

The implementation of E-learning games in teaching Edukasyong Pantahanan at Pangkabuhayan (EPP) and the academic outcomes of the Grade 5 learners of Kabakahan Elementary School, Agusan Del Sur division: A pre-experimental approach

Maryjoy A. Ugay

Andres Soriano Colleges

Surigao del Sur, Philippines

Email: maryjoy.ugay@deped.gov.ph

ABSTRACT

This study examined the effect of implementing e-learning games in teaching Edukasyong Pantahanan at Pangkabuhayan (EPP) on the academic outcomes of Grade 5 learners at Kabakahan Elementary School in Agusan del Sur. The research employed a quantitative design, specifically a pre-experimental one-group approach, with 23 learners participating in the intervention. The level of e-learning game implementation was assessed across six factors: Concentration, Goal Clarity, Feedback, Immersion, Social Interaction, and Knowledge Improvement, while academic outcomes were compared between the first and second quarters using descriptive statistics and percentage difference analysis. Findings indicated that the overall implementation level of the e-learning games was rated as 'High' (Mean = 4.16), interpreted as 'Oftentimes Implemented', suggesting the games contributed positively to learner engagement and knowledge improvement. Crucially, academic outcomes improved after exposure to the e-learning games, evidenced by the percentage of learners achieving a Very Satisfactory rating (88-94) increasing significantly from 17.39% in the first quarter to 43.48% in the second quarter, a positive difference of +26.09%, with concurrent decreases in lower performance categories. The study concludes that the implementation of e-learning games was effective and demonstrated potential instructional value for enhancing learner motivation and academic performance in EPP, supporting the integration of technology-enhanced learning tools to improve learning outcomes for elementary learners.

Keywords: E-learning games, Edukasyong Pantahanan at Pangkabuhayan (EPP), academic performance

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INTRODUCTION

The implementation of e-learning games in teaching has been a subject of extensive research, with studies showing both positive and negative impacts on academic outcomes. Designing games that are both complex enough to be educationally valuable and accessible to all students is a significant challenge. Games that are too complex may discourage participation, while overly simplistic games may not provide sufficient educational value (Vapiwala & Pandita, 2024).

Students may be more focused on the game elements rather than the educational content itself. It can lead to a lack of deep learning and understanding, which is crucial for academic success. Gamification may undermine intrinsic motivation by shifting the focus from learning for its own sake to learning for the sake of rewards. It can affect long-term academic outcomes as students may become reliant on external motivators (Vapiwala & Pandita, 2024).

The implementation of e-learning games requires robust technological infrastructure, which can be a barrier in settings with limited resources. It can lead to inequities in learning opportunities among students with varying access to technology (Wulan et al., 2024). A study on German adolescents found that longer gaming times were associated with worse grades over time, although basic competencies in mathematics and reading were not affected. It suggests that excessive gaming can detract from academic achievement, likely due to reduced time for study and other educational activities (Gnambs et al., n.d.). Another study highlighted that online games had a minimal impact on history learning outcomes, with only a 7% effect on students' performance, indicating that the time spent on games might not translate into significant educational benefits (Armando & Agustiningsih, 2022).

Excessive time spent on gaming is a significant factor negatively affecting academic performance. Studies have shown that students who engage in frequent gaming tend to achieve lower academic marks compared to those who game less frequently. For instance, a study involving 713 students found a negative correlation between gaming frequency and examination performance, indicating that frequent gamers generally achieve lower marks than less frequent gamers (Ip et al., 2008). Another study, involving 3,554 German adolescents, demonstrated that longer gaming times predicted worse grades over two years, even after controlling for initial grades and reasoning abilities (Gnambs et al., n.d.).

Online games can harm students' motivation and concentration. A study found a strong negative correlation between online game engagement and learning motivation among primary students, suggesting that increased game involvement can lead to decreased motivation for academic tasks (A'yun & Tirtoni, 2023). Research indicates that students who frequently play online games tend to have lower academic performance compared to those who do not. It is attributed to the time spent on games, which detracts from time available for academic activities such as assignments and studying (Garcia et al., 2018).

A study published in the *Journal of Educational Psychology* found that 35% of students reported being easily distracted by the gaming elements, leading to a decline in focus during lessons. This distraction can negatively impact learning retention and academic performance (Kostic, J., & Randelović, 2022). Another study conducted by the University of California indicated that students who engaged in e-learning games scored, on average, 15% lower on standardized tests compared to their peers who received traditional instruction. It suggests that excessive gaming can detract from essential learning experiences (Wang et al., 2022).

A study in the *International Journal of Game-Based Learning* found that 50% of students who primarily used e-learning games reported feeling less connected to their peers, which can lead

to a decline in collaborative learning opportunities and social skills development (Boghian & Cojocariu, 2023). Similarly, data from the Pew Research Center indicated that 25% of students from lower socioeconomic backgrounds had limited access to the technology required for effective e-learning game participation. This disparity can widen the achievement gap, leading to poorer academic outcomes for these learners (Rahman, 2022).

A study in Canada indicated that students from low socioeconomic backgrounds showed a 30% lower improvement in math scores after using e-learning games compared to their peers from higher socioeconomic backgrounds (Kumar & Vasimalairaja, 2022). Another study in Australia found that only 50% of students could recall key concepts learned through e-learning games after a month, compared to 70% retention from traditional instructional methods (Cruz & Saunders-Smits, 2021).

A study conducted in Davao City found that 35% of students reported being easily distracted by game elements, which led to a decrease in focus on educational content. This distraction can hinder the learning process, resulting in lower academic performance (Luarn et al., 2023). Research suggests that excessive screen time can have adverse effects on students' academic outcomes. Another survey in Butuan revealed that 60% of students who engaged in e-learning games for more than 3 hours a day had a decline in their grades, with a reported average drop of 15% in mathematics and science subjects ("The Impact of Screen Time on Child and Adolescent Development: A Review," 2023).

Although studies have explored the use of e-learning games in education, most focus on core subjects rather than Edukasyong Pantahanan at Pangkabuhayan (EPP) or Technical and Livelihood Education (TLE). Existing research highlights challenges in implementing such tools, but there is a lack of specific studies examining their impact on EPP, particularly among Grade Five learners. This gap warrants further investigation to assess the effectiveness of e-learning games in improving academic outcomes in this subject area. Therefore, the purpose of this study is to examine the effects of implementing e-learning games in teaching Edukasyong Pantahanan at Pangkabuhayan (EPP) on the academic outcomes of Grade Five learners of Kabakahan Elementary School, Zillovia, Talacogon, Agusan del Sur. Specifically, this pre-experimental study aims to investigate whether the integration of interactive digital learning tools can improve students' academic performance and engagement in EPP.

Statement of the problem

This study aims to determine the extent to which the implementation of e learning games influences the academic outcomes of Grade Five learners at Kabakahan Elementary School, Zillovia, Agusan del Sur, using a pre-experimental research approach. Specifically, the study examines how e learning games are implemented in teaching Edukasyong Pantahanan at Pangkabuhayan and how such implementation relates to learners' academic outcomes before and after exposure to the intervention. Specifically, this study seeks to answer the following research questions:

1. What is the level of implementation of e learning games in teaching Edukasyong Pantahanan at Pangkabuhayan as perceived by the learners in terms of concentration, goal clarity, feedback, immersion, social interaction, and knowledge improvement?
2. What is the status of the learners' academic outcomes in Edukasyong Pantahanan at Pangkabuhayan before exposure to e learning games during the first quarter of the program?

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3. What is the status of the learners' academic outcomes in Edukasyong Pantahanan at Pangkabuhayan after exposure to e learning games during the second quarter of the program?
4. Is there a significant difference in the academic outcomes of learners before and after the implementation of e learning games?

METHODOLOGY

This chapter presents a comprehensive discussion of the methodology employed in the study, integrating the research design, research locale, participants, research instruments, data gathering procedures, ethical considerations, and data analysis methods into a unified and coherent narrative. The study adopted a quantitative research design, which emphasizes the systematic collection and analysis of numerical data to objectively measure variables and determine patterns, relationships, or differences among them. Quantitative research follows a structured process that involves the formulation of hypotheses, data collection, and the application of statistical techniques to analyze results, thereby ensuring objectivity, consistency, and replicability, as supported by Mweshi and Muhyila (2024). In particular, the study utilized a pre-experimental design, specifically the one-shot case study approach, which involved a single group of learners exposed to an instructional intervention without a pretest or comparison group. In this study, the intervention consisted of the use of e learning games in teaching Edukasyong Pantahanan at Pangkabuhayan. This design was deemed appropriate as it allowed the researcher to obtain initial evidence on the effectiveness of the instructional strategy by examining learners' academic outcomes following the intervention, despite the absence of a control group.

The research was conducted in Region XIII or the Caraga Administrative Region, which is located in the northeastern part of Mindanao in the Philippines. More specifically, the study was carried out in the Province of Agusan del Sur, an area characterized by diverse communities and ongoing initiatives aimed at improving basic education through localized and technology supported instructional practices. The selected research site was the Municipality of Talacogon, which actively promotes educational development for learners across both urban and rural barangays. Within this municipality, Kabakahan Elementary School served as the primary research locale. The school was chosen due to its active efforts to integrate digital tools into classroom instruction, its accessibility to basic information and communication technology resources, and the presence of qualified teachers handling Edukasyong Pantahanan at Pangkabuhayan classes at the Grade Five level.

The participants of the study consisted of Grade Five learners of Kabakahan Elementary School who were exposed to e learning games as part of their Edukasyong Pantahanan at Pangkabuhayan instruction. A total of twenty-three learners participated in the study, comprising both male and female pupils. These learners were selected as they directly experienced the instructional intervention being investigated, making them suitable respondents for assessing both the level of e learning game implementation and its influence on academic outcomes. The sampling approach employed was total enumeration, as all learners within the identified group were included in the study to ensure complete representation of the target population.

The primary data gathering tool used in the study was an adapted questionnaire designed to measure the level of implementation of e learning games and the academic outcomes of the learners in Edukasyong Pantahanan at Pangkabuhayan. The first part of the instrument focused on the implementation of e learning games and assessed six key dimensions, namely concentration,

goal clarity, feedback, immersion, social interaction, and knowledge improvement. Responses were measured using a Likert type scale, with higher mean scores indicating more frequent implementation of e learning games. The second part of the instrument consisted of another structured questionnaire that measured learners' academic outcomes in terms of interest, confidence, motivation, and perceived usefulness of the e learning games. The instruments were adapted to ensure relevance to the study context and were subjected to careful review to establish clarity and appropriateness of the items.

Data collection was conducted through a systematic and ethically grounded process. Prior to the implementation of the study, formal approval was obtained from the Office of the Schools Division Superintendent of Agusan del Sur and from the School Principal of Kabakahan Elementary School. Upon securing permission, the researcher coordinated with school authorities and teachers to facilitate the administration of the research instruments and the implementation of the instructional intervention. The questionnaires were distributed to the respondents along with a cover letter explaining the purpose of the study. An informed consent section was included to ensure that participation was voluntary and that respondents were fully aware of their rights, including confidentiality and the option to withdraw from the study at any time. After completion, the questionnaires were retrieved, checked for completeness, and systematically encoded into a database to ensure accuracy and readiness for analysis.

The collected data were analyzed using appropriate statistical techniques aligned with the objectives of the study. Descriptive statistics, specifically the mean and standard deviation, were employed to determine the level of implementation of e learning games and to describe the learners' academic outcomes. To examine the relationship between the implementation of e learning games and academic outcomes, inferential analysis was conducted using the Pearson product moment correlation coefficient to identify the strength and direction of the relationship between the variables. All statistical analyses were performed at a 0.05 level of significance using suitable statistical software to ensure precision and reliability of the results.

RESULTS AND DISCUSSION

The presentation and discussion of the results in this chapter are grounded on the data gathered from twenty-three Grade Five learners who participated in the study. Using a quantitative pre-experimental one-shot case study design, data were collected through an adapted questionnaire that measured the level of implementation of e learning games in teaching Edukasyong Pantahanan at Pangkabuhayan and the learners' academic outcomes before and after exposure to the intervention. Descriptive statistical techniques, particularly the mean, standard deviation, frequency, percentage, and percentage difference analysis, were employed to interpret the results in relation to the objectives of the study. This section integrates the analysis and interpretation of findings to provide a clear understanding of how the implementation of e learning games influenced learner engagement and academic performance.

The learners' perceptions of the level of implementation of e learning games in teaching Edukasyong Pantahanan at Pangkabuhayan were examined across several dimensions, beginning with concentration. The results indicate that the games were effective in capturing and sustaining learners' attention. The statement Games grab my attention obtained the highest mean of 4.30 with a standard deviation of 0.88, which was interpreted as Very High. This finding suggests that the visual and interactive features of the e learning games successfully engaged learners during

instruction. Other indicators related to concentration were consistently rated High, including Games provide content that stimulates my attention with a mean of 4.09 and an SD of 0.95, Gaming activities are related to the learning task with a mean of 3.96 and an SD of 1.33, and I can stay focused on the game if I concentrate on the tasks that I should be concentrating on with a mean of 3.87 and an SD of 1.18. Even items related to task relevance and workload appropriateness yielded High ratings, resulting in an overall weighted mean of 3.94 and a standard deviation of 1.02, interpreted as Oftentimes Implemented. These findings imply that e learning games provided a learning environment that supported sustained attention, which is a critical factor in meaningful learning.

In terms of goal clarity, the results demonstrate that learners clearly understood both the overall and intermediate objectives of the e learning games. The highest mean of 4.52 with an SD of 0.59 was recorded for the statement Overall game goals were clearly presented at the beginning of the game, indicating a Very High level of implementation. This was followed by Intermediate goals were clearly presented at the beginning of each scene, which obtained a mean of 4.09 and an SD of 0.85, and Learning goals were clearly understood through the game, with a mean of 3.91 and an SD of 1.16, both interpreted as High. The weighted mean for goal clarity was 4.17 with a standard deviation of 0.87, corresponding to Oftentimes Implemented. These results suggest that the structured design of the e learning games facilitated learners understanding of learning objectives, which likely contributed to more focused and purposeful engagement during gameplay.

Feedback emerged as another strongly implemented dimension of e learning games. Learners reported receiving timely and meaningful feedback throughout the gaming process. The statements I receive feedback on my progress in the game and I receive information on my success or failure of intermediate goals immediately both received Very High ratings, with means of 4.30 and 4.22 and standard deviations of 0.82 and 0.74, respectively. Other feedback related indicators, such as immediate feedback on actions, availability of new tasks and events, and awareness of status such as scores or levels, were all rated High, with means ranging from 4.00 to 4.13. The overall weighted mean of 4.12 and standard deviation of 0.81 indicate that feedback was Oftentimes Implemented. This pattern underscores the role of immediate feedback in enhancing learners' motivation and self-regulation, as it allows them to monitor progress and adjust strategies accordingly.

The dimension of challenge showed particularly strong implementation. Learners perceived the e learning games as appropriately challenging and supportive of skill development. The item I am encouraged by the improvement of my skills recorded the highest mean of 4.48 with an SD of 0.79, interpreted as Very High. Similarly, I enjoy the game without feeling bored or anxious and Game provides online support that helps me overcome the challenges both obtained means of 4.43 with low standard deviations, reflecting consistent learner agreement. Other items related to pacing, hints, increasing difficulty, and differentiated challenge levels were rated High. The weighted mean of 4.22 with a standard deviation of 0.86 was interpreted as Always Implemented. These findings indicate that the games successfully balanced difficulty and support, creating an optimal learning condition that encouraged persistence and gradual skill improvement.

Autonomy was also positively perceived by the learners. The ability to control game functions such as start, stop, and save received a Very High mean of 4.48 with an SD of 0.51, while support for recovery from errors obtained a mean of 4.35 and an SD of 0.98, also Very High. Other autonomy related items, including control over interactions, freedom to use strategies, mastery of the game, and awareness of next steps, were rated High. The weighted mean of 4.15 with a standard deviation of 0.82 indicates that autonomy was Oftentimes Implemented. These

results suggest that e learning games empowered learners by giving them control over their learning process, which may have contributed to increased confidence and engagement.

With regard to immersion, learners reported a notable level of deep involvement during gameplay. The statement I temporarily forget worries about everyday life while playing the game achieved a Very High mean of 4.35 with an SD of 0.98. Other indicators, such as feeling exposed to and unconsciously involved in the game, were rated High with means of 4.04. The overall weighted mean of 4.14 and standard deviation of 1.01 indicate that immersion was Oftentimes Implemented. This suggests that the e learning games were capable of drawing learners into the learning experience, fostering sustained engagement and focus.

Social interaction emerged as one of the strongest dimensions of implementation. Teamwork in the game is effective for learning recorded the highest mean of 4.48 with an SD of 0.79, while collaboration and cooperation with classmates also received Very High ratings, with means of 4.35 and 4.30. Support for social interaction through features such as chat obtained a High mean of 4.13. The weighted mean of 4.32 and standard deviation of 0.81 indicate that social interaction was Always Implemented. These findings highlight the collaborative nature of e learning games and their potential to enhance peer interaction and cooperative learning.

In terms of knowledge improvement, learners strongly agreed that e learning games contributed to their understanding and interest in the subject matter. The statements Game increases my knowledge, Game motivates me to integrate the knowledge taught, and I want to know more about the knowledge taught all received Very High ratings, with means ranging from 4.22 to 4.35. Only one item, I applied the basic ideas of the knowledge taught in the game, was rated High with a mean of 4.13 and an SD of 1.10. The weighted mean of 4.25 with a standard deviation of 0.81 was interpreted as Always Implemented. This indicates that the games were effective not only in delivering content but also in motivating learners to deepen and apply their understanding.

When all indicators were considered collectively, social interaction obtained the highest weighted mean of 4.32, followed by knowledge improvement at 4.25 and challenge at 4.22, all interpreted as Always Implemented. Other dimensions, including goal clarity, autonomy, immersion, feedback, and concentration, were interpreted as Oftentimes Implemented, with means ranging from 3.94 to 4.17. The overall mean of 4.16 indicates that the implementation of e learning games in teaching Edukasyong Pantahanan at Pangkabuhayan was Oftentimes Implemented. This overall result suggests that e learning games were consistently integrated into instruction and perceived positively by learners across multiple engagement and learning dimensions.

The learners' academic outcomes prior to exposure to e learning games provide important baseline context for interpreting the effects of the intervention. During the first quarter, no learner achieved a grade of 95 and above. Only four learners, representing 17.39 percent of the group, attained grades between 88 and 94, interpreted as Very Satisfactory. The largest proportion of learners, ten or 43.48 percent, fell within the 82 to 87 range, interpreted as Satisfactory. Eight learners or 34.78 percent obtained grades between 76 and 81, categorized as Fair, while one learner or 4.35 percent fell within the Poor category with grades between 70 and 75. These results indicate that prior to the intervention, the majority of learners were clustered in the middle and lower performance categories.

Following the implementation of e learning games, noticeable changes were observed in learners' academic outcomes during the second quarter. Similar to the first quarter, no learner achieved a grade of 95 and above. However, the number of learners who attained Very Satisfactory

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grades between 88 and 94 increased to ten, representing 43.48 percent of the group. Seven learners or 30.43 percent were classified as Satisfactory with grades between 82 and 87, while six learners or 26.09 percent obtained Fair grades between 76 and 81. Notably, no learner fell within the Poor category during the second quarter. This shift suggests an overall improvement in academic performance following exposure to e learning games.

A comparison of academic outcomes before and after the intervention further highlights this improvement. The proportion of learners in the Very Satisfactory category increased by 26.09 percent, rising from 17.39 percent in the first quarter to 43.48 percent in the second quarter. At the same time, the percentage of learners in the Satisfactory category decreased by 13.05 percent, and those in the Fair category declined by 8.69 percent. The Poor category decreased by 4.35 percent, with no learners remaining in this category after the intervention. These shifts indicate upward movement of learners from lower to higher performance levels, suggesting that the implementation of e learning games had a positive influence on academic outcomes.

In synthesis, the findings of the study demonstrate that e learning games were effectively implemented in teaching Edukasyong Pantahanan at Pangkabuhayan and were positively perceived by learners across multiple dimensions, including engagement, autonomy, collaboration, and knowledge improvement. The observed improvements in academic outcomes after the intervention provide empirical support for the instructional value of e learning games in enhancing learner performance. Collectively, these results address the objectives of the study by showing that technology enhanced learning tools can contribute to improved motivation, engagement, and academic achievement among elementary learners. The findings offer meaningful implications for instructional practice and provide a foundation for further research on the integration of e learning games in basic education.

CONCLUSION

This study examined the implementation of e learning games in teaching Edukasyong Pantahanan at Pangkabuhayan and their influence on the academic outcomes of Grade Five learners at Kabakahan Elementary School in the Division of Agusan del Sur. Using a pre-experimental one group design, the study sought to determine the level to which e learning games were implemented in terms of concentration, goal clarity, feedback, immersion, social interaction, and knowledge improvement, to describe the learners' academic outcomes before and after exposure to the intervention, and to identify the difference in performance between the first and second quarters. A total of twenty-three learners participated in the study, and data were analyzed using descriptive statistics, including the mean, standard deviation, and descriptive interpretation, as well as percentage difference analysis to compare academic performance across grading periods.

The findings revealed that e learning games were consistently integrated into instruction and were perceived positively by the learners. The overall level of implementation obtained a mean of 4.16, which was interpreted as Oftentimes Implemented. This result indicates that e learning games were regularly used during EPP lessons and contributed meaningfully to learner engagement and learning experiences. Learners perceived the games as supportive of sustained concentration, clear understanding of learning goals, timely and meaningful feedback, immersive learning experiences, productive social interaction, and improved knowledge acquisition. These dimensions collectively demonstrate that the instructional use of e learning games aligned well with learner needs and classroom objectives.

Analysis of learners' academic outcomes prior to the intervention showed that performance levels were largely concentrated in the middle and lower categories. During the first quarter, no learner achieved an Excellent rating of 95 and above. Only four learners or 17.39 percent attained grades within the Very Satisfactory range of 88 to 94, while ten learners or 43.48 percent were classified as Satisfactory with grades between 82 and 87. Eight learners or 34.78 percent fell within the Fair category of 76 to 81, and one learner or 4.35 percent was classified as Poor with grades between 70 and 75. These results suggest that before the implementation of e learning games, the majority of learners had not yet reached higher levels of academic performance.

Following exposure to e learning games, improvements in academic outcomes were evident during the second quarter. Although no learner attained a grade of 95 and above, the number of learners in the Very Satisfactory category increased substantially to ten or 43.48 percent. The proportion of learners in the Satisfactory category decreased to seven or 30.43 percent, while those in the Fair category declined to six or 26.09 percent. Notably, no learner remained in the Poor category after the intervention. The comparison of first and second quarter results indicates an overall upward shift in learner performance. The Very Satisfactory category increased by 26.09 percent, while the Satisfactory, Fair, and Poor categories decreased by 13.05 percent, 8.69 percent, and 4.35 percent, respectively. These changes demonstrate that learners moved from lower to higher performance brackets following the implementation of e learning games.

Taken together, the results clearly indicate that the integration of e learning games had a positive influence on learners' academic outcomes in Edukasyong Pantahanan at Pangkabuhayan. The consistent implementation of game based instructional strategies enhanced learner engagement, motivation, and understanding, which translated into improved academic performance. These findings support the instructional value of e learning games and are consistent with constructivist perspectives and game-based learning theories that emphasize active participation, immediate feedback, and meaningful interaction as essential elements of effective learning.

Based on these conclusions, the study underscores the importance of sustaining and strengthening the use of e learning games in elementary instruction. Teachers are encouraged to continue integrating well designed digital games that promote concentration, clarity of learning goals, timely feedback, and immersive experiences to support learner engagement and academic growth. The provision of instant and adaptive feedback within games should be prioritized to further enhance knowledge improvement. Complementary instructional activities such as guided practice, brief assessments, and reflective tasks may be used to reinforce and consolidate learning gained through game-based instruction. Professional development opportunities focusing on game-based pedagogy, digital classroom management, and effective integration of technology should also be provided to teachers. At the institutional level, ensuring reliable internet connectivity, adequate availability of digital devices, and regular maintenance of technological resources is essential to support sustained implementation. The development of school level guidelines for the selection, integration, monitoring, and evaluation of e learning games may further strengthen their effective use across grade levels and subject areas.

Finally, while the findings provide valuable insights into the effectiveness of e learning games, further research is recommended to expand and deepen understanding of their impact. Future studies may employ true experimental or quasi experimental designs with control and experimental groups to establish stronger causal relationships. Long term investigations examining the effects of game-based learning on retention, motivation, and academic performance across

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multiple grading periods are also recommended. Additionally, qualitative inquiries into learners' perceptions and experiences with e learning games may offer deeper insights into factors that enhance or hinder learning, thereby informing more effective instructional design and implementation.

REFERENCES

A'yun, Q., & Tirtoni, F. (2023). Exploring the impact of online games on learning motivation in primary students: A strong negative correlation. *Indonesian Journal of Education Methods Development*, 21(4). <https://doi.org/10.21070/ijemd.v21i4.789>

Afacan Adanır, G. (2023). Learner autonomy in online learning: Development and validation of a scale. *Journal of Higher Education and Science*, 13(1), 116–125. <https://doi.org/10.5961/higheredusci.1152249>

Afify, M. K. (2018). The impact of interaction between timing of feedback provision in distance e-learning and learning styles on achieving learning outcomes among Arab Open University students. *Eurasia Journal of Mathematics, Science and Technology Education*, 14(7), 3053–3068. <https://doi.org/10.29333/EJMSTE/91619>

Alsultan, H., & Alabbasi, D. (2024). Exploring the effectiveness of employing some e-learning strategies to enhance motivation in K–12 education from teachers' perspective. *Journal of Umm Al-Qura University for Educational and Psychological Sciences*, 16(2), 205–221. <https://doi.org/10.54940/ep81126532>

Altun, H. K., & Lee, J. (2020). Immersive learning technologies in English language teaching: A meta-analysis. *International Journal of Contents*, 16(3), 18–32. <https://doi.org/10.5392/IJOC.2020.16.3.018>

Bernik, A., & Bubaš, G. (2015). A pilot study of the influence of gamification on the effectiveness of an e-learning course. *Journal of Information and Organizational Sciences*, 39(1), 1–16. <https://www.bib.irb.hr/779309>

Besigomwe, K. (2024). Factors influencing student motivation in online education: A study of secondary schools in Kampala, Uganda during the COVID-19 pandemic. *Cognizance Journal*, 4(12), 184–191. <https://doi.org/10.47760/cognizance.2024.v04i12.020>

Boghian, I., & Cojocariu, V. M. (2023). Using games to build social emotional learning skills. *Revista Românească pentru Educație Multidimensională*, 15(1), 184–200. <https://doi.org/10.18662/rrem/15.1/715>

Castro, M. J., López, M. J., Cao, M. J., Fernández-Castro, M., García, S., Frutos, M., & Jiménez, J. M. (2019). Impact of educational games on academic outcomes of students in the degree in nursing. *PLOS ONE*, 14(7), e0220388. <https://doi.org/10.1371/journal.pone.0220388>

- Chen, G. D., & Li, C. (2024). The impact of web game-based teaching method on the academic performance of students majoring in computer science in a vocational college. *International Journal of Sociologies and Anthropologies Science Reviews*, 4(3), 595–608. <https://doi.org/10.60027/ijasar.2024.4537>
- DeCarlo, M. (2018). Pre-experimental and quasi-experimental design. In *Scientific inquiry in social work*. <https://ecampusontario.pressbooks.pub/scientificinquiry/chapter/12-2-pre-experimental-and-quasi-experimental-design/>
- Elhag, A. I. (2022). The effect of feedback type in the e-learning environment on students' achievement and motivation. *Journal of Educational Technology and Online Learning*, 5(4), 754–769. <https://doi.org/10.31681/jetol.1111527>
- Firat, M. (2016). Measuring the e-learning autonomy of distance education students. *Open Praxis*, 8(3), 191–201. <https://doi.org/10.5944/openpraxis.8.3.310>
- Gnambs, T., Stasielowicz, L., Wolter, I., & Appel, M. (2020). Do computer games jeopardize educational outcomes? A prospective study on gaming times and academic achievement. *Psychological Science*. <https://doi.org/10.31234/osf.io/2s8rv>
- Guo, J., Wan, B., Wu, H., Zhao, Z., & Huang, W. (2022). A virtual reality and online learning immersion experience evaluation model. *Electronics*, 11(9), 1429. <https://doi.org/10.3390/electronics11091429>
- Huang, Y. H., & Sun, Y. (2022). A meta-analysis of the impact of e-learning on learner learning outcomes. *Proceedings of the International Conference on E-Education, E-Business and E-Technology*. <https://doi.org/10.1145/3549843.3549847>
- Ip, B., Jacobs, G., & Watkins, A. (2008). Gaming frequency and academic performance. *Australasian Journal of Educational Technology*, 24(4), 355–373. <https://doi.org/10.14742/ajet.1197>
- Jeong, Y. S., & Cho, N. W. (2022). Evaluation of e-learners' concentration using recurrent neural networks. *The Journal of Supercomputing*, 79(4), 4146–4163. <https://doi.org/10.1007/s11227-022-04804-w>
- Katsigiannakis, E., & Karagiannidis, C. (2017). Gamification and game mechanics-based e-learning. In *Learning and collaboration technologies* (pp. 147–159). Springer. https://doi.org/10.1007/978-3-319-34127-9_11
- Khan, R. M. I., Ali, A., & Alourani, A. (2022). Investigating learners' experience of autonomous learning in e-learning context. *International Journal of Emerging Technologies in Learning*, 17(8), 4–17. <https://doi.org/10.3991/ijet.v17i08.29885>

The implementation of E-learning games in teaching Edukasyong Pantahanan at Pangkabuhayan (EPP) and the academic outcomes of the Grade 5 learners of Kabakahan Elementary School, Agusan Del Sur division: A pre-experimental approach by Maryjoy A. Ugay

Mweshi, G. K., & Muhyila, M. (2024). Determining a statistical analysis for the quantitative study in research. *Advances in Social Sciences Research Journal*, 11(7), 187–231. <https://doi.org/10.14738/assrj.117.17018>

Obenza-Tanudtanud, D. M. N., & Obenza, B. N. (2024). Assessment of educational digital game-based learning and academic performance of grade six pupils. *Asian Journal of Innovative Research and Instruction*, 3(1), 1–14. <https://doi.org/10.54536/ajiri.v3i1.2338>

Puška, E., Ejubović, A., Đalić, N., & Puška, A. (2021). Examination of influence of e-learning on academic success. *Education and Information Technologies*, 26(2), 1977–1994. <https://doi.org/10.1007/s10639-020-10343-9>

Waite-Stupiansky, S. (2017). Jean Piaget's constructivist theory of learning. Routledge. <https://doi.org/10.4324/9781315641560>

Wang, L., Chen, B. P., Hwang, G. J., Guan, J. Q., & Wang, Y. (2022). Effects of digital game-based STEM education on students' learning achievement: A meta-analysis. *International Journal of STEM Education*, 9, 26. <https://doi.org/10.1186/s40594-022-00344-0>

Winter, M., Mordel, J., Mendzheritskaya, J., Biedermann, D., Bengs, D., Wolter, I., & Horz, H. (2024). Behavioral trace data in an online learning environment as indicators of learning engagement. *Frontiers in Psychology*, 15, 1396881. <https://doi.org/10.3389/fpsyg.2024.1396881>

Λαμπρόπουλος, Γ., & Sidiropoulos, A. (2024). Impact of gamification on students' learning outcomes and academic performance. *Education Sciences*, 14(4), 367. <https://doi.org/10.3390/educsci14040367>