

Improving Fifth-Grade Students' Mathematics Learning Outcomes through Animated Videos, Interactive Presentations, and Quizizz: A Classroom Action Research

Aldi Hidayat

aldihidayat08081998@gmail.com

Universitas Cokroaminoto Palopo, Indonesia

Stevan Alfandi

Universitas Cokroaminoto Palopo, Indonesia

Alfhian Abdullah

Universitas Cokroaminoto Palopo, Indonesia

Anugra

Universitas Cokroaminoto Palopo, Indonesia

Seri Ntodu

Universitas Cokroaminoto Palopo, Indonesia

Airin Shofiah Bukka

Universitas Cokroaminoto Palopo, Indonesia

Juwita Crestiani M*

juwitacrestiani@uncp.ac.id

Universitas Cokroaminoto Palopo, Indonesia

*corresponding author

Abstract

This study was motivated by the low mathematics learning outcomes of fifth-grade students at SDN 48 Andi Patiware, resulting from instruction that was still dominated by conventional methods, which caused students to be less active and to experience difficulty understanding fraction material. This study aimed to improve students' mathematics learning outcomes through the implementation of digital media assisted by the Quizizz application. The study employed the Classroom Action Research (CAR) method following the Kemmis and McTaggart model, carried out in two cycles comprising the stages of planning, action implementation, observation, and reflection. The research subjects consisted of 28 fifth-grade students at SDN 48 Andi Patiware. Data collection techniques included observation, learning outcome tests, and documentation, while the data were analyzed descriptively using both quantitative and qualitative approaches based on the increase in average scores, learning mastery, and teacher and student activity. The results showed that the implementation of digital media assisted by Quizizz was found to improve students' mathematics learning outcomes. The students' average score increased from 58.5 in the pre-cycle

to 68.2 in Cycle I and 79.6 in Cycle II. The percentage of learning mastery also increased from 35.7% to 57.1% and reached 85.7% in Cycle II, thereby exceeding the research success indicator of 75%. Teacher and student activity during the learning process also improved, from the Good and Fairly Good categories in Cycle I to Very Good in Cycle II. Based on these results, it can be concluded that the implementation of digital media assisted by Quizizz is effective in improving the mathematics learning outcomes of fifth-grade students at SDN 48 Andi Patiware and can serve as an innovative alternative for learning in elementary schools.

Keywords: *Mathematics learning outcomes, digital media, Quizizz, classroom action research.*

INTRODUCTION

The development of information and communication technology has brought major changes to the field of education, including opportunities to create learning processes that are more interactive, engaging, and student-centered. In practice, however, mathematics instruction in elementary schools is still largely dominated by lecture methods and conventional worksheets. This condition causes students to be less actively involved and to experience difficulty understanding abstract mathematical concepts, particularly in the topic of fractions.

Based on initial observations at SDN 48 Andi Patiware, it was found that fifth-grade students' understanding of mathematics remained relatively low, particularly regarding the concept of fractions and mixed arithmetic operations. This low level of understanding was influenced by instruction that was still conventional and by the minimal use of visual media that could help students build concrete conceptual understanding, which in turn caused students' learning motivation to decline.

Various previous studies have shown that digital media are effective in improving mathematics learning outcomes. Saputra and Meilinda (2021) reported an increase in the average score of fourth-grade students from 62.5 to 81.3 following the implementation of Quizizz. Hakim, Wahyudi, and Indriati (2022) found that Quizizz made fifth-grade students more active and motivated due to its game-based features and immediate feedback. Dewi and Rismaatun (2023) concluded that technology-based interactive learning media improved the motivation and mathematics learning outcomes of elementary school students. In line with this, Fitriani, Hamzah, and Sulistyowati (2023) demonstrated that interactive PowerPoint improved mathematics learning outcomes, while Kurniawan and Setyaningsih (2022) showed that digital animation media improved fifth-grade students' understanding of fraction concepts. The systematic review by Yulianti, Budiyo, and Riyadi (2022) also confirmed a positive trend in the use of digital media in mathematics learning during the 2018-2022 period.

Nevertheless, the implementation of digital media in elementary schools in certain regions, including SDN 48 Andi Patiware, remains relatively limited and has not been designed contextually according to the needs of students and the local environment. Most previous studies have also focused only on short-term learning outcomes without combining three types of digital media simultaneously (animated video, interactive presentation, and quiz application) within a single, measurable series of action cycles. This gap underlies the need for further research that is more contextual and measurable.

Based on the description above, the research problem is how mathematics learning outcomes of fifth-grade students at SDN 48 Andi Patiware can be improved through digital-media-assisted instruction. This study aims to improve the mathematics learning outcomes of fifth-grade

students at SDN 48 Andi Patiware through digital-media-assisted instruction. The novelty of this study lies in the combination of three digital media (contextual animated video, interactive presentation, and the Quizizz application) tailored to the characteristics of the students and the school environment, accompanied by adaptive feedback features that allow students to identify and correct their mistakes immediately within the framework of the Classroom Action Research (CAR) cycle.

METHOD

This study employed the Classroom Action Research (CAR) method following the Kemmis and McTaggart model, which consists of four stages repeated in each cycle, namely planning, acting, observing, and reflecting (Arikunto, 2021). The research was conducted in two cycles, with each cycle consisting of three learning sessions and one end-of-cycle test.

The research was conducted at SDN 48 Andi Patiware, Amassangan Sub-district, Wara District, Palopo City, during the second semester of the 2025/2026 academic year. The research subjects were all fifth-grade students, totaling 28 students, consisting of 8 male students and 20 female students.

The action procedure in each cycle began with the preparation of a digital-media-based lesson plans on fraction material. The implementation of the intervention combined three digital media: mathematics animated videos as an introductory activity to activate students' prior knowledge, interactive PowerPoint presentations for delivering the core material, and the Quizizz application for interactive quizzes at the end of each session. Observations were carried out during the learning process to examine its implementation as well as teacher and student activity, while reflection was conducted at the end of each cycle to evaluate shortcomings as a basis for improvement in the following cycle. Improvements made in Cycle II included providing a brief guide on using Quizizz, simplifying the duration of material delivery, replacing the animated video to better suit the characteristics of fifth-grade students, and adding a group question-and-answer session before the quiz was administered.

Data collection techniques consisted of observation and testing. Observation used an instructional implementation sheet as well as teacher and student activity sheets with a rating scale of 1-4 (Poor, Fairly Good, Good, Very Good). The learning outcome test consisted of 15-20 multiple-choice questions administered at the end of each cycle to measure mastery of fraction material and fraction arithmetic operations. Data were analyzed descriptively using both quantitative and qualitative approaches by calculating the class average score and the percentage of classical learning mastery using a minimum mastery criterion (KKM) of 70 (Arikunto as cited in Sari, in Tandungan, 2020). The study was considered successful if the percentage of classical learning mastery reached at least 75% of the total number of students.

FINDINGS

Initial Condition (Pre-Cycle)

The results of the pre-cycle test showed a class average score of only 58.5, far below the KKM. Of the 28 students, only 10 students (35.7%) achieved learning mastery, while 18 students (64.3%) had not yet reached mastery. This condition indicated the need for instructional intervention.

Cycle I

In Cycle I, instruction using animated video, interactive presentations, and Quizizz quizzes showed an increase in student learning activity compared to the pre-cycle, although some students still required additional support in operating the application. The class average score increased to 68.2, with a classical learning mastery percentage of 57.1% (16 of 28 students), which had not yet met the 75% success indicator. The teacher activity score reached 3.1 (Good category), and the student activity score reached 2.9 (Fairly Good category).

Cycle II

After improvements were made based on the reflection results of Cycle I, instruction in Cycle II was implemented more effectively. Students were more active in group discussions and completed the interactive quizzes more quickly. The class average score increased to 79.6, with a classical learning mastery percentage reaching 85.7% (24 of 28 students), exceeding the established success indicator. The teacher activity score increased to 3.7, and the student activity score increased to 3.5, both falling into the Very Good category.

Recapitulation of Learning Outcome Improvement

A recapitulation of students' mathematics learning outcomes from the pre-cycle through Cycle II is presented in Table 1, while a recapitulation of teacher and student activity scores is presented in Table 2.

Table 1. Recapitulation of the Improvement in Students' Mathematics Learning Outcomes

No.	Description	Pre-Cycle	Cycle I	Cycle II
1	Class average score	58.5	68.2	79.6
2	Highest score	82	90	98
3	Lowest score	35	45	55
4	Number of students achieving mastery (>70)	10 (35.7%)	16 (57.1%)	24 (85.7%)
5	Number of students not achieving mastery	18 (64.3%)	12 (42.9%)	4 (14.3%)

Table 2. Recapitulation of Teacher and Student Activity Scores

No.	Aspect Observed	Cycle I	Cycle II
1	Teacher activity score (scale of 4)	3.1 (Good)	3.7 (Very Good)
2	Student activity score (scale of 4)	2.9 (Fairly Good)	3.5 (Very Good)

The data in Table 1 and Table 2 show a consistent upward trend across all indicators, both in learning outcomes and in teacher and student activity, from the pre-cycle through Cycle II.

DISCUSSIONS

Improvement in Mathematics Learning Outcomes

The class average score increased by 9.7 points from the pre-cycle to Cycle I and by 11.4 points from Cycle I to Cycle II, representing a total increase of 21.1 points from the initial

condition to Cycle II. The percentage of classical learning mastery also increased from 35.7% to 85.7%, exceeding the 75% success indicator. This finding is consistent with Saputra and Meilinda (2021), who showed that the Quizizz application significantly improved students' mathematics learning outcomes, as well as with Wulandari and Surjono (2021), who demonstrated that animated video meaningfully improved students' cognitive learning outcomes.

Improvement in Student Learning Activity

The student activity score increased from 2.9 (Fairly Good) in Cycle I to 3.5 (Very Good) in Cycle II, marked by an increase in students' willingness to ask questions, engage in discussion, and respond to the teacher's questions. This result reinforces Nurdyansyah's (2019) argument that digital media can create more active, student-centered learning, and is consistent with Hakim, Wahyudi, and Indriati (2022), who found that the gamification features of Quizizz increased student motivation and engagement.

Effectiveness of the Combined Digital Media

The combination of three digital media, animated video, interactive presentation, and Quizizz, appeared to complement one another effectively: animated video effectively presented abstract concepts in a visual and contextual manner, interactive presentations facilitated the structured delivery of material (Fitriani, Hamzah, & Sulistyowati, 2023), while Quizizz provided an enjoyable learning experience through gamification-based quizzes. This finding is consistent with Prasetyo and Hamid (2022), who demonstrated that the implementation of digital media in CAR significantly improved understanding of mathematical concepts, as well as with Kurniawan and Setyaningsih (2022) and Utami and Widodo (2022), who confirmed that the use of information and communication technology has a positive effect on mathematics learning outcomes in elementary schools. This trend is also consistent with the systematic review by Yulianti, Budiyo, and Riyadi (2022) on the effectiveness of digital media in mathematics learning.

Research Limitations

This study has several limitations. First, students' initial ability to use digital technology was uneven, so that some students required a longer adaptation period in Cycle I. Second, occasional internet connectivity issues at the school hindered the smooth use of Quizizz. Third, the study involved only one class, so that generalization of the results to other school contexts should be made with caution.

CONCLUSION

The implementation of digital media assisted by the Quizizz application, combined with animated video and interactive presentations, was found to improve the mathematics learning outcomes of fifth-grade students at SDN 48 Andi Patiware over two cycles of Classroom Action Research. The class average score increased from 58.5 (pre-cycle) to 68.2 (Cycle I) and 79.6 (Cycle II), while the percentage of classical learning mastery increased from 35.7% to 57.1% and reached 85.7% in Cycle II, thereby exceeding the 75% success indicator. Teacher and student activity also improved from the Good/Fairly Good categories to Very Good. Digital media were found to facilitate capable of creating more interactive, engaging, and student-centered learning,

thereby encouraging increased motivation, active participation, and understanding of mathematical concepts, particularly fraction material.

Based on these findings, it is recommended that elementary school teachers consider implementing a similar combination of digital media in mathematics instruction, accompanied by technical assistance at the outset so that students can adapt more quickly. Schools are advised to improve the availability of digital facilities and stable internet access, while future research is recommended to involve more than one class or school to strengthen the generalizability of the results, as well as to explore the long-term sustainability of digital media use.

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