

## Development of E-Books and Quizizz-Based Interactive Quizzes to Improve Learning Evaluation Engagement of Fifth-Grade Elementary School Students

Nur Apida<sup>1</sup>, Muh. Faisal<sup>2</sup>, Lathifa Abdul Rahman<sup>3</sup>

<sup>12</sup>Universitas Negeri Makassar

<sup>3</sup>UPT SPF SDI Pabaeng-Baeng 1

Article	Abstract
<p><b>Keywords:</b> <i>Learning Outcomes, Flat Build, Origami Paper Media.</i></p> <p><b>Article History</b> Received: Nov 12, 2025 Reviewed: Des 11, 2025 Accepted: Jan 11, 2026 Published: Feb 03, 2026</p>	<p><i>This research aims to improve student learning outcomes through the use of origami paper media in grade 2 flat building materials at UPT SPF SDI Pabaeng-Baeng 1. The type of research used in this study is Classroom Action Research (PTK). The sample of this study amounted to 28 students. The data collection techniques used are test and non-test. This research was carried out in two cycles, each cycle consisting of two meetings. One research cycle contains planning, action, observation, and reflection activities. The results of this study show that there is an increase in student learning outcomes through the use of origami paper media in grade 2 flat building materials. In the first cycle, there was an increase in the number of students who obtained complete learning results, which was 64.3%. In the second cycle, the number of students who obtained complete learning results reached 82.1%. So it can be concluded that students' learning outcomes can be improved through the use of origami paper media in grade 2 flat building materials at UPT SPF SDI Pabaeng-Baeng 1.</i></p>



Copyright ©2026 by Author(s); This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License. All writings published in this journal are personal views of the authors and do not represent the views of this journal and the author's affiliated institutions.

### INTRODUCTION

Education is a process that must be passed by all mankind in order to gain knowledge and experience for the sustainability of life changes for the better. The education put forward by Ki Hajar Dewantara is to liberate human beings in accordance with his statement that teaching and education that are useful for living together is to liberate human beings as part of the unity (people). According to Law No. 20 of 2003, Education is a conscious and planned effort to create a learning atmosphere and learning process so that students are actively developing themselves to have religious spiritual strength, self-control, personality, intelligence, noble morals, and skills needed by themselves, society, nation and state. Article 6 also states that every citizen aged seven to fifteen years

is required to attend basic education. In this case, the primary education in question is elementary school.

At the elementary school level, there is one compulsory subject that is always complained about by students, namely mathematics. Mathematics is one of the main subjects in the curriculum in Indonesia that studies numbers, the relationships between numbers, and the operational procedures used in solving problems about numbers. According to Prastyani (2019), mathematics is a basic science that has a very important role and is studied by all levels of education starting from elementary school (SD), junior high school (SMP), and high school (SMA). The objectives of mathematics learning as stated in the 2006 Permendiknas are 1) Understanding mathematical concepts, explaining the relationship between concepts and applying concepts or algorithms, flexibly, accurately, efficiently, and precisely, in solving problems, (2) Using reasoning on patterns and properties, manipulating mathematics in making generalizations, compiling evidence, or explaining mathematical ideas and statements, (3) Solving problems that include mathematical abilities Understand problems, design mathematical models, solve models and interpret the solutions obtained, (4) Communicate ideas with symbols, tables, diagrams or other media to clarify circumstances or problems, (5) Have an attitude of appreciating the usefulness of mathematics in life, namely having curiosity, attention, and interest in learning mathematics, as well as tenacity and confidence in problem solving.

Based on initial observations made by researchers of mathematics subjects in class II b UPT SPF SDI Pabaeng-Baeng 1, it was found that the learning process carried out by teachers still needs improvement, both in terms of teacher competence, the use of models, strategies, media and teaching and learning activities that occur in the classroom. Teachers seem to have more control over the classroom and are very less involved in the learning process. This results in students not getting a good learning experience and has an impact on the learning outcomes obtained by students. As many as 71.4% or 20 students out of the total number of students as many as 28 people did not reach the specified learning completeness criteria (KKM), which was 75. On this basis, the researcher proposed a solution that could overcome this problem, namely the use of origami paper to improve students' learning outcomes in mathematics subjects, especially in flat building materials. The selection of this media is based on the form of origami paper that is practical, attractive and colorful so that it can improve students' learning and motivate them to follow the learning process.

Learning media according to Pagarra H & Syawaludin (2022) are all tools used as intermediaries to deliver learning materials so that they reach people who are

learning correctly and effectively. This is in line with the statement of Wulandari (2023) who argues that the existence of learning media will make it easier for students to receive information conveyed by teachers, so that the learning process runs effectively and efficiently. The use of learning media is certainly not done carelessly, but is based on certain criteria. According to Mahulae (2023), the selection of media must be based on established principles, such as having a purpose that is in accordance with the nature and characteristics of the media to be used. From this opinion, it can be understood that learning media is chosen based on the needs in the learning process.

Based on the description above, the researcher wants to improve students' learning outcomes by using origami paper media. Therefore, the problem can be formulated, namely how to improve student learning outcomes using origami paper media in grade 2 flat building materials? The purpose of this study is to improve students' learning outcomes through the use of origami paper media in grade 2 flat building materials.

## **METHOD**

The type of research used is Class Action Research (PTK). Classroom action research is a research activity by observing a learning activity that is given action, which is deliberately raised in a class, which aims to solve problems or improve the quality of learning in the classroom (Farhana, 2019) This research was carried out in two cycles where each cycle consisted of two meetings. One research cycle contains planning, action, observation, and reflection activities.

This research was carried out at UPT SPF SDI Pabaeng-Baeng 1 which is located on Jl. St. Alauddin Komp Brimob Dormitory, Pabaeng-Baeng Village, Tamalate District, Makassar City. The sample used was class IIb which amounted to 28 students.

The data collection techniques used are test and non-test techniques. The technical test is in the form of a test of students' learning outcomes regarding flat building materials, while non-test techniques are in the form of observation to obtain information related to students' responses to the materials and media used as well as obstacles encountered during the research process. The data analysis technique used is in the form of giving a score to each student's learning outcomes with the condition of completeness if they reach the KKM, which is 75. After that, compare the presentation of the completeness of students' learning outcomes in each cycle. The indicator of success in this study is the increase in student learning outcomes as seen from the large number of students who get a score of 75 and above amounting to 80% of the total number of students.

## RESULTS AND DISCUSSION

### Results

#### Initial Condition Research Results

At the initial condition stage, class IIb students were given an initial test in the form of a description. From the results of the test, it can be seen that the average score of student learning outcomes is 59.8 with a percentage of 28.6% or 8 students are included in the complete category and 71.4% or as many as 20 students are included in the incomplete category. The following is data on students' learning outcomes at the initial stage of conditions.

**Table 1. Data on Student Learning Outcomes in Initial Conditions**

Category	Number of Students	Percentage
Conclusion	8	28,6 %
Incomplete	20	71,4 %

**Source:** Student Learning Outcomes (Initial Condition Test)

Based on the analysis of the data above, it can be concluded that the average learning outcome score of students in flat building material in the initial condition is still very far to meet the success indicators that have been set previously because the number of students who have been included in the complete category is still below 80%, namely as many as 28.6% (8 students) who have managed to achieve the KKM score.

#### Results of Research Cycle I

At the meeting at the end of cycle I, class IIb students were given a test consisting of 5 questions in the form of descriptions. From the results of the test, it can be seen that the average score of student learning outcomes is 73.75 with a percentage of 64.3% or 18 students in the complete category and 35.7% or as many as 10 students in the incomplete category. The following is data on student learning outcomes in the first cycle stage.

**Table 2. Data on Learning Outcomes of Cycle I Students**

Category	Number of Students	Percentage
Conclusion	18	64,3 %
Incomplete	10	35,7 %

**Source:** Student Learning Outcomes (Final Test of Cycle I)

Based on the analysis of the data above, it can be concluded that the average learning outcome score of students in the flat building material in cycle 1 has not met the success indicators that have been set previously because the number of students who have been included in the complete category is still below 80%, namely 64.3% (18 students) who have managed to achieve the KKM score. However, the learning outcomes of students have increased compared to the initial condition of the students.

### **Results of Cycle II Research**

At the meeting at the end of cycle II, class IIb students were again given a test consisting of 5 questions in the form of descriptions. From the results of the test, it can be seen that the average learning outcome score of students is 75.89 with a percentage of 82.1% or 23 students included in the complete category and 17.9% or as many as 5 students were included in the incomplete category. The following is data on student learning outcomes in the second cycle stage.

**Table 3. Student Learning Outcome Data Cycle II**

<b>Category</b>	<b>Number of Students</b>	<b>Percentage</b>
Conclusion	23	82,1 %
Incomplete	5	17,9 %

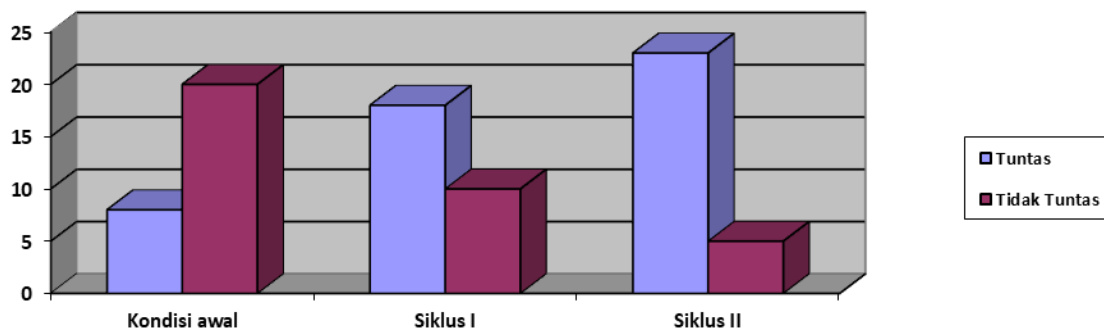
**Source:** Student Learning Outcomes (Final Test Cycle II)

Based on the analysis of the data above, it can be concluded that the average learning outcome score of students in flat building material in cycle II has met the success indicators that have been set previously and has experienced an increase in learning outcomes from cycle II. This can be seen from the number of students who have been included in the complete category has exceeded 80%, namely 82.1% (23 students) who have managed to achieve KKM scores.

### **Improving Student Learning Outcomes**

The results of the research were carried out in 2 cycles, namely cycle I and cycle II, each cycle through the stages of planning, action, observation and reflection was found to be proportional to the completeness of the students' learning outcomes as shown by the following graph.

**Graph 1 Improvement in Students' Learning Outcomes**



**Source:** Comparison of Learning Outcomes of Students in Early Conditions, Cycle I and Cycle II

Based on the graph above, it can be seen that there was an increase in the completeness of student outcomes, where in the initial condition only 8 students with a percentage of 28.6% were completed, then in the first cycle it increased to 18 students with a percentage of 64.3% and in the second cycle the number of students who completed increased to 23 students with a percentage of 82.1%. With this percentage value, the research cycle was stopped in cycle II because it had met the achievement indicators in this study.

## Discussion

In this study, teachers conduct learning by teaching flat building materials using origami paper media. The use of origami paper media is intended to increase students' understanding as seen from increasing the completeness of student learning outcomes. Based on the results of the research when students were given initial condition test questions, cycle I, and cycle II. At the time of the initial condition, where origami paper media had not been applied and data was obtained that only 28.6% of students achieved the completeness of learning outcomes to achieve KKM. In the first cycle, the use of origami paper media has been applied in learning and data was obtained on 64.3% of students who have met the KKM. However, because the number of students has not met the indicators of research achievement, a second cycle was carried out which in learning has also applied origami paper media. The data obtained from cycle II is 82.1% of students who have completed or met the KKM. In this study, there was a difference and an increase in student learning outcomes due to the difference in the actions given. The difference in the action given lies in the use of origami paper media in cycle I and cycle II while in the initial condition no action has been given. Based on this research, it can be proven that learning media has a great influence on the learning process. This is in line with the opinion Elaine (2023) which states that the purpose of learning media is to improve learning. In this case, the use of origami paper media can improve student learning outcomes.

In the classroom action research, the improvement of student learning outcomes through origami paper, the flat building material experienced an increase in learning outcomes from cycle I to cycle II, as evidenced by the provision of tests in the form of description questions at the end of each cycle I and cycle II meeting. According to Prastyani (2019), through the improvements made by teachers in the learning process from cycle I to cycle II make students better understand mathematical concepts such as intensive guidance, motivation and reinforcement so that students will better understand and understand the material that has been given. In line with this statement, the researcher reflected on the learning results in cycle I which then made improvements to the learning process in cycle II. Thus, better results were obtained in cycle II. This is also in line with the statement Aryuninda & Irfan (2024) which states that the achievement of the expected criteria cannot be separated from the improvements that the researcher has made based on reflections in the previous cycle that were able to make improvements from the previous meeting.

The use of learning media in the learning process is one of the alternatives in helping the teaching and learning process in the classroom run smoothly so that the expected goals can be achieved. This is in line with the statement Shoffa (2021) which explains that the use of learning media aims to stimulate students' emotional and cognitive aspects, such as feelings, thoughts, interests, joy, and attention, so that the learning process can run effectively. Thus, it can be said that learning media is actually a tool or means used to convey information or messages to students and encourage them to carry out learning tasks with the aim of achieving certain learning targets. The use of learning media does not necessarily use existing media, but the selection of learning media must be adjusted to the needs of students, student characteristics, teaching methods and learning goals to be achieved. According to Muali in Shoffa (2021), The criteria in the selection of learning media include five things, namely 1) suitability for communication learning, 2) comfortable, flexible and durable, 3) ability and capability to use it, 4) student situation, and 5) availability. Based on these criteria, the researcher chose the use of origami paper media in the learning process which will be juxtaposed with flat building materials. The selection of this media is also based on opinions Susanti & Rosyidi (2013) which states that Origami-based learning is a combination of vocabulary and mathematical concepts in the learning steps through folding learning and the origami model. Origami is not only fun, but it hosts a diversity of learning styles that help children understand mathematics and it is an innovative method for the development of educational, cultural, and social abilities.

The success indicators of this research are not only seen from the learning outcomes of students obtained from giving tests in each cycle, but also seen from the increase in observation of student activities during the learning process. According to Colorful (2019), some aspects that can be assessed from student activities during the learning process are preparation aspects, attention aspects, participation aspects, and understanding aspects. Based on the observation sheet of student activities, there are differences in student activities in each cycle. In the first cycle, learning has used origami paper media but students are still not fully focused because they do not understand the use of media. In contrast to cycle II, students seem to understand the use of origami paper media so that students look more focused on learning and more motivated to follow learning. As a result, in the second cycle, it has an impact on the participation of students who are more active and more confident so that students' understanding also increases. This proves that the use of the right learning media can produce good results ranging from a more effective learning process to increased learning outcomes.

## CONCLUSION

Based on the results of the research that has been carried out, it can be concluded that the use of origami paper media in grade 2 flat building materials can improve the learning outcomes of students at UPT SPF SDI Pabaeng-Baeng 1. This can be evidenced by increasing the completeness of student learning outcomes in each cycle. In the initial condition, only 28.6% of students obtained complete category learning results. In the first cycle, there was an increase in the number of students who obtained complete learning results, which was 64.3%. In the second cycle, the number of students who obtained complete learning results reached 82.1%. This research is said to be successful because it has met the success indicator, namely the increase in student learning outcomes as seen from the large number of students who get a score of 75 and above amounting to 80% of the total number of students.

## Suggestions

The suggestions submitted based on this research are as follows: the next researcher should be able to study more deeply about the sources or references related to origami paper learning media so that the results of further research can be better, and if this research can be useful and can be one of the references for future studies related to improving student learning outcomes using origami paper media.

## REFERENCES

- Aryuninda, R., & Irfan, M. (2024). *Improving Mathematics Learning Outcomes through the NHT Cooperative Model Using Misyu Catung Media*. 4, 15–24.
- Ministry of National Education. (2003). Law of the Republic of Indonesia no. 20 of 2003 concerning the National Education System. Downloaded from <https://pusdiklat.perpusnas.go.id>. on May 22, 2024.
- Elyasa, D., Sidik, G. S., & Zahrah, R. F. (2023). Increasing Understanding of the Concept of Flat Build Areas through Puzzle Media in Grade IV Elementary School N Jamanis. *Scientific Journal of Realistic Mathematics (JI-MR)*, 4(2), 172–179. <https://jim.teknokrat.ac.id/index.php/pendidikanmatematika/article/view/2965>
- Farhana, H., Awiria, & Nurul, M. (2019). Classroom Action Research. *Journal of Chemical Information and Modeling*, 53(9), 1689–1699.
- Mahulae, P. S. (2023). *Development of Learning Media*. Purbalingga: CV Publisher. Eureka Media Aksara.
- Mawarni, M. (2019). Improving Understanding of Flat Building Materials Using Origami Paper Media in Grade VI Students of Mi Datok Sulaiman Putra.

- Pedagogic Journal of Islamic Elementary School*, 2(1), 55–66.  
<https://doi.org/10.24256/pijies.v2i1.696>
- Pagarra H & Syawaludin, et al. (2022). Learning Media. Makassar: UNM Publishing Body
- Prastyani, N. W. ., Ariawan, I. P. ., & Suharta, I. G. P. (2019). Improving the understanding of mathematical concepts for students of class X Mipa 2 SMA Negeri 1 Kediri through the application of a realistic learning model with a cooperative setting assisted by structured lks. *Indonesian Journal of Mathematics Education and Learning*, 8(2), 19–29.  
<https://doi.org/10.23887/jppm.v8i2.2849>
- Shoffa, S. et al. (2021). Learning Media Books. West Pasaman: CV. Library Afasa
- Susanti, L., & Rosyidi, A. H. (2013). Origami-based learning to improve spatial visualization and geometry skills of junior high school students. *MATHEdunesa*.  
<https://jurnalmahasiswa.unesa.ac.id/index.php/mathedunesa/article/view/2697>
- Wulandari, D. R., Intiana, S. R. H., & Najat, S. (2023). Improving Students' Understanding of Flat Building Materials by Using Interactive Powerpoint Media Based on the Canva Application in Grade 1 Mathematics Subject SDN 6 Cakranegara Academic Year 2022-2023. *Tsaqofah*, 3(6), 1283–1292. <https://doi.org/10.58578/tsaqofah.v3i6.1941>