember Regency. The application of this game-based learning method is played by class VII students. The purpose of implementing this game-based learning method is to help students learn and understand addition operations easily and without boredom. In addition, this method must support students in thinking critically, quickly, and accurately.

METHOD

The method used in this research is exploratory qualitative. The research was conducted at SMP Plus Raudlatul Muqorrobin Kalisat, Kalisat District, Jember Regency. The data sources were 2 math teachers and class VII students of SMP Plus Raudlatul Muqorrobin Kalisat, consisting of 4 boys and 2 girls. In this study, data collection techniques in the form of observations related to multiplication and division operations learning activities, interviews with class VII mathematics teachers, and photographic documentation were used to confirm the results of the research material. The data analysis technique used in this study uses Miles and Huberman (1992:26) in the stages of data reduction, data presentation, and conclusion or verification.

RESULT

The results of interviews, observations, and documentation are the objectives of this research, namely to obtain information about student data, learning tools, and learning methods. Then the results of the interviews were described by the researcher in more depth. The following

is an excerpt from an interview conducted by the researcher (P) with the respondent/class teacher (R):

Q: "How many grade VII students are there in SMP Plus Raudlatul Muqorrobin Kalisat?"

R: "There are 6 students, 4 boys, and 2 girls."

Q: "What learning tools do you use in math lessons?"

R: "The learning that I use is similar to Permendikbud 65 of 2013."

Q: "Describe what learning methods you use to teach multiplication and division math operations material in class VII."

R: "The method that I use to learn mathematics, arithmetic operations, multiplication, and division, is a method of learning by playing. This game is played in pairs with partners. The game is played like this:

1. Bench mates face each other with their hands behind their backs.
2. The first student takes out a few fingers that are used for multiplication and division. For example, a student holds up 4 fingers, in this case, the student also has to remember multiplication and division by 4.
3. Then another student or his opponent also raises a finger, for example, 3.
4. Then the two quickly guessed at each other.
5. The first student to guess the correct answer is the winner. Then the student plays again with other students who win the multiplication and division, and so on until the first and second winners emerge."

Q: "Do you think this method is effective enough to improve student learning outcomes?"

R: "In my opinion, it is quite effective because playing with this method does not feel boring while learning and of course, students feel like they want to win the game, so students must remember multiplication and division beforehand. Because multiplication and division are almost the same, that is, division only changes the result to division, if the multiplication and division are relatively large, students must first memorize the ratio and division, so that the calculation does not take too long.

Q: "So what problems did you encounter using this method?"

R: "The obstacle I encountered was related to the method used, namely confusion in explaining the game system in the context of sales materials."

Q: "Are there any students who still can't reproduce?"

R: "Most of them know how to do it, but there are also students who need further guidance."

Q: "How do you deal with students who still can't memorize?"

R: "After teaching and learning tasks are finished, I ask students to memorize multiplication and division at home. If the knife is sharpened frequently, it will become sharper later.

Based on some of the snippets of the questions above, the method used in learning mathematics on multiplication and division arithmetic operations at SMP Plus Raudlatul Muqorrobin Kalisat is a game-based learning method as shown in Figure 1 below.



Picture 1. Student and Teacher Activities During Learning.

The method used by the mathematics teacher is used to facilitate the learning process. Jean Piaget, who is also a biologist, connects the developmental stages of physical maturity with the stages of cognitive development. These stages are sensory-motor (0-2 years), pre-operational (2-7 years), concrete operational (7-11 years), and formal operational (11.15 years). According to Piaget, children go through a definite sequence of stages of cognitive development. In this theory, children are predicted to have maturity in quantity and quality based on the stages they go through. Stage cognitive development is a continuation of the previous stage of cognitive development. Media is an inseparable part of the teaching and learning process to achieve learning objectives. This is to the notion of media according to Susilana (in Harefa & Laia, 2021), media is one of the factors that can determine the success of a lesson, with media the learning process can be more interesting and enjoyable. According to the defendants, the application of game-based learning methods to the multiplication and division of arithmetic material can improve student learning outcomes because students must remember that when taking learning tests they are used to it and know how to answer questions correctly.

DISCUSSION

Based on the results of observations with class VII teachers at SMP Plus Raudlatul Muqorrobin Kalisat, the solutions used by teachers to overcome difficulties in the process of learning mathematics, especially in the material of arithmetic multiplication operations; 1) applying appropriate learning methods in class in a way that increases student learning interest and helps students absorb material, 2) teachers should add references to concepts or material taught to students because this can lead to creativity and innovative learning and 3) use of the learning environment adapted to the goals and teaching materials of students. Based on these suggestions, it aims to help students, teachers, and readers so that learning goes well.

Using appropriate learning methods in the classroom encourages students to increase their interest in learning and helps students retain material. This is by Tien Kartin's research which found that the learning methods used and student learning interests affected improving student learning outcomes (Benjamin, 2019). The effectiveness of the application of the method used by the teacher is reflected in the positive changes in students. The observation results also show that the student's enthusiasm for this game is very large. A student who wants to win the game must know how to remember the arithmetic operations in multiplication and division and be careful in answering them. Some students remember multiplication and division but quickly lose it when answering with their peers. So that not a few students lost in the first unit because they did not know the answers to the multiplication and division arithmetic operations, besides that it could also be due to other factors, namely wrong answers and not answering quickly. Therefore, this game requires students to be fast and precise in answering arithmetic multiplication and division operations. The ability of students to absorb and memorize material varies, some are fast and some are slow. Slow students are given extra tutoring to help them keep up with other students. In addition, the teacher must remind that before the lesson, students first memorize multiplication and division at home, parents or friends can guide them.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results and discussion of the data above, it can be concluded that the application of game-based mathematics learning methods at SMP Plus Raudlatul Muqrobin Kalisat in mathematics is very appropriate and effective to use. This is one of the things that has been implemented in class VII students of SMP Plus Raudlatul Muqrobin Kalisat on multiplication and division arithmetic operations. Game-based learning methods used in learning mathematics provide opportunities for students to be able to learn while playing and support positive changes in students. The results showed that there was high student enthusiasm when doing the learning. It was found that there was active interaction between students and students and between students and teachers in classroom learning which made students not bored. The implementation of this learning method is also more oriented than traditional learning toward expanding understanding of concepts, especially those related to multiplication arithmetic, and division calculations. Teachers who want to apply this learning method must pay attention to students' abilities because the ability to grasp material is very different for each student.

The importance of understanding mathematical concepts for high school students forces teachers to be creative in overcoming the difficulties they face in learning mathematics. From the results of this study, teachers can use several methods to overcome difficulties in learning mathematics, especially in the material for arithmetic operations, multiplication, and division, namely: 1) applying appropriate learning methods in the classroom in a way that encourages students to increase their interest in learning and helps students absorb the material, 2) the teacher should provide references to concepts or material taught by students to be added because it can be, 3) the use of the learning environment adapted to the learning objectives and teaching materials of students. By implementing some of these things it is expected that the learning process can take place well and the learning objectives can be achieved as expected.

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