

Classroom action research: increasing learning interest of Grade IV students through the TGT model assisted by Quizwhizzer

Elita Hermawanti¹, Grasianus Agresspa Aga Prasetya^{1*}, Nensi Desiana Purnamasari¹,
Ratnasari Dyah Utami¹, Nur Laili Maulidah²

¹Teacher Professional Education, Universitas Muhammadiyah Surakarta, Central Java, Indonesia

²SD Negeri Kleco 1 Surakarta, Central Java, Indonesia

*Correspondence: agresspa66.a6@gmail.com

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Abstract

Amid growing interest in integrating digital tools to enhance student engagement, this study aims to enhance fourth-grade elementary students' interest in learning mathematics by implementing Quizwhizzer as a learning medium. The research employs a Classroom Action Research (CAR) design, consisting of two cycles, each comprising two sessions. Each cycle follows the stages of planning, action implementation, and reflection. In the first cycle, questionnaire results indicated that 62.07% of students had low learning interest. However, 96.55% of students demonstrated high interest in the second cycle. These findings suggest a significant increase in students' interest in learning mathematics following using Quizwhizzer. The study concludes that Quizwhizzer is an effective tool for fostering learning interest. Nonetheless, challenges related to time and classroom management were encountered, prompting a recommendation for better planning and management in future implementations.

Keywords: Learning interest, Quizwhizzer, Mathematics Subject

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INTRODUCTION

Education is one of the important things in everyone's life for a better life (Marginso, 2020). There are several important factors in the success of an educational process, one of which is learning interest (Widiati et al., 2022). Interest has a big impact on learning; if the learning material is not interesting to students, then learning is not interesting, and the learning process will not be optimal (Meylitha et al., 2022). Interest is a sustainable desire to pay attention to or do something (Abidin, 2020). Learning

interest in students makes it easier for students to follow learning by teachers because of a sense of interest. Otherwise, if students have no interest, it will make them lazy to follow learning, decreasing learning outcomes (Arlina et al., 2023). Student learning interest can be known from indicators, which are then measured and analysed so that the teacher can determine the high and low interest in student learning during the learning process.

Saputro et al. (2023) stated that there are four indicators related to learning interest: a sense of pleasure and interest in learning, active participation in learning activities, the desire to complete tasks on time, and having a regular learning routine. Different from this statement, Asih and Imami (2021) states that indicators of interest in learning include: (1) feeling pleasure when participating in learning; (2) giving full attention and focus in learning; (3) showing interest in the learning process; and (4) in learning activities, showing a disciplined attitude. A statement then supports these three understandings, Prianti and Rezania (2022) which states that indicators of student interest in learning are divided into four indicators: students have a sense of pleasure, students are interested in learning, students pay attention, and students are involved in learning. So according to some of the above understandings, the researcher determines that the indicators that will be used to measure the increase in student interest in learning are: (1) When given a task, students can complete the task appropriately; (2) Students are active in asking questions; (3) Students are active in conducting group discussions; (4) Students are interested in learning; and (5) The learning process involves students actively. These indicators of learning interest will affect students in the continuity of the learning process at school, one of which is in the learning content of mathematics.

According to Sadewo et al. (2022), mathematics underlies the development of modern technology, a universal science. Meanwhile, according to Mega and Madani (2023), mathematics is an abstract science that presents learning materials aligned with students' daily activities. The application of mathematics learning helps students in critical and deductive thinking, with material tailored to the level and characteristics of students at that level. This is supported in Zuliatin (2021), which explains that mathematics is a deductive process with an abstract form that creates learning content. The deductive reasoning process involves finding facts from logical thinking based on pre-existing facts. With the acceptance of this fact, there is a close and clear relationship between mathematics learning materials and the level of education and student

characteristics.

Fourth-grade students, according to Muzayyanah et al. (2023), students are in the phase of having high objectivity, so they will have a high curiosity to investigate, try, and experiment. This is supported by Bujuri (2018), students' cognitive development enters C3 (applying) and C4 (analysing) abilities so that the learning system can be carried out collaboratively. Meanwhile, in the research of Ni and Purwati (2020), namely at the high grade level of elementary school, around 9 to 13 years. It has characteristics such as an interest in daily life that are real and can be applied directly. Some things and special subjects will be of interest to students. Therefore, at this age, the formation of peer groups is often done, and they even make rules in the group.

When researchers observed and administered questionnaire sheets to students in class IV of SD Negeri Kleco 1 Surakarta, problems were found not by theories related to student learning interest. According to the questionnaire results of students' interest in learning, the problem is the low interest in learning of grade IV students in mathematics learning activities. The questionnaire results prove that students with a percentage of 40% or above, or moderate, high, and very high criteria, reach 11 or 37.93% of the total number of students. Meanwhile, students with a percentage of 41% or below or with low and sufficient criteria, reach 18 or 62.07% of the total students. This data shows interest in learning in class IV SD Negeri 1 Kleco in math learning content is still relatively low. So, to overcome this problem, researchers offer a solution, namely, using Quizwhizzer digital media.

According to Laeli and Kasmui (2024) Quizwhizzer Media is an interactive game that increases student learning and cooperation. Liandri and Mutiara (2024) Quizwhizzer offers activities such as answering quizzes and questions that many players can play. It also has various features based on Android applications. Quizwhizzer media is one of the latest technologies that can be applied in the learning process to increase collaboration between teachers and students through digital-based learning media (Alfianistiawati et al., 2022). According to the above understanding, Quizwhizzer media is a digital-based learning media that offers activities to answer questions or quizzes to support interaction between students and teachers. Quizwhizzer Media has several advantages that can support the learning process in the classroom.

According to Adhi et al. (2023), one of the advantages for teachers in utilising or

using Quizwhizzer media is that it helps teachers present learning material in an interesting and non-boring way, and this media is a narrative and flexible educational game application. The application of learning media using Quizwhizzer also has a positive impact on the spirit of the student learning process in learning because students can be actively involved in interesting and interactive learning activities (Taqwa et al., 2024; Sugiarni & Durri, 2022). In addition, the advantages of Quizwhizzer media when viewed from the learning process carried out by Assyura (2023) are: (1) helping teachers in making creative questions based on digital media; (2) Making it easier when the teacher wants to assess because points will automatically appear after students answer all the questions; (3) Helping students make self-corrections because they can see their answers again after answering all the questions in the Quizwhizzer media; and (4) The selection of randomised question mode can help students in practicing question answering skills and honesty in students. Every learning media certainly has advantages and disadvantages, as for the weaknesses of Quizwhizzer media according to Assyura (2023), namely if the network or internet used is unstable, it can hamper the learning process carried out, and the use of Quizwhizzer media which is not common to use will make students confused in its implementation, thus making students join late which can obstruct the learning process carried out. Researchers will anticipate the weaknesses in Quizwhizzer media by using special strategies to overcome existing weaknesses. The reason researchers use Quizwhizzer to overcome the problems found is the existence of previous similar studies that have been conducted.

Technological advances have recently added to developing more innovative and creative learning, especially in mathematics (Dahlan et al., 2022). Prasetyo et al. (2024) suggested that using digital quiz technology in the form of Quizizz during math learning affects elementary school students' interest in learning because it helps students actively participate in the math learning process. Apart from Quizizz, Vassya et al. (2023) stated that using digital quiz technology in the form of Kahoot during the math learning process affected elementary students' interest in learning, with the results of the percentage that appeared being 100% complete. Adhi et al. (2023) stated that digital quiz technology in the form of Wordwall in mathematics learning also affected increasing elementary school students' interest in learning, which was seen to increase by 86% with very good completeness. Through these conclusions, digital quiz technology has a positive impact

on increasing interest in learning mathematics for elementary school students. Therefore, this study will use digital quiz media using a different platform, Quizwhizzer. Supported by the results of existing research, Kurnia (2023) said that digital quiz media in the form of Quizwhizzer directly impacted junior high school students' interest in learning. Thus, researchers try to apply digital quizzes in the form of Quizwhizzer in elementary school.

Previous research has demonstrated that Quizwhizzer effectively enhances students' interest in mathematics at the junior high school level. Building upon these findings, the present study investigates the potential of this digital gamification tool to foster greater interest in mathematics among elementary school students. This research contributes to the growing body of international literature on integrating digital learning technologies, particularly in the context of gamified instruction. By combining the Teams Games Tournament (TGT) model with interactive digital media, this study adopts a collaborative and competitive learning framework that reflects global efforts to leverage technology for improving student engagement and learning outcomes at the primary education level. Accordingly, this study seeks to examine the impact of Quizwhizzer on increasing mathematics learning interest among fourth-grade elementary students. The central research question is: To what extent does the use of Quizwhizzer influence students' interest in mathematics in grade IV? The hypothesis is that implementing Quizwhizzer significantly enhances mathematics learning interest among fourth-grade students.

METHODS

Classroom Action Research is used as the design of this research. According to Vista et al. (2023) stated that classroom action research is one design to improve learning methods in the classroom through certain actions more effectively and efficiently. This class action research design aims primarily to improve the quality of learning in the classroom. Researchers have their respective roles and duties to achieve the desired results when carrying out this research.

The researcher acts as a class teacher in implementing this class action research, observer, and designing, implementing and reflecting on the learning actions that have been carried out. In this case, the researcher will act as a subject who takes action in the

classroom and observes the course of learning activities during learning actions. Researchers who act as teachers will carry out learning using the design of learning tools that have been made, and researchers who act as observers will make observations to determine the success of implementing the actions taken. This process will be repeated several times based on the existing cycle in class action research.

This class action research uses three stages of a continuous action cycle: planning, action, observation, and reflection. Researchers make plans at the planning stage which contains the design of learning actions that will be used, at the action and observation stage, researchers carry out the design of learning actions and collect data through observation activities when taking action, and at the reflection stage, researchers will analyse the results of actions and observations made then make improvements and renewals if the specified success criteria are still not achieved. The stages in one cycle of this research consist of two learning actions. They will be repeated continuously until there is an increase in student interest in learning, as provided by the success criteria.

The implementation of the stages of each cycle is adjusted based on the location and subject of the research. This research was conducted in class IV of SD Negeri Kleco 1 Surakarta. The subject of this research was a grade IV elementary school with 29 students. The action was implemented in the odd semester of the 2024/2025 school year from October to November through two research cycles consisting of two actions per cycle. The instruments used in this study were a learning interest questionnaire to measure learning interest before and after the action in each cycle, and an observation sheet used to observe student activities during the learning process.

To get maximum results, researchers need to use appropriate data collection techniques. This research uses two data collection techniques, namely observation and questionnaires. Academic supervisors have validated the observations and questionnaires used in this research. Researchers used observation and questionnaires only to focus on qualitative and quantitative data. Observation is used to analyse qualitative descriptive data, while questionnaires are used to analyse quantitative data. The observation will be done during the research action, and the questionnaire will be given at the end.

Researchers must use appropriate data collection techniques, observation and questionnaires to achieve maximum results. The observations and questionnaires used

have undergone instrument validation conducted by expert validators, namely supervisors. Before validation, the validator was first given a research synopsis of the research description to be carried out to clarify the research questionnaire to be validated. The validation process is then carried out using a validator filling out a questionnaire validation sheet, which aims to clarify the feasibility of the questionnaire to be used by signing by the validator and to obtain data that will be used for validity and reliability tests for this questionnaire.

To get maximum results, researchers need to use appropriate data collection techniques. This research uses two data collection techniques, namely observation and questionnaires. Academic supervisors have validated the observations and questionnaires used in this research. Researchers used observation and questionnaires only to focus on qualitative and quantitative data. Observation is used to analyse qualitative descriptive data, while questionnaires are used to analyse quantitative data. The observation will be done during the research action, and the questionnaire will be given at the end.

This data analysis aims to provide an overview of student activities by describing what occurs during the learning action process. So the focus of this research is to analyse the increase in learning interest of grade IV elementary school students through digital game media through Quizwhizzer, so the success criteria of this study are that the questionnaire results show the average high interest of students reaches a percentage of $\geq 70\%$ of all existing students. This specified limitation is based on research conducted by Adrianti et al. (2023).

RESULT AND DISCUSSION

Pre-action Description

The research began with two actions: distributing questionnaires to students and analysing the results of filling out questionnaires of fourth-grade students of SD Negeri 1 Kleco Surakarta. The analysis of student questionnaires shows that students with a percentage of 40% and above, or with moderate, high, and very high criteria, reach 37.93% or 11 students from the total number available. Meanwhile, students with a percentage of 41% or below or with low and sufficient criteria, reach 18 or 62.07% of the total number of students. The criteria for low learning interest and high learning interest

are based on the research achievement criteria according to Adrianti et al. (2022) which states that if it is above or equal to 70% it is stated to have high learning interest, while if it is below 70% it is stated to have low learning interest. This data shows that the learning interest of fourth-grade students of SD Negeri 1 Kleco Surakarta in mathematics learning content is still relatively low. The results of the analysis can be conveyed in [Table 1](#).

Table 1. Pre-treat Questionnaire Analysis Results

Criteria	Pre-action	
	Total	Precentage
High interest	11 students	37,93%
Low interest	18 students	62,07%

The Teams Games Tournament (TGT) learning model is combined with the Quizwhizzer game media to improve student learning outcomes. Students are divided into several heterogeneous groups based on academic ability in this learning. Each group competes in a quiz-based game through the Quizwhizzer platform, which allows students to answer math problems interactively and earn points for their group.

The TGT approach with Quizwhizzer makes learning fun and encourages teamwork and a sense of responsibility in solving math challenges. This process stimulates a healthy competitive spirit and increases active student participation. After implementing this model, the evaluation results showed increased students' understanding of concepts and learning motivation. The average class score increased significantly, with more students achieving moderate to high criteria. In addition, the learning atmosphere became more dynamic, and students looked more enthusiastic about following the lessons.

Description of Cycle I Action Implementation

The implementation of the action in October 2024 consists of three stages: planning, implementation of the action and reflection. Some of the things done in the planning stage are setting the time for implementing research actions; preparing scenarios and learning devices that will be used in the form of teaching modules, teaching materials, Learner Worksheets (LKPD), question cards, preparing Quizwhizzer media; preparing research instruments that will be used including observation sheets and questionnaire sheets. The action implementation stage is carried out in two learning action meetings. Students are invited to learn at each meeting using digital quiz game

media in the form of Quizwhizzer. The implementation of learning using Quizwhizzer media is carried out in groups using a laptop. The following are the stages carried out by the teacher in using Quizwhizzer, including the implementation of the action in October 2024, which consists of three stages: planning, implementation of action, and reflection. Some of the things done in the planning stage are setting the time for implementing research actions; preparing scenarios and learning devices that will be used in the form of teaching modules, teaching materials, Learner Worksheets (LKPD), question cards, preparing Quizwhizzer media; preparing research instruments that will be used including observation sheets and questionnaire sheets. The action implementation stage is carried out in two learning action meetings. Students are invited to learn at each meeting using digital quiz game media in the form of Quizwhizzer. Learning using Quizwhizzer media is implemented in groups using a laptop, as shown in [Figure 1](#).



Figure 1. Cycle I learning activities

The following are the stages carried out by the teacher in using Quizwhizzer, including: (1) The teacher opens the Quizwhizzer media using a laptop connected to the internet; (2) The teacher logs into the Quizwhizzer account and creates a quiz using Quizwhizzer; (3) The finished quiz is distributed to learners in the form of a Quizwhizzer code that is displayed via powerpoint; (4) Students access the Quizwhizzer media by entering the code the teacher has distributed (The teacher supervises the tournament activity); (5) The score will appear when you finish working on the Quizwhizzer questions.

Based on several stages carried out by the teacher, the things that students can do in using Quizwhizzer include: (1) Students join the Quizwhizzer media through the code displayed by the teacher; (2) After joining, each group enters the group name; (3) After joining, students can choose a character as they wish; (4) Each group answers the

questions already available on the Quizwhizzer media (When the group answers the question correctly, the level goes up); (5) During the tournament process, there is a power-up feature to help each group complete the level. After completing all the questions, the score will appear.

The teacher determined the time for students to complete their tasks in the Quizwhizzer media. While using Quizwhizzer media, students in groups held discussions to solve all the questions. Through the process of using Quizwhizzer media and discussion in groups, researchers make observations to provide an overview of the learning action process that has been implemented. Through observation, the results were obtained in the form of students not understanding the steps of implementing Quizwhizzer media. The seating position was ineffective for discussion, so several students were not actively involved. The results of this observation are supported by filling out a questionnaire on interest in learning conducted by students.

Based on the questionnaire results, four students have very high criteria, 8 have high criteria, 5 have medium criteria, 9 have sufficient criteria, and 3 have low criteria. This data shows that 58.62% of the average percentage of students have a high interest in learning, and 41.38% have a low interest in learning from all existing students. So that the increase in student interest in learning from pre-action to cycle I can be expressed in [Figure 2](#).

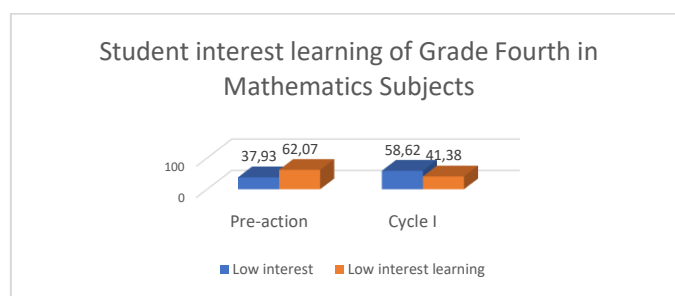


Figure 2. Increase in Student Learning Interest Cycle I

The increase in the results of the learning interest questionnaire for cycle I action has not yet reached the predetermined research success criteria; the average student with a high interest in learning is still below 70%, thus the researcher decided to continue the research with cycle II. Therefore, through the results of the reflection on the actions in cycle I, it is necessary to improve the learning process in cycle II.

The results of the first cycle reflection showed that students accepted the use of

Quizwhizzer media well, based on the results of observations and questionnaires that had been carried out. However, some students still do not understand how to implement learning using Quizwhizzer media. In addition, some students are still not active during group discussions, because the seating position is ineffective in conducting discussions. So, to overcome this problem, researchers who act as teachers will add learning steps by explaining the LKPD first and changing the seating position so that students can participate in discussion activities more comfortably and actively.

Description of Cycle II Action Implementation

The action was carried out during November 2024, and it consisted of three stages: planning, action implementation, and reflection. The activities carried out in this planning stage are determining the time for implementing research actions; preparing learning scenarios; and learning tools used, namely teaching modules, teaching materials, Learner Worksheets (LKPD), question cards, preparing Quizwhizzer, and preparing research instruments to be used, including observation sheets and questionnaire sheets, at the stage of implementing the action carried out through two learning action meetings. Students are invited to learn at each meeting using digital quiz game media in the form of Quizwhizzer. The implementation of learning using Quizwhizzer media is carried out in groups using a laptop.

The teacher carries out several stages in using Quizwhizzer, including: (1) The teacher explains the steps of using Quizwhizzer media through LKPD; (2) The teacher opens Quizwhizzer media using a laptop connected to the internet; (3) The teacher logs into the Quizwhizzer account and creates a quiz using Quizwhizzer, which will be used in the math learning process; (4) The finished quiz is distributed to students in the form of a Quizwhizzer code that is displayed through powerpoint; (5) Students access Quizwhizzer media by entering the code the teacher shares. The teacher supervises the tournament activity process. (6) The score will appear if you have finished working on the questions in Quizwhizzer.

Based on several stages carried out by the teacher, the things that students can do in using Quizwhizzer include: (1) Students join the Quizwhizzer media through the code displayed by the teacher; (2) After joining, each group enters the group name; (3) After joining, students can choose the character as they wish; (4) Each group answers the questions already available on the Quizwhizzer media; (5) When the group answers the

question correctly, the level will increase; (6) During the tournament process, there is a power-up feature to help each group complete the level, as seen in [Figure 3](#). After completing all the questions, the score will appear.

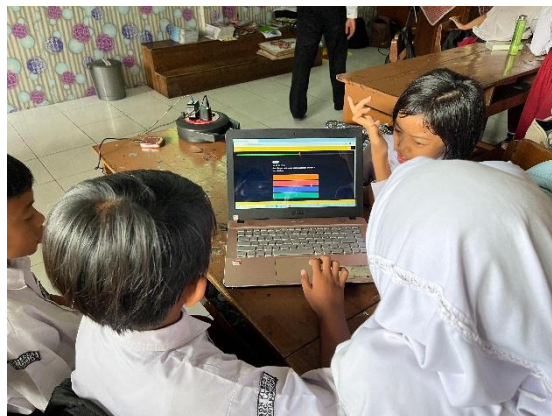


Figure 3. Cycle II learning activities

The teacher determines the time for students to complete their tasks in the Quizwhizzer media. While using Quizwhizzer media, students in groups discuss and work on the questions that have been made. Using Quizwhizzer media and discussion in groups, researchers make observations that explain the learning action process that has been carried out. Through observation, the results were obtained through students' enthusiasm and high interest in learning when carrying out learning activities. However, there were still obstacles from the teacher's class mastery, which was not maximised, so it exceeded the time limit specified in the teaching module. The results of this observation are supported by filling out the learning interest questionnaire cycle II.

Based on the questionnaire results, 16 students are in the very high category, 7 in the high category, 5 in the medium category, and 1 in the moderate category. These results show that the average student with high learning interest has a percentage of 96.55%, and the average student with low learning interest has a percentage of 3.45% of all existing students. Thus, the increase in student interest in learning from pre-action to cycle II can be expressed in [Figure 4](#).

The increase in the learning interest questionnaire results in cycle II has met the established research success criteria: most students have a high interest in learning, above 70%. Hence, the researcher concluded that this research was successful. However, some reflections can be observed from cycle II, which has been carried out. So, researchers will offer solutions to the reflections that have been observed.

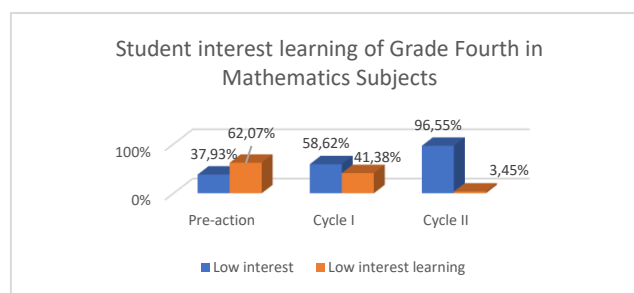


Figure 4. Increased Student Learning Interest Cycle II

The results of the second cycle reflection showed that students enthusiastically accepted the use of Quizwhizzer media based on observation and questionnaire analysis results. However, during the learning actions of cycle II, the teacher also still had difficulty organising the class due to the high enthusiasm of students in participating in learning, so the learning exceeded the time specified in the teaching module. In addition, the limited internet speed makes the implementation of learning using Quizwhizzer media experience obstacles and requires more time.

Strategic steps that can be applied in future research are required to overcome the challenges faced in implementing the actions of this research. The first step was to set clear rules to limit discussion time and divide roles to supervise students while working on tasks through Quizwhizzer. The second step was creating a backup plan to download questions or use screen sharing so students could still participate in the game without accessing it on their devices. These steps are expected to realise an efficient learning environment without reducing students' interest in learning.

The results that have been obtained show that there is harmony with the results of previous research, which shows an increase in interest in learning using digital media in elementary schools. The previous research by Prasetyo et al. (2024) stated that the use of digital quiz media in the form of Quizizz in learning mathematics affected elementary school students' interest in learning because it caused an influence on students to encourage student activity in understanding the material. In addition to Quizizz, Vassya et al. (2023) stated that the use of digital quiz technology in the form of Kahoot during the math learning process affected the learning interest of elementary school students, with the results of the percentage that appeared being 100% complete. Adhi et al. (2023) stated that digital quiz technology in the form of Wordwall in mathematics learning also affected increasing elementary school students' interest in learning, which was seen to

increase by 86% with very good completeness. Through the conclusions of this research, the apparent comparison with the research conducted is the use of digital media in the form of Quizwhizzer, which can also significantly increase students' interest in learning. In addition, the development of the times adapts to students to interact more often using technology, which can be interesting for learning if it also uses technology-based media.

Based on these findings, future research should focus on developing an implementation model that integrates digital quiz media with classroom management strategies tailored to the dynamic nature of elementary school students. This includes designing flexible teaching modules that allocate sufficient time for interactive activities, improving school infrastructure, especially internet connectivity, and effectively incorporating teacher training to manage enthusiasm-driven challenges. Furthermore, comparative studies on digital quiz platforms could provide deeper insights into the most effective tools for fostering sustained student engagement in mathematics learning.

CONCLUSION

Using Quizwhizzer learning media has proven effective in increasing the interest of fourth-grade students at SD Negeri Kleco 1 Surakarta in learning mathematics. A significant increase was seen in cycle II, where 96.55% of students achieved high learning interest, exceeding the established success criteria ($\geq 70\%$). This success was supported by improvements in learning strategies, such as providing more detailed explanations of the steps for using the media and arranging seating positions that support group discussions.

However, this study identified several obstacles, such as difficulty organising the class due to high student enthusiasm and limited internet access, which affected the smooth use of the media. These findings indicate that the success of using Quizwhizzer depends on the media and the teacher's ability to manage the class and adjust learning strategies.

The broader implication of this study is that digital learning media such as Quizwhizzer have the potential to be applied to other subjects or at different grade levels, especially if supported by careful planning and efficient time management. For further research, it is recommended to test the effectiveness of this media in more diverse contexts and explore strategies to overcome technical barriers and improve teachers'

classroom management skills in digital learning environments.

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CONFLICTS OF INTEREST

The authors declare that this research was conducted without commercial elements that could be interpreted as triggering potential conflicts of interest.

FUNDING STATEMENT

The researcher independently funded this research with support from school facilities in implementing learning. Quizwhizzer Media utilises the free version access provided by the platform. If additional features are needed, funding for premium subscriptions will be sought through the researcher's funds or support from the school. In addition, supporting facilities such as technological devices and internet connections are used based on the facilities available in the school environment.

AUTHOR CONTRIBUTIONS

The following are the contributions made by each author in this study:

Elita Herwamanti: software, investigation, resources, writing – original draft, project administration.

Grasianus Agresspa Aga Prasetya: conceptualisation, methodology, formal analysis, investigation, writing – original draft. **Nensi Desiana Purnamasari:** software, formal analysis, data curation, writing – original draft, supervision, project administration.

Ratna Dyah Utami: conceptualisation, validation, writer-review and editing, supervision, project administration.

Laili Nur Maulidah: validation, supervision.

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