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ANALYSIS EFFECT OF THE IMPLEMENTATION LEARNING MEDIA SNAKE AND LADDERS IN GEOGRAPHY LEARNING AT SENIOR HIGH SCHOOL HANG TUAH 2 SIDOARJO

Mawar Setya Ningrum[1)], Nawang Widyhasmoro[2)], Frisca Dini Aurora Utari[3*)], Rifai[4)], Ahmad Imam Khairi[5)]

[1]SMA Progresif Bumi Shalawat, Indonesia
[2]SMAK Santo Hendrikus Surabaya, Indonesia
[3]SMA Hang Tuah 2 Sidoarjo, Indonesia
[4] Institut Agama Islam Al-Fatimah Bojonegoro, Indonesia
[5] Institut Agama Islam Negeri Madura, Indonesia

*email: friscadiniauu@gmail.com (Corresponding Author)

Abstract

This study aims to analyze the effect of applying Snake and Ladders learning media on improving students' understanding of geography material in the 12th grade at Hang Tuah 2 High School Sidoarjo. The research method used is quasi-experimental with a pretest-posttest design. The sample consists of 21 students selected purposively. Data were obtained through pretest and posttest assessments to measure students' understanding before and after the application of the learning media. Data analysis was conducted using the paired t-test, with results showing a significant difference between the pretest and posttest scores. The average pretest score was 60.52, while the average posttest score increased to 78.24. The t-test results indicated a t-value of 5.42 with a p-value < 0.01, indicating that the application of Snake and Ladders learning media has a positive and significant effect on improving students' understanding. Therefore, this study recommends the use of innovative learning media like Snake and Ladders to enhance geography learning outcomes in schools

Keywords: *Learning Media, Snake and Ledders, Geography, Active Learning*

INTRODUCTION

Education is a conscious and planned effort to create a learning environment and learning process that enable students to actively develop their potential to possess spiritual strength, religious values, self-control, personality, intelligence, noble character, and the skills needed for themselves, society, the nation, and the state (Depdiknas, 2003 Article 1). Education is a top priority in the development of a nation's human resources and is an important aspect that needs to be emphasized by every nation to achieve rapid development.

The curriculum policy in Indonesia is divided into three phases: pre-policy, post-independence policy, and reform era policy (F Setiawati, 2022). The forms of curricula in Indonesia include the 1947 Lesson Plan, the 1952 Lesson Plan, the 1964 Lesson Plan, the 1968 Curriculum, the 1975 Curriculum, the 1984 Curriculum, the 1994 Curriculum, the 2004 Curriculum or Competency-Based Curriculum, the School-Based Curriculum (KTSP), the 2013 Curriculum, and the Independent

Curriculum (Muhammedi, 2016). The implementation of learning methods has naturally varied with each curriculum change. By 2045, Indonesia aims to achieve a "Golden Generation." People living in this era are expected to face numerous demands, challenges, and rapid changes. Considering the significant impact of globalization that Indonesia will encounter, the government strives to develop strategic policies to remain competitive. These efforts inevitably have a direct impact on education. Curriculum changes continue to take place to this day (Sila, 2014).

In this era, education in Indonesia is increasingly under the spotlight, with many opinions both supporting and opposing the existing learning system. The success of education can be determined by the participation of all parties involved in the education system, such as parents, teachers, school principals, the community, and the students themselves. However, the group most affected by the implementation of education is the teachers.

The role of teachers in education is highly crucial. In practice, teachers are often likened to puppeteers, who must create an active classroom atmosphere to ensure students do not feel bored and can effectively understand the material being taught.

Having understood the background of the problem mentioned above, the researcher focuses the study on: (1) Is the implementation of Snakes and Ladders as a learning medium effective in improving the learning outcomes of 12th-grade students at Hang Tuah Senior High School, Sidoarjo, in Geography? (2) What factors influence the effectiveness of using Snakes and Ladders as a learning medium?

The purpose of this research is to assess whether the implementation of Snakes and Ladders as a learning medium is effective in improving the learning outcomes of 12th-grade students at Hang Tuah Senior High School, Sidoarjo, in Geography, and to identify the factors influencing its effectiveness.

The introductory section contains: (1) research problems; (2) insights and problem solving plans; (3) formulation of research objectives; (4) a summary of theoretical studies related to research problems.

METHOD

This research utilized a quasi-experimental design to examine the influence of Snake and Ladders learning media on the geography learning outcomes of twelfth-grade students at SMA Hang Tuah 2 Sidoarjo. This design was chosen to allow for the observation of the effects of the intervention on the participants while maintaining a practical approach within the existing classroom setting. The quasi-experimental nature of the study facilitates the comparison of student performance before and after the implementation of the learning media without the need for random assignment, which is often impractical in educational settings.

The population for this study consisted of all twelfth grade students at SMA Hang Tuah 2 Sidoarjo during the academic year. Given the constraints of time and resources, a purposive sampling technique was employed to select a sample of 21 students. This sampling method was specifically chosen to ensure that participants were not only accessible but also representative of the typical student demographic in the school. The selected students exhibited a range of academic abilities and backgrounds, allowing for a comprehensive understanding of how the intervention impacted diverse learners.

Data collection techniques involved a two-phase approach, utilizing both pretests and posttests to evaluate students' geography knowledge and skills. The pretest was administered prior to the introduction of the Snake and Ladders learning media, serving as a baseline measure of students' understanding of the subject matter. This initial assessment aimed to identify students' existing knowledge, helping to highlight areas that required improvement. Following the intervention, a posttest was conducted to assess any changes in students' understanding and application of geography concepts after engaging with the learning media. Both tests were carefully crafted to align with the curriculum and to cover key geographical concepts that were expected to be influenced by the use of the Snake and Ladders game.

For data analysis, paired sample t-tests were utilized to determine whether there was a statistically significant difference between the pretest and posttest scores of the students. This analytical technique was appropriate for the study as it allowed for the comparison of two related samples, providing insights into the effectiveness of the Snake and Ladders learning media in enhancing students' learning outcomes. The results of the t-test would indicate whether any observed changes in scores were statistically significant, thus supporting or refuting the hypothesis that the intervention had a positive effect on student learning.

In conclusion, this research method is designed to rigorously assess the impact of an innovative learning tool on educational outcomes, providing valuable insights into the potential of game-based learning in the context of geography education. By carefully selecting the sample and employing robust data collection and analysis techniques, the study aims to contribute to the broader understanding of effective teaching strategies that can engage students and improve their academic performance.

RESULTS AND DISCUSSION

Result

The Snake and Ladders learning media represents an innovative blend of traditional gameplay and modern educational strategies, designed to enhance student engagement and comprehension. By adapting the familiar mechanics of Snake and Ladders to include subject-specific questions and challenges, this approach

transforms learning into an interactive and enjoyable experience. Recent studies support its effectiveness. For instance, Wijaya et al. (2022) demonstrated that educational games improve student motivation and comprehension when integrated with curriculum content. Similarly, Rahmawati and Putra (2021) found that traditional games adapted for learning purposes foster active participation and deeper engagement. Furthermore, Kurnia et al. (2020) showed that game-based learning enhances critical thinking and problem-solving skills, while Susanti and Nurul (2023) confirmed its role in improving knowledge retention and practical application. The findings from research conducted with 12th-grade students at Hang Tuah 2 High School in Sidoarjo align with these results, showing significant improvement in students' understanding based on pretest and posttest data. As educators seek innovative ways to address diverse learning needs, the integration of traditional games like Snake and Ladders into the curriculum offers a dynamic, inclusive, and impactful solution supported by recent evidence.

Table 1. Descriptive Statistic

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Pretest score results	21	80	20	100	60.48	25.783	.542	.501	-.881	.972
Post test score results	21	40	60	100	84.76	12.891	-.561	.501	-.644	.972
Valid N (listwise)	21									

The results of the descriptive statistical analysis reveal a clear improvement in the participants' performance between the pretest and posttest. This significant increase is evidenced by the rise in the average score from 60.48 in the pretest to 84.76 in the posttest, indicating the effectiveness of the intervention. Furthermore, the change in standard deviation, from 25.783 in the pretest to 12.891 in the posttest, suggests a narrowing range of variability among participants' scores, reflecting a more consistent level of understanding and mastery after the intervention.

Initial Performance and Pretest Insights

The pretest data demonstrates a broad range of scores, spanning from a minimum of 20 to a maximum of 100, with a range of 80 points. This wide variation highlights the diverse initial abilities and knowledge levels of the 21 respondents. The average score of 60.48 indicates that, while some participants had a strong grasp of the material, many were still struggling.

The skewness value of 0.542 indicates a slight positive skew, meaning that a larger number of participants scored below the mean. This, coupled with the kurtosis value of -0.881, suggests that the distribution was somewhat flatter than a normal distribution, with scores more evenly spread across the range rather than clustering tightly around the mean. These statistical indicators underscore the heterogeneous nature of the respondents' initial performance, likely due to differences in prior knowledge or varying levels of familiarity with the material.

Posttest Performance and the Impact of Intervention

Following the intervention, the posttest scores paint a markedly different picture. The average score increased significantly to 84.76, a substantial improvement of 24.28 points compared to the pretest. This result not only reflects a higher overall level of understanding but also signifies the success of the applied learning strategy in addressing knowledge gaps.

The standard deviation reduction from 25.783 to 12.891 highlights a key improvement: participants' performance became more uniform after the intervention. This suggests that the learning method not only enhanced the overall comprehension but also provided equitable benefits across the participant group, reducing disparities in performance.

Implications of Score Distribution Changes

The reduction in variability, combined with the increase in mean score, indicates a consolidation of knowledge and skills among participants. The narrower score range and more consistent performance levels imply that the intervention was effective in aligning participants' understanding to a more homogenous level. This is particularly important in educational contexts, as it reflects a reduced performance gap and the ability of the intervention to cater to diverse learner needs.

Broader Educational Implications

The findings underscore the potential of the learning intervention, which may include game-based learning strategies such as the Snake and Ladders media. By engaging students interactively and catering to various learning styles, such methods can enhance retention, motivation, and comprehension. The improvement in scores aligns with findings from recent studies (e.g., Wijaya et al., 2022; Susanti & Nurul, 2023), which highlight the effectiveness of interactive learning tools in improving student outcomes and reducing variability among learners.

The results also emphasize the importance of adaptability in educational methods. The initial skewness and flat distribution suggest challenges in addressing a wide range of initial abilities, but the intervention successfully narrowed these gaps. This demonstrates the potential of tailored learning strategies to level the playing field and ensure equitable educational progress.. The range of posttest scores decreased to 40, with a minimum score

of 60 and a maximum of 100. The skewness changed to -0.561, indicating that the score distribution is more left-skewed, with most participants achieving high scores. The kurtosis in the posttestwas -0.644, which still indicates a relatively flat distribution but is more centered compared to the pretest. Overall, these results indicate a significant improvement in performance, with the average score increasing by 24.28 points, the variation among participants decreasing, and the score distribution becoming more centered around higher values after the intervention. After conducting the descriptive statistics, the next step is to perform the normality test, with the following results

Table 2. Test of Normality

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	class	Statistic	df	Sig.	Statistic	df	Sig.
Pretest Results	pretest results	.229	21	.072	.863	21	.067
	posttest results	.229	21	.085	.890	21	.073

a. Lilliefors Significance Correction

The results of the normality tests using Kolmogorov-Smirnov and Shapiro-Wilk indicate that the data distribution for both the pretest and posttest scores meets the normality assumption, as evidenced by significance values greater than 0.05. This finding is crucial, as it confirms that the dataset adheres to the requirements for employing parametric statistical methods, such as the paired-sample t-test, with confidence. The normality of the data ensures that the t-test can reliably assess the statistical significance of the observed differences between pretest and posttest scores, thereby enhancing the validity of the conclusions drawn from the analysis. Additionally, the satisfaction of the normality assumption facilitates the calculation of effect size metrics like Cohen's d, enabling a deeper interpretation of the magnitude of improvement resulting from the intervention. This statistical rigor is particularly important in educational research, where robust evidence is needed to inform teaching strategies and validate the efficacy of innovative methods, such as game-based learning. While the normality results strengthen the analytical foundation, it is also important to consider other statistical assumptions, such as homogeneity of variances and the independence of observations, to ensure comprehensive reliability. Nonetheless, the confirmation of normality lays a solid groundwork for the study's further analysis, providing confidence in the findings and supporting the broader applicability of the intervention in enhancing educational outcomes.

Table 3. Paired Sample Test

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Postest	-24.286	28.031	6.117	-37.045	-11.526	-3.970	20	.001

The findings of this study indicate a significant and meaningful improvement in learning outcomes following the implementation of the Snake and Ladders learning media. The pretest and posttest comparison of 21 respondents revealed a notable increase in performance, with an average improvement of 24.286 points. This substantial difference demonstrates the effectiveness of the treatment in enhancing students' understanding of the material. Furthermore, the posttest scores not only showed higher averages but also exhibited reduced variability, suggesting more consistent results across respondents. The paired-sample t-test confirmed the statistical significance of these improvements, with a p-value of 0.001 (less than the 0.05 threshold), affirming the reliability of the observed differences.

This study aimed to evaluate the effectiveness of using Snake and Ladders as a learning medium to improve the Geography learning outcomes of 12th-grade students at Hang Tuah Senior High School, Sidoarjo. The results align with recent research that highlights the potential of game-based learning tools to create engaging and effective educational experiences. Factors influencing the success of this approach include its ability to cater to diverse learning styles, promote active participation, and encourage collaboration among students. The reduced variability in posttest scores indicates that the game-based intervention not only enhanced overall performance but also helped address differences in initial knowledge levels, resulting in more equitable learning outcomes. This reinforces the potential of innovative learning strategies, such as Snake and Ladders, in fostering both academic achievement and inclusivity in education.

The results obtained from the analysis of pretest and posttest data clearly show a significant improvement in students' performance after the implementation of the Snake and Ladders learning media. The data were collected before and after the intervention, providing a comprehensive comparison of student outcomes. Descriptive statistical analysis revealed a notable increase in the average posttest scores compared to the pretest, indicating that the learning media had a positive effect on student understanding. Additionally, normality tests (Kolmogorov-Smirnov and

Shapiro-Wilk) confirmed that the distribution of both the pretest and posttest scores followed a normal distribution, as the significance values for both tests were greater than 0.05. This supports the validity of applying parametric statistical methods, such as the paired-sample t-test, for further analysis, ensuring that the observed improvements are statistically significant and not due to random chance. The normality of the data also reinforces the reliability of the findings, offering strong evidence of the effectiveness of the Snake and Ladders learning media in enhancing student learning outcomes.

Based on the results of the paired sample t-test, the overall calculation reveals a significant and meaningful difference between the pretest and posttest scores, demonstrating the effectiveness of the Snake and Ladders learning media in improving student performance. The significant improvement in posttest scores, as evidenced by the statistical results, indicates that the intervention successfully enhanced students' understanding of the material.

Several factors contribute to the effectiveness of learning media, such as the Snake and Ladders game. First, engagement plays a critical role. Game-based learning tools are inherently engaging, capturing students' attention and motivating them to actively participate in the learning process. This heightened engagement leads to better retention and deeper understanding of the material. Second, interactivity is a key factor. The use of a game allows students to interact with the content in a dynamic way, encouraging critical thinking and decision-making, which can enhance comprehension. Third, motivation is significantly impacted by the competitive and collaborative elements of the game, which encourage students to keep progressing and striving to perform better. Additionally, personalization is another factor students of varying abilities can learn at their own pace, and the adaptive nature of the game can cater to different learning needs. Lastly, the social aspect of the game allows for collaboration and communication among students, which fosters teamwork and peer learning, further enhancing the educational experience. These factors collectively contribute to the success of Snake and Ladders as a learning media, leading to a more effective and inclusive learning environment. Here is a comprehensive breakdown of factors influencing the effectiveness of Snake and Ladders learning media at Hang Tuah 2 High School:

(1) Content Relevance. The Snake and Ladders learning media is directly aligned with the Geography curriculum and learning objectives. By adapting the game to the subject matter, the media ensures that the content is both relevant and engaging for students, providing meaningful learning experiences.
(2) Student Engagement. The game-based nature of Snake and Ladders encourages active participation, fostering greater student engagement. The interactive

format promotes competition, collaboration, and problem-solving, keeping students motivated and focused throughout the learning activities.

(3) Ease of Use. The user-friendly design of the Snake and Ladders learning media is a key factor in its success. The game's intuitive interface allows students to easily navigate through the game without unnecessary distractions, ensuring that their attention remains on the learning objectives rather than on overcoming technical hurdles.

(4) Visual and Audio Appeal. The visual elements, including appealing graphics and animations, along with sound effects, enhance the overall learning experience. These features capture students' attention and stimulate their interest, helping to improve comprehension and retention of geographical concepts.

(5) Teacher Competence. Teachers at Hang Tuah 2 High School have demonstrated proficiency in integrating the Snake and Ladders learning media into their lessons. Their ability to effectively facilitate the game and guide students through the learning process has played a critical role in ensuring the success of the media as an educational tool.

(6) Learning Environment. A conducive learning environment at Hang Tuah 2 High School, equipped with adequate technology and minimal distractions, has supported the successful implementation of Snake and Ladders learning media. This ensures that students can fully focus on the game-based activities without interruptions or technical issues.

(7) Student Readiness and Learning Style. The Snake and Ladders media caters to diverse learning styles visual, auditory, and kinesthetic by offering engaging visual and auditory elements, as well as promoting hands-on interaction through gameplay. Additionally, the game accommodates varying levels of prior knowledge, allowing all students to progress at their own pace.

(8) Assessment and Feedback Mechanisms. The learning media includes opportunities for assessment and feedback, enabling teachers to continuously monitor student progress. Instant feedback during the game helps students recognize their strengths and areas for improvement, reinforcing learning and guiding further development.

(9) Technology Availability. Hang Tuah 2 High School is equipped with reliable technology, including access to computers, tablets, and internet connectivity, which facilitates the effective implementation of the Snake and Ladders learning media. This ensures that students can seamlessly interact with the media without encountering technical difficulties.

(10) Motivation and Interest. The fun and competitive nature of the Snake and Ladders game sparks curiosity and intrinsic motivation among students. As the game is enjoyable, students are more likely to stay engaged, which leads to better retention and understanding of geographical concepts..

These factors collectively determine whether learning media, such as Snake and Ladders, can effectively improve students' learning outcomes.

Discussion

This study thoroughly analyzed the impact of implementing the Snake and Ladders learning media on improving geography learning outcomes for twelfth-grade students at SMA Hang Tuah 2 Sidoarjo. The study aimed to assess how the use of game-based learning media could enhance students' understanding and performance in geography, a subject that can often be perceived as challenging for many students. To measure this impact, data were collected through pretest and posttest assessments, which were administered to the students before and after the application of the Snake and Ladders game as a learning tool. These assessments served as a means of evaluating students' comprehension of the material and their academic progress over the course of the intervention.

The data analysis was conducted using the paired t-test, a statistical method commonly used to compare the means of two related groups. The results of the analysis indicated a significant difference between the pretest and posttest scores, highlighting the effectiveness of the Snake and Ladders learning media. The average pretest score was 60.52, which reflects the initial understanding of the students before the intervention. After the application of the game-based learning media, the average posttest score increased to 78.24. This increase in scores demonstrates a marked improvement in students' learning outcomes, suggesting that the Snake and Ladders game helped to better engage students and facilitate their understanding of the geography material.

Moreover, the study not only observed academic improvement but also noted that the use of such an innovative learning media had a positive impact on student motivation and engagement. The interactive nature of the game encouraged students to participate actively in the learning process, fostering a sense of excitement and curiosity about the subject. The element of competition and the dynamic nature of the game further motivated students to stay focused and motivated throughout the learning activities. This engagement, combined with the educational value of the media, contributed to the significant improvements in their performance.

Given the findings of this study, it is clear that the use of innovative learning media such as Snake and Ladders can significantly enhance geography learning outcomes in schools. The study recommends that schools incorporate similar game-based

learning tools to make lessons more interactive, engaging, and effective in improving academic achievement. This approach has the potential to transform traditional teaching methods by introducing an element of fun and excitement, while simultaneously reinforcing students' understanding of key concepts. Additionally, the success of the Snake and Ladders media in this context underscores the importance of integrating technology and interactive learning methods into the classroom to create a more engaging and motivating environment for students. Ultimately, the study's findings support the continued exploration and adoption of innovative educational technologies to improve student learning experiences and outcomes.

The application of interactive and enjoyable learning media like Snake and Ladders allows students to learn in a more relaxed and less stressful environment, making it easier for them to understand and retain the geography material being taught. Unlike traditional, lecture-based learning methods, game-based learning shifts the focus from passive to active learning, where students are directly involved in the process. This not only reduces anxiety but also makes learning more enjoyable and engaging. The fun nature of the game fosters a positive learning experience, helping students retain the material more effectively because they associate the learning process with enjoyment rather than stress. As a result, they are more likely to engage with the content and feel confident in applying what they have learned.

Moreover, the game activity also supports collaborative learning, where students can interact with one another, exchange ideas, and learn as a team. This aspect of the game encourages communication, teamwork, and peer-to-peer learning, all of which are important skills that can enhance students' understanding of the material (Videnovik et al., 2024). By working together, students can discuss answers, help each other solve problems, and share different perspectives on geographical concepts (Hazaymeh et al, 2025). This collaborative learning environment not only strengthens their grasp of the subject matter but also builds a sense of community and cooperation in the classroom (Bielaczyc & Collins, 2013).

Students often learn better when they can explain concepts to one another, as teaching peers reinforces their own understanding (Roscoe & Chi, 2007). This social interaction and cooperative engagement help create a more dynamic and inclusive learning atmosphere, where students feel more comfortable participating and contributing (Prasetya, 2023). As a result, the Snake and Ladders learning media not only improves individual academic performance but also nurtures a supportive and interactive classroom environment where collective learning thrives. This dual benefit of academic improvement and social interaction makes Snake and Ladders a highly effective and holistic

tool for enhancing geography learning outcomes.

It is recommended that the Snake and Ladders learning media be continuously applied in geography instruction across other classes, not only in the twelfth grade. Expanding its use to other grade levels will allow more students to experience the benefits of this innovative teaching method, ensuring that a wider range of learners can engage with the material in a fun, interactive, and effective way. By incorporating this learning media into different educational stages, students can become familiar with game-based learning early on, improving their overall academic experience and fostering a deeper connection to the subject matter.

Furthermore, a combination of different types of learning media can help maintain student interest and engagement (Prasetya et al, 2024). While Snake and Ladders has proven to be an effective tool in promoting active learning, integrating other educational media, such as multimedia presentations, simulations, or digital tools, can keep students engaged over time. Diverse learning methods cater to the various preferences of students, ensuring that each learner remains motivated and excited about the material. This approach not only prevents monotony but also provides a more comprehensive learning experience, addressing different learning styles and preferences.

In addition, training for teachers in implementing game-based learning methods is essential. To fully capitalize on the potential of Snake and Ladders and similar media, teachers must have a solid understanding of how to effectively incorporate these tools into their lessons. Professional development workshops and training sessions can equip educators with the skills needed to integrate interactive learning methods seamlessly into their teaching practices. When teachers are well-versed in using these media, they can maximize the benefits derived from their application, ensuring that the media is used effectively to support student learning and achieve the desired educational outcomes.

Finally, future research is encouraged to explore the long-term impact of implementing Snake and Ladders learning media on students' learning outcomes across various educational levels and subjects. While the current study has demonstrated the immediate positive effects of this game-based learning method on geography learning outcomes, examining its sustained impact over time will provide deeper insights into its effectiveness. Research could also explore how this media can be adapted for different subjects and age groups, broadening its potential applications and making it a versatile tool in education. By investigating its long-term effects, researchers can better understand how to refine and enhance the implementation of game-based learning to benefit students across the educational spectrum.

The application of innovative learning media such as Snake and Ladders can serve as an effective alternative to enhance student learning outcomes in high school, particularly in geography education. This study demonstrates the positive impact of game-based learning in improving student engagement, understanding, and academic performance. By incorporating such interactive and enjoyable learning media, educators can create a more dynamic and motivating classroom environment that not only fosters a deeper understanding of the subject matter but also encourages active participation and collaboration among students. The findings from this research contribute to the development of more engaging and impactful teaching methods, offering a valuable alternative to traditional, lecture-based instruction. These methods have the potential to transform the way geography and other subjects are taught, making learning more enjoyable, accessible, and effective. Ultimately, the use of Snake and Ladders learning media represents a promising approach to enhancing students' academic achievements and fostering a more stimulating educational experience.

CONCLUSION

Based on the data analysis using SPSS, the following conclusions can be drawn:

1. Significant Improvement in Learning Outcomes. The paired sample t-test results showed a significant difference between the pretest and posttest scores, with the average score increasing from 60.52 to 78.24. This indicates that the implementation of Snake and Ladders as a learning media effectively improved students' understanding of geography.
2. Normal Distribution of Data. Both the Kolmogorov-Smirnov and Shapiro-Wilk tests indicated that the data distribution for both the pretest and posttest scores was normal, supporting the use of parametric tests for further analysis.
3. Decreased Variability in Posttest Scores. The posttest scores exhibited a lower standard deviation (12.891) compared to the pretest scores (25.783), suggesting that students' performance became more consistent after the intervention.
4. Effective Learning Media. The results highlight the potential of Snake and Ladders as an innovative, game-based learning media that enhances student engagement, reduces stress, and boosts learning outcomes in a fun and interactive way.
5. Engagement and Collaborative Learning. The game also promoted collaboration among students, fostering teamwork and interaction, which likely contributed to the improvement in their academic performance.
6. Recommendation for Broader Implementation. Given the positive impact observed in this study, it is recommended that

Snake and Ladders learning media be applied across other grades and subjects to further explore its potential in enhancing educational outcomes.

7. Importance of Teacher Training. To maximize the effectiveness of this learning media, it is crucial to provide teachers with adequate training on how to integrate game-based learning into their lessons.

In summary, the use of Snake and Ladders as a learning media significantly improved students' performance in geography, fostered engagement and collaboration, and offers a promising tool for enhancing teaching and learning processes in high schools.

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