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Research Paper

Enhancing the Inference Skills of Selected AP (Araling Panlipunan)-Grade 7 Students at OCABIS (Old Cabalan Integrated School): A Study Utilizing the Snake and Ladder Board Game

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Abstract

The integration of game-based learning has gained popularity for enhancing cognitive skills such as critical thinking and inference. Interactive tools such as board games nurture engagement and assist in comprehending complex concepts. The Araling Panlipunan curriculum in the Philippines emphasizes critical thinking, making innovative teaching methods essential. This study aimed to determine the effectiveness of using the snake and ladder board game in enhancing the inference skills of Grade 7 Emerald students from the Old Cabalan Integrated School (OCABIS) in Araling Panlipunan (Social Studies) during the 2023-2024 academic year. The study employed a convergent parallel approach that included pre-tests, post-tests, and focus group interviews to collect data. Statistical analyses were used to examine the results, including frequency distribution, percentage, mean, Shapiro-Wilk test, Mann–Whitney U test, Wilcoxon signed-rank test, and thematic analysis. The results revealed that integrating the snake and ladder board game positively impacted students' critical thinking and inference skills, with post-test scores showing significant improvement as it revealed a notable enhancement in scores, showing a median pre-test score of 8 and a post-test score of 12 ($W = 630.000$, $z = -5.184$, $p = .000$), resulting in a moderate effect size ($d = .62$). The study also found that the board game strategy was equally effective for male and female students, providing a more engaging learning environment and reducing boredom. Based on these findings, the researchers proposed guidelines for further improving the snake and ladder board game strategy to enhance students' inference skills.

Keywords: convergent parallel; pretest; posttest; focus group interview; snake and ladder board game; inference skills

INTRODUCTION

The development of inference skills is essential for academic success, especially in Araling Panlipunan (Social Studies) education. Defined as the ability to draw logical conclusions from evidence, understand implied meanings, and connect ideas, inference skills are crucial for higher-order thinking. They enable students to analyze information, synthesize knowledge and engage in problem solving across various disciplines. This emphasis on inference skills is becoming increasingly important in educational psychology and pedagogy (Facione, 2011). Recent data from the Program for International Student Assessment (PISA) revealed that students in the Philippines are among the lowest performers globally in math, reading, and science (Philstar Global News, 2023). While there has been some improvement in test scores compared to the 2018 assessments, the ongoing repercussions of the pandemic have exacerbated these challenges, leading to substantial learning losses and a rising number of students struggling with basic literacy. This situation highlights the urgent need to enhance inference skills because they directly influence students' academic performance (Ruga, 2024).

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Inference skills are crucial for higher-order thinking across various subjects. According to Marye (2023), these skills allow students to draw logical conclusions and make connections between ideas. However, factors such as the widespread use of digital media and a decline in traditional reading habits hinder students' ability to effectively infer meaning from texts. Arora (2022) argued that improving students' critical reading and thinking skills requires a focus on explicit information, implied messages, and unstated ideas to foster their analytical abilities.

Such skills are not only valuable in English language arts but also applicable in diverse real-world contexts, which also correspond to the journal of Lai (2020), which indicated that inference skills are foundational to academic achievement and influence reading comprehension, critical thinking, and overall learning outcomes. These skills are particularly important in subjects such as language arts, science, and social studies, where students are required to interpret texts, analyze data, and understand complex concepts. As educational standards increasingly emphasize critical thinking and analytical abilities, the need for effective instruction in inference skills has become paramount (Ritchhart et al., 2019).

Bayat and Çeti˙nkaya (2020) examined the correlation between inference skills and reading comprehension. They found that students with lower inference skills had lower reading comprehension, indicating a strong link between inference ability and understanding the subject matter. These students also faced challenges in interpreting historical events, analyzing primary sources, and establishing connections between past and present contexts. This indicates that the students struggled to construct well-reasoned arguments and actively participate in meaningful discussions. Their limited inference skills might hinder their ability to analyze, assess information, engage in critical thinking, and inform discussions. However, existing research seems to have disregarded the direct relationship between inference skills and critical thinking in the Araling Panlipunan subject, a Tagalog word for "Social Studies" subject that exposes students to diverse social issues, both within their local context and on a global scale (Sanchez, 2023). This subject encourages critical thinking and fosters empathy among students. In addition, existing research has not explored using game-based strategies to enhance inference skills among students in the Araling Panlipunan subject. Therefore, this study fills this gap by determining the effectiveness of integrating a specific game-based approach, namely the snake and ladder board game, to enhance students' inference skills in Araling Panlipunan.

The current study aims to fill this gap by examining the effectiveness of a specific game-based approach—the snake and ladder board game—in enhancing students' inference skills in Araling Panlipunan. In recent years, game-based learning has emerged as a promising pedagogical strategy for improving student engagement and learning outcomes (Hamari et al., 2014). Previous research, such as that conducted by Solekhah et al. (2023), has indicated that gamification strategies can significantly enhance student engagement, particularly when incentivized by rewards. This suggests that similar gamification techniques can improve inference skills in Araling Panlipunan.

As educators work to equip students for 21st-century success, it is crucial to focus on teaching styles and instructional strategies that enhance inference skills. Effective teaching practices can empower students to tackle educational challenges, and educators must implement innovative strategies that foster critical thinking and create a supportive learning environment (Darling-Hammond et al., 2017).

Additionally, teacher-related factors, such as teaching style, significantly influence student learning experiences. According to Jimola (2024), interaction between teachers and students is essential in shaping educational outcomes. In the 21st century, there is an increasing emphasis on equipping students with skills relevant to their daily lives. Teachers, as the backbone of the education system, must possess the necessary competencies to address the diverse needs of their students effectively (Dejacto et al., 2023). This underscores the responsibility of educators to

empower students to overcome educational challenges.

This study sought to answer the following questions:

(1) How may the level of students' inference skills be measured in terms of pre-test and post-test scores;
(2) Is there a significant difference in students' post-test scores according to sex at birth after the integration of the snake and ladder board game;
(3) Is there a significant difference in students' inference skills between pre-test and post-test scores after the integration of the snake and ladder board game; and
(4) What are the students' feedback on the utilization of the snake and ladder board game?

This research enhances inference skills within the Araling Panlipunan curriculum and contribute to the broader discourse on educational improvement in the Philippines. By identifying effective strategies and empowering educators, this study can significantly boost academic performance and prepare students for the complexities of the modern world.

LITERATURE REVIEW

The integration of game-based learning in educational settings has gained significant attention as an effective pedagogical approach. This literature review explores the use of board games, specifically the Snake and Ladder game, as a tool for enhancing inference skills among seventh-grade students. This study draws on various studies that highlight the cognitive benefits of game-based learning, the specific skills targeted, and the implications for educators.

According to Larrosa et al. (2023), gamification refers to strategies that incorporate game-like elements and dynamics to convey specific content rather than simply for the enjoyment of playing. It is believed that the psychological effects of playing are beneficial because playful environments possess great motivational potential and enable active participation and fluid exchanges among participants. However, there is a significant gap in the understanding of which specific game elements most effectively enhance learning outcomes, which necessitates further research to identify and isolate these elements.

Furthermore, while gamification has shown promise in subjects like Mathematics, there is limited research on its effectiveness across various disciplines is limited, particularly in social studies or humanities subjects such as Araling Panlipunan. The introduction of various technology-assisted learning tools, such as mobile devices, dartboards, tablets, laptops, simulations, dynamic visualizations, and virtual laboratories, has significantly transformed the educational landscape in schools and academic institutions (Haleem et al., 2022). However, the interplay between gamification and these technologies has not been thoroughly explored, indicating a need for research that examines how different technologies can enhance or hinder the effectiveness of gamification.

Game-based learning (GBL) has been recognized for its potential to enhance cognitive skills, including problem-solving, critical thinking, and inference. According to Gee (2003), games provide a rich context for learning, allowing students to engage in active problem-solving and decision-making. However, there is a gap in the understanding of which specific game mechanics are most effective in fostering these cognitive skills, necessitating further research to identify these elements. This aligns with Vygotsky's (1978) social constructivist theory, which indicates that learning is a social process. While collaborative gameplay is believed to promote higher-order thinking skills, including inference, there is insufficient research exploring how different types of collaborative interactions within games impact learning outcomes. Additionally, most studies have focused on short-term gains rather than assessing the long-term effects of GBL on cognitive skill development. Tambuwal et al. (2023) reported that specific game elements responsible for the positive impacts of gamification remain unclear, which necessitates further research. This emphasis on the need for

more studies on gamification across diverse settings is sure to keep audiences engaged and interested in the topic.

Moreover, the research paper by Inocencio (2018) systematically reviewed the literature to analyze how gamification outcomes should be measured, providing a map of the most frequently used scales for evaluating gamification in educational contexts. The findings identify motivation, engagement, self-efficacy, and flow/cognitive absorption as the primary constructs of experiential outcomes. Additionally, the review highlights research opportunities to develop a better understanding of the effects of motivational rewards on experiential outcomes, as well as the potential for gamification to facilitate problem-solving transfer as an instrumental outcome, as incorporating gamification concepts may offer an effective strategy for enhancing learning, including by fostering friendly competition among students (Zainuddin et al., 2020). It fosters friendly competition among students since, as cited in the study of Chen and Liang (2022), utilizing educational games as learning aids is a viable strategy because games possess the ability to impart knowledge and develop crucial skills such as problem-solving, cooperation, and communication. Games also have extraordinary motivational power, often engaging players without tangible rewards, solely for the enjoyment and thrill of winning (Dicheva et al., 2015). Inference skills are crucial for academic success, particularly in the Araling Panlipunan subject. According to McGee and Polias (2018), students must be able to draw conclusions from evidence to understand complex concepts. Inference involves synthesizing information, recognizing patterns, and applying prior knowledge to new situations. Enhancing these skills can lead to improved academic performance and greater independence in learning.

The application of gamification to support learning in K-12 education has been a growing topic of academic interest in recent years. A study by Dehghanzadeh et al. (2023) highlights the promising role of gamification in improving cognitive, emotional, and behavioral learning outcomes for students. This potential for gamification to significantly enhance learning outcomes is a reason for optimism and hope for the future of education.

Board games have been employed in educational settings for decades, providing dynamic and interactive learning environments. The Snake and Ladder game, with its simple rules and engaging format, offers a unique opportunity to promote inference skills. Research by Barata et al. (2013) indicates that board games can create a safe space for risk-taking and experimentation, which are essential components of the learning process.

Several studies have specifically examined the impact of board games on inference skills. For instance, Lee and Hammer (2011) found that students engaged in game-based learning demonstrated significantly higher inference abilities compared to those who received traditional instruction. The interactive nature of the game encouraged students to think critically about their moves and predict outcomes based on previous turns.

Moreover, a study by Hwang et al. (2019) used a modified Snake and Ladder game to teach mathematical concepts. The results indicated that students not only improved their mathematical reasoning but also enhanced their ability to make inferences based on game outcomes. These findings suggest that game mechanics can be tailored to target specific cognitive skills effectively. Suppose that gamification is effective in Mathematics. In that case, it could also work well in Araling Panlipunan, as this subject can also explore the use of gamification. However, further studies are needed to identify which adaptations are most effective for different learning contexts and populations. If gamification was found to be effective in Mathematics, more exploration is required to determine how these principles can be successfully applied to other subjects, including social studies, and how cultural and contextual factors might affect implementation.

The integration of board games like Snake and Ladder into the curriculum could have several implications for educators. The literature supports the notion that game-based learning,

particularly through the use of board games such as Snake and Ladder, can significantly enhance inference skills among seventh-grade students. As education continues to evolve, incorporating playful and interactive elements into the learning process is essential for fostering critical thinking and problem-solving abilities. Future research should explore the long-term effects of such interventions and how they can be effectively integrated into diverse learning environments.

The researchers used the Input-Process-Output (IPO) model as a general framework and guide for the study progress. The input included the students' inference skills measured through their pre- and post-test scores and feedback on the use of the snake and ladder board game. In the process, the researcher employed pre-test and post-test examination papers and conducted focus group interviews to gather data. Excel and SPSS 26 were used for data entry, while frequency distribution, percentage, mean, Shapiro-Wilk test, Mann-Whitney U test, Wilcoxon signed-rank test, and thematic analysis were utilized for data analysis and statistical treatment. Moreover, the hypotheses of this study were tested at a 0.05 significance level: (1) There is no significant difference in post-test scores according to sex at birth after the integration of the snake and ladder board game; (2) There is no significant difference in students' inference skills between pre-test and post-test scores after the integration of the snake and ladder board game.

RESEARCH METHOD

This study used a convergent parallel design, which is a type of mixed-methods research that combines elements of quantitative and qualitative research to answer the research questions. In a convergent parallel design, quantitative and qualitative data are collected simultaneously and analyzed independently. Once both analyses were finalized, the results were compared to formulate the overall conclusions (George, 2021).

In the quantitative part, the researchers used a one-group pretest-posttest design in which a single group of participants was measured before and after the treatment or intervention (Search Research, 2021). Its purpose is to assess whether changes in the dependent variable result from treatment. In this design, the pre-test serves as a baseline measurement to determine the initial level of the dependent variable before any intervention is applied. Then, the treatment or intervention was introduced to the group, and a post-test was conducted to measure the dependent variable again after the intervention. By comparing the pre-test and post-test scores, the researcher can evaluate the effectiveness of the treatment or intervention. In the qualitative part, focus group interviews were conducted by the researchers. This involves a small group of participants (typically 6-10) who engage in a facilitated discussion led by a researcher (Dovetail Editorial Team, 2023). This module will provide insights from respondents into shared perspectives, disagreements, and collective experiences.

The respondents in this study comprised 35 Grade 7 Emerald students from the Old Cabalan Integrated School during the academic year 2023-2024. The class consisted of 19 male and 16 female students. The researchers specifically selected Grade 7 Emerald respondents.

The researchers used stratified random sampling, which divides the population into homogeneous subgroups (strata) based on shared characteristics and randomly selects samples from each stratum. This approach ensures adequate representation of each subgroup, enhancing the precision and representativeness of the results (Simkus, 2023).

To enhance students' inference skills, the researchers used a snake-and-ladder board game with a multimodal approach. By presenting challenging scenarios within the game, students were advised to analyze information and draw conclusions. The integration of tactile and visual elements within the game seeks to heighten student engagement and reinforce inference abilities through multiple sensory channels. This innovative strategy aims to foster critical thinking, active participation, and the development of students' inference skills.

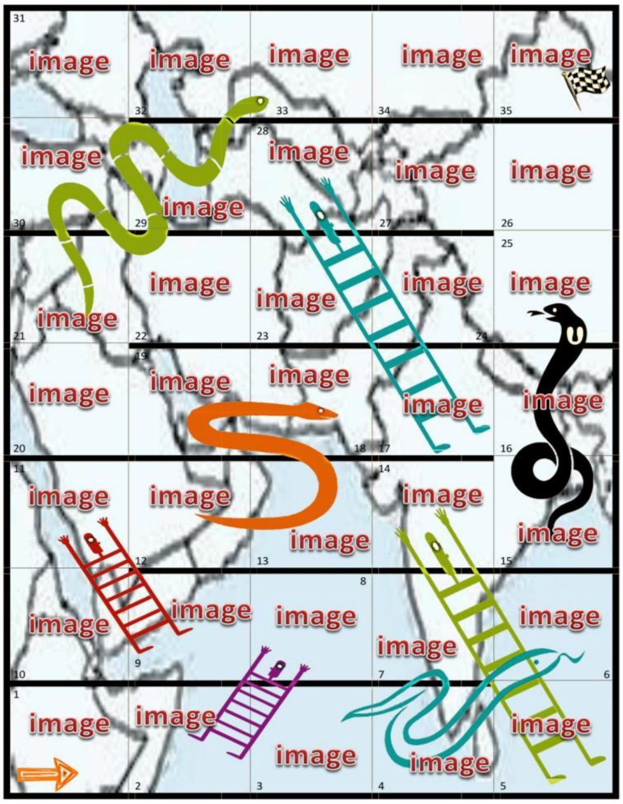

Figure 1. Snake and ladder board game

This study utilized two (2) instruments: pretests and posttests, and a set of interview questions for focus group interviews on students' feedback using the Snake and Ladder Board Game. In the first instrument, the pretest and posttest questionnaires were used in this study to assess the participants before and after the intervention. The researchers themselves developed the assessment contents. To ensure that the instruments used in the study adhered to the standards set by the Department of Education (DepEd), the Araling Panlipunan (Social Studies) Teacher III from the Old Cabalan Integrated School (OCABIS) validated the assessment tools. By having her, the researchers confirmed that the tests and measures used in the study aligned with the DepEd's established guidelines and expectations for creating student assessment materials. This external validation process by a subject matter expert from a school context helps strengthen the credibility and validity of the assessments used in this study. This validation step further enhances the overall detailed construction and trustworthiness of the research methodology employed in the study.

The pre- and post-tests were used to measure the respondents' baseline levels and any changes resulting from the intervention. By comparing the pre-test and post-test data, the researchers determined the effectiveness of the intervention. The second instrument, a set of interview questions, was used to assess the students' feedback on the use of the Snake and Ladder Board Game after the post-test. These questions were designed to provide a more comprehensive understanding of the research topic and explore both the effects of interventions and respondents' subjective experiences. The interview was conducted using a set of structured questions designed to gather student feedback on the use of the Snake and Ladder Board Game after the post-test. The interviews were likely conducted in a focus group setting, where the participants were encouraged to share their thoughts and experiences in an open discussion. Standard guidelines for conducting interviews, such as ensuring a comfortable environment, maintaining neutrality, and asking follow-up questions to clarify the responses, were probably followed. References such as qualitative

research methods were used to guide the interview process, ensuring reliability and consistency. The selection of interviewees was likely based on stratified random sampling, where students who participated in the game and post-test were chosen to provide insights, ensuring that feedback reflected the experiences of those directly involved in the study.

FINDINGS AND DISCUSSION

The following tables reveal the study's results regarding the effectiveness of the snake and ladder board game in enhancing students' inference skills.

Table 1. Students' Inference Skills according to Pretest Scores

Score	Frequency	Percentage	Descriptive Interpretation
3	1	2.9	Failed
4	2	5.7	Failed
5	1	2.9	Failed
6	3	8.6	Failed
7	7	20.0	Failed
8	4	11.4	Failed
9	8	22.9	Failed
10	6	17.1	Fair
11	3	8.6	Fair
Composite Mean Score	**8**		Failed

Note: n = 35; Legend: (20)-*excellent*, (18-19)-*very good*, (14-17)-*good*, (10-13)-*fair*, (<10)-*failed*

Table 1 displays the distribution of students' inference skills according to their pre-test scores.

Results, providing valuable information on respondents' initial competency levels. Most students obtained scores that were classified as "*failed*," with frequencies varying from (n = 1) 2.9% to (n = 8) 22.9% across different score categories.

The results revealed that many students needed help in their ability to make inferences before the intervention. The lack of scores classified as "*excellent*" or "*good*" was particularly noteworthy, indicating widespread failure in the inference abilities of the students in the sample. However, it is worth mentioning that some students (n = 9, 25.7%) achieved scores in the "*fair*" range, suggesting a fundamental grasp of inference skills. The composite mean score of 8 confirmed respondents' tendency toward low competence levels. These findings highlighted the critical need for targeted interventions designed to improve students' ability to make inferences, emphasizing the importance of incorporating educational games and strategies. Moreover, these findings established a starting point for evaluating the effectiveness of intervention approaches, offering significant knowledge for academic professionals and policymakers seeking to improve students' critical thinking skills. The results of this study correspond with the critical review of

Dicheva and Dichev (2017), who examined empirical evidence on the effectiveness of gamified strategies in fostering critical thinking skills. They found that well-designed gamified approaches, which align with learning objectives and provide meaningful challenges, can significantly improve students' ability to think critically, analyze information, and solve complex problems, which also corresponds with the research of Buckley and Doyle (2016), which determined that when gamified strategies were integrated into the learning process, students demonstrated higher levels of critical thinking, information analysis, and problem-solving skills.

Table 2. Students' Inference Skills according to Posttest Scores after Integrating the Snake and Ladder Board Game

Score	Frequency	Percentage	Descriptive Interpretation
10	10	28.6	Fair
11	5	14.3	Fair
12	6	17.1	Fair
13	2	5.7	Fair
14	4	11.4	Good
15	2	5.7	Good
16	3	8.6	Good
17	1	2.9	Good
18	1	2.9	Very Good
19	1	2.9	Very Good
Composite Mean Score	**12.6**		Fair

Note: n = 35; Legend: (20)-*excellent*, (18-19)-*very good*, (14-17)-*good*, (10-13)-*fair*, (<10)-*failed*

Table 2 shows the distribution of students' inference skills based on post-test scores after integrating the snake and ladder board game. Unlike the pre-test scores in Table 2, the post-test scores demonstrated considerable improvement in the students' inference skills. Most students received scores classified as "*fair*," with frequencies ranging from (n = 5) 14.3% to (n = 10) 28.6% across several scores. Additionally, many students earned scores classified as "*good*" (n = 10, 28.6%) or even "*very good*" (n = 2, 5.8%), showing a marked improvement in their inference skills compared to their pre-test scores. Notably, the composite mean score of 12.6 falls under the "fair" category and demonstrates an overall increase in inference skills among the sampled students. These data imply that integrating the snake and ladder board game positively benefited students' critical thinking abilities, leading to significant growth in their inference skills. The shift toward higher score categories emphasized the usefulness of gamified instructional approaches in supporting cognitive development and boosting learning outcomes. These results provide convincing evidence for the sustained deployment of such solutions to address educational challenges and increase student achievement. According to McMaster et al. (2014), providing

effective solutions to address low inference skills is essential for supporting struggling students' reading comprehension development. Correspondingly, Young et al. (2012) suggested that game-based interventions can effectively address low-inference skills, which aligns with the findings of their study.

Table 3. Differences in Post-Test Scores According to Sex after Integrated Snake and Ladder Board Game

Sex	N	Median	U	Z	Asymp. Sig	Conclusion
Male	19	12	146.000	-.202*	.857	Not Significant
Female	16	12				

Note: *p<0.05

Table 3 shows the students' post-test scores according to assigned sex after integrating the snake and ladder board game using the Mann–Whitney U test. The test found no significant difference between males (Mdn = 12) and females (Mdn = 12) with U = 146.000, z = .202, and p = .857 at the 5% significance level, with a negligible effect size (d = .03) (Cohen, 1988). This implied that integrating the snake and ladder board game had an equivalent influence on male and female students' learning outcomes. Thus, the method was effective for both sexes. These findings advocate the broad implementation of gamified instructional approaches, as they offer exciting potential for promoting gender-neutral educational interventions and building fair learning environments. Moreover, the results confirmed that personalized pedagogical practices, such as gamification, can be solid instruments for fostering educational equity and boosting learning outcomes across varied student demographics. The study conducted by Kheloui et al. (2023) demonstrated that there are no consistent or meaningful differences between males and females in terms of cognitive abilities, including those related to inference generation since an individual's birth sex is not a significant factor in determining inference skills (Voyer et al., 2017).

Table 4. Differences in Students' Inference Skills Between Pre-and Post-Test Scores after Integrating the Snake and Ladder Board Game

	N	Median	*W*	z	Asymp. Sig	Conclusion
Pre-test	35	8	630.00	-5.184*	.000	Significant
Post-test	35	12				

Note: *p<0.05

Table 4 reveals the difference in students' inference skills between pre-and post-test scores after incorporating the snake and ladder board game using the Wilcoxon signed-rank test. The test demonstrated a significant difference between pre-test (Mdn=8) and post-test (Mdn=12) scores with W = 630.000, z = -5.184, and p = .000 at the 5% significance level. The results revealed that the pre-test scores subsequently increased after integrating the snake and ladder board game strategy,

with a moderate effect size (d = .62) (Cohen, 1988). Hamari et al. (2014) recommended further integrating game-based approaches into instructional techniques and curricular designs.

This recommendation was based on research showing that gamified strategies have a positive impact on student learning, performance, and skill development, as evidenced by the findings of Sailer et al. (2017).

Thematic Analysis of Student Feedback on the use of the Snake and Ladder Board Game

The following responses from the transcribed interviews revealed students' feedback on using snake and ladder board games through thematic analysis.

Comfort in the Learning Environment

Based on the responses from the transcribed interviews, the following were the recurring insights of the respondents; thus, it was found that comfort in the learning environment became a shared experience for Grade 7 Emerald students when the researcher integrated the snake and ladder board game during class discussion.

"Yes, we are comfortable…" (Opo, comfortable kami …) – ***Grp. 1***

"Yes, we are comfortable because … we are really enjoying playing in class" (Opo, comfortable po kami kasi … gustong gusto po namin na naglalaro kami sa klase).
Grp. 2

"… we are comfortable because we enjoy playing the game, especially since the snake and ladders board is so big. Amazing!" (… comfortable naman po kasi natutuwa po kami laruin kasi ang laki nung snake and ladder. Nakaka-amaze!) –
Grp. 3

"Yes, we are comfortable playing … we are really enjoying ourselves …" (Opo, comfortable kami laruin … natutuwa po talaga kami …) – ***Grp. 4.***

The interview responses revealed that the students expressed strong enthusiasm and enjoyment for the game-based learning approach, indicating that it made them feel more comfortable and engaged in the learning process. Thus, incorporating game-based learning approaches, such as integrating the snake and ladder board game, can foster a more comfortable and engaging learning environment for students. The findings of this research correspond to the research of Boyle et al. (2016), who found that when students find learning activities enjoyable and challenging, they are more likely to feel comfortable participating and actively engaging with the content, which also corresponds to the article by Dicheva et al. (2015), which suggests that when students feel learning activities are tailored to their needs, they are more likely to feel comfortable and engaged.

Reduced Boredom

Based on the responses from the transcribed interviews, the following were the respondents' recurring insights; thus, it was found that reduced boredom became a shared experience of grade 7 Emerald students when the researcher integrated the snake and ladder board game during class discussion.

"Yes, we are more motivated to answer your questions … it is not boring …" (Opo, mas namotivate po kami na magsagot sa mga tanong niyo … hindi boring …) – ***Grp. 1***

"… we are enjoying answering because this is the first time someone has let us play a game like this during a discussion …" (… natutuwa po kaming magsagot dahil first time din po kasi may nagpalaro sa amin ng ganyan habang nagdidiscuss …)

– *Grp. 2*

"To be honest, AP is really boring … but because of snake and ladder game, we enjoy answering the questions." (Sa totoo lang po ang boring po kasi talaga ng AP … pero dahil sa snake and ladder na laro natutuwa kami magsagot sa mga tanong.)

– *Grp.3*

"We were enjoying ourselves earlier … some of your questions were quite difficult, but we're trying to answer them because we're enjoying it - it's not boring, we're not sleepy." (Nag-eenjoy kami kanina … medyo mahirap po yung ibang tanong niyo pero tinatry naming masagot kasi nag-eenjoy kami hindi boring, hindi kami inaantok.) – ***Grp. 4***

According to the interview responses, integrating the snake and ladder board game in Araling Panlipunan classroom discussions was an effective strategy for reducing boredom. This result suggests that teachers should consider integrating gamified strategies in their Araling Panlipunan lessons to combat boredom and foster a more active and participatory classroom experience. The findings of this study correspond to the research findings of Sardone and Devlin-Scherer (2016), who found that the use of game-based learning in social studies classrooms, including board games like Snake and Ladder, can foster a more enjoyable and engaging learning environment for students, thereby reducing feelings of boredom and disinterest in the Araling Panlipunan subject. This also corresponds with the study of Byun and Joung (2018), who found that game-based approaches, such as the snake and ladder game, can significantly improve student attention, involvement, and overall enjoyment of the Araling Panlipunan subject, particularly in comparison to traditional lecture-based instruction.

Fostering critical thinking skills

Based on the responses from the transcribed interviews, the following were the respondents' recurring insights; thus, it was found that fostering critical thinking became a shared experience for Grade 7 Emerald students when the researcher integrated the snake and ladder board game during class discussion.

"… even though you only showed us pictures, we understand it… even though you didn't give us the answers but let us analyze the answers, we were able to answer because of the pictures on the snake and ladder board." (… kahit pictures lang yung pinapakita niyo, naintindihan namin … kahit hindi niyo po kami bigyan ng sagot at hinahayaan lang na ianalyze yung sagot, nasasagot naman po namin dahil sa mga pictures sa snake and ladder.) – ***Grp. 1***

"… the way you ask questions - when we don't understand, you explain the questions further so we can grasp the meaning of the pictures better …" (yung pagtatanong niyo po kasi kapag di namin maintindihan, dadalian niyo para mas magets po namin yung nasa pictures …) – ***Grp. 2.***

"… the snake and ladder board is enjoyable and your questions made it easier … we find ourselves saying 'Ah, I understand now!'" (… nakaka-enjoy naman yung nasa snake and ladder at

napapadali dahil sa tanong niyo po … napapasabi nalang po kami ng 'ay alam ko na!) – ***Grp. 3.***

"…the answer comes from us, what we understand from the image, what we think happened there. In a way, we're the ones really thinking …" (… sa amin po manggagaling yung sagot kung ano ba yung naintindihan namin sa larawan, ano ba sa tingin namin naganap doon. Kumbaga kami po talaga yung nag-iisip …)

– ***Grp 4.***

According to the interview responses, integrating the snake and ladder board game into classroom discussions could be an effective strategy to foster critical thinking and enhance students' inference-making skills. The interactive and problem-solving nature of the game-based learning approach encourages students to analyze visual cues, make connections, and draw logical conclusions, which are crucial components of inference-making abilities. The findings of this study correspond with those of Kailani et al. (2019), who found that students who participated in game-based learning activities demonstrated significantly higher levels of inference skills compared to those in the control group based on a literary review conducted by the researchers. The interactive and problem-solving nature of the game required students to analyze visual cues, make connections, and draw conclusions, which enhanced their inference-making abilities.

The findings of this study present a comprehensive analysis of the impact of integrating the snake and ladder board game on students' inference skills, encompassing both quantitative and qualitative results. The quantitative data (Tables 1 and 2) indicate a substantial enhancement in students' inference skills, as evidenced by the significant improvement in pre-to post-test scores. The initial low competency levels, with a majority of students scoring poorly and falling into the "failed" category, experienced a remarkable transformation post-intervention, with a noticeable shift in scores to higher categories such as "fair" and "good." This improvement is denoted by a composite mean score, signifying an overall positive progression in students' inference skills. Furthermore, the Wilcoxon signed-rank test confirms a significant increase between pre-and post-test scores, reaffirming the efficacy of the gamified approach.

Qualitative feedback from students aligns with and reinforces the quantitative findings, emphasizing enhanced engagement and learning experiences resulting from incorporating the snake and ladder board game. The thematic analysis of the student interviews revealed prevalent themes, including increased comfort in the learning environment, reduced monotony, and the cultivation of critical thinking skills. Students preferred the game's interactive nature, citing its role in making learning more enjoyable and less monotonous, thereby bolstering their motivation and active involvement in classroom discussions. The comfort and excitement derived from the gamified learning environment led to deeper engagement with the educational content. Moreover, the game's emphasis on problem-solving and analytical elements prompted students to develop critical and independent thinking skills, thus bolstering their ability to make inferences. This result aligned with the study of Kapp (2012) study, which indicated that immersive aspects of games can lead to higher levels of cognitive engagement, allowing students to explore concepts more thoroughly. This also corresponds with the systematic review by Wang and Chen (2021), which found that game-based learning significantly improves cognitive engagement, which positively impacts academic performance.

These findings underscore the positive influence of integrating the snake and ladder board game on students' cognitive development, fostering an enriched learning environment, and enhancing inference skills. The intertwined nature of the quantitative enhancements and qualitative feedback underscores the dual benefits of gamification in education: tangible academic improvements and heightened student motivation and engagement, advocating for the broader implementation of such strategies within educational contexts.

CONCLUSIONS

The research indicates that integrating the traditional snake and ladder board game as a teaching tool has significantly improved students' inference skills in Araling Panlipunan into academic instruction, notably affecting students' ability to draw logical conclusions, as evidenced by improvements in their test scores before and after the intervention. While many students initially struggled with this skill, data collected after the game-based intervention revealed a marked improvement, with more students demonstrating proficiency. In addition, qualitative feedback from students underscored the positive effects of the game, emphasizing heightened engagement, ease of participation, and decreased boredom during learning sessions. The game's interactive nature encouraged students to think critically and actively engage with the material, thus confirming its beneficial influence on educational outcomes. These findings provide a strong case for implementing gamified teaching methods to enhance cognitive development and student enthusiasm in academic environments.

LIMITATION & FURTHER RESEARCH

This study focused on enhancing the inference skills of Grade 7 Emerald students in Araling Panlipunan at Old Cabalan Integrated School during the 2023-2024 academic year by utilizing the Snake and Ladder Board Game as the primary teaching strategy. However, selecting a single section limits the generalizability of the findings because the results may not reflect the experiences of students in other grades or schools. Key limitations include the narrow scope, which restricts widespread conclusions; the short duration, which may overlook long-term effects; the small sample size, which affects the robustness of the data; and the lack of consideration for confounding factors like prior knowledge and learning styles. In future research, it is recommended that at least three sections of Grade 7 students from multiple schools be included to create a larger and more diverse sample. A longitudinal design that assesses changes in inference skills over an academic year is necessary to evaluate long-term effects. Additionally, a comparative study should compare the Snake and Ladder strategy with traditional teaching methods, such as lectures. Researchers should investigate individual factors such as prior knowledge and learning styles through targeted surveys. Finally, monitoring the authenticity of the game implementation in the classroom will help eliminate variations that could impact the outcomes. By following these recommendations, future studies can better understand the effectiveness of the Snake and Ladder board game in terms of enhancing inference skills.

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