

The Effect of a Genially-Based Digital Snakes and Ladders Game on Elementary Students' Interest in Natural and Social Sciences

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Abstract

Background: Technological developments encourage teachers to implement interactive instructional media. One instructional media innovation is the Genially-assisted Digital Snakes and Ladders learning medium. This study aimed to examine the effect of the Genially-assisted Digital Snakes and Ladders learning medium on students' learning interest in Integrated Science and Social Studies (IPAS). **Methodology:** This study used a quantitative approach with a quasi-experimental method and a static group comparison design. The sample consisted of 60 fourth-grade elementary school students divided into an experimental group and a control group, each with 30 students selected through purposive sampling. Data were collected using a learning interest questionnaire. Instrument testing showed that 24 of 30 items were valid, while the reliability test obtained a Cronbach's Alpha coefficient of 0.849, indicating reliability. Data were analyzed using descriptive and inferential statistics with IBM SPSS Statistics version 26, including the Shapiro–Wilk normality test, Levene's Test of Homogeneity of Variance, independent-samples *t*-test, and Cohen's *d* effect size analysis. **Findings:** The experimental group obtained a higher mean learning interest score (96.97) than the control group (90.67). The independent-samples *t*-test results showed a significance value of 0.031 ($p < 0.05$), indicating a significant effect, while the Cohen's *d* value of 0.545 indicated a moderate effect. The results show that the Genially-assisted Digital Snakes and Ladders learning medium is effective in elementary schools. **Contributions:** Practically, the digital Snakes and Ladders learning medium can be an alternative because it can support student-centered learning while encouraging active participation through an enjoyable learning environment.

Keywords: Digital Snakes and Ladders; Elementary School; Instructional Media; Learning Interest; Natural and Social Sciences (IPAS)



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INTRODUCTION

The digital transformation in education has shifted the learning paradigm from teacher-centered instruction to student-centered learning through the integration of technology, enabling more interactive, collaborative, and meaningful learning experiences. In line with this transformation, elementary school teachers are expected to adapt to technological advancements and effectively integrate them into classroom instruction (Nada & Indrawan, 2023). However, the implementation of digital learning continues to face several challenges, including teachers' limited digital competencies and the lack of supporting facilities, which hinder the optimal use of technology in the teaching and learning process (Prinanda, 2025).

One form of digital transformation in education is the utilization of instructional media that actively promotes student engagement. In this context, elementary education plays a crucial role in establishing students' foundational knowledge, attitudes, and interest in learning. One of the factors influencing the quality of learning in fostering students' knowledge, attitudes, and engagement is the effective use of instructional media that can provide active, engaging, and meaningful learning experiences in accordance with students' developmental characteristics (Ramadani et al., 2023). This is consistent with the implementation of Integrated Science and Social Studies (IPAS) learning, which emphasizes students' direct interaction with and active participation in their surrounding environment. Therefore, through IPAS learning, students are expected not only to understand the subject matter but also to gain meaningful learning experiences (Wahyuni et al., 2025).

Despite the emphasis of Integrated Science and Social Studies (IPAS) learning on providing meaningful learning experiences, its implementation in elementary schools continues to face challenges, particularly students' low interest in learning. Learning interest is a determining factor that influences individuals in achieving satisfactory learning outcomes. According to Mutlifah & Kaltsum (2022) students' interest in learning refers to their attitude of showing enthusiasm toward a particular subject, which is reflected in their willingness and commitment to learn. Furthermore Andira et al., (2022) stated that learning interest plays an important role in influencing students' engagement with and understanding of the learning materials. This is supported Nasucha et al., (2023) who argued that students with a high level of learning interest tend to understand the material more easily and demonstrate greater diligence and enthusiasm in the learning process.

Low learning interest primarily occurs when the learning process is conducted in a passive or monotonous manner and when innovative instructional media are not effectively utilized. In addition, low learning interest is attributed to the limited variety of instructional media employed, the lack of relevance between the learning materials and real-life contexts, and the limited active interaction between teachers and students, resulting in students' minimal engagement in the learning process (Walfath et al., 2026). Therefore, the implementation of innovative instructional media in Integrated Science and Social Studies (IPAS) learning at the elementary school level is essential, as such media serve as instructional tools that support teachers in facilitating effective learning.

The need for innovation in instructional media is consistent with the actual conditions observed in the field, as identified through a preliminary observation conducted at SDN Pulo Gebang 03 Pagi. The findings revealed that teachers still relied on conventional instructional media, such as textbooks, and that the presentation of learning materials tended to be less varied and insufficient to capture students' attention, as textbooks remained the primary and sole learning resource. This condition resulted in low student engagement during classroom activities, making the learning process monotonous. Such circumstances are particularly incompatible with the objectives of Natural and Social Sciences (IPAS), which require active participation, interaction, and critical thinking skills in understanding concepts related to natural and social phenomena. This finding is further supported by the results of the mid-semester assessment in IPAS, which indicated that 59% of students scored below the Minimum Mastery Criterion, while only 41% achieved scores above the KKM.

The data presented above indicate that students have a low level of learning interest, resulting in less-than-optimal learning outcomes. Moreover, throughout the learning process, students demonstrated a lack of enthusiasm and appeared to participate in learning activities out of obligation rather than genuine interest. Consequently, they were less focused on understanding the materials presented by the teacher. These findings indicate the need for innovative instructional media that can create a learning environment that is enjoyable, interactive, collaborative, and capable of fostering students' interest and curiosity. One form of innovative instructional media that can be implemented by utilizing technology is a Genially-assisted digital Snakes and Ladders learning medium.

The digital Snakes and Ladders learning medium is a transformation of the traditional Snakes and Ladders game commonly played by children into an instructional medium containing learning materials developed using the Genially platform. Through the use of a Genially-assisted digital Snakes and Ladders learning medium, the game can be designed to incorporate a set of questions relevant to the Integrated Science and Social Studies (IPAS) curriculum. Consequently, each move in the game serves not only as a form of entertainment but also as an opportunity to encourage students to engage in meaningful learning. According to [Rajab et al., \(2023\)](#) stated that the digital Snakes and Ladders learning medium can create meaningful and interactive learning experiences by presenting instructional content in the form of a game, thereby making learning more enjoyable for students. Furthermore, instructional media serve as effective tools for creating a learning environment that is both enjoyable and interactive ([Amanda et al., 2023](#)).

According to the study conducted [Syahfitri et al., \(2023\)](#) the Snakes and Ladders learning medium has a positive effect when implemented in elementary school classrooms, as it is capable of creating an enjoyable, engaging, and non-monotonous learning environment. Similarly, [Ayu et al., \(2022\)](#) reported that the Snakes and Ladders game is an effective instructional medium for use in elementary schools, particularly in improving students' learning outcomes. Both studies demonstrated that the Snakes and Ladders learning medium is effective for implementation in elementary education. However, the focus of the two studies differed. [Syahfitri et al., \(2023\)](#) emphasized the effect of the instructional medium on students' learning interest in Civic Education, whereas [Ayu et al., \(2022\)](#) focused on

developing a learning medium that was valid, practical, and effective in improving students' learning outcomes in Social Studies.

Despite these findings, both studies have several limitations. First, the Snakes and Ladders learning medium was implemented only in its conventional or physical form and had not yet been developed into a digital format. Second, both studies were limited in terms of sample size and the scope of implementation, restricting the generalizability of their findings. These limitations reveal a research gap that warrants further investigation, particularly regarding whether a Genially-assisted digital Snakes and Ladders learning medium can influence fourth-grade elementary school students' learning interest in Integrated Science and Social Studies (IPAS). Furthermore, this study is expected to provide empirical evidence that contributes to the development of digital instructional media that focuses not only on improving students' learning outcomes but also on enhancing their learning interest.

Considering the actual conditions observed in the field, this study is necessary because these circumstances underscore the urgent need for innovation in digital instructional media. Therefore, the implementation of interactive, engaging, and developmentally appropriate digital learning media for elementary school students is essential to enhance their engagement and learning interest in IPAS. Accordingly, this study aims to determine whether the use of Genially-assisted digital Snakes and Ladders learning media has a significant effect on students' learning interest in the IPAS subject.

METODE

This study employed a quantitative approach using a quasi-experimental method involving a treatment to examine a cause-and-effect relationship. This study consisted of two groups, namely an experimental group and a control group. It employed a quasi-experimental design without random assignment of the research participants, as both groups had already been established based on the existing classroom conditions at the school (Abraham & Supriyati, 2022). Furthermore, the study adopted a static group comparison research design. According to Anantasia (2025) the Static Group Comparison design is a quasi-experimental research design that compares the final outcomes of a treatment group with those of a comparison group without conducting an initial measurement (pretest). The research design is presented in Table 1.

Table 1. Research Design

Group	Treatment	Posttest
Eksperimental	X	O ₁
Control	-	O ₂

Notes:

- O₁ : Administration of the posttest learning interest questionnaire to the experimental group.
O₂ : Administration of the posttest learning interest questionnaire to the control group.
X : Treatment through the implementation of the Genially-assisted digital Snakes and Ladders learning medium.

Research Sample

The sample in this study consisted of two fourth-grade classes, namely Class IVB (experimental group) and Class IVC (control group), with 30 students in each class. The sampling technique employed was non-probability sampling, specifically purposive sampling, in which the sample was selected based on characteristics that were considered appropriate for achieving the objectives of the study (Fadhillah et al., 2024). The purposive sampling technique was employed because the sample was selected based on predetermined criteria that aligned with the objectives of the study. In addition, this study adopted a quasi-experimental design involving pre-existing classroom groups, making random sampling and random assignment of participants impractical. Therefore, the selected sample was expected to be representative of the target population and to provide relevant information that addressed the objectives of the study.

Table 2. Research Sample

Class	Amount of Students
IVB	30
IVC	30
Total	60

Research Instrument

The research instrument employed in this study was a questionnaire. The questionnaire was developed based on the indicators of learning interest. According to Setiawan et al., (2022) there are six indicators of learning interest, namely: (1) enjoyment, (2) attention, (3) interest, (4) learning engagement, (5) task completion, and (6) awareness of learning objectives. The questionnaire was constructed using a Likert scale. The Likert scale was employed to measure respondents' attitudes, perceptions, and evaluations more comprehensively through graduated levels of agreement (Husin et al., 2025). The research instrument consisted of both positive and negative statements and employed a five-point Likert scale. Positive statements were scored on a scale ranging from 5 to 1, whereas negative statements were scored using the reverse scale, ranging from 1 to 5, in order to obtain more objective data. The response categories were as follows: Strongly Agree, Agree, Less Agree, Disagree, and Strongly Disagree.

Prior to administering the questionnaire to the research sample, the instrument was subjected to validity and reliability testing. The instrument validity assessment was conducted in two stages. First, content validity was established through expert judgment by specialists in the relevant field. Second, empirical validity was examined by conducting a pilot test involving 35 students who were not included in the research sample. The data obtained from the pilot test were subsequently analyzed using the Product Moment correlation to evaluate the validity of each questionnaire item. Meanwhile, the reliability of the instrument was assessed using *Cronbach's alpha* to

determine its internal consistency and ensure that the instrument would produce consistent results when administered repeatedly under similar conditions.

Data Collection

Data were collected using a questionnaire administered to both the experimental and control groups after the completion of the instructional intervention (posttest). The study involved two research variables: an independent variable and a dependent variable. The independent variable was the implementation of the Genially-assisted digital Snakes and Ladders learning medium in the experimental group, which was intended to create an engaging and enjoyable learning environment. The dependent variable was students' learning interest in Integrated Science and Social Studies (IPAS), which was measured using a questionnaire based on six indicators: enjoyment, attention, interest, learning engagement, task completion, and awareness of learning objectives.

Procedure

This study was conducted at SDN Pulo Gebang 03 Pagi during the second semester of the 2025/2026 academic year. The research was carried out over two meetings, with each class receiving two instructional sessions, and each treatment session lasted 2×35 minutes. At the end of the second meeting, following the completion of the treatment, a learning interest questionnaire was administered to the students. The research procedure consisted of three stages: preparation, implementation of the instructional treatment, and data collection.

The treatment administered to the experimental group involved the use of Genially-assisted digital Snakes and Ladders learning media. In the initial stage, the teacher facilitated students' learning by presenting instructional materials that had been systematically organized using Genially. The materials were delivered in an engaging, interactive, and contextual manner to help students develop their initial understanding before proceeding to the next learning activity. Subsequently, students participated in the digital Snakes and Ladders game in groups. During this stage, the teacher explained the game rules, turn-taking procedures, and how to respond to the questions presented at each step of the game. Each group actively participated in the game, in which every square on the digital Snakes and Ladders board contained challenges in the form of questions, as well as rewards or penalties.

In the control group, instruction was conducted using the ZepQuiz learning media. The lesson began with the teacher explaining the learning materials to all students. After the presentation, the teacher divided the students into four groups and explained the rules and procedures for playing ZepQuiz to ensure that all students understood the game mechanics before the activity began. The game was then played alternately by two groups selected to participate first. Before starting the game, each group representative played rock-paper-scissors to determine the order of play. The winning group was given the first opportunity to play the game and complete each challenge in the form of questions. Throughout the activity, students collaborated with their group members to discuss and answer each question until all groups had taken their turns. The use of ZepQuiz in the control group was based on methodological

considerations to maintain treatment equivalence between the two groups. ZepQuiz was selected because, like the Genially-assisted digital Snakes and Ladders learning media, it is a game-based digital instructional medium that promotes interactive learning and actively engages students. Therefore, both the experimental and control groups received comparable learning experiences through the use of digital technology.

Data Analysis

The data analysis technique employed in this study began with descriptive statistical analysis, which included the calculation of the mean as a measure of central tendency, the minimum and maximum values to describe the range of scores, as well as the median, mode, and standard deviation to indicate the level of data variability or dispersion. Subsequently, the assumptions for statistical analysis were tested using the *Shapiro–Wilk* normality test and *Levene's Test* of Homogeneity of Variance. According to [Muslimah et al., \(2026\)](#) the normality test is used to ensure that the data do not significantly deviate from a normal distribution, whereas the homogeneity test is conducted to verify that the variances between groups are equal. Both assumption tests were performed as prerequisites before conducting parametric analysis using the t-test. According to [Wahyudi et al., \(2023\)](#) the t-test is a parametric statistical analysis technique used to compare the means of two groups drawn from normally distributed populations. In this study, the parametric analysis employed the independent-samples t-test, which was used to compare the mean scores of two independent groups ([Indriyanti et al., 2025](#)). All data analyses were performed using IBM SPSS Statistics version 26, with a significance level set at α 0.05. The criteria for decision-making in the independent-samples t-test are as follows, When the significance value (Sig. (2-tailed)) is less than 0.05 ($p < 0.05$), the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted. Conversely, if the significance value (Sig. (2-tailed)) exceeds 0.05 ($p > 0.05$), the null hypothesis (H_0) is accepted, and the alternative hypothesis (H_1) is rejected.

RESULTS AND DISCUSSION

Results

Prior to conducting the study, the learning interest questionnaire was pilot-tested to determine the accuracy of the research instrument. The pilot instrument consisted of 30 questionnaire items. Subsequently, the instrument was evaluated for both validity and reliability. According to [Zayrin et al., \(2025\)](#) validity refers to the extent to which an instrument accurately measures the data that reflect the actual conditions intended to be investigated by the researcher. The validity test was conducted using the Product Moment correlation, by comparing the calculated correlation coefficient (r-value) with the critical r-table value, where $df = N - 2$ at a significance level of 5%. An item was considered valid and appropriate for use as a measurement instrument if its calculated r-value exceeded the corresponding r-table value.

Meanwhile, according to [Sugiyono \(2023\)](#) a reliable instrument is one that produces relatively consistent results when used repeatedly to measure the same object. An instrument is considered reliable if its Cronbach's Alpha coefficient is greater than

0.60. Therefore, an instrument with a Cronbach's Alpha value exceeding 0.60 is regarded as reliable or dependable (Forester et al., 2024). The instrument validity was assessed using the Product Moment correlation, whereas the instrument reliability was evaluated using *Cronbach's Alpha*. Based on Table 1, of the 30 questionnaire items, 24 were found to be valid, while 6 were identified as invalid. Therefore, a total of 24 questionnaire items were deemed valid and were subsequently used in this study.

Table 1. Instrument Validity Test

Description	Number of Istrument Item
Valid	24
Invalid	6

Table 2. Instrument Reliability Test

Cronbach's Alpha	Interpretation
0.849	Reliable

Based on Table 2, the reliability test results showed that the *Cronbach's Alpha* coefficient was 0.849, which exceeded the minimum acceptable threshold of 0.60. According to Forester et al., (2024), an instrument is considered reliable if its reliability coefficient is greater than 0.60. Therefore, it can be concluded that the instrument was reliable and suitable for use in this study.

Data Description

This descriptive analysis includes the calculation of the mean as a measure of central tendency, the minimum and maximum values to illustrate the range of scores, and the standard deviation to indicate the degree of variation or dispersion of the data. The data description was performed using SPSS version 26. The data description is presented in Table 3, as follows:

Table 3. Descriptive Statistics

Group	N	Min	Max	Median	Modus	Mean	Std. Deviation
Experimental	30	75	120	97.50	97	96.97	11.42
Control	30	69	117	92.00	77	90.67	10.57

In the experimental group, the learning process was conducted using the Genially-assisted digital Snakes and Ladders learning medium, whereas the control group received instruction using ZepQuiz. As presented in Table 3, the experimental group consisted of 30 students, with a minimum score of 75 and a maximum score of 120. The group obtained a mean score of 96.97, a median of 97.50, and a mode of 97, with a standard deviation of 11.42. Meanwhile, the control group also consisted of 30 students, with a minimum score of 69 and a maximum score of 117. The control group obtained a mean score of 90.67, a median of 92.00, and a mode of 77, with a standard deviation of 10.57.

These findings indicate that students in the experimental group who were taught using the Genially-assisted digital Snakes and Ladders learning medium demonstrated a higher mean learning interest score than those in the control group who were taught using ZepQuiz. In addition, the experimental group exhibited a slightly higher standard deviation than the control group, indicating greater variability in students' learning interest scores.

Normality Test

The normality test was conducted as one of the preliminary stages of data analysis to determine whether the data distribution in each research group followed a normal distribution. Normally distributed data are characterized by observations that are clustered around the mean value. Therefore, this test enables researchers to determine whether the data are normally distributed (Setyowati & Syafi, 2025). The analysis was performed using IBM SPSS Statistics version 26. The results of the posttest normality test for Classes IVB and IVC are presented in Table 4.

Table 4. Results of the *Shapiro-Wilk* Normality Test

Group	N	α	Sig.
Experimental	30	0.05	0.547
Control	30	0.05	0.412

Based on Table 4, the significance value (*Sig.*) for the experimental group was 0.547, while the control group obtained a significance value of 0.412. Since the significance values for both groups exceeded the 0.05 significance level ($0.547 > 0.05$ and $0.412 > 0.05$), it can be concluded that the posttest data for both the experimental and control groups were normally distributed.

Homogeneity Test

According to Nasar et al., (2024) the homogeneity test is a statistical procedure used to determine whether the variances of two or more groups are equal, thereby indicating whether the groups originate from populations with comparable levels of variability. The homogeneity test in this study was conducted using IBM SPSS Statistics version 26. The results are presented in Table 5.

Table 5. Result *Levene's* Test Homogeneity

Group	N	α	Sig.
Experimental	30	0.05	0.998
Control	30		

Based on the table above, the significance value (*Sig.*) obtained for both the experimental group and the control group was 0.998. This value is greater than the significance level of 0.05 ($0.998 > 0.05$). Therefore, it can be concluded that the posttest data variances of the experimental and control groups were homogeneous, indicating that the two groups have equal variances.

Independent Sample t-Test

Independent-samples t-test is a statistical procedure used to compare the mean scores of two independent groups. In the present study, the independent samples t-test was employed to determine whether there was a significant difference in students' learning interest between the experimental and control groups. The results of the independent-samples t-test are presented in Table 6.

Table 6. Independent Sample t-Test

F	Sig.	t-value	t-table	Df	Sig. (2-tailed)
0.000	0.998	2.217	2.001	58	0.031
		2.217			0.031

Based on the results presented in Table 6, the independent-samples t-test yielded a calculated t-value of 2.217, which exceeded the critical t-table value of 2.001 ($2.217 > 2.001$), with 58 degrees of freedom ($df = 58$). Furthermore, the obtained significance value (*Sig. 2-tailed*) was 0.031, which was lower than the significance level of 0.05. These findings indicate a statistically significant difference in students' learning interest between the experimental and control groups. Therefore, the null hypothesis (H_0) was rejected, and the alternative hypothesis (H_1) was accepted.

Effect Size Test

The effect size test was conducted to determine the magnitude of the treatment effect or the strength of the difference between the two groups. In this study, the effect size was measured using Cohen's d, a standardized measure of the difference between the means of two groups expressed in units of standard deviation. The results of the effect size analysis are presented in Table 7.

Table 7. Effect Size Test

Cohen's d Value	Interpretation
0.545	Medium

Based on the *Cohen's d* effect size analysis, the obtained effect size was 0.545, which falls within the moderate category. These findings indicate that the Genially-assisted digital Snakes and Ladders learning medium had a moderate effect on elementary school students' learning interest. Therefore, this instructional medium can be considered effective for implementation in elementary school classrooms.

DISCUSSION

The implementation of Genially-assisted digital Snakes and Ladders learning media in the experimental group created a more interactive and enjoyable learning environment than that of the control group. Throughout the learning activities, students not only waited for their turn to play but also actively participated in discussions, collaborated with their group members, and provided mutual support.

These findings are consistent with Piaget's Constructivist Theory, which posits that knowledge is actively constructed through individuals' interactions with their learning environment. Accordingly, students are not merely passive recipients of information but rather active agents who construct meaning through their learning experiences (Kurniawan & Darmawan, 2024). By creating an active learning environment, instructional media also serve as supporting tools in the learning process. Instructional media facilitate interaction between teachers and students, thereby promoting an engaging and enjoyable learning process (Pratama & Zasa, 2024).

The instructional media used in this study took the form of a digital Snakes and Ladders game designed with an attractive interface, which encouraged students to participate in the learning activities. Consistent with the findings of Elvadola et al., (2025) digital Snakes and Ladders learning media with an attractive design encourage students to interact more actively with their learning environment, thereby increasing their participation in the learning process. Similarly, According to Ristiani & Faturrahman (2026) found that digital Snakes and Ladders learning media are effective for implementation in elementary schools because their attractive design promotes interactive, collaborative, and student-centered learning, making them an innovative instructional medium for classroom use.

In addition to the aspect of knowledge construction developed by students, these findings are also related to students' psychological conditions during the learning process. The implementation of Genially-assisted digital Snakes and Ladders learning media in Class IVB (the experimental group) also created an enjoyable and non-monotonous learning environment, enabling students to feel comfortable and secure while actively participating in classroom activities. These findings are consistent with Abraham Maslow's Humanistic Theory, which posits that individuals are more likely to demonstrate interest and active engagement when their psychological needs, such as a sense of security, recognition, and enjoyable learning experiences, are fulfilled. Learning interest is shaped by psychological conditions that manifest in students' cognitive and emotional engagement, influenced by personal factors, the learning environment, and the quality of instruction (Wardah & Meilana, 2025).

This theoretical interpretation is supported by the findings of Rajab et al., (2023) who reported that the implementation of digital Snakes and Ladders learning media creates an enjoyable and engaging learning environment, thereby preventing students from becoming easily bored during learning activities. According to Devi et al., (2023) Snakes and Ladders learning media enhance students' enthusiasm for learning and increase their motivation to participate in classroom activities. These findings are also consistent with those of Rezkillah et al., (2026) who reported that digital Snakes and Ladders learning media are an effective instructional medium for teachers because they contribute positively to creating an enjoyable learning environment and encouraging students to participate more actively, which ultimately fosters their learning interest.

Similarly, According to Rahma et al., (2022) found that learning activities using Snakes and Ladders learning media created an enjoyable and entertaining classroom atmosphere, thereby enhancing students' learning interest. Furthermore, the findings of the present study support those of Wadud & Lailiyah (2024) who found that digital Snakes and Ladders learning media had a significant effect on students'

learning interest, with a calculated t-value of 3.699, a Sig. (2-tailed) value of $0.001 < 0.05$, and a mean difference of 5.650. These findings are further supported [Herdianti et al., \(2024\)](#) who reported that 82% of students expressed positive responses toward the use of digital Snakes and Ladders learning media because it created an enjoyable learning environment and encouraged active participation.

Based on the results of the data analysis, the mean score of students' learning interest in the experimental group was 96.96, whereas the control group obtained a mean score of 90.66. These results indicate that the mean learning interest score of students in the experimental group, which used Genially-assisted digital Snakes and Ladders learning media, was higher than that of the control group, which used ZepQuiz. Furthermore, hypothesis testing was conducted using the independent-samples t-test on both research groups. The analysis yielded a calculated t-value of 2.217 and a critical t-value of 2.001, indicating that the calculated t-value was greater than the critical t-value ($2.217 > 2.001$). In addition, the significance value (Sig. 2-tailed) was 0.031, with a significance level of 0.05. Since the significance value was lower than the predetermined significance level ($0.031 < 0.05$), H_0 was rejected and H_a was accepted. Therefore, it can be concluded that the use of Genially-assisted digital Snakes and Ladders learning media had a significant effect on improving students' learning interest in Natural and Social Sciences (IPAS) at the elementary school level.

Overall, the findings of this study suggest that the successful implementation of Genially-assisted digital Snakes and Ladders learning media requires adequate technological resources, effective time management, and the researcher's ability to manage game-based learning activities efficiently to ensure that the instructional process remains aligned with the intended learning objectives. Nevertheless, the findings demonstrate that the Genially-assisted digital Snakes and Ladders learning media can make a meaningful contribution as an instructional medium by providing an interactive, collaborative, and enjoyable learning experience, while simultaneously fostering students' learning interest in Natural and Social Sciences (IPAS) at the elementary school level.

CONCLUSION

This study demonstrates that the use of the Genially-assisted Digital Snakes and Ladders learning medium has a significant effect on students' learning interest in Integrated Science and Social Studies (IPAS) among fourth-grade elementary school students. The findings showed that the experimental group obtained a mean score of 96.96, whereas the control group obtained a mean score of 90.66. These results indicate that the experimental group achieved a higher mean learning interest score than the control group. Furthermore, the results of the Independent Samples t-test showed that the calculated t-value (2.217) was higher than the t-table value (2.001), with a significance value (Sig. 2-tailed) of 0.031, which was lower than 0.05 ($p = 0.031 < 0.05$). These results indicate a statistically significant difference between the two groups. Practically, the findings show that the Genially-assisted Digital Snakes and Ladders learning medium can serve as an alternative instructional medium for IPAS in elementary schools that supports student-centered learning, increases active

participation, and fosters learning interest through an interactive and enjoyable learning environment. This study also provides empirical contributions to the development of gamification-based digital instructional media, particularly in elementary IPAS learning, by demonstrating that the use of this medium can support students' affective outcomes in the form of learning interest. However, this study has limitations regarding its relatively limited implementation duration and sample size, which involved only 60 students from two classes, meaning that the findings cannot yet be widely generalized. Therefore, future research is recommended to involve larger and more diverse samples and to examine the effectiveness of the medium on other variables, such as learning outcomes, learning motivation, and critical thinking skills, as well as in different subjects while maintaining effective classroom management.

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