



APeriod Go: Educational board game for students' engagement

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Abstract

In recent years, there has been a growing interest in utilizing game-based learning tools to enhance student engagement and educational outcomes. This study explores the use of APeriod Go, an educational board game, to enhance student engagement in Araling Panlipunan. The study aimed to determine if the game could improve student engagement and learning outcomes in a subject often perceived as uninteresting. A quantitative research design was employed, utilizing a Likert Scale-based survey to measure student engagement levels before and after implementing the board game. The sample consisted of fifty Grade 5 learners from two heterogeneous sections, representing a diverse range of academic abilities. The pre-survey showed moderate student engagement, while the post-survey increased, indicating consistent active participation in Araling Panlipunan. The difference between the pre-survey and post-survey was statistically significant, demonstrating the intervention's enhancement in the engagement of students towards Araling Panlipunan. Integration of innovative teaching aids like "APeriod Go" into the curriculum expands the integration of this educational board game into other grade levels and subjects leading towards the student-led game development. The research highlights the importance of creating engaging educational experiences to make learning more meaningful and enjoyable for students. Future research could explore the long-term effects of such interventions and their applicability across various educational contexts and subjects.

Keywords: *APeriod GO, engagement level, game-based, gamification, teaching aid*

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1. Introduction

Teachers oftentimes face challenges in making their subject engaging and relevant to students' experiences. The study of Cosme (2019) revealed that lack of motivation, disinterest, and struggles with retaining principles or adapting to teaching styles contribute to students' poor behavior and low performance. For instance, students often find Araling Panlipunan uninteresting due to its focus on politics, economy, history, and society, which are taught in an objective manner. It is often seen as an uninteresting subject as it contains too many concepts, particularly about the sequence of historical events.

In response to these challenges, several studies have explored alternative, more engaging instructional strategies. Alejandria et al. (2023) demonstrated that using an instructional board game to teach the periodic table significantly improved students' understanding in chemistry. Their findings showed a marked increase in post-test scores compared to pre-test results, indicating enhanced cognitive development and engagement through game-based learning. Beyond academic improvement, the study also noted increased student interaction and enjoyment, highlighting the potential of games to make learning more dynamic and collaborative. Similarly, Buenaflor (2024) developed the AGILA (Araling Panlipunan Game-based Interactive Learning Activity), which aimed to boost students' attitudes toward learning the subject both at home and in school. Results from this research showed a considerable enhancement in student motivation and attitude, as measured by student feedback on skill development, game mechanics, and the overall learning experience. The gamification of the subject allowed students to experience historical and societal content in an interactive, meaningful way, thus bridging the gap between abstract knowledge and personal engagement.

Teachers are increasingly using supplemental teaching aids to enhance classroom experiences. Building on these innovative approaches, the researchers developed "APeriod Go," an educational board game designed to make learning Araling Panlipunan more enjoyable and engaging. By integrating traditional teaching methods with interactive gameplay, the tool aims to improve students' understanding and retention of key concepts while fostering human interaction and socialization. APeriod Go provides a tangible alternative to digital learning, encouraging the use of multiple senses and making the subject more accessible and fun, ultimately enhancing students' engagement and appreciation for Araling Panlipunan.

This study looks into the perspectives and dispositions of educators and learners concerning the implementation of APeriod board game in the educational setting. The study intends to get important input from the learners by gathering their opinions and ideas to guide future attempts to incorporate instructional board games into the Araling Panlipunan curriculum. Specifically, the study aims to determine the engagement level before and after the intervention of the board game.

2. Literature Review

2.1. Game-Based Learning

Games can be used as a support tool to complement traditional teaching methods to improve the learning experience of the learners while also teaching other skills such as following rules, adaptation, problem-solving, interaction, critical thinking skills, creativity, teamwork, and good sportsmanship. According to Thiell (2022), game-based learning and gamification are effective tools for fostering meaningful and enjoyable participation. Teachers can integrate specific game elements into lessons or have students design cooperative, exploratory games to interact with academic content. By placing students at the center of their learning, this approach encourages a sense of self and accomplishment through independent, game-based activities. Similarly, Dabbous et al. (2022) link game-based learning to improved motivation and learning outcomes, emphasizing how its interactive and immersive nature enhances educational performance. Popular game genres used in education include role-playing, strategy, simulations, riddles, and adventure.

Educational games are widely viewed by students as an engaging method to enhance learning of a specific subject or topic. According to Poole et al. (2019), board games provide peer scaffolding, encouraging involvement and improving academic performance. Students' positive feedback reflects increased engagement, deeper knowledge retention, enhanced flow—a state of deep focus—and improved learning achievement. These benefits show that integrating educational games enriches learning by fostering reflection, immersion, and better academic outcomes. Furthermore, in an organized investigation, Dahalan (2024) found that gamified learning has several benefits for vocational learners, including higher academic achievement, motivation, and engagement. Since gamification and game-based learning reduce the likelihood of making mistakes, they may have a big influence on the direction of vocational education and training in the future. They could provide a risk-free introduction to

a variety of hazardous professions where failing is expected while learning through a game, rather than a problem.

One of the crucial advantages of gamified learning highlighted by Dahalan (2024) is its potential to create a risk-free learning environment. In vocational education, where students often train for hazardous professions, the ability to make mistakes without real-world consequences is invaluable. Traditional learning environments may not provide such a safe space for trial and error, whereas gamified learning allows students to engage in experiential learning. This method enables learners to practice and master skills without the fear of real-life repercussions, thus encouraging exploration and experimentation. In elementary education, this method can foster a sense of curiosity and creativity among students. Just as vocational learners benefit from making mistakes in a safe setting, elementary students also thrive in environments where they can explore concepts and ideas without fear of failure. This freedom to experiment helps young students build confidence and resilience, essential qualities for lifelong learning.

Moreover, Galoyo (2021) argues that games play a significant role in students' daily lives. As the majority of players claim, these games provide students with several benefits, such as enjoyment, fulfillment, and learning a new method or strategy to pick up new knowledge, develop new abilities, and even outperform rivals. It also emphasizes the benefits of the periodic table of games and how they affect students' intellectual development (Ong & Linaugo, 2019). These games not only serve as tools for reviewing material but also create a collaborative and participatory learning environment. When students work together in a game-based setting, they build teamwork and communication skills, reinforcing their understanding of the subject matter through peer interaction. Educational games stimulate cognitive processes by challenging students to think critically and solve problems creatively (Ong & Linaugo, 2019). By engaging with these games, students develop a deeper and more structured understanding of various subjects.

A large number of teachers use game-based learning techniques to help students grasp concepts and become engaged, which eventually results in concept mastery (Piyawattanaviroj et al., 2019). For instance, colleges and K–12 schools are starting to adopt game-based learning (Shu & Liu, 2019). It is increasingly evident that the use of games in the classroom increases student engagement, develops their ability to make calculated judgments to solve issues, and makes the process of playing games enjoyable (Spiegel et al., 2008; Selvi

& Cosan, 2019). In terms of educators' responsibilities, educational games can also be seen as an efficient and interactive teaching strategy that supports traditional teaching approaches. In the end, this increases and inspires students' motivation to learn, makes the learning process enjoyable, and fosters teamwork.

2.2. Effects of Game-Based Learning on Students' Engagement Level

Alejandria et al. (2023) found that an instructional board game could enhance students' understanding of the periodic table of elements in their chemistry coursework. They observed a significant improvement in students' post-test results compared to their pre-test scores after using the game. This suggests that game-based learning, particularly through an instructional board game, positively affects student engagement and cognitive development. Additionally, the game encourages social interaction, helps students improve their communication skills, and makes learning enjoyable. As a relatively underutilized tool, the educational board game shows promise as an effective supplement to traditional teaching methods for studying the periodic table.

In another study, utilizing mobile-based scaffolding framework, Hou et al. (2023) discovered that the game greatly increased the efficacy of students' learning and decreased their anxiety related to chemistry. During the game, the behavioral pattern was also discovered to feature a problem-solving learning process, scaffolding, and reflection. Moreover, Buenaflor (2024) developed AGILA with game-based activities in Araling Panlipunan, which demonstrated positive impact on students' attitudes toward learning. Similarly, Tomines et al. (2021) developed AP-DAMA board game as an intervention in enhancing the test performance of the students in Araling Panlipunan, resulting to enhanced students' motivation and improved test scores. Agregado et al. (2022) also developed a game-based educational resource that teaches important concepts and historical events that have happened in the Philippines over the past century to grade 7 pupils following the Philippine K–12 curriculum. The students expressed great satisfaction with the game's usability and ability to increase the students' memory retention in grasping important concepts in Philippine History.

2.3. Board Games as a Tool for Enhancing Academic Learning

Barull (2024) used a randomized controlled trial to examine the cognitive and educational benefits of board games in primary schools and found that board games significantly enhanced critical thinking and learning outcomes, suggesting their potential to improve cognitive development in young learners. Similarly, Rajković et al. (2020) explored the use of history-based board games as an educational tool, with their findings emphasizing how these games not only engaged students but also deepened their understanding of historical events, making history more interactive and accessible. Similarly, Gregorio et al. (2024) used "Snakes and Ladders" board game to improve inference skills among Grade 7 students in Araling Panlipunan, demonstrating that the game could effectively foster analytical thinking, supporting its potential as a valuable learning resource. These studies collectively highlight the diverse ways in which board games can be utilized to enhance educational outcomes, whether by promoting critical thinking, deepening subject knowledge, or developing analytical skills.

2.4. Game-Based Learning to Foster Creativity and Motivation

Educational games have become a powerful tool in fostering creativity, engagement, and motivation among students. In the study by Bulut (2022), the process of designing educational games was shown to stimulate students' creativity, confirming that developing games not only enhanced students' innovative thinking but also provided them with the opportunity to express and develop new ideas. This process allowed students to think critically about the educational content and approach problem-solving in unique ways.

Cheung and Ng (2021) examined the role of educational games in enhancing student engagement and learning motivation and study found that students were more enthusiastic and participated actively during game-based sessions. This indicates that the interactive nature of games increases students' intrinsic motivation and makes learning more enjoyable. As a result, game-based learning not only captivates students but also boosts their involvement in the learning process. In line with these findings, Nadeem (2023) highlighted the significant impact of digital game-based learning on student engagement and motivation. By incorporating interactive and immersive elements, digital games have a profound effect on students' learning experience. Not only did it increase engagement across various subjects, but it also brought psychological benefits by promoting positive emotions such as enjoyment

and satisfaction. These psychological benefits help improve students' attitudes toward learning, making it more enjoyable and motivating them to put more effort into their academic pursuits. Through game-based experiential learning, students were able to engage more deeply with sustainability concepts, apply them in practical situations, and develop a better understanding of the material (Ho & Hsu, 2022). This approach not only supported creativity but also contributed to a more comprehensive and practical learning experience.

2.5. Designing and Developing Educational Board Games

The integration of educational board games into the learning process has gained considerable attention for its effectiveness in enhancing various cognitive and academic skills. Botes (2024) demonstrates how pedagogical content knowledge could be showcased through the development of science board games, providing frameworks for creating content-specific games. This highlights how board games can be used as a tool for delivering complex scientific concepts in a more interactive and engaging way. In the same vein, Hasan et al. (2020) reinforce the idea that educational games can play a vital role in deepening subject knowledge in an engaging manner. Nautiyal et al. (2024) proposed a practical framework for designing and implementing educational board games in K-12 classrooms, emphasizing the importance of maximizing the educational value of such games by focusing on appropriate design principles.

According to Khaldi et al. (2023), games can go beyond traditional subjects, integrating health education into an interactive format that enhances learning through experience. Additionally, Chen (2019) have shown that game-based instruction, especially in subjects like natural science, improves academic performance and understanding of scientific principles. These highlight the potential of games in fostering both cognitive and subject-specific skills. On the other hand, Jipa et al. (2023) explored the impact of board games on the development of situational motivation in primary school children, showing how games can create a positive and motivating learning environment. For this, Greenhalgh (2024) suggests that design elements in educational board games affect player reception and engagement, providing further insight into how well-designed games can enhance the learning experience. This illustrates the multifaceted role of educational board games in enhancing learning, from academic performance to motivation and cognitive development (Estrada-Plana et al., 2024; Rudenskyi, 2024).

2.6. Theoretical Framework

The study is grounded on three prominent learning theories: constructivist theory, game-based learning and experiential learning theory.

According to Serhat (2021), Piaget's Constructivist Theory of learning argues that people develop an understanding of what they learn based on their past experiences. This means that each individual constructs knowledge in their mind based on their existing knowledge, which is why learning is different for every individual. In the context of this study, the board game "APeriod Go" is used as a supplementary teaching aid in Araling Panlipunan 5. The game is designed to engage students and enhance their learning experience. According to Piaget, games are fundamental mediums for the development of imagination, the construction of new experiences, and the modification of past knowledge.

Meanwhile, game-based learning is an education model in which students learn new concepts and test their knowledge through playing games. It is an active learning strategy that uses strategies typically reserved for games to encourage and enhance learning, practice, and assessment. This type of learning takes educational content and transforms it into a game that students can play. In the case of "APeriod Go", the game could provide a fun and engaging way for students to learn and understand the concepts taught in Araling Panlipunan 5. The game could also help students to unconsciously learn through play (Havziu et al., 2023).

According to McLeod (2022), Kolb's Experiential Learning Theory suggests that knowledge is created through the transformation of experience. This process involves four stages; a concrete experience where learners encounter a new experience or situation, or reinterpret an existing experience; reflective observation where learner reflects on the new experience in light of their existing knowledge; abstract conceptualization learners' reflection gives rise to a new idea, or a modification of an existing abstract concept; lastly active experimentation where learners apply their ideas to the world around them to see what happens. Through this process, the APeriod Go board game serves as a tool for experiential learning, allowing students to gain a deeper understanding of Araling Panlipunan 5. It provides a fun and engaging way for students to learn and apply new concepts, making the learning process more effective and enjoyable.

3. Methodology

3.1. Research Design

A quasi-experimental quantitative research design was selected to study the students' engagement level before and after the intervention of the APeriod GO board game. According to Alejandria et al. (2023), quasi experimental is utilized when researchers investigate cause and effect relationships between variables. The study employed the quasi-experimental design to assess the effectiveness of the APeriod GO board game in boosting students' engagement levels. By comparing student engagement levels before and after the intervention, the study aims to establish whether the board game had a measurable impact on students' interest, involvement, and overall engagement in the learning process.

3.2. Participants of the Study

The study employed a quota sampling technique to select participants from two heterogeneous sections of Grade 5 students at a public elementary school in Laguna, Philippines. Each section comprised 25 pupils, resulting in a total sample size of 50 respondents. This approach ensured an even distribution of participants across the two sections, representing a diverse range of academic abilities.

Increasing the sample size across two groups enhances the reliability of the study's findings by reducing the impact of chance variations. With more data points, the study can provide more precise estimates of engagement levels among Grade 5 pupils, reduce sampling error, increase generalizability to the population, enhance statistical power to detect real effects, and improve robustness to outliers. This approach ensures a more accurate understanding of engagement dynamics.

3.3. Instrumentation and Data Gathering Process.

This study utilized a descriptive survey design to assess the effectiveness of APeriod Go. The researchers developed a 20-item checklist to measure engagement levels, which was used for both the pre-survey and post-survey. To ensure the validity of the survey instrument, the checklist was reviewed and validated by master teachers.

The intervention involved the implementation of APeriod, a board game specifically designed to promote active learning and engagement. Alongside the board game, the researchers developed a comprehensive manual detailing the rules and mechanics of the

game, as well as guide sheets containing historical facts, important figures, and relevant concepts in Araling Panlipunan.

The pre-test was conducted in the first week of the study to establish the baseline engagement levels of students before introducing the APeriod GO board game. The assessment was carried out using a 20-item checklist developed by the researchers, which was validated by master teachers to ensure its accuracy and relevance. The students were asked to complete the checklist independently, rating their engagement in Araling Panlipunan using a Likert scale ranging from "always" to "never." The pre-test was administered in a classroom setting under the supervision of the researchers and the subject teacher to ensure consistency and reliability in data collection.

The implementation for the research was conducted over a five-week period from March to May. The researcher developed a board game titled APeriod Go, inspired by the popular game Monopoly Go. This game aimed to engage Grade 5 pupils in educational activities during their Araling Panlipunan. The class was divided into four groups, each assigned a "token" to track their progress on the game board. Players rolled dice to determine their movement, with their token advancing accordingly. Upon landing on a tile, the color indicated the corresponding sequence card to be drawn, which contained questions related to the topics covered in the first to fourth grading periods. Correct answers earned them localized currency, which could be used to purchase additional sequence cards. The first group to collect all five sequence cards won the game. This setup was implemented daily from Monday to Friday, facilitated by the researchers.

The following five-week intervention utilizing the APeriod Go Board Game, a post-test was administered to assess the impact of this game-based learning approach on students' engagement levels in Araling Panlipunan. The post-test comprised 20 questions identical to those in the pre-test, ensuring consistency in the assessment criteria and allowing for a direct comparison of student responses before and after the intervention. This design facilitated the measurement of any changes in students' engagement attributable to the game-based learning experience. The use of identical questions is a standard practice in educational research, as it provides a reliable measure of shifts in specific variables, such as student engagement, over time. The post-test was administered under standardized conditions to all participating students at the conclusion of the intervention period, ensuring equal opportunity for completion and mitigating potential biases. The data collected from the post-test were

subsequently analyzed using descriptive statistics, including mean, standard deviation, and t-test, to evaluate the significance of any observed changes in student engagement levels.

3.4. Data Analysis

The study utilized Microsoft Excel Data Analysis Tool Pack to carry out the statistical calculations on the data. The survey items were designed to assess the degree of frequency of students' engagement in Araling Panlipunan, with weighted values assigned based on a Likert scaling system. This scaling system typically ranges from "always" to "never," allowing respondents to indicate the extent to which they engage in specific behaviors or activities related to Araling Panlipunan. After calculating the mean level of student engagement from the survey data, the researchers employed the T-test to ascertain whether there was a significant difference between the pre and post-survey measurements.

3.5. Research Ethics

Ethical considerations are essential in ensuring the integrity, fairness, and credibility of research. In this study, informed consent was obtained from the school administration, teachers, and students, ensuring that all participants were aware of the research's purpose, procedures, and their right to withdraw at any time. Confidentiality and privacy were strictly maintained by anonymizing student responses, safeguarding personal information, and ensuring that data was only used for academic analysis. Moreover, participation was entirely voluntary, with no coercion or pressure placed on students to engage in the board game or complete the survey. The study also prioritized the well-being of students by ensuring that the intervention was designed to be engaging and educational without causing psychological or academic stress. Additionally, the validity and integrity of the research were upheld by using expert-validated instruments and established statistical methods for data analysis, ensuring accurate and credible findings. By adhering to these ethical principles, the study maintained transparency and respect for all individuals involved, fostering a responsible and meaningful academic inquiry.

4. Findings and Discussion

Table 1

The mean level of the students' engagement before the implementation of APeriod Go

Criteria	Mean	Standard Deviation	Percentage Score	Interpretation
Engagement	3.14	0.56	62.8%	Sometimes

Legend: 1.00 - 1.80 Never; 1.81 - 2.60 Rarely; 2.61 - 3.40 Sometimes; 3.41 - 4.20 Often; 4.21 - 5.00 Always

Table 1 shows that the mean level of students' engagement before implementing APeriod Go was 3.14, with a standard deviation (SD) of 0.56. This corresponds to 62.8% of the maximum engagement level based on the scale, falling under the sometimes category. This result suggests that before the intervention, students exhibited moderate levels of engagement. They occasionally participated in lessons but were not consistently actively involved or fully interested in the subject. The relatively low percentage score indicates a potential need for interventions to enhance their engagement. These findings align with the study by Buenaflor (2024), which demonstrated that game-based interactive learning activities significantly enhance students' attitudes towards learning. The low pre-intervention engagement levels observed in this study underscore the necessity for innovative educational interventions to boost student interest and participation.

Table 2

The mean level of the students' engagement after the implementation of APeriod Go

Criteria	Mean	Standard Deviation	Percentage Score	Interpretation
Engagement	4.48	0.20	89.6%	Always

Legend: 1.00 - 1.80 Never; 1.81 - 2.60 Rarely; 2.61 - 3.40 Sometimes; 3.41 - 4.20 Often; 4.21 - 5.00 Always

Table 2 shows that the mean engagement level after the implementation of APeriod Go increased significantly to 4.48, with a standard deviation (SD) of 0.20. This corresponds to 89.6% of the maximum engagement level placing it in the always category. This result highlights the effectiveness of the intervention in promoting student engagement. After the implementation, students consistently demonstrated active participation and interest in their Araling Panlipunan 5 classes. This substantial increase in engagement supports the findings of the Buenaflor (2024), which demonstrated that interactive, game-based learning activities

can considerably enhance students' learning attitudes. Moreover, it parallels the results from Tomines et al. (2021) that board game intervention significantly benefited students' test performance by increasing their motivation and engagement with the subject matter.

Table 3

The significant difference in the students' engagement before and after the implementation of APeriod Go

Criteria	Mean Score	t-value	Significance Level	Critical Value	Interpretation
Pre-Test	3.14	-11.97	0.05	2.0096	Significant
Post-Test	4.48				

Table 3 shows the significant difference in the students' engagement before and after the implementation of APeriod Go. The mean score for engagement increased from 3.14 (pre-test) to 4.48 (post-test). The t-value of -11.97, at a 0.05 level of significance with a critical value of 2.0096, indicates a statistically significant difference in engagement scores. The implementation of APeriod Go had a significant and positive impact on students' engagement. The students' engagement levels increased from 62.8% "sometimes" to 89.6% "always", confirming the effectiveness of this educational intervention in enhancing participation and interest in Araling Panlipunan 5. These findings are consistent with Tomines et al. (2021) and Buenaflor (2024).

5. Conclusion

The results of this study demonstrate a significant improvement in students' engagement in Araling Panlipunan 5 after the implementation of APeriod Go: Educational Board Game. The pre-test mean engagement level of 3.14 (62.8%) suggests that students only "sometimes" engaged in lessons, indicating moderate levels of interest and participation before the intervention. In contrast, the post-test mean engagement level of 4.48 (89.6%) reveals that students "always" engaged in lessons, demonstrating consistently high levels of participation and interest after the intervention. The paired t-test confirmed a statistically significant difference between the pre-test and post-test scores, underscoring the impact of APeriod Go on student engagement and rejecting the null hypothesis. These findings suggest that integrating interactive and educational tools, such as board games, can effectively enhance classroom engagement and promote an active learning environment.

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Institutional Review Board Statement

This study was conducted in accordance with the ethical guidelines set by the Laguna University. The conduct of this study has been approved and given relative clearance(s) by the Laguna University's Research Development Center.

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