

The Effect of Using the ZEP Quiz Application on Fifth-Grade Students' Learning Outcomes in Pancasila Education

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ABSTRACT : The development of digital technology has transformed the learning process in elementary schools, particularly through the integration of interactive digital learning media. One platform that can support this transformation is ZEP Quiz, a gamification-based learning application designed to create an engaging, interactive, and enjoyable learning environment. However, the learning process of Pancasila Education at SD Negeri 2 Konda is still predominantly conducted using conventional methods, which may limit student engagement and result in suboptimal learning outcomes. This study aimed to determine the effect of using the ZEP Quiz application on the learning outcomes of fifth-grade students in Pancasila Education. This study employed a quantitative approach using a quasi-experimental method with a Pretest–Posttest Control Group Design. The sample consisted of 58 fifth-grade students, comprising 31 students in the experimental class and 27 students in the control class, selected using a saturated sampling technique. Data were collected through learning outcome tests, observations, and documentation. The data were analyzed using descriptive statistics and inferential statistics, including the Shapiro–Wilk normality test, Levene’s test of homogeneity, and the Independent Samples t-Test. The results showed that students who learned using the ZEP Quiz application achieved higher learning outcomes than those who received conventional instruction. The hypothesis test revealed a significance value (Sig. 2-tailed) of less than 0.05, indicating a significant difference in learning outcomes between the experimental and control groups. Therefore, the use of the ZEP Quiz application had a positive and significant effect on the learning outcomes of fifth-grade students in Pancasila Education. These findings indicate that ZEP Quiz can serve as an innovative gamification-based digital learning medium to support more interactive and effective Pancasila Education learning in elementary schools.

Keywords: ZEP Quiz, Gamification, Digital Learning Media, Learning Outcomes, Pancasila Education.

INTRODUCTION

Digital transformation has brought significant changes to education, including the learning process at the elementary school level. The use of information and communication technology in education is no longer limited to supporting the delivery of learning materials but has also become an important instrument for creating interactive, collaborative, and student-centered learning experiences. The integration of digital technology is therefore an important strategy for improving the quality of learning while developing 21st-century competencies, including critical thinking, creativity, communication, and collaboration. In this context, teachers are required to

select and utilize innovative learning media that are appropriate to students' characteristics and the demands of contemporary education.

The use of digital learning media is also closely related to the development of innovative learning in elementary schools. Saqjuddin and Saputra (2025) emphasized that the use of digital learning media can support the creation of more engaging learning experiences and increase students' interest in participating in the learning process. Furthermore, the transformation of Pancasila Education requires learning approaches that are not only oriented toward the delivery of concepts but also encourage students to actively construct knowledge and develop competencies relevant to the 21st century (Saqjuddin et al., 2025). Therefore, the use of interactive digital media can serve as an important component in creating learning that is more active, meaningful, and relevant to the characteristics of elementary school students.

One of the innovative approaches that has developed along with digital transformation is gamification. Gamification refers to the integration of game elements, such as challenges, points, levels, rewards, competition, and immediate feedback, into non-game contexts, including education. The application of gamification can encourage students to participate more actively, increase learning motivation, and create a more enjoyable learning environment. A meta-analysis conducted by Wang et al. (2022) showed that gamification and game-based learning have positive effects on student learning achievement and motivation. Gamification can make learning activities more engaging because students are encouraged to complete challenges and achieve learning objectives through activities that resemble games.

One digital platform that applies the concept of gamification in learning is ZEP Quiz. ZEP Quiz provides an interactive virtual learning environment that enables students to participate in quizzes presented in a game-based format with an engaging three-dimensional visual environment. Unlike conventional digital quiz platforms, ZEP Quiz combines quiz activities with game elements, challenges, interaction, avatars, and immediate feedback. These features enable students to experience learning in a more interactive and enjoyable manner. The use of ZEP Quiz therefore has the potential to transform evaluation activities that are often perceived as monotonous into learning experiences that encourage student participation.

Several recent studies have demonstrated the potential of ZEP Quiz as a gamification-based learning medium. Abidah et al. (2026) found that the use of ZEP Quiz-based educational games was effective in increasing students' learning motivation. Similarly, Fitria et al. (2026) reported that gamification based on ZEP Quiz had a positive effect on student learning outcomes. Research by Wahyuni et al. (2026) also showed that the use of interactive ZEP Quiz media within a Game-Based Learning

model could improve students' motivation and cognitive learning outcomes. These findings indicate that ZEP Quiz has the potential not only to increase student engagement but also to support the achievement of better learning outcomes.

Pancasila Education plays a strategic role in developing students' knowledge, character, attitudes, and civic competencies. The subject is not merely aimed at developing students' cognitive understanding of Pancasila but also at fostering the ability to apply Pancasila values in everyday life. Consequently, the learning process should be designed to encourage active student participation, meaningful interaction, and the contextual application of learning concepts. Saqjuddin, Parisu, and Saputra (2025) stated that the transformation of Pancasila Education in elementary schools requires learning approaches that are oriented toward the development of 21st-century competencies and deeper learning. In addition, Saputra (2025) emphasized the importance of Pancasila and civic education in shaping students' character and values through learning experiences that are relevant to real-life situations.

The need for innovative learning is particularly important because Pancasila Education learning is sometimes still implemented through teacher-centered approaches that emphasize explanation, memorization, and question-and-answer activities. Such approaches can limit student participation and make it difficult for students to connect the material with real-life experiences. Saputra (2025) emphasized that Pancasila and civic education should be used as a means of developing students' character and moral awareness through meaningful learning processes. Therefore, the use of interactive and gamification-based digital media can provide an alternative learning environment that encourages students to participate more actively and understand learning material through engaging experiences.

Based on initial observations at SD Negeri 2 Konda, the learning process in Pancasila Education was still dominated by lecture methods and the limited use of interactive learning media. This condition resulted in some students being less active and less motivated to participate in learning activities. The limited use of digital media also resulted in learning activities that tended to be one-way, while students required more varied learning experiences that were consistent with the characteristics of the digital era. This condition ultimately had an impact on the achievement of student learning outcomes, which were not yet optimal.

The use of the ZEP Quiz application is expected to provide a solution to these problems. Through quizzes packaged as educational games, students can participate in learning activities through challenges, competition, virtual interaction, and immediate feedback. These features can encourage students to become more actively involved in learning and can help teachers create a more engaging learning environment. In addition, the use of ZEP Quiz allows assessment activities to be integrated with game-

based learning experiences, making the evaluation process more interactive and potentially increasing students' attention and learning engagement.

Although several studies have examined the use of ZEP Quiz in various subjects, research specifically investigating its effect on learning outcomes in Pancasila Education at the elementary school level remains limited. Previous studies have primarily focused on foreign language learning, science, social studies, and secondary education. Therefore, this study offers novelty by examining the effect of the ZEP Quiz application on student learning outcomes in Pancasila Education at the elementary school level. The study is also relevant to the current transformation of digital learning and the development of innovative Pancasila Education that is oriented toward student participation and 21st-century competencies.

Based on the description above, this study aims to determine the effect of using the ZEP Quiz application on the learning outcomes of fifth-grade students in Pancasila Education at SD Negeri 2 Konda. The results of this study are expected to contribute to the development of gamification-based learning media and provide practical information for elementary school teachers in implementing innovative, interactive, and technology-based learning to improve student learning outcomes.

METHODS

This study employed a quantitative approach using a quasi-experimental method to examine the effect of the ZEP Quiz application on students' learning outcomes in Pancasila Education. The research design used was a Pretest–Post-test Control Group Design. This design was selected because it enables researchers to compare the learning outcomes of an experimental group that receives treatment using the ZEP Quiz application with those of a control group that receives conventional learning. Before the treatment was implemented, both groups were administered a pretest to determine their initial learning abilities. Following the learning process, both groups were administered a post-test to measure changes and differences in their learning outcomes.

The research design is presented in Table 1.

Table 1. Pretest–Post-test Control Group Design

Group	Pretest	Treatment	Post-test
Experimental	O ₁	X ₁	O ₂
Control	O ₃	X ₂	O ₄

Information:

O₁ = Pretest for the experimental group

O₂ = Post-test for the experimental group

O_3 = Pretest for the control group

O_4 = Post-test for the control group

X_1 = Learning using the ZEP Quiz application

X_2 = Conventional learning

The research was conducted at SD Negeri 2 Konda during the even semester of the 2025/2026 academic year. The population consisted of all fifth-grade students enrolled in two classes, comprising a total of 58 students. Because the population was relatively limited, the study used a saturated sampling technique (total sampling), in which all members of the population were included as research participants. The sample consisted of 31 students in the experimental class and 27 students in the control class. The experimental class received Pancasila Education learning using the ZEP Quiz application, whereas the control class received learning through conventional methods commonly implemented by the teacher.

The research instruments consisted of a learning outcome test, observation sheets, and documentation. The learning outcome test was used as the primary instrument to measure students' mastery of competencies in Pancasila Education before and after the treatment. The test consisted of 20 multiple-choice items developed based on the learning objectives and indicators of the material taught. Before being used for data collection, the test instrument was subjected to instrument testing, including validity and reliability tests, item difficulty analysis, and discriminatory power analysis. These procedures were conducted to ensure that the instrument was appropriate for measuring students' learning outcomes.

Observation sheets were used to observe and document the implementation of the learning process in both the experimental and control classes. The observation focused on the implementation of the learning activities, student participation, and the application of the learning procedures in accordance with the research design. Documentation was used as supporting data, including student lists, learning materials, research activities, photographs of the learning process, and other relevant documents.

The research procedure was conducted in three main stages: preparation, implementation, and completion. The preparation stage involved identifying the research problem, preparing the learning materials, developing the research instruments, preparing the learning scenarios, and conducting the necessary instrument testing. The learning materials and activities were adjusted to the learning objectives of Pancasila Education.

The implementation stage began with the administration of a pretest to both the experimental and control groups. The pretest was conducted to determine the students' initial abilities before the learning treatment. Subsequently, the

experimental class participated in learning activities using the ZEP Quiz application. Learning activities were designed by integrating Pancasila Education material with interactive quizzes and gamification elements available through the ZEP Quiz platform. Meanwhile, the control class participated in learning using conventional methods commonly used by the teacher. After the learning materials had been completed, both groups were administered the same post-test to measure their learning outcomes after the learning process.

The completion stage involved collecting, organizing, processing, and analyzing the research data. The results of the pretest and post-test were analyzed to determine the learning outcomes of the experimental and control groups and to test the research hypothesis.

Data analysis was conducted using IBM SPSS Statistics. The analysis began with descriptive statistics to describe the characteristics of the data, including the number of students, mean, minimum score, maximum score, and standard deviation of the pretest and post-test results for both groups. Descriptive analysis was used to provide an overview of the learning outcomes before and after the learning process.

Before hypothesis testing was conducted, prerequisite tests were performed. The normality of the data was tested using the Shapiro–Wilk test because the number of students in each group was less than 50. The data were considered normally distributed if the significance value was greater than 0.05. A homogeneity test was then conducted using Levene’s test to determine whether the variances of the experimental and control groups were homogeneous. The data were considered homogeneous if the significance value was greater than 0.05.

After the normality and homogeneity assumptions were fulfilled, hypothesis testing was conducted using the Independent Samples t-Test at a significance level of 0.05. This test was used to determine whether there was a statistically significant difference in learning outcomes between students who learned using the ZEP Quiz application and those who received conventional learning. The decision-making criteria were that if the significance value (Sig. 2-tailed) was less than 0.05, H_0 was rejected and H_a was accepted. Conversely, if the significance value was greater than 0.05, H_0 was accepted and H_a was rejected. Therefore, a significance value of less than 0.05 indicates that the use of the ZEP Quiz application has a significant effect on students’ learning outcomes in Pancasila Education.

RESULT AND DISCUSSION

RESULT

A. Description of Student Learning Outcomes

The description of student learning outcomes was conducted to determine the initial and final achievement of students in the experimental and control classes. Before the treatment was implemented, students in both classes were given a pretest consisting of 20 multiple-choice questions. The pretest was administered to identify the students' initial abilities before the learning process. After the treatment, the students were given a posttest using the same indicators to measure changes in their learning outcomes.

The experimental class received learning treatment using the ZEP Quiz application as an interactive and gamification-based learning medium, whereas the control class received learning through conventional learning methods. The descriptive statistical results of the pretest and posttest scores are presented in Table 2.

Table 2. Descriptive Statistics of Student Learning Outcomes

Statistics	Experimental Class Pretest	Experimental Class Posttest	Control Class Pretest	Control Class Posttest
N	25	25	23	23
Range	65.00	50.00	55.00	40.00
Minimum	10.00	45.00	25.00	35.00
Maximum	75.00	95.00	80.00	75.00
Sum	1,020.00	1,875.00	1,270.00	1,150.00
Mean	40.80	75.00	55.22	50.00
Std. Deviation	20.599	11.815	18.370	10.766
Variance	424.333	139.583	337.451	115.909

Based on Table 2, the experimental class obtained an average pretest score of 40.80, which increased to 75.00 after the implementation of learning using the ZEP Quiz application. This indicates an increase of 34.20 points. Meanwhile, the control class obtained an average pretest score of 55.22 and a posttest average score of 50.00. Thus, the control class experienced a decrease in the average score of 5.22 points.

The difference in the average scores between the two classes indicates that the use of the ZEP Quiz application provided a more positive learning improvement than the learning process implemented in the control class. The experimental class not only

achieved a higher posttest average but also demonstrated a substantial increase from the initial learning condition.

B. Prerequisite Analysis

1. Normality Test

The normality test was conducted to determine whether the learning outcome data were normally distributed. The Shapiro–Wilk test was used because the number of students in each group was fewer than 50. The decision criterion was that the data were considered normally distributed if the significance value was greater than 0.05.

Table 3. Results of the Shapiro–Wilk Normality Test

Data	Statistic	df	Sig.
Control Pretest	0.898	23	0.023
Control Posttest	0.816	23	0.053
Experimental Pretest	0.927	25	0.079
Experimental Posttest	0.989	25	0.398

Based on Table 3, the significance value of the control class pretest was 0.023, which was less than 0.05. Therefore, the control class pretest data were not normally distributed. However, the control class posttest data obtained a significance value of 0.053, which was greater than 0.05, indicating a normal distribution.

The experimental class pretest data obtained a significance value of 0.079, while the experimental class posttest data obtained a significance value of 0.398. Both values were greater than 0.05, indicating that the experimental class pretest and posttest data were normally distributed.

Because one of the pretest data sets was not normally distributed, the normality results should be considered carefully when selecting the final inferential test. However, the posttest data from both groups were normally distributed, which supports the comparison of the final learning outcomes between the experimental and control classes.

2. Homogeneity Test

The homogeneity test was conducted to determine whether the variances of the learning outcome data in the experimental and control classes were homogeneous. The test used Levene's Test of Homogeneity of Variances.

Table 4. Results of the Homogeneity of Variances Test

Test Basis	Levene Statistic	df1	df2	Sig.
Based on Mean	0.205	1	46	0.653
Based on Median	0.205	1	46	0.653
Based on Median with Adjusted df	0.205	1	45.816	0.653

Based on Trimmed Mean	0.199	1	46	0.658
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The results in Table 4 show that the significance value based on the mean was 0.653. This value was greater than 0.05, indicating that the variances of the experimental and control classes were homogeneous. Similar results were also found in the tests based on the median and trimmed mean, with significance values greater than 0.05. Therefore, the two groups had relatively similar variance characteristics.

3. N-Gain Analysis

The N-Gain analysis was used to determine the level of improvement in student learning outcomes from the pretest to the posttest. The N-Gain score was calculated by comparing the increase in student scores with the maximum possible increase.

Table 5. N-Gain Results of the Experimental and Control Classes

Class	N	Minimum	Maximum	Mean	Std. Deviation
Experimental Class	25	0.167	0.824	0.571	0.186
Control Class	23	-1.400	0.333	-0.248	0.476

Based on Table 5, the experimental class obtained an average N-Gain score of 0.571, which was categorized as moderate. Meanwhile, the control class obtained an average N-Gain score of -0.248, indicating a low level of improvement. These results show that the increase in learning outcomes in the experimental class was considerably higher than that in the control class.

The difference in N-Gain scores indicates that the use of the ZEP Quiz application contributed positively to the improvement of student learning outcomes. The interactive features, game elements, challenges, and immediate feedback provided through the application may have encouraged students to participate more actively in the learning process.

C. Hypothesis Testing

Hypothesis testing was conducted to determine whether there was a significant difference in learning outcomes between students who learned using the ZEP Quiz application and students who learned using conventional learning methods.

Because the research design involved two independent groups, namely the experimental and control classes, the hypothesis test was conducted using an Independent Samples t-Test. The hypotheses were formulated as follows:

H₀: There is no significant difference in learning outcomes between students who learn using the ZEP Quiz application and students who learn using conventional learning methods.

H₁: There is a significant difference in learning outcomes between students who learn using the ZEP Quiz application and students who learn using conventional learning methods.

The decision-making criterion was that if the significance value (Sig. 2-tailed) was less than 0.05, H₀ was rejected and H₁ was accepted.

Table 6. Independent Samples t-Test Results

t	df	Sig. (2-tailed)	Mean Difference
-7.640	46	< 0.001	-25.000

Based on Table 6, the Independent Samples t-Test produced a t-value of -7.640 with 46 degrees of freedom and a significance value of less than 0.001. Because the significance value was less than 0.05, H₀ was rejected and H₁ was accepted. Therefore, there was a significant difference in learning outcomes between students who learned using the ZEP Quiz application and students who learned using conventional learning methods.

The mean difference of -25.000 indicates that the average posttest score of the experimental class was 25 points higher than that of the control class. The experimental class obtained an average posttest score of 75.00, whereas the control class obtained an average posttest score of 50.00. Thus, the results demonstrate that the use of the ZEP Quiz application had a significant positive effect on student learning outcomes in Pancasila Education.

Based on the results of the descriptive analysis, N-Gain analysis, and hypothesis testing, the use of the ZEP Quiz application was more effective in improving student learning outcomes than conventional learning. The findings indicate that gamification-based digital media can provide a more interactive, engaging, and motivating learning experience for elementary school students.

DISCUSSION

The results of this study show that the use of the ZEP Quiz application had a positive and significant effect on the learning outcomes of fifth-grade students in Pancasila Education. This finding is evidenced by the higher average posttest score obtained by the experimental class compared with the control class. The experimental class achieved an average posttest score of 75.00, while the control class achieved an average of 50.00. In addition, the N-Gain analysis showed that the experimental class obtained an average score of 0.571, which was higher than the control class, which obtained an average score of -0.248. The results of the Independent Samples t-Test also showed a significance value of less than 0.001, which was lower than 0.05. These results indicate that the difference in learning outcomes between the two groups was statistically significant.

The improvement in learning outcomes in the experimental class indicates that the use of ZEP Quiz provided a more engaging learning experience than conventional learning. During the learning process, students were not only passive recipients of information but also actively involved in answering questions, completing challenges, receiving immediate feedback, and participating in a digital learning environment with game elements. These activities encouraged students to pay greater attention to the learning material and participate more actively in the learning process. Consequently, students had more opportunities to understand, practice, and reinforce the Pancasila Education concepts being studied.

These findings can be explained through the principles of constructivist learning theory, which emphasize that knowledge is actively constructed by students through interaction with learning experiences and their environment. The use of ZEP Quiz provides opportunities for students to interact directly with learning content, respond to questions, solve challenges, and evaluate their understanding through immediate feedback. This learning process allows students to construct knowledge gradually rather than simply receiving information from the teacher. Srisuda and Chaijareon (2019) explain that gamification-based learning environments can be designed to support constructivist learning by encouraging active interaction, student participation, and self-regulated learning. Thus, the use of ZEP Quiz is consistent with a student-centered learning approach that emphasizes active participation and the construction of knowledge through meaningful learning experiences.

The findings also support the concept of gamification in education. Gamification refers to the integration of game elements into non-game contexts, including learning activities, to increase motivation, engagement, and participation. Elements such as challenges, points, competition, feedback, and achievement can make learning activities more attractive and encourage students to participate actively. Simao and Jardim (2023) emphasize that gamified activities have an important relationship with student motivation because they can create a more stimulating learning environment and encourage students to become more actively involved in the learning process. In the context of this study, the interactive features of ZEP Quiz contributed to the creation of a learning atmosphere that was more enjoyable and challenging for students.

The results of this study are also supported by the findings of Wang et al. (2022) whose meta-analysis showed that gamification and game-based learning can positively influence learning achievement and student motivation. The integration of game elements into learning can increase student engagement and create opportunities for students to receive feedback during the learning process. This theoretical and empirical evidence is consistent with the findings of the present study, in which

students who learned using the ZEP Quiz application demonstrated a greater improvement in learning outcomes than students in the control class.

The findings of this study are consistent with the research of Wahyuni et al. (2026) which found that the use of interactive ZEP Quiz media integrated into a Game-Based Learning model had a positive effect on students' motivation and cognitive learning outcomes. Similarly, Fitria et al. (2026) reported that ZEP Quiz-based gamification was effective in improving student learning outcomes. These findings reinforce the results of the present study, although the current research was conducted in the context of Pancasila Education at the elementary school level. The consistency of these findings indicates that ZEP Quiz has the potential to be used across different subjects and educational levels.

The results are also in line with Windarti et al. (2025), who examined gamification-based joyful learning through the use of ZEP Quiz. Their findings indicate that the use of ZEP Quiz can create a more enjoyable learning environment and support student participation. This is relevant to the results of the present study because the increase in learning outcomes was not only related to the digital format of the media but also to the learning atmosphere created through interactive and game-based activities. When students experience learning as an enjoyable and challenging activity, they are more likely to participate actively and maintain their attention during the learning process.

Furthermore, Nurfajriah et al. (2026) found that the use of ZEP Quiz as a digital quiz-based learning tool could support student learning motivation. Although their research was conducted in the context of chemistry learning, the findings demonstrate that ZEP Quiz can function as an interactive digital assessment tool that encourages students to participate in learning activities. In the present study, similar characteristics were observed in Pancasila Education learning, where students could complete quizzes and receive feedback in a more engaging format than conventional evaluation activities.

The findings of this study also correspond with the research of Pertiwi and Kalisa (2026) which showed that students perceived ZEP Quiz-based game learning positively and experienced increased motivation in the learning process. Positive student perceptions of the learning medium are important because students' acceptance of digital learning technology can influence their willingness to participate in learning activities. When students perceive the learning environment as interesting and accessible, they are more likely to engage in learning tasks and interact with the learning material.

In addition, Logayah et al. (2026) demonstrated that ZEP Quiz can be integrated with innovative learning approaches to create a more interactive learning experience.

This finding supports the argument that the effectiveness of ZEP Quiz does not depend solely on the application itself but also on how teachers integrate it into the learning process. In this study, ZEP Quiz was used as part of the learning process in Pancasila Education, allowing students to engage with the material through interactive questions and digital challenges. Therefore, teachers play an important role in designing learning activities that make optimal use of the features provided by the application.

Nasution et al. (2026) further emphasized the importance of user experience and engagement in gamification-based digital quiz systems. Their comparative analysis of digital quiz platforms highlights that the quality of interaction and user engagement can influence students' experiences when using digital learning media. This finding is relevant to the present study because the effectiveness of ZEP Quiz is related not only to the content of the questions but also to the interactive environment in which students complete learning activities.

The results of this study also support the findings of Guspinda and Peterianus (2026) who found that gamification-assisted learning can improve student learning outcomes. Although their research used a different digital platform, the results reinforce the broader conclusion that the integration of game elements into learning can improve student participation and achievement. Thus, the positive results obtained in this study are not limited to the specific characteristics of ZEP Quiz but are also related to the broader pedagogical potential of gamification-based learning.

In the context of Pancasila Education, the use of ZEP Quiz is particularly relevant because the subject requires students to understand concepts, values, norms, and attitudes that are related to everyday life. Learning Pancasila Education should not be limited to memorizing concepts but should encourage students to understand and apply Pancasila values in various situations. Through interactive quizzes and digital challenges, teachers can present learning content in a more contextual and engaging manner. The use of digital media can also encourage students to discuss answers, think about problems, and evaluate their understanding of the material.

The significant difference between the experimental and control classes indicates that learning outcomes are influenced not only by the material taught but also by the learning strategies and media used. Conventional learning tends to provide fewer opportunities for students to interact directly with learning content and receive immediate feedback. In contrast, ZEP Quiz creates an interactive environment in which students can respond directly to questions, identify errors, and improve their understanding through repeated learning experiences. This process can help strengthen students' understanding and retention of the material.

However, the effectiveness of ZEP Quiz should not be interpreted as meaning that digital applications can replace the role of teachers. The teacher remains responsible for designing learning activities, explaining concepts, providing guidance, and ensuring that game-based activities remain aligned with the learning objectives. The application functions as a supporting medium that can strengthen the learning process when integrated with appropriate pedagogical strategies.

Overall, the findings of this study demonstrate that the ZEP Quiz application is an effective gamification-based digital learning medium for improving student learning outcomes in Pancasila Education. The significant difference between the experimental and control classes, supported by the higher N-Gain score in the experimental class, demonstrates the positive contribution of the application to student learning achievement. These findings reinforce the importance of integrating digital technology and gamification into elementary school learning. Therefore, teachers are encouraged to utilize interactive digital media such as ZEP Quiz creatively and appropriately to create learning experiences that are more engaging, active, student-centered, and relevant to the characteristics of 21st-century learners.

CONCLUSION

This study demonstrates that the use of the ZEP Quiz application has a positive and significant effect on the learning outcomes of fifth-grade students in Pancasila Education. The results of the descriptive analysis showed that students in the experimental class who received learning treatment using the ZEP Quiz application experienced a greater improvement in learning outcomes than students in the control class who participated in conventional learning. The experimental class obtained an average posttest score of 75.00, while the control class obtained an average posttest score of 50.00. Furthermore, the N-Gain analysis showed that the experimental class achieved an average score of 0.571, while the control class obtained an average score of -0.248.

The results of the Independent Samples t-Test showed a significance value of less than 0.001, which was lower than the 0.05 significance level. Therefore, the null hypothesis was rejected and the alternative hypothesis was accepted. These results confirm that there was a significant difference in learning outcomes between students who learned using the ZEP Quiz application and students who learned through conventional learning. Thus, the use of ZEP Quiz as a gamification-based digital learning medium had a significant positive effect on student learning outcomes in Pancasila Education.

The improvement in learning outcomes indicates that gamification-based digital learning can create a more interactive, engaging, and student-centered learning

environment. Features such as interactive quizzes, challenges, game elements, and immediate feedback encourage students to participate more actively in the learning process. These features provide students with opportunities to interact directly with learning materials, test their understanding, and receive immediate responses to their answers. Consequently, the learning process becomes more meaningful and can support students in understanding Pancasila Education material more effectively.

This study also provides practical implications for elementary school teachers. The ZEP Quiz application can be used as an alternative digital learning medium to support innovative and interactive Pancasila Education learning. However, its use should be integrated with appropriate learning strategies and teacher guidance so that the game-based activities remain aligned with the learning objectives. For future research, it is recommended that studies involve larger samples, different educational levels, and control groups with more varied learning approaches. Further research may also examine the influence of ZEP Quiz on other variables, such as learning motivation, critical thinking skills, collaboration, digital literacy, and problem-solving skills, to provide a more comprehensive understanding of the effectiveness of gamification-based learning.

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