



Enhancing Student Learning Outcomes Through the Use of Time Unit Cards in Grade 2 Elementary School

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ABSTRACT

This research is a classroom action research (CAR). This research was conducted to improve students' learning outcomes by using time unit cards in mathematics subjects for students in class 2C SD Negeri Pandeglang 4. This research aims to determine the use of time unit cards in the mathematics subject of grade 2 SD Negeri Pandeglang 4 and the improvement of learning outcomes in mathematics using time unit cards. The subjects of this study were class 2C students in the 2022/2023 academic year, totaling 30 students consisting of 14 female students and 16 male students. The procedure for implementing this class action research consists of planning, implementation, observation, and reflection. The results of this study are 2. Student learning outcomes before CAR were an average percentage of 30% completeness. After the first CAR cycle, it increased to 77%, and at the end of cycle II, it increased beyond classical completeness by 87% of the minimum score of 85%. This research highlights the significant impact of innovative learning media, such as time unit cards, in fostering student engagement, improving conceptual understanding, and achieving higher academic performance in mathematics.

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INTRODUCTION

Science and technology have had a very significant development as the means used to obtain various kinds of information, which can have a tremendous impact on the development of human life, especially in managing human resources in the environment. The development of the acquisition of science and technology indeed leads to the goal of improving quality to answer the needs of the times in accordance with nature as a human being. The needs of this era make humans to be able to have competence and compete to be able to improve these qualities so that they can be applied in life.

Improving the quality of human resources certainly requires the right platform so that the improvement goal can be achieved optimally. One of the efforts to improve the quality of human resources is the existence of educational pathways through formal and non-formal institutions. In Indonesia, formal education institutions are through schools with different levels of education, namely primary school education, junior high education, senior high education, and tertiary education. At the primary school level, students can discover and develop their potential by touching three domains: cognitive, affective, and psychomotor. This elementary school level has an age range of 7-12 years, providing information that in carrying out learning, it is necessary to create an effective

learning environment so that learner development can be carried out optimally.

Learning is inseparable from the subject of counting that we usually recognize, namely mathematics learning. This learning has an important role in the development of science and technology, and this is in line with the mathematics learning process that accustoms students to solve problems correctly. Mathematics problems in elementary school lead to concrete activities, so to carry out this learning activity effectively, the teacher carefully requires planning and implementing learning with a well-planned learning strategy so that implementing the activity will give a good impression to students.

Learning media is used as a tool that can help teachers present learning materials in different packaging and take advantage of the important role of learning media, especially in improving student learning outcomes. Learning media can be applied to learning materials with shortcomings in achieving learning objectives if the implementation of learning is only explanatory. Learning media is a tool used to convey the content of learning materials that can help attract students' enthusiasm to participate in the learning process [1]. So, with the above, we can understand that the media is a communication channel wherein learning. The media has a role as a tool that helps teachers to convey learning material to students in the hope of stimulating students to achieve the expected learning objectives.

Media, according to [2], is a communication channel. Where [2] exemplifies media such as diagrams, television, films, printed materials, computers, and instructors. Meanwhile, [3] suggests that learning media is everything (be it humans, objects, or the surrounding environment) that can be used to convey or provide messages in learning activities to stimulate students' attention, interest, thoughts, and feelings to achieve the goals of learning activities. This opinion is also in line with what was conveyed by Gagne and Briggs, who state that learning media is a tool used to convey the content of learning materials that can help attract students' enthusiasm to participate in the learning process [3]. In general, the media has the following benefits [4].

1. Clarify so that the message is not too verbose.
2. To overcome limitations in space, time, energy, and sensory power.
3. Generate a passion for learning, where the media will cause direct interaction with students.
4. Allows students to learn with their respective learning abilities.
5. It will bring up similarities in stimulation, experience, and perception.

According to [5], learning media can be classified as follows.

1. Motion audiovisual media is the most complete form because it utilizes audiovisual and videography skills. Audiovisual media is material and absorption by sight and hearing to facilitate students' acquisition of knowledge, skills, or attitudes.
2. Still, audiovisual media can be heard and seen but cannot move.
3. Semi-motion audio media can present sound accompanied by linear point movements. However, it cannot display authentic images as a whole.
4. Visual-motion media has visual capabilities and movement without accompaniment or sound.
5. Silent-visual media can show information visually but cannot display sound or movement.
6. Semi-motion visual media
7. Audio media media that can manipulate the ability to emit sound only.
8. Print media can only display information in letters and certain verbal symbols.

The manufacturing process influences the characteristics of this media, according to Kustiawan learning media, which are divided into two, namely simple and modern learning media [6].

In the manufacturing process, it can be seen that card media is included in the type of silent visual media this time, which is reflected in the use of media that can only be seen and requires assistance from the teacher. Card media is easy to make this time, so it is called simple learning media.

The advantage of this electronic media is that it can generally provide a more 'lively' atmosphere. It has a more attractive appearance and can also be used to provide a more realistic view of certain processes.

Meanwhile, non-electronic media can provide students maximum opportunities to learn something or perform tasks in real-life situations. Non-electronic media also offer opportunities for students to experience real-life situations and practice skills using as much meaning as possible.

The disadvantages of this electronic media are mainly technical and also cost. Using these vehicles requires supporting certain facilities and infrastructure, such as electricity and unique equipment/materials that are not always available in some places. Meanwhile, non-electronic media poses a direct risk to students without teacher supervision.

Implementing instructional media in mathematics education has proven highly effective in enhancing students' understanding and engagement. One notable example is the integration of GeoGebra Applets, a dynamic and interactive learning tool that supports visual exploration and manipulation of mathematical concepts. Research highlights that GeoGebra Applets have been utilized across diverse mathematical topics, including geometry, calculus, and linear algebra, to aid students in visualizing abstract concepts and solving complex problems [7]. This tool has demonstrated its utility in fostering individual comprehension and facilitating collaborative and innovative learning environments [7]. Furthermore, developing Android-based learning media, such as the PROGLIN application, exemplifies how STEM approaches can be tailored to linear programming topics, offering students a practical and accessible means of engaging with mathematics [8]. Incorporating such technologies has improved critical thinking, spatial reasoning, and problem-solving skills, underscoring the importance of technology-assisted learning in modern education [7], [9].

Card media is one of the visual media that is not projected. It is hoped that using this media will increase student attention to the subjects the teacher delivers, improving student learning outcomes. This card media is a tool that can help teachers convey learning easily and can be understood by students [10]. This card media is divided into picture cards and word cards.

This card media is used as a tool that can help students be actively involved in learning, and of course, this card media has the advantage of being implemented in several subjects. how to make it quite easy for the teacher can

1. Determine the framework of the media to be created.
2. Implement the framework into Canva.
3. Choose additional designs or decorations to make it more interesting.
4. The design results are downloaded and printed.
5. Cut according to the size of the card
6. Then, it tidied up for use.

The advantages and disadvantages of this card media include those quoted from Gannis's opinion [11]. Card media has three advantages including:

1. Creating a more pleasant learning atmosphere.
2. There is guidance for students to be actively involved in learning activities.
3. It can be used as a tool to play while learning.

As for the shortcomings, of course, on how the manufacturing process is carried out, it cannot be denied that the design process requires sufficient focus and creativity by considering the aspects needed.

Rusffendi stated that mathematics is organized from various elements that cannot be defined, various definitions, axioms, and postulates [12], where the various postulates, when proven true, will apply in general. Hence, this causes mathematics to be known as a deductive science.

Mathematics learning is also one of the main lessons that is taught not only at school but also at every level of education. This is intended to help develop students' thinking skills. Learning mathematics is more likely to be an introduction to concepts, skills, and thinking strategies that are essential to individual life every day. Where mathematics learning also helps to stimulate curiosity, more creativity also gives birth to skills needed in their environment.

Based on Piaget's opinion about the stage of child development in elementary school, elementary school age is at the concrete operational stage, so learning must be taught concretely. Elementary school children like fun learning activities, especially when the teacher brings interesting learning media. Using this media is necessary in the learning process because it will help explain abstract concepts in mathematics, automatically creating a pleasant learning atmosphere.

Learning outcomes are the acquisition of new experiences by a person as a change in behavior due to the learning interaction process with an object in the learning environment. Learning as a process activity is a very important part of implementing every type and level of education. This means that the success or failure of achieving educational goals depends largely on the learning process experienced by students both at school and at home. That is why learning is very important; only by learning can you gain knowledge.

Specifically, problems originating from internal factors relate to (1) student character, (2) learning attitudes, (3) learning motivation, (4) ability to concentrate on learning, (5) ability to process learning materials, (6) ability to study learning outcomes, (7) self-ability - self-confidence - self-confidence, (8) learning habits. At the same time, external factors affect (a) teacher factors, (b) social environment, especially including peers, (c) school curriculum, and (d) facilities and infrastructure [13].

Based on the results of observations made by researchers on Tuesday, 2 May 2023, in class II C of SD Negeri Pandeglang 4, it was found that the problem that became the main factor in learning when making observations was the low learning outcomes of students which had an impact on the acquisition of learning outcomes in mathematics. This is in accordance with the class condition, which lacks tools for learning activities, so learning outcomes are still low and have not reached KKM. This is evidenced by the acquisition of the daily test scores of class II C. Out of 30 students, 17 boys, and 13 girls, only 10 scored above the KKM, while the other 20 still scored below the KKM standard. From the observations that have been made, the learning process is carried out without using learning media in learning activities, so learning activities are less than optimal.

The low learning outcomes students possess are influenced by two factors, including factors from the teaching teacher and the students themselves. Based on the teacher's factor, this is motivated by the tendency of high teacher dominance in learning activities so that students are not actively involved in learning, as well as other factors, namely due to the limited media used to increase students' understanding. The factors that come from students include the fact that students have not mastered basic operations in counting and are stuck to thematic package books only. Hence, learning media is limited and does not attract students' attention to learning activities. The way that is

considered appropriate is to provide interesting and interactive learning media so that students are motivated and will help to solve the problem of low learning ability in understanding learning concepts.

This research has previously been conducted by [11] with the title 'Efforts to Improve Mathematics Learning Outcomes in Simple Fraction Material Through Fraction Card Media in Class III SD Negeri 2 Wates' where this research is based on the same observations, namely departing from the problem in the learning process which is dominated by the teacher where the teacher only applies the lecture method. This study obtained good results, namely an increase in learning outcomes through 2 cycles carried out, wherein the first cycle the results were 72.7% and increased to 93.5%. The same research was also conducted by [14] with the title 'The Use of Unit of Time Board and Card Media to Improve Learning Outcomes of Third Grade Elementary School Students in Maros Regency'. This study shows that the background of this research is the low learning outcomes of students in teaching units of time. The results obtained in this study are an increase from cycle I, namely 70.83%, to an increase in cycle II, namely 75%.

Based on the results of this study, what will be new from previous research is the object of material to be used, where researchers will use this media in unit time material in class II. In addition to applying different materials, the constituent elements in the cards used will differ from those in previous research. Media use in learning activities needs to be done to attract students' attention and improve learning outcomes. Based on this background, the researcher is interested in conducting classroom action research titled "Enhancing Student Learning Outcomes Through the Use of Time Unit Cards in Grade 2 Elementary School".

METHODS

This research is classroom action research (CAR), which is used to improve teachers' learning. According to [15], classroom action research is carried out to improve the learning process, which leads to the goal of improving the ability of reflective teachers to achieve learning objectives.

The procedure described in this study is a systematic description of the implementation of the research to be carried out. The main purpose of carrying out this research is to improve students' process and learning outcomes on the unit of time material in class 2. Learning media in this study is used as an object in the process of finding student learning outcomes. Where this research design is carried out through 4 stages of implementing classroom action research, which is divided into two cycles, including:

1) Planning.

At this planning stage, activities are related to what must be done to improve the learning process and answer the problems.

2) Implementation

This learning is implemented by dividing students into several groups, explaining the flow of learning activities, providing triggering questions, distributing time unit cards, giving tasks to students to study together, ensuring that other group members understand well, and providing conclusions.

3) Observation

This is done by observing the activities of students during the learning process.

4) Reflection

It was carried out to measure how students understand the material seen from the learning outcomes in each cycle.

RESULTS AND DISCUSSION

The research was conducted in class 2C of SD Negeri Pandeglang 4 in the even semester of the 2022/2023 school year with a total of 30 students consisting of 17 male students and 13 female students with different abilities. This research focuses on improving learning outcomes by addressing the diverse abilities of students through the use of innovative learning media. By dividing the study into two cycles, the researcher aimed to observe the progression and effectiveness of interventions implemented during each cycle. The data collected provides valuable insights into the impact of the methods used, showcasing a clear upward trend in student performance and engagement. This study's approach highlights the importance of adapting teaching strategies to meet the needs of all learners, emphasizing the role of reflective teaching practices and targeted interventions in achieving significant improvements in educational outcomes.

This research is divided into two cycles. Learning outcomes can be seen in the table below.

Table 1. Learning Results Before CAR

No	Interval Score	Category	Number
1	89-100	Very Good	0
2	77-88	Good	2
3	65-76	Fair	7
4	<65	Less	21
Total			30
Percentage of Completion			30%
Percentage of Incomplete			70%

Based on Table 1. Above, it can be seen that no students are in the 89-100 score interval. The interval 77-88 was two students, the interval 65-76 was seven people, and in the interval <65, as many as 21 people. Before CAR, the class average obtained was 56, a poor category. Individual completeness was 9 out of 30 students. Classical completeness of 30% has not been declared complete because the criteria for classical completeness is at least 85% of the students in the class. Cycle 1 student learning outcomes can be seen in Table 2 below.

Table 2. CAR Learning Outcomes Cycle 1

No	Interval Score	Category	Number
1	89-100	Very Good	5
2	77-88	Good	4
3	65-76	Fair	14
4	<65	Less	7
Total			30
Percentage of Completion			77%
Incomplete Percentage			23%

Based on Table 2 above, it can be seen that five students are in the 89-100 score interval. The interval 77-88 was 4 students, the interval 65-76 was 14 people, and there were as many as seven people in the interval <65. Before the CAR, the class average obtained was 72 with a sufficient category. Individual completeness was 23 out of 30 students. Classical completeness of 77% has not been declared complete because the criteria for classical completeness is at least 85% of the students in the class.

Based on the researcher's observation of the implementation of learning using this media is that there is no seriousness to following the teacher's instructions in utilizing the media, so the next improvement plan (Replanning) is arranged so that it can help students to be more prepared in the learning process. Cycle 2 student learning outcomes can be seen in Table 3 below.

Table 3. Learning Outcomes of CAR Cycle II

No	Interval Score	Category	Number
1	89-100	Very Good	5
2	77-88	Good	6
3	65-76	Fair	15
4	<65	Less	4
Total			30
Percentage of Completion			87%
Incomplete Percentage			13%

Based on Table 3. Above, it can be seen that five students are in the 89-100 score interval. The interval 77-88 value was six students, the interval 65-76 was 15 people, and in the interval <65, as many as four people. Before the CAR, the class average was 74, with a sufficient category. Individual completeness was 26 out of 30 students. Classical completeness was 87% and declared complete because the criteria for classical completeness was at least 85% of the students in the class.

Reflecting on this cycle II, the researcher did not find difficulties that were quite disturbing because the students in the class could already be conditioned well. After using media, student learning outcomes have increased from the first cycle to the second cycle after reflection. The learning outcomes of students in class II-C experienced an increase in learning outcomes, starting from before CAR with a percentage of completeness of 30% and improving further in the first cycle with a percentage of completeness of 77%, then improving well with two percentage assessment criteria, namely the percentage of classical completeness of 87%.

Using time card media can help learners increase their sense of involvement by learning while playing cards in groups. The learning atmosphere that occurs also encourages learners to be more comfortable and helps them improve their learning outcomes. Card media is one of the visual media that is not projected. It is hoped that using this media will increase student attention to the subjects the teacher delivers, improving student learning outcomes. This card media is a tool that can help teachers convey learning easily and can be understood by students.

When comparing the findings of this study to previous research, it is evident that the use of card-based learning media has consistently demonstrated significant positive impacts on students' learning outcomes across various contexts. For instance, earlier research highlights that card media, such as flashcards and card sort methods, effectively enhanced mathematical learning outcomes, student motivation, and engagement levels [16], [17]. Similarly, the systematic review by [17] emphasizes the adaptability of card-based media in addressing mathematical literacy challenges and improving comprehension across diverse educational settings. This aligns with the current study's results, which showed an improvement in classical learning completeness, rising from 30% before the intervention to 87% by the second cycle. Additionally, as reported in previous studies, the interactive and group-based nature of card-based methods contributes to creating an engaging learning environment that fosters collaborative skills and deeper cognitive engagement [17], [18]. Thus, the findings of this research affirm and extend the established understanding of the efficacy of card-based learning methods in mathematics education.

The study's results showed an increase in student learning outcomes from the first to the second could be obtained due to several important factors supporting the learning process. First, the use of innovative learning media, such as time unit cards, was able to attract students' attention and make them more interested in being actively involved in the learning process. This card media provides an interactive and fun learning experience, which differs greatly from conventional learning methods. Using cards as visual aids also helps clarify abstract concepts so students can more easily understand the material being taught.

Secondly, dividing students into small groups allows for student cooperation and discussion. This encourages students to share knowledge and teach each other, indirectly improving their understanding of the material. In small groups, students who understand the material more quickly can help their friends who are still struggling, thus creating a supportive learning environment. In addition, the provision of triggering questions and group tasks also stimulates students to think critically and creatively in solving the problems given.

Third, teachers' supervision and guidance during the learning process also play a major role in improving learning outcomes. Teachers can provide immediate feedback on students' performance and give clear directions on correcting mistakes or shortcomings. With continuous observation and reflection, teachers can identify problems faced by students and take immediate action to address them. This reflection process also allows teachers to evaluate the teaching methods' effectiveness and make necessary adjustments for the next cycle.

Fourth, intrinsic and extrinsic motivation given to students also influences improving learning outcomes. Teachers can praise and reward students who show progress, increasing their motivation to continue learning. In addition, a conducive and pleasant classroom atmosphere also makes students feel more comfortable and motivated to follow the lessons well.

Overall, the combination of using interesting learning media, teaching methods that involve group cooperation, effective guidance and supervision from teachers, and motivation given to students are key factors that contribute to the significant improvement in learning outcomes. This research proves that innovations in learning methods can have a major positive impact on students' understanding and academic achievement. By developing and implementing effective learning strategies, it is hoped that the quality of education can continue to improve and produce a smart and competent generation.

CONCLUSIONS AND SUGGESTIONS

Based on the research carried out in cycle I and cycle II, it can be concluded that using time card media can improve student learning outcomes through the use of time unit cards in class 2 of Pandeglang 4 State Elementary School. Furthermore, student learning outcomes before CAR were an average percentage of completeness of 30%. After the first CAR cycle, it increased to 77%, and at the end of cycle II, it increased beyond classical completeness by 87% of the minimum value of 85%.

The researcher conveyed several suggestions, including that teachers use this card media to improve student learning outcomes in understanding units of time in class 2. Further researchers will be able to add variations when using this media.

The significant improvement in student learning outcomes observed throughout the cycles of this study can be attributed to several key factors. Firstly, the interactive nature of the time unit cards engaged students more effectively than traditional teaching methods. Students could grasp the material more concretely and with greater interest by transforming abstract concepts into tangible,

manipulable objects. The hands-on approach encouraged active participation and allowed students to learn through doing, which is particularly beneficial for younger learners.

Secondly, implementing cooperative learning strategies within the classroom played a crucial role. Group activities and collaborative tasks facilitated peer learning and allowed students to benefit from each other's strengths. This collaborative environment fostered a better understanding of the material and enhanced social skills and teamwork among students. Teachers observed that students were more motivated and took greater responsibility for learning and helping their peers.

Moreover, the continuous assessment and reflective practices adopted during the study provided valuable insights into student progress and areas needing improvement. By systematically evaluating student performance and adjusting instructional strategies accordingly, teachers could ensure that the learning process remained responsive to the students' needs. This iterative process of planning, acting, observing, and reflecting was essential in improving student learning outcomes.

Furthermore, the supportive classroom atmosphere created by using engaging and fun learning tools such as the time unit cards helped reduce anxiety and build a positive learning environment. When students feel comfortable and supported, they are more likely to take risks and participate actively in their learning. The positive reinforcement and teacher feedback also contributed to building students' confidence and motivation.

In conclusion, using time unit cards has proven to be an effective educational tool for improving learning outcomes in understanding time units in a second-grade classroom. The success of this approach underscores the importance of incorporating interactive and student-centered teaching methods in early education. Future research should explore additional ways to enhance and diversify such media to support student learning and engagement further. Teachers are encouraged to adopt these innovative strategies to foster a more dynamic and effective learning experience for their students.

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