maktab: Jurnal Pendidikan dan Teknologi. Vol. 1 No. 3 November 2022 - February 2023
p-ISSN 2829-2901 | e-ISSN 2829-0925 | Hal 730-739

IMPROVING STUDENT LEARNING OUTCOMES IN MULTIPLE MATERIALS USING THE JARIMATICS METHOD ASSISTED OF THE MULTIPLE SMART BOARD

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ABSTRACT

Learning outcomes can be used as an indicator of the success of a study. Based on the results of a preliminary study conducted by the researcher, most of the second grade students at SDN Demangan 1 Bangkalan have low learning outcomes in the subject matter of multiplication in mathematics. To overcome this, the researcher plans to take action in a study, namely using the jarimatics method assisted by multiplication smart board media with the aim of increasing student learning outcomes in multiplication material. This research is a class action research with a class action method. Data collection techniques were carried out using observation techniques, interviews, documentation, and tests. The collected data were then analyzed using quantitative data analysis techniques. The results of this study indicate that the use of the jarimatics method will improve student learning outcomes on multiplication material using multiplication smart board media. This is shown by the increase in average learning outcomes and the percentage of students who complete each cycle. In cycle I, the average learning outcomes are still below the minimum completeness criteria, namely 54.4 with a percentage of 39%. This increased in cycle II to an average of 71 with a percentage of 81 students completing.

ARTICLE INFO

Article History:
Received 29 November 2022
Revised 5 December 2022
Accepted 10 December 2022
Available online 15 December 2022

Keywords:
Learning Outcomes; Jarimatics Method; Multiple Smart Board.

A. Introduction

Education and teaching is a conscious process that has a purpose. The purpose of education is the formulation of the results expected by students after carrying out learning experiences. One indicator of the achievement of the other educational goals is from the achievements and learning outcomes achieved by students. The higher the achievement and learning outcomes, the knowledge is also considered to be higher. Education in Elementary Schools (SD) is held to provide basic knowledge, attitudes, and skills for students. This basic education is then developed to improve the self-quality of students. Education in schools cannot be separated from the learning process and interactions between teachers and students.

Learning activities are the most important and crucial activities in the education system. Education and learning at the Elementary School (SD) level is the first formal education system that forms the foundation of the knowledge, attitudes, and skills of students at the next level. Currently, several elementary school institutions are still implementing learning with a thematic approach. This approach is carried out at the elementary school level according to the mindset and characteristics of students at the elementary school age which, according to Gagne's cognitive development theory, is still holistic (thorough) and concrete operational.

The education system is controlled by the curriculum. The curriculum is an educational instrument that is useful for making Indonesian people have competence attitudes, knowledge, and skills so that they can become productive, creative, innovative, and affective individuals and citizens. This is in accordance with the objectives of the 2013 curriculum character education, namely to improve the quality of educational processes and outcomes. In practice, the 2013 curriculum applies thematic learning, scientific approaches, authentic assessments, and character education which are also integrated into all the subjects taught.

Thematic learning is learning in which most of the subjects in it are packaged in the form of themes that are close to the student's environment so that it is expected to provide meaningful experiences for students (Hindayani, 2017). In the 2013 curriculum, the process of acquiring students' knowledge is directed towards a scientific approach. The scientific approach is intended to provide understanding

to students in knowing and understanding various materials, realizing that information can come from anywhere, at any time, and does not depend on the information provided by the teacher. In addition, keep in mind that the assessment of students' knowledge, attitudes, and skills in thematic learning is done by converting the scores obtained by students. Value conversions are carried out using guidelines set by the Ministry of Education and Culture.

Thematic learning uses themes that have been provided by the central government. The theme is adapted to the teacher's book and school curriculum which refers to the national curriculum. In planning thematic learning the teacher no longer determines the theme. The theme used in the student handbook, namely BUPENA, is that which is in the student's living environment. Themes are made according to the interests, needs, environment, and learning experiences of students. The application of thematic learning in elementary schools requires integrated learning between one subject and another, even with students' daily lives. Although currently available teacher and student books can be used as learning resources, it is necessary to strive for integrated learning scenarios to help students understand various knowledge stemming from themes inherent in life and their environment.

Mathematics is one of the subjects taught in schools with the highest percentage of study hours compared to other subjects. Ironically, Mathematics tends to be seen as a subject that is disliked by many students. For them mathematics tends to be seen as a subject that is less desirable and should be avoided if possible. This situation is understandable considering that for simple types of calculations, if an error occurs in one wrong number, the result will also be wrong. For more complex levels, the math sentences become more characterful and more difficult. The complexity and lack of liking for this subject results in low mathematics learning outcomes, both at the elementary to university levels, many students feel afraid, reluctant and less interested in mathematics, both in studying it and solving the problems they learn.

Jarimatika is a way of counting using finger aids. With this technique, students are trained to memorize basic multiplication. The involvement of students in demonstrating jarimatika can make learning meaningful. They can use their fingers to solve counting problems based on the rules of hand formation and finger-solving. This jarimatics technique is not only flexible but also does not burden the brain's memory and in the calculation process, it shows a high level of accuracy.

Based on the results of observations of researchers in the field, it was found that there were student problems in class. 8 students had difficulty in learning multiplication arithmetic operations. This is reinforced by the results of observations made by researchers. Some of the obstacles found in learning mathematics in class are first, learning is very monotonous where the teacher does not use learning media when learning causes students to get bored and bored so that learning does not run smoothly. Second, the teacher uses a memorization method where every day students are told to read multiplication 1-10 in front. Third, the teacher's lack of explanation in teaching students. Based on these three problems, the researcher plans to use the Jarimatika method using multiplication smart board learning media.

The visual aid in the form of a multiplication smart board is part of the teaching media. Media is not only a tool or material, but other things that enable students to gain knowledge. The use of multiplication smart boards is not new in teaching mathematics. Including the use of multiplication smart boards by teachers at UPTD SDN Demangan 1. The use of multiplication smart boards is not implemented continuously and there is no research that describes the extent to which the benefits of using multiplication smart boards are in teaching mathematics. This reason, given the importance of using teaching aids in the form of a multiplication smart board in teaching mathematics, the writer will carry out classroom action research (PTK) in the mathematics subject of multiplication material to solve problems teaching mathematics at UPTD SDN Demangan 1. Based on the description above, it can be held the reasons for carrying out research on Improving Mathematics Learning Outcomes on Multiplication Material Through the Jarimatics Method Through the Multiplication Smart Board in Class II Students of UPTD SDN Demangan 1.

B. Method

This research uses a type of classroom action research (CAR). According to (Septatiningtyas, 2020) PTK is divided into three words namely research, action, and class. Research is an activity of observing a certain object using certain procedures to find data with the aim of improving quality. Action is treatment that is carried out intentionally and planned with a specific purpose. Class is a place where a group of students receive lessons from the same teacher. Therefore classroom action

research can be interpreted as a type of research that aims to find data and improve the quality of education by implementing an action in the classroom.

The location of the research was carried out at UPTD SDN Demangan 1, which is located at Jl. HOS Cokroaminoto No. Bangkalan. This research was conducted from October to November 2022. The subjects in this study were all 38 students in grade II at UPTD SDN Demangan 1. This research was conducted for 1 month, from 15 October to 12 November 2022. This research was conducted in 2 cycles. Each cycle has 4 stages in classroom action research namely planning, acting, observing, and reflecting. The research instrument used observation sheets, interview sheets, and test sheets. The observation sheet was carried out by the researcher observing the learning process in class. Interview sheets were carried out to class II teachers to find out multiplication abilities. The test sheet was carried out to grade II students by providing 10 multiple choice questions. This research data collection techniques using observation, interviews, and tests. The data that has been collected is then analyzed using a quantitative approach.

C. Result and Discussion

Description of Cycle 1

1. Planning

At the planning stage the researcher begins the activity by looking for a problem obtained from interviews and observations. There are several steps that the researcher did at the planning stage, as follows:

a. Looking for problems at UPTD SDN Demangan 1.
b. Make observation sheets and interview sheets.
c. Looking for solutions to the problems of the UPTD SDN Demangan 1.
d. Making learning devices (RPP). The researcher determines the Mathematics content with the Multiplication material for class II students.
e. Develop learning media "Multiplication Smart Board".
f. Make a test sheet that is given to students.

2. Acting

At this implementation stage the researcher carried out the Learning Implementation Plan (RPP) that had been made. The researcher applied class II students on October 15 2022 at the UPTD SDN Demangan 1. The activity began with an introduction, core and closing.

a. Preliminary activities: the teacher says greetings, prays, asks greetings, takes attendance, does ice-breaking and conveys learning objectives.
b. Core activity: the teacher gives apperception by asking questions to students. The teacher explains the multiplication arithmetic operating system using the jarimatics method. The teacher asks all students to complete the multiplication using jarimatika. The teacher re-explains the multiplication counting operating system using the learning media "Multiplication Smart Board". The teacher asks several students to come forward to solve the multiplication problem using the help of a multiplication smart board.
c. Closing activity: The teacher gives conclusions to students, asks students to pray, the teacher ends learning and says hello.

3. Observing

At the observation stage, observations were carried out directly to student activities. From the results of observations that have been carried out on class II students at UTPD SDN Demangan 1, the following data is obtained:

Table 1. Student Learning Test Results in Cycle I

No	Name	M/F	Score	Complete	Not Complete
1.	Annisa Rizka Solikin	F	80	C	
2.	Arshela Sandriana R	F	30		TT
3.	Alfa Sabrianti	F	40		TT
4.	Farel Daffanza	M	70	C	
5.	Felicia Nur Quella	F	50		TT
6.	Ijaz Jauza Asnara	M	70	C	
7.	Islnecca Aurra P	F	90	C	
8.	Jenita Rahmawati W	F	80	C	
9.	Kevin Mahraja L	M	50		NC
10.	Moch. Fahri Aula H	M	50		NC
11.	Angga wijaya	M	80	C	
12.	Moch Syarif H	M	20		NC
13.	Moh, arland	M	70	C	
14.	Mohammda. Febrigio	M	60		NC
15.	Nafiza Arlaura	F	10		NC
16.	Naura salsabila	F	90	C	
17.	Nisaul Kauisah	F	60		NC
18.	Raffa Pramudya F	M	80	C	
19.	Raffi Pramudya F	M	20		NC
20.	Raina Shafira P	F	40		NC
21.	Raisha Shafira P	F	70	C	
22.	Raziq Hanna P	M	60		NC
23.	Refan Al izyan	M	80	C	
24.	Reisya Alvara anjani	F	70	C	
25.	Sabrina Naura R	F	50		NC
26.	Salwa Agustin	F	40		NC
27.	Siti Aisyah	F	40		NC
28.	Sultan Farhan B	M	50		NC
29.	Sholeh firman	M	30		NC
30.	Tsurayya Syaheda	F	80	C	

31.	Devi Putri A	F	60		NC
32.	Dwi Nur Saadah	F	30		NC
33.	Farhan Cahyanto	M	40		NC
34.	Elsa Fitriani	F	30		NC
35.	Ivan Novianto	M	30		NC
36.	Yeyen Wiandoro	M	80	C	
37.	Wildan Putra Jaya	M	70	C	
38.	Yogi Amanda	M	20		NC
Total Value Total			2.070		
Average value			$\frac{2.070}{38} = 54{,}4$		
Number of Completed Students			15 siswa		
Mastery Presentation			$\frac{15}{38}\ x\ 100\% = 39\%$		

Based on table 1 above, it can be seen that there are 15 students with values> 70, while <70 are 23 students. From these results, it can be said that cycle I is still incomplete because there are still many students who are less than the KKM. So that from the results of the data above the researcher needs to carry out improvements to the next cycle, namely cycle II.

4. Reflecting

Based on the analysis of the observations made in cycle I, the average learning outcomes obtained were 54.4. The score is still below the minimum completeness criterion score that applies in the class. In addition, the percentage of students who passed was also obtained, which was 39%. This score also has not reached the success target determined by the researcher, namely 75%. From the above results, therefore, the researcher will repeat the action in cycle II to be able to maximize the action process so that the target of research success will be achieved.

Description of Cycle II

1. Planning

There are several steps that the researcher did at the planning stage, as follows:

a. Analyzing the results obtained in cycle I through a literature study and interviews with teachers and students.
b. Formulate solutions to existing problems in cycle I
c. Determining Mathematics content with Multiplication material for class II students
d. Making learning tools (RPP and evaluation tools).

2. Acting

At this implementation stage the researcher carried out the Learning Implementation Plan (RPP) that had been made. The researcher used class II students on October 15, 2022 at UPTD SDN Demangan 1. The activities in the implementation stage in cycle II were not much different from those carried out in cycle I. It's just that in cycle II, the teacher explained more about how to calculate multiplication using the jarimatic method. In addition, the teacher also adds an explanation of the basic concept of multiplication which is also repeated addition. There are also improvements made by providing motivation and more attention to students during the learning process.

3. Observing

At the observation stage, observations were carried out directly to student activities. From the results of observations that have been carried out on class II students at UTPD SDN Demangan 1, the following data is obtained:

Table 2. Results of Student Learning Tests in Cycle II

No	Nama	L/P	Score	Tuntas	Tidak Tuntas
1.	Annisa Rizka Solikin	F	80	C	
2.	Arshela Sandriana R	F	70	C	
3.	Alfa Sabrianti	F	70	C	
4.	Farel Daffanza	M	90	C	
5.	Felicia Nur Quella	F	80	C	
6.	Ijaz Jauza Asnara	M	70	C	
7.	Islnecca Aurra P	F	90	C	
8.	Jenita Rahmawati W	F	80	C	
9.	Kevin Mahraja L	M	80	C	
10.	Moch. Fahri Aula H	M	80	C	
11.	Angga wijaya	M	80	C	
12.	Moch Syarif H	M	50		NC
13.	Moh, arland	M	70	C	
14.	Mohammda. Febrigio	M	80	C	
15.	Nafiza Arlaura	F	50		NC
16.	Naura salsabila	F	90	C	
17.	Nisaul Kauisah	F	80	C	
18.	Raffa Pramudya F	M	80	C	
19.	Raffi Pramudya F	M	60		NC
20.	Raina Shafira P	F	70	C	
21.	Raisha Shafira P	F	70	C	
22.	Raziq Hanna P	M	80	C	
23.	Refan Al izyan	M	80	C	
24.	Reisya Alvara anjani	F	70	C	
25.	Sabrina Naura R	F	70	C	
26.	Salwa Agustin	F	80	C	
27.	Siti Aisyah	F	70	C	
28.	Sultan Farhan B	M	70	C	

29.	Sholeh firman	M	60		NC
30.	Tsurayya Syaheda	F	90	C	
31.	Devi Putri A	F	80	C	
32.	Dwi Nur Saadah	F	60		NC
33.	Farhan Cahyanto	M	70	C	
34.	Elsa Fitriani	F	60		NC
35.	Ivan Novianto	M	70	C	
36.	Yeyen Wiandoro	M	90	C	
37.	Wildan Putra Jaya	M	70	C	
38.	Yogi Amanda	M	50		NC
Total Value Total			2687		
Average value			$\frac{2.687}{38} = 70{,}7$		
Number of Completed Students			31 siswa		
Mastery Presentation			$\frac{31}{38}\ x\ 100\% = 81\ \%$		

Based on table 2 above, it can be seen that there were 31 students with scores > 70, while <70 were 7 students. These results indicate that in cycle 2 there was a significant increase in learning outcomes compared to cycle 1.

4. Reflecting

Based on the analysis of the observations made in cycle II, the average student learning outcomes reached a score of 71. This score has reached the minimum completeness criteria applied in class, namely 70. Another indicator is the percentage of students who complete class in cycle II, namely as many as 31 children with a percentage of 81%. These results indicate a significant increase in learning outcomes.

D. Conclusion

Learning in grade 2 using the Jarimatika method assisted by multiplication smart board media can improve student learning outcomes in multiplication material in mathematics. This is proven based on the increase in the score of learning outcomes in each cycle. In cycle I, the average student learning outcomes were still 54.4. The score then increased in cycle II to 71, so that the average student learning outcomes met the minimum completeness criteria as an indicator of research success. Another indicator is the percentage of students who pass. In cycle I, the percentage of students who completed was 39%. This percentage increased to 81% of students passing in cycle II. This increase occurred because the jarimatics method, besides being more flexible and accurate, this method is also less burdensome to students' brain memory. In addition, the use of learning media also makes abstract mathematical concepts more concrete and fun.

References

Republik Indonesia, 2013 Permendikbud No. 65 Tahun 2013 tentang Standar Proses Pendidikan Dasar dan Menengah, Jakarta. Kementrian Pendidikan dan Kebudayaan.

Runtukahu, J Tombokan dan Selpius Kandou. 2016. Pembelajaran Matematika Dasar Bagi Anak Berkesulitan Belajar. Yogyakarta: Ar-ruzz Media

Hidayani, M. (2017). Pembelajaran tematik dalam kurikulum 2013. At-Ta'lim: Media Informasi Pendidikan Islam, 15(1), 150-165.

Yuniasih, N., Ladamay, I., & Wahyuningtyas, D. T. (2014). Analisis pembelajaran tematik pada kurikulum 2013 di SDN Tanjungrejo 1 Malang. Mimbar Sekolah Dasar, 1(2), 148-152.

Aini, Q., & Relmasira, S. C. (2018). Penerapan Pembelajaran Tematik Integratif Berbasis Kontekstual untuk Meningkatkan Keaktifan dan Hasil Belajar Siswa Kelas 1 SD. Sekolah Dasar: Kajian Teori dan Praktik Pendidikan, 27(2), 124-132.

Deviana, T., & Kusumaningtyas, D. I. (2019). Analisis Kebutuhan Penyusunan Perangkat Pembelajaran Tematik Berbasis HOTS (Higher of Order Thinking Skills) pada Kurikulum 2013 di SD Muhammadiyah 05 Batu. Edumaspul: Jurnal Pendidikan, 3(2), 64-74.

Sugita, S. (2014). Meningkatkan kemampuan perkalian siswa kelas 2 SDN 003 Rantau Pulung menggunakan alat peraga Kelereng dan batu kerikil. Dinamika Ilmu, 214-225.

Rahmah, H., & Sere, N. Peningkatan Hasil Belajar Matematika Materi Perkalian melalui Metode Jarimatika pada Siswa Kelas II Sekolah Dasar.

Hidayah, N. (2015). Pembelajaran tematik integratif di Sekolah Dasar. Terampil: Jurnal Pendidikan dan Pembelajaran Dasar, 2(1), 34-49.

Mirnasulistyawati, M., Armelia, A., & Afdal, A. (2020). Analisis Penerapan Jurikulum 2013 Dalam Meningkatkan Kualitas Pembelajaran. JURNAL MAPPESONA, 3(1).

Susilowati, Dwi. (2018). Penelitian Tindakan Kelas (PTK) Solusi Alternatif Problematika Pembelajaran. Jurnal Edunomika, 2 (1).

Khaatimah, H., & Wibawa, R. (2017). Efektivitas Model Pembelajaran Cooperative Integrated Reading And Composition Terhadap Hasil Belajar. Jurnal Teknologi Pendidikan, 2 (2).

Septatiningtyas, N., dkk. (2020). Penelitian Tindakan Kelas (PTK). Klaten: Lakeisha