

RESEARCH ARTICLE

Digital snake-and-ladder game for promoting learning independence and critical thinking in Pancasila Education

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ABSTRACT

Background: Pancasila Education requires learning experiences that provide students with opportunities to participate actively, develop learning independence, and strengthen critical thinking. However, classroom practices that remain predominantly teacher-centered may limit students' opportunities to learn independently and engage critically with Pancasila-related concepts.

Purpose: This study aimed to examine the effect of a Game-Based Learning approach supported by a digital Snake-and-Ladder game on students' learning independence and critical thinking skills in Pancasila Education.

Method: A quantitative approach with a quasi-experimental pretest-posttest control group design was employed. The participants were 56 seventh-grade students at SMPN 2 Kamal, consisting of 28 students in the experimental group (VII-A) and 28 students in the control group (VII-B). Data were collected using a learning independence questionnaire and a critical thinking skills test. Data analysis included normality and homogeneity tests, followed by an independent-samples t-test to examine differences between the groups.

Findings: The pretest results indicated no significant difference in the initial abilities of the two groups. Following the intervention, the experimental group obtained a higher mean learning independence score (50.50) than the control group (32.79), with $p < 0.001$. The experimental group also achieved a higher mean critical thinking score (89.32) than the control group (68.61), with $p < 0.001$.

Implication: These findings indicate that the integration of Game-Based Learning with a digital Snake-and-Ladder game can effectively support the development of learning independence and critical thinking skills in Pancasila Education.

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INTRODUCTION

Pancasila education should not be limited to memorizing the principles, symbols, or examples of normative behavior; instead, Pancasila education must guide students toward

reasoning processes, decision-making, action evaluation, and personal responsibility in real-world scenarios (Santoso, 2020). As a result, proficiency in critical thinking and self-reliance are two vital skills important for the learning process when it comes to implementing Pancasila values (Bustomi et al., 2025; Fitriasaki & Masyitoh, 2020).

The main ongoing challenge in Pancasila Education learning is the inconsistency between the curriculum's emphasis on value application and learning practices, which continue to be dominated by a teacher-centered and informative approach (Sandi Arifin et al., 2023). In lecture-dominated learning, students are frequently positioned as passive information consumers rather than as active participants who analyze moral dilemmas, formulate arguments, and reach conclusions (Saryono et al., 2022). On the contrary, the content regarding the use of Pancasila values is relevant to the situation, as it relates to everyday issues faced by students, including cooperation, justice, tolerance, responsibility, deliberation, and social concern (Octavia & Tirtoni, 2024; Wika Alzana et al., 2021). Learning strategies that allow students to experience, discuss, choose, reason, accept consequences, and reflect on decisions are essential when dealing with such material (Jayanti et al., 2023; Kandia et al., 2026). When linked to students' literacy and thinking skills achievements, the need for learning that encourages critical thinking becomes clearer. Within the scope of digital citizenship teaching, UNESCO highlights the significance of teaching methods that improve ethical choices and critical analysis in the online world (Hartati et al., 2025).

Initial studies at SMPN 2 Kamal emphasize this urgency. The teaching of Pancasila Education regarding the application of Pancasila values shows symptoms such as students being less active in asking questions, not daring to express opinions, relying on teacher instructions, and being unable to provide logical reasons for their choices, as indicated by the initial observation results. The initial observations indicate that students are classified as low-level learners in terms of learning independence, especially in the areas of learning initiative, task completion responsibility, learning strategy organization, and self-evaluation. Learners have not achieved a satisfactory standard in the measures of problem assessment, providing reasons, evaluating alternative actions, and drawing conclusions, according to initial data on critical thinking skills. These preliminary results suggest that the issues with learning stem not just from poor academic achievement but also from insufficient learning opportunities that can nurture students' critical thinking abilities and autonomy at the same time.

One of the pertinent solutions to this problem is game-based learning. Mao et al. (2022) demonstrated through meta-analysis that game-based learning improves students' critical thinking skills. Furthermore, when created in accordance with learning objectives, gamification and game-based learning can improve critical thinking abilities, motivation, engagement, and learning behaviors, according to (Sailer & Homner 2020). This

demonstrates that games should be seen as learning environments that incorporate objectives, rules, challenges, feedback, consequences, and reflection rather than just as entertainment (Bai et al., 2020; Zainuddin et al., 2020).

In addition to improving critical thinking abilities, game-based learning can help students become more independent learners (Anastasiadis et al., 2018). Learning independence is the capacity of students to independently organize, oversee, and assess their educational journey, empowering them to assume accountability for accomplishing their learning goals (Theobald, 2021). The integration of digital games with support for learning independence strategies can enhance students' motivation, self-efficacy, engagement, and ability to manage their learning processes (Dorit, 2023; Faza & Lestari, 2025; Noriega Cortes & Carreño-Bolivar, 2024). These results are significant because the development of learning independence does not solely depend on task assignments; rather, it is shaped thru learning experiences that require reflection, strategy, choice, and responsibility (Lampropoulos & Sidiropoulos, 2024).

Because of its simplicity, familiarity, competition, and ease of adaption to value-based learning media, digital snakes and ladders media fits the traits of seventh-grade pupils (Rahayuningtyas & Ningtyas, 2023). Each game package can contain questions, case studies, moral dilemmas, discussion challenges, or reflective activities directly associated with the implementation of Pancasila values (Setyaningsih & Arini, 2025). Snakes can represent the negative consequences of behavior that contradicts the values of Pancasila, while the ladder mechanism can represent the positive consequences of behavior that aligns with those values (Kusuma Wardani et al., 2025). As a result, digital snakes and ladders not only serve as a platform for practice questions but also as a value-based learning simulation that motivates students to reflect, choose, debate, and evaluate their actions (Hanifah & Sukartono, 2024).

The usefulness of game-based learning as a pedagogical approach is consistently supported by existing research, yet there are still gaps in this area. First of all, most research focuses on critical thinking skills, motivation, or student engagement, without simultaneously evaluating learning independence and critical thinking. The second point is that research on game-based learning has primarily been conducted in subjects such as science, mathematics, language, and digital citizenship, while there is still a lack of research on Pancasila Junior secondary education. Since studies on this subject often concentrate on media development or cognitive critical thinking abilities, the impacts of the digital Snakes and Ladders game have not been thoroughly examined using quasi-experimental designs with control groups. This study is novel in that it combines a game-based learning model with digital snakes and ladders to assess how it affects seventh-grade junior secondary students' independence and critical thinking abilities in the context of implementing

Pancasila principles. In the context of implementing Pancasila ideals, this study attempts to investigate how a game-based learning paradigm, enabled by digital snakes and ladders, affects seventh-grade junior high school students' critical thinking abilities and learning independence. The research was conducted at SMPN 2 Kamal using a quasi-experimental pretest–posttest control group approach. Based on the research objectives, this study addresses two specific research questions: (1) Does the Game-Based Learning model supported by a digital Snake-and-Ladder game significantly affect the learning independence of seventh-grade students in Pancasila Education? (2) Does the Game-Based Learning model supported by a digital Snake-and-Ladder game significantly affect the critical thinking skills of seventh-grade students in Pancasila Education?

Accordingly, two hypotheses were formulated. H1: There is a significant difference in learning independence between seventh-grade students who learn Pancasila Education through the Game-Based Learning model supported by a digital Snake-and-Ladder game and those who receive conventional learning. H2: There is a significant difference in critical thinking skills between seventh-grade students who learn Pancasila Education through the Game-Based Learning model supported by a digital Snake-and-Ladder game and those who receive conventional learning.

The study involved 56 seventh-grade students at SMPN 2 Kamal. Twenty-eight students from Class VII-A were assigned to the experimental group, while 28 students from Class VII-B were assigned to the control group. The hypotheses were tested by comparing the posttest scores of the two groups using an independent-samples t-test, following tests of normality and homogeneity.

METHODS

This study employed a quantitative approach with a quasi-experimental pretest–posttest control group design. This design was selected because the study aimed to examine the effectiveness of the Game-Based Learning (GBL) model supported by a digital Snake-and-Ladder game in improving students' critical thinking skills and learning independence in Pancasila Education. The research questions and hypotheses required a comparison between students who received the GBL intervention and those who experienced conventional learning, both before and after the learning process. The pretest was administered to identify the initial condition of the two groups, while the posttest was used to examine changes following the intervention. The inclusion of a control group also provided a basis for determining whether differences in the outcomes were associated with the learning intervention rather than merely reflecting students' initial differences. This design was considered appropriate because the study was conducted in existing classes,

where random assignment of individual students to experimental and control groups was not feasible.

The study was conducted during the second semester of the 2025–2026 academic year at SMP Negeri 2 Kamal, Bangkalan Regency, East Java. The research examined two dependent variables, namely students' critical thinking skills and learning independence, with the Game-Based Learning model supported by a digital Snake-and-Ladder game serving as the intervention.

Every seventh-grader from SMP Negeri 2 Kamal made up the study population. The study sample was chosen using a purposive sampling strategy based on the comparability of students' academic attributes and class size. 28 students from Class VII-A were assigned to the experimental group and 28 students from Class VII-B were assigned to the control group, making up the total sample of 56 students. While the control group was instructed using traditional teaching techniques, the experimental group was taught using the Game-Based Learning (GBL) approach, which was bolstered by a computerized Snakes and Ladders game. Both groups took a pretest before the intervention to determine baseline equivalency, and a posttest was given after the instructional intervention was finished to assess how the outcome variables had changed.

Two instruments were used to collect data in this study: a learning independence questionnaire and a critical thinking skills test. The instruments were developed based on the indicators of each research variable and adapted to the characteristics of seventh-grade students and the Pancasila Education learning context.

The learning independence questionnaire consisted of 20 statements covering five indicators: learning initiative, responsibility for learning tasks, self-discipline, persistence in overcoming learning difficulties, and the ability to manage learning activities independently. The questionnaire used a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The critical thinking skills test consisted of 10 essay questions developed according to four indicators of critical thinking: analysis, evaluation, inference, and explanation. Each item was related to the Pancasila Education learning material and was assessed using a scoring rubric to ensure consistent evaluation of students' responses.

Before being used in the main study, both instruments were reviewed by two experts in education and Pancasila Education. The expert validation focused on the relevance of the items to the research variables, clarity of language, suitability of the content, and appropriateness for seventh-grade students. Based on the experts' suggestions, several statements and questions were revised to improve their clarity and alignment with the intended indicators.

The instruments were subsequently tested on students with characteristics similar to those of the research participants. Item validity was examined using the Pearson product-moment correlation, while reliability was assessed using Cronbach's alpha. The validity analysis indicated that the items used in the final data collection met the predetermined validity criteria. The reliability coefficient was approximately 0.87 for the learning independence questionnaire and 0.84 for the critical thinking skills test, indicating good internal consistency. Therefore, both instruments were considered sufficiently appropriate for collecting data on students' learning independence and critical thinking skills.

The final instruments were administered to the experimental and control groups before and after the intervention. The resulting scores were then analyzed to determine whether the Game-Based Learning model supported by a digital Snake-and-Ladder game produced differences in students' learning independence and critical thinking skills.

IBM SPSS Statistics version 26 was used to evaluate the data utilizing a sequential analytical process. To describe the features of the data, descriptive statistics were initially calculated. The Shapiro-Wilk test for normality and Levene's test for homogeneity of variance were then used to assess the parametric analysis assumptions. Once these presumptions were met, an independent samples t-test with a significance threshold of 0.05 ($\alpha = 0.05$) was used to compare the experimental and control groups' levels of critical thinking and learning independence. The p-value was used to make statistical conclusions; when $p < 0.05$, the alternative hypothesis was deemed supported.

RESULT AND DISCUSSION

Results

Descriptive statistical analysis was used to look at the students in the experimental and control groups' baseline and post-intervention performance. An overview of how the Game-Based Learning paradigm, which is backed by a digital Snakes and Ladders game, affects students' learning independence and critical thinking abilities can be found in the descriptive statistics for the pretest and posttest results. Tables 1 provide the findings.

Tables 1.

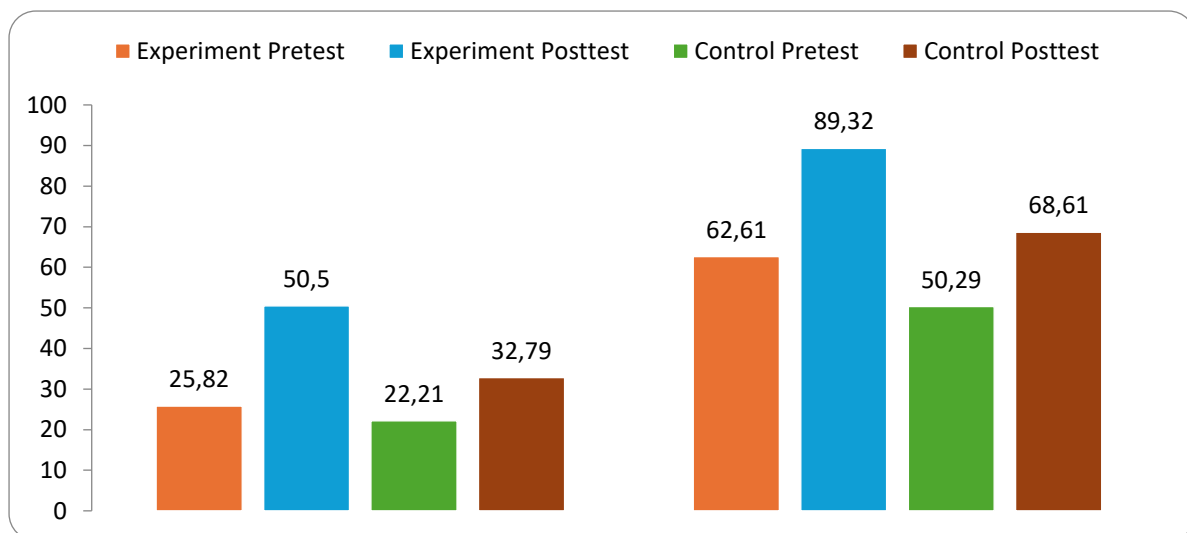
Descriptive Statistics of Pretest and Posttest Scores for Learning independence and Critical Thinking Skills

Variable	Groups	N	Pretest Mean	Posttest Mean
Learning independence	Experiment	28	25,82	50,50
	Control	28	22,21	32,79
Critical thinking skill	Experiment	28	62,61	89,32
	Control	28	50,29	68,61

Both the experimental and control groups showed gains in learning independence and critical thinking abilities from the pretest to the posttest, as shown in Tables 1. On both end variables, however, the experimental group showed significantly higher improvements than the control group. The experimental group's mean score for learning independence rose from 25.82 to 50.50, whereas the control group's mean score climbed from 22.21 to 32.79. Critical thinking abilities showed a similar trend, with the experimental group's mean score increasing from 62.61 to 89.32 while the control group's increased from 50.29 to 68.61. These descriptive results imply that compared to traditional education, the Game-Based Learning intervention promoted more gains. Figure 1 shows a graphical comparison of the pretest and posttest mean scores for critical thinking and learning independence abilities.

Figure 1.

Comparison Graph of Pretest-Posttest Learning Independence and Critical Thinking Ability



The table below illustrates the Shapiro-Wilk normality prerequisite test related to the variables of student interest and critical thinking ability:

Tables 2.

Results of Levene's Test of Normality for the variables of learning independence and critical thinking ability

Variable	Measurement	Shapiro-Wilk test	Category
Learning independence	Pretest	0,470	Normal
	Posttest	0,127	Normal
Critical thinking skill	Pretest	0,307	Normal
	Posttest	0,133	Normal

The Shapiro-Wilk test revealed that all datasets for critical thinking abilities and learning independence satisfied the assumption of normalcy, as shown in Tables 2. With values of 0.470 and 0.127 for learning independence and 0.307 and 0.133 for critical thinking abilities, the significance values were higher than the 0.05 cutoff. These findings show that

the data were normally distributed, making them appropriate for further parametric studies. Levene's test was used to evaluate the homogeneity of variance once normality was confirmed; the findings are shown in Tables 3.

Tables 3.

Levene's Test of Homogeneity of Variance for Learning Independence and Critical Thinking Skills

Variable	F	Sig. (2 Tailed)	Category
Learning independence	11,936	0,120	Homogen
Critical thinking skill	0,561	0,457	Homogen

Levene's test revealed that the homogeneity of variance assumption was met for both outcome variables, as shown in Tables 3. The significant values for critical thinking abilities were 0.457 and for learning independence were 0.120, both of which were higher than the 0.05 cutoff. These findings show that there was statistical homogeneity in the variances of the experimental and control groups. As a result, the data could be examined using an independent samples t-test since the homogeneity assumption needed for parametric analysis was satisfied. Tables 4 provide the independent samples t-test findings.

Tables 4.

Comparing Learning Independence and Critical Thinking Capabilities in the Experimental and Control Groups Using Independent Samples t-Test

Variabel	Measurement	t	df	Sig. (2-tailed)	Description
Learning independence	Pretest	3,008	54	0,074	Not Significant
	Posttest	9,309	54	< 0,001	significant
Critical thinking skill	Pretest	1,591	54	0,118	Not Significant
	Posttest	4,524	54	< 0,001	significant

The pretest analysis showed no statistically significant differences between the experimental and control groups in either critical thinking skills ($t = 1.591$, $p = 0.118$) or learning independence ($t = 3.008$, $p = 0.074$), as shown in Tables 4. This suggests that the two groups were similar at baseline before the intervention. On the other hand, the posttest findings showed statistically significant differences in learning independence ($t = 9.309$, $p < 0.001$) and critical thinking abilities ($t = 4.524$, $p < 0.001$). These results imply that compared to traditional teaching methods, the use of the Game-Based Learning paradigm, bolstered by a digital Snakes and Ladders game, resulted in noticeably higher gains in students' critical thinking abilities and learning independence.

Tables 5.*Effect size of media treatment on the group*

Variabel	Cohen's d	Interpretation
Learning independence	7,221	Large
Critical thinking skill	1,209	Large

The Game Based Learning paradigm and the digital snakes and ladders had a highly significant impact size on both research variables, as Table 5 demonstrates. Cohen's d values of 7.221 and 1.209 were found for critical thinking abilities and learning independence, respectively, suggesting significant effect sizes. Both learning independence and critical thinking ability fell into the big group. As a result, the results show that when compared to traditional training, the Game-Based Learning approach produced not only statistically significant gains but also considerable practical advantages in fostering students' critical thinking abilities and learning independence.

Hypotesis testing

The hypotheses were tested by comparing the pretest and posttest results of the experimental and control groups using an independent-samples t-test. The pretest analysis indicated that there were no statistically significant differences between the experimental and control groups in learning independence ($t = 3.008$, $df = 54$, $p = 0.074$) or critical thinking skills ($t = 1.591$, $df = 54$, $p = 0.118$). These results indicate that the two groups had comparable initial conditions before the intervention.

After the implementation of the Game-Based Learning model supported by a digital Snake-and-Ladder game, significant differences were found between the two groups. For learning independence, the experimental group obtained a significantly higher posttest score than the control group ($t = 9.309$, $df = 54$, $p < 0.001$). Therefore, H1 was accepted, indicating that the Game-Based Learning model supported by a digital Snake-and-Ladder game had a significant effect on students' learning independence in Pancasila Education.

A significant difference was also found in critical thinking skills. The posttest analysis produced $t = 4.524$ with $df = 54$ and $p < 0.001$. Thus, H2 was accepted, indicating that the Game-Based Learning model supported by a digital Snake-and-Ladder game had a significant effect on students' critical thinking skills in Pancasila Education.

The descriptive results further support these findings. The mean learning independence score in the experimental group increased from 25.82 in the pretest to 50.50 in the posttest, whereas the control group increased from 22.21 to 32.79. Similarly, the mean critical thinking score in the experimental group increased from 62.61 to 89.32, while the control group increased from 50.29 to 68.61. The effect size analysis also indicated a large practical effect for both learning independence (Cohen's $d = 7.221$) and critical thinking skills

(Cohen's $d = 1.209$). Taken together, the statistical and descriptive findings provide evidence supporting both research hypotheses.

Discussion

The findings demonstrate that the Game-Based Learning (GBL) model supported by a digital Snake-and-Ladder game significantly improved learning independence and critical thinking skills among seventh-grade students in Pancasila Education. The absence of significant differences in the pretest results indicates that the two groups started from statistically comparable conditions. The significant differences observed in the posttest results therefore provide evidence that the learning intervention was associated with better outcomes in the experimental group.

The improvement in learning independence was particularly evident in the experimental group. The mean score increased from 25.82 before the intervention to 50.50 after the intervention, while the control group increased from 22.21 to 32.79. This difference suggests that the digital game did more than make classroom activities more enjoyable; it provided students with opportunities to participate actively and take greater responsibility for their learning.

In the GBL environment, students were encouraged to make decisions, respond to questions or situations presented during the game, and complete learning activities without continuously depending on direct teacher assistance. Such activities can gradually encourage students to take initiative, manage their learning tasks, remain engaged when encountering difficulties, and become more responsible for the consequences of their decisions. These characteristics are closely related to the concept of learning independence.

The digital Snake-and-Ladder game also provided a learning environment in which students could receive feedback and immediately respond to the results of their actions. This process gave students opportunities to recognize errors, reconsider their responses, and adjust their strategies. Consequently, learning independence was developed through direct participation rather than merely through teacher instruction. This finding is consistent with previous research reporting that game-based learning can create more active learning environments and encourage students to assume greater responsibility for their learning ([Chen et al., 2026](#); [Volkotrubova et al., 2023](#); [Darmayanti & Suarjana, 2024](#)).

From a constructivist perspective, the finding can be understood through the active role of students in constructing knowledge through interaction with the learning environment. Rather than receiving information passively, students experience learning through decisions, interactions, challenges, and feedback. The digital Snake-and-Ladder game therefore functions not only as instructional media but also as a learning environment

that provides opportunities for students to exercise initiative and responsibility ([Keneth Treceñe et al., 2022](#); [Winasari et al., 2025](#); [Givi Efgivia, et al. 2021](#)).

The findings also indicate a significant improvement in critical thinking skills. The experimental group's mean score increased from 62.61 to 89.32, compared with an increase from 50.29 to 68.61 in the control group. The significant posttest difference ($p < 0.001$) indicates that students who participated in GBL activities supported by the digital Snake-and-Ladder game achieved better critical thinking outcomes than students who received conventional learning.

The improvement can be explained by the nature of the activities embedded in the game. Students were not simply required to remember Pancasila concepts but were encouraged to examine situations, consider possible responses, provide reasons for their choices, and determine solutions based on Pancasila values. These activities create opportunities for students to practice analysis, evaluation, inference, and decision-making, which constitute important aspects of critical thinking ([Komalasari et al., 2024](#); [Princessa et al., 2023](#); [Supena et al., 2021](#)).

The contextual presentation of Pancasila values through the digital game may also have contributed to the development of critical thinking. When students encounter situations that require them to decide how Pancasila values should be applied, they must connect conceptual knowledge with practical circumstances. This process encourages students to consider alternatives and justify their responses rather than simply reproduce information provided by the teacher. Previous studies similarly indicate that game-based learning can provide contextual problem-solving experiences that support analytical and reflective thinking ([Andrew et al., 2019](#); [Regiamtama et al., 2025](#); [Safitri & Marwanto, 2025](#)).

The contribution of this study lies in the integration of GBL with a digital Snake-and-Ladder game specifically within Pancasila Education. Previous studies have frequently examined game-based learning in relation to academic achievement, motivation, or higher-order thinking in science and mathematics. The present study extends this line of research by examining its application in Pancasila Education while simultaneously considering learning independence and critical thinking skills ([Diah et al., 2024](#); [Abdullah Fasha et al. 2024](#)).

The digital Snake-and-Ladder format provides a structured but interactive learning experience. Students encounter learning challenges while progressing through the game, interact with peers, and make decisions related to Pancasila values. This combination allows learning activities to move beyond the transmission of conceptual knowledge toward active engagement, independent participation, and contextual decision-making. Thus, the effectiveness of the intervention may be attributed not merely to the use of digital media,

but to the way the media was integrated into a student-centered Game-Based Learning process (Nabila Asyam et al., 2025; Puji & Dwi, 2025).

Overall, the findings suggest that the Game-Based Learning model supported by a digital Snake-and-Ladder game offers a meaningful alternative for Pancasila Education. Its value is particularly evident in providing students with opportunities to develop learning independence and critical thinking skills simultaneously. For teachers, the findings highlight the importance of designing digital game activities that require students to make decisions, solve contextual problems, explain their reasoning, and reflect on the outcomes of their choices. Such an approach can help create learning experiences that are more active, contextual, and meaningful while remaining aligned with the development of students' competencies.

CONCLUSIONS

The findings of this study indicate that the implementation of a Game-Based Learning model supported by a digital Snakes and Ladders game and integrated with Pancasila values was associated with higher levels of critical thinking and learning independence among the seventh-grade students involved in the study. Within the learning conditions examined, the model provided students with opportunities to engage in interactive activities, make decisions, discuss problems, and take greater responsibility for their learning. The results therefore support the research hypothesis and suggest that the use of digital Snakes and Ladders within a Game-Based Learning approach can be a relevant instructional alternative for developing critical thinking and learning independence in Pancasila Education at the junior secondary level.

The contribution of this study lies in bringing critical thinking and learning independence together within a single game-based instructional framework. The findings provide empirical evidence from the participating seventh-grade students that contextually designed digital game-based media can support classroom learning in Pancasila Education. However, these findings should be interpreted within the population, learning context, and implementation conditions of the present study and should not be generalized beyond similar settings without further evidence. Future studies could examine the model with larger and more diverse student populations, different Pancasila Education topics, and other educational contexts. Further research may also consider related 21st-century competencies, such as digital literacy, creativity, collaboration, and problem-solving, to obtain a broader understanding of how game-based learning may support students' learning development.

DECLARATIONS

Author Contribution

Yaturrohma, N., contributed to the conception and design of the study, development of the research methodology, data collection, data analysis, interpretation of the findings, and preparation of the manuscript. **Hatip, H.**, to the conception and design of the study, participated in reviewing and revising the manuscript, approved the final version, and accepted responsibility for the integrity and accuracy of the work. **Listiana, Y.**, participated in reviewing and revising the manuscript, approved the final version, and accepted responsibility for the integrity and accuracy of the work.

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Conflicts of Interest

The authors affirm that the work described in this publication was not influenced by any known conflicting financial interests or personal ties.

Declaration of AI Use

The authors declare that no artificial intelligence tools were used to conduct the research, analyze the data, interpret the findings, or prepare the manuscript. The research and writing process was carried out by the authors, who take full responsibility for the content and integrity of this work.

REFERENCE

- Abdullah Fasha, H., Ika Murpratiwi, S., Ali Albar, M., & Luh Putu Agetania, N. (2024). Android Educational Game for Pancasila and Civic Education Learning. *J-COSINE (Journal of Computer Science and Informatics Engineering)*, 8(2). <https://doi.org/10.29303/jcosine.v8i2.615>
- Anastasiadis, T., Lampropoulos, G., & Siakas, K. (2018). Digital Game-based Learning and Serious Games in Education. *International Journal of Advances in Scientific Research and Engineering*, 4(12), 139–144. <https://doi.org/10.31695/IJASRE.2018.33016>
- Andrew, J., Henry, S., Yudhisthira, A. N., Arifin, Y., & Permai, S. D. (2019). Analyzing the Factors that Influence Learning Experience through Game Based Learning using Visual Novel Game for Learning Pancasila. *Procedia Computer Science*, 157, 353–359. <https://doi.org/10.1016/J.PROCS.2019.08.177>
- Bai, S., Hew, K. F., & Huang, B. (2020). Does gamification improve student learning outcome? Evidence from a meta-analysis and synthesis of qualitative data in

- educational contexts. *Educational Research Review*, 30, 100322. <https://doi.org/10.1016/J.EDUREV.2020.100322>
- Bustomi, A. A., Khosiah, N., & Fathurrohman, A. (2025). Developing Pancasila Learning Strategies through Culture-Based Interactive Media in Elementary Schools. *Assyfa Learning Journal*, 3(1), 43–56. <https://doi.org/10.61650/alj.v3i1.622>
- Chen, Z., Huang, Q., Zheng, B., Mu, M., Zhao, Y., Li, Y., & Zhou, D. (2026). The impact of competition mechanisms on primary school students' digital game-based mathematics learning. *Acta Psychologica*, 267, 107175. <https://doi.org/10.1016/J.ACTPSY.2026.107175>
- Darmayanti, N. K. E. B., & Suarjana, I. M. (2024). GASEKO: Scramble Game Media to Increase Elementary School Students' Learning Independence. *Journal for Lesson and Learning Studies*, 7(1), 105–115. <https://doi.org/10.23887/jlls.v7i1.74957>
- Diah, A. A. R., Sri Untari, & Ade Eka Anggraini. (2024). "SIMLA" Educational Game-Based Learning Media for the Inculcation of Pancasila Symbols and Principles, Augmenting Independent Character. *Jurnal Penelitian Dan Pengembangan Pendidikan*, 8(1), 179–186. <https://doi.org/10.23887/jppp.v8i1.68601>
- Dorit. (2023). Assessing the benefits of gamification in mathematics for student gameful experience and gaming motivation. *Computers & Education*, 200, 104806. <https://doi.org/10.1016/J.COMPEDU.2023.104806>
- Faza, A., & Lestari, I. A. (2025). Self-Regulated Learning in the Digital Age: A Systematic Review of Strategies, Technologies, Benefits, and Challenges. *International Review of Research in Open and Distributed Learning*, 26. <https://doi.org/10.19173/irrodl.v26i2.8119>
- Fitriasari, S., & Masyitoh, I. S. (2020). The Role of Pancasila Education Teachers and Citizenship in Strengthening Character Education Based on Pancasila Values. *2nd Annual Civic Education Conference*, 418(1). <https://doi.org/10.2991/assehr.k.200320.101>
- Givi Efgivia, M., Rinanda, A. R., Hidayat, A., Maulana, I., & Budiarjo, A. (2021). Analysis of Constructivism Learning Theory. *International Seminar on Health, Social Science and Humanities*, 585(1). <https://doi.org/10.2991/assehr.k.211020.032>
- Hanifah, T., & Sukartono. (2024). Utilizing Snakes And Ladders Media In Learning Mathematic Elementary School Students. *Jurnal Cakrawala Pendas*, 10(2), 296–306. <https://doi.org/10.31949/jcp.v10i2.8858>
- Hartati, R. D., Abidin, A. A., Tamam, I. Y. B., & Junaenti, J. (2025). Implementation of the Project Strengthening Profile of Pancasila Students with Ecotourism Education in Ciletuh-Palabuhanratu UNESCO Global Geopark Area: A Case Study in Secondary School. *Journal of Innovation in Educational and Cultural Research*, 6(1), 1–8. <https://doi.org/10.46843/jiecr.v6i1.1986>

- Jayanti, M., Rini, R., & Soraya Nuryadika, A. (2023). International Journal of Current Science Research and Review Implementation of Pancasila Ideology in Indonesian Educational Leadership: A Literature Review. *International Journal of Current Science Research and Review*, 6(6). <https://doi.org/10.47191/ijcsrr/V6-i6-08>
- Kandia, W., Wayan, I., Santika, E., & Bali, P. N. (2026). Transformation of Pancasila Education in Addressing the Moral Crisis of the Young Generation in Indonesia. *Journal of Civic Education Research*, 4(1). <https://doi.org/10.60153/jocer.v4i1.333>
- Keneth Treceñe, J. D., Batan, M. B., & Abines, A. L. (2022). Development of a digital snake and ladder game as a strategic intervention material for basic education. *Journal of Engineering Science and Technology Special Issue on ICITE20222*, 48–58.
- Komalasari, K., Abdulkarim, A., & Sopianingsih, P. (2024). Digital-Based Living Values Project Activities Learning Model for Strengthening Students' Pancasila Character. *New Educational Review*, 75, 127–139. <https://doi.org/10.15804/tner.2024.75.1.10>
- Kusuma Wardani, E., Retnasari, L., Alfarizqi, M., Ghiffari, N., & Al, N. (2025). AR Snakes and ladders game innovation to remote learning to live together in elementary schools. *International Journal of Mathematics and Sciences Education*, 3(2), 57–70. <https://doi.org/10.59965/ijmsed.v3i2.264>
- Lampropoulos, G., & Sidiropoulos, A. (2024). Impact of Gamification on Students' Learning Outcomes and Academic Performance: A Longitudinal Study Comparing Online, Traditional, and Gamified Learning. *Education Sciences*, 14(4). <https://doi.org/10.3390/educsci14040367>
- Mao, W., Cui, Y., Chiu, M. M., & Lei, H. (2022). Effects of Game-Based Learning on Students' Critical Thinking: A Meta-Analysis. *Journal of Educational Computing Research*, 59(8), 1682–1708. <https://doi.org/10.1177/07356331211007098>
- Nabila Asyam, S., Rofiqoh, N., & Kunci, K. (2025). Effectiveness of the Edugame-Based Problem-Based Learning Model in Improving Learning Outcomes in Pancasila Education. *Universitas Islam Nahdlatul Ulama Jepara*, 123. <https://doi.org/10.17509/mimbardik.v10i1>
- Noriega Cortes, M. A., & Carreño-Bolivar, L. (2024). Virtual game-based learning environments to promote self-regulated learning skills in foreign language learners. *F1000Research*, 13. <https://doi.org/10.12688/f1000research.157746.1>
- Octavia, A. A., & Tirtoni, F. (2024). Implementation of the Pancasila Student Profile in Pancasila Education Subjects to Improve Democratic Character. *Lectura: Jurnal Pendidikan*, 15(1), 235–244. <https://doi.org/10.31849/lectura.v15i1.18570>
- Princessa, D. O., Fathurrohman, Sekar Purbarini Kawuryan, & Bambang Saptono. (2023). Implementation of Pancasila Values in Civics Learning in the Digital Era. *MIMBAR PGSD Undiksha*, 11(3), 384–395. <https://doi.org/10.23887/jjpgsd.v11i3.61880>

- Puji, R. V., & Dwi, P. F. (2025). Snakes and Ladders Media to Improve Learning Outcomes in Pancasila Education for Fourth Grade Elementary School Students. *JPI (Jurnal Pendidikan Indonesia)*, 14(1), 135–144. <https://doi.org/10.23887/jpiundiksha.v14i1.81968>
- Rahayuningtyas, W., & Ningtyas, L. P. K. (2023). Application of Snakes and Ladders Game Media in Dance Learning. *Unima International Conference on Social Sciences and Humanities*, 681–687. https://doi.org/10.2991/978-2-494069-35-0_84
- Regiamtama, K. I., Ekowidjaja, Y. A. R., & Chowanda, A. (2025). Learning Pancasila Through Enhanced Interaction with a Serious Game. *Procedia Computer Science*, 269, 741–748. <https://doi.org/10.1016/J.PROCS.2025.09.017>
- Safitri, R. R., & Marwanto, E. (2025). Game-Based Learning Media: Effort To Increase Self-Regulated Learning And Critical Thinking Skills In Science. *Jurnal Didaktika Pendidikan Dasar*, 9(3). <https://doi.org/10.26811/didaktika.v9i3.2021>
- Sailer, M., & Homner, L. (2020). The Gamification of Learning: a Meta-analysis. *Educational Psychology Review*, 32(1), 77–112. <https://doi.org/10.1007/s10648-019-09498-w>
- Sandi Arifin, Mochamad Alif Kusumah, Hesti Melati, Syaif Ali Yusrifal, & Ratu Zahara Faradisha. (2023). The Importance of Pancasila Education as Learning Material in Higher Education. *Indonesian Journal of Educational Science and Technology*, 2(2), 207–214. <https://doi.org/10.55927/nurture.v2i2.4279>
- Santoso, G. (2020). The structure development model of pancasila education (Pe) and civic education (ce) at 21 century 4.0 era in indonesian. *Proceedings of the 2nd African International Conference on Industrial Engineering and Operations Management*, 7(10). <https://doi.org/10.29138/ijebd.v4i2.1221>
- Saryono, S., Iriansyah, H. S., & Syafira, W. (2022). Learning Outcomes of Pancasila and Citizenship Education. *Proceedings of the 1st International Conference on Education*, 33–42.
- Setyaningsih, E., & Arini, N. W. (2025). Development of Interactive Snakes and Ladders Media to Improve Student Learning Outcomes in Elementary School. *Journal of Educational Sciences*, 9(4), 2730–2739.
- Supena, I., Darmuki, A., & Hariyadi, A. (2021). The influence of 4C (constructive, critical, creativity, collaborative) learning model on students' learning outcomes. *International Journal of Instruction*, 14(3), 873–892. <https://doi.org/10.29333/iji.2021.14351a>
- Theobald, M. (2021). Self-regulated learning training programs enhance university students' academic performance, self-regulated learning strategies, and

- motivation: A meta-analysis. *Contemporary Educational Psychology*, 66, 101976.
<https://doi.org/10.1016/J.CEDPSYCH.2021.101976>
- Volkotrubova, A., Tymoshchuk, O., Struk, O., Shevchenko, V., & Boiaryshcheva, T. (2023). Learning gamification tools for the development of students' cognitive independence. *Revista EDaPECI*, 23(2), 48–60.
<https://doi.org/10.29276/redapeci.2023.23.218686.48-60>
- Wika Alzana, A., Harmawati, Y., & Pd, M. (2021). Pendidikan Pancasila sebagai pendidikan multikultural. *Citizenship: Jurnal Pancasila Dan Kewarganegaraan*, 9(1), 51–57.
- Winasari, Dicky, A. N., & Muhammad, F. bin Z. (2025). The effect of augmented reality-based Snake and Ladder game on early childhood cognitive development. *Jurnal Inovasi Teknologi Pendidikan*, 12(3).
- Zainuddin, Z., Chu, S. K. W., Shujahat, M., & Perera, C. J. (2020). The impact of gamification on learning and instruction: A systematic review of empirical evidence. *Educational Research Review*, 30, 100326.
<https://doi.org/10.1016/J.EDUREV.2020.100326>