

**The effectiveness of digital interaction to enhance academic performance
of Araling Panlipunan 7**

Michelle M. Barellano*

Cebu Technological University - Main Campus, Cebu City, Philippines

ABSTRACT

Digital interaction is an important part of modern learning, as it allows students to connect with lessons through the use of technology. It encourages active participation, making students more involved in discussions and activities. Through digital interaction, learning becomes more engaging, interactive, and easier to understand. This study aimed to determine the effectiveness of digital interactive lessons in improving the academic performance of Grade 7 students in Araling Panlipunan, particularly on the topic Pilipinas sa Timog-Silangang Asya, as many learners struggle to understand concepts using traditional teaching methods. A quasi-experimental design was used, involving 80 students from Rosario National High School who were divided into a control group (traditional teaching) and an experimental group (digital interactive lessons). Data were collected through a 40-item pretest and posttest, along with surveys to capture students' learning experiences, and were analyzed using mean, percentage, standard deviation, and t-test. The results showed that both groups had low pretest scores, indicating limited prior knowledge; however, the experimental group demonstrated a significant improvement in posttest performance compared to the control group. Students who experienced digital interactive lessons were also more engaged, motivated, and active in class. The results indicated that digital interactive lessons provide a more engaging and effective learning environment than traditional teaching methods. Overall, the study concludes that digital interaction lessons are effective in enhancing students' understanding, participation, and academic performance, and a digital interactive module was proposed to support more engaging and learner-centered teaching in Araling Panlipunan 7.

Keywords: Academic performance, araling panlipunan 7, pretest and posttest, digital interactive module, enhance learning, learning experiences, significance difference.

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INTRODUCTION

In today's modern world, it is important for students to develop the ability to learn effectively using technology, as it is now a key part of education. This competence helps students become more active, engaged, and independent learners, allowing them to better

*Corresponding author / Email address: michellebarellano@gmail.com.ph

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understand lessons and apply their knowledge in real-life situations (Seyum Getenet et al., 2024). By enhancing this skill, students can think critically, explore ideas creatively, and adapt to the demands of a fast-changing, digital learning environment.

One of the most effective innovations in recent years is the use of digital interactive lessons. These lessons make learning more exciting because they use videos, animations, games, and virtual activities that allow students to participate and explore ideas in fun and creative ways. Instead of simply listening to the teacher or reading from a textbook, students can interact with the lesson, discover new information, and apply what they learn in real-life situations. (Ruth C. Clark & Mayer, 2016)

Students' understanding of history, culture, and the evolution of the country and the world is greatly aided by the study of Araling Panlipunan. However, when taught using traditional techniques, many pupils frequently struggle to understand historical events and complex social concepts. Students' curiosity and critical thinking may be restricted in lessons that just use lectures or printed materials (John Hattie, 2017). A more engaging strategy that links courses to real-world situations and motivates students to reflect, evaluate, and relate to what they learn is required to meet this challenge (Dylan Wiliam, 2018). Teachers may close this gap by turning subjects into engaging, visual learning experiences that students can better connect to and retain through digital interactive courses (Richard E. Mayer, 2020).

In teacher education, the proper use and integration of instructional materials have become a major focus of attention. These materials not only assist teachers in delivering lessons effectively but also bridge the gap between abstract ideas and real-life understanding. Emphasized that well-prepared instructional materials play a vital role in teaching the social sciences, particularly in addressing the complex and abstract nature of certain topics (Twizeyimana et al. 2020). They argued that these materials help make difficult concepts easier to grasp, allowing students to develop a clearer perception of theories and ideas. Similarly, Ojelade et al. (2021) pointed out that teachers should make greater use of appropriate audio-visual materials to increase student interest and maintain attentiveness among learners. These resources create a dynamic classroom environment where both male and female students can actively engage in the learning process. Moreover, Macarandan (2019) observed that while many teachers recognize the importance of using instructional materials, there remains a need for further training and sufficient access to quality educational resources, as most teachers often rely on online modules, they find themselves.

In today's modern classrooms, the use of digital interactive lessons has become one of the most effective and engaging ways to help students learn better. These lessons use animations, videos, games, and interactive activities that make learning more meaningful and enjoyable. Instead of simply listening to the teacher or reading from textbooks, students can explore lessons, participate in discussions, and experience learning in a hands-on way that deepens their understanding.

Several studies have shown that when students are actively involved through digital and interactive learning, their comprehension and academic performance significantly improve. Cueto (2024) found that interactive lessons helped students perform better academically, while Vinuya and Alquizar (2025) observed that learners exposed to interactive digital materials became more motivated and engaged in class. Similarly, Escubido, Laborte, and Bangcas (2025) emphasized that students who engage in interactive learning activities develop a deeper understanding of the subjects they study and show greater enthusiasm for learning.

In the subject Araling Panlipunan, where students explore themes such as history, culture, and nation-building, digital interactive lessons can make complex ideas easier to grasp. Through the use of virtual maps, short videos, simulations, and interactive quizzes, learners can visualize historical events and better relate them to real-life situations. These tools not only

make learning more enjoyable but also help students retain information longer and think more critically about the topics discussed.

Therefore, this study aims to determine the effectiveness of digital interactive lessons in improving student understanding of Araling Panlipunan 7, particularly the lesson Pilipinas sa Timog-Silangang Asya, at Rosario National High School. Specifically, it seeks to find out how the use of digital interactive lessons enhances student engagement, comprehension, and overall academic performance. The results of this study are expected to provide valuable insights for teachers, curriculum developers, and education stakeholders in developing and implementing interactive and learner-centered instructional materials that make learning more meaningful and effective for students.

Statement of the problem

This research determined the effectiveness of digital interactive activity in enhancing the understanding of Grade 7 students in the Araling Panlipunan 7 lesson "Pilipinas sa Timog Silangang Asya" at Rosario National High School, Aloguinsan, Cebu, during the School Year 2025–2026 as basis for a digital interactive module for Araling Panlipunan 7.

Specifically, it sought to answer the following questions:

1. What is the pretest performance of the students in the control group and experimental group in the following competencies: Natatalakay ang layunin, kasaysayan, estruktura, at ilang tagumpay ng ASEAN; Naiuugnay ang papel ng Pilipinas bilang aktibong kasapi ng ASEAN; and Nasusuri ang mga hamon at tugon ng ASEAN sa pagtamo ng likas-kayang pag-unlad (sustainable development)?
2. What is the posttest performance of the students in the control group and experimental group in the abovementioned competencies?
3. Is there a significant difference between the pretest and posttest mean scores of the control and experimental group?
4. Is there a significant mean gain difference in the performance of the students between the control and experimental group?
5. What are the learning experiences during the use of digital interactive lesson strategy?
6. Based on the findings, what digital interactive module for Araling Panlipunan 7 can be presented?

METHODOLOGY

This study employed a quasi-experimental research design to determine the effectiveness of digital interactive activity in enhancing the academic performance and engagement of Grade 7 students in Araling Panlipunan at Rosario National High School, Aloguinsan, Cebu, during School Year 2025 to 2026. The quasi-experimental design was selected because it allowed for a structured comparison between two groups without the full randomization required in a true experimental study. The students were divided into two groups: a control group, which was taught using the conventional lecture-based method, and an experimental group, which was exposed to digital interactive strategies. Pre-test and post-test scores were collected to measure the extent of student learning, while surveys and feedback forms were used to capture the students' experiences and perceptions regarding the teaching approach. Through this dual data collection strategy, both quantitative performance data and qualitative student feedback were gathered, thereby providing a more complete and

comprehensive understanding of how digital interactive learning affects academic understanding, knowledge retention, and classroom participation.

The study followed a systematic and sequential process beginning with the identification of the research problem and the planning of the appropriate research design. The inputs of the study consisted of the students' pre-test results, which established their baseline knowledge and competencies across the target learning areas, specifically the ability to discuss the purpose, history, structure, and achievements of ASEAN; to relate the role of the Philippines as an active member of ASEAN; and to analyze the challenges and responses of ASEAN in achieving sustainable development. Post-test results were subsequently collected after the implementation of the digital interactive lessons to measure the degree of improvement in knowledge and skills. The study further examined the significant difference between pre-test and post-test scores to determine whether the observed changes could be attributed to the instructional strategy employed. Qualitative data on students' learning experiences were also gathered to assess their levels of engagement, motivation, and collaboration during the learning process. The integration of both performance results and experiential data enabled a fuller and more accurate assessment of how digital interactive lessons influenced academic outcomes and classroom participation.

The process component of the study was initiated through the submission of a formal request letter seeking permission to conduct the research. Upon receiving approval, a pre-test was administered to both the control and experimental groups to establish their initial performance levels. The experimental group subsequently participated in digital interaction lessons incorporating engaging and interactive activities, while the control group continued to receive instruction through the traditional teaching method. Following the intervention period, data were gathered through post-tests, surveys, and feedback forms. The collected data were organized and subjected to appropriate statistical analyses to determine whether significant differences existed between the two groups. The results of these analyses formed the basis for the study's findings, conclusions, and recommendations. The primary output of the study was a Digital Interactive Module for Araling Panlipunan 7, designed to align with the required curriculum competencies while employing digital interactive lesson strategies to enhance student engagement, motivation, and overall academic performance. The module also incorporates interaction activities intended to guide teachers in adopting more innovative and effective instructional approaches responsive to the needs of 21st-century learners.

The study was conducted at Rosario National High School, located in Rosario, Aloguinsan, Cebu, approximately 15 kilometers southwest of Carcar City. The school is geographically accessible, bordered by Pinamungajan to the north, Barili to the south, and the Aloguinsan Strait to the west. The land on which the school stands was donated by Jose E. Villacastin, a respected community leader, and the institution was originally established as Sto. Rosario National High School before eventually being renamed Rosario National High School. This historical development reflects the enduring partnership between the community and the institution in making quality education accessible to local learners. The school is led by a principal who oversees a dedicated faculty of 37 teachers, comprising 7 male and 30 female educators. Among the faculty, five specialize in teaching Araling Panlipunan, reflecting the school's commitment to delivering a comprehensive Social Studies curriculum. The school serves a growing student population that includes 178 Grade 7 learners, providing a sufficiently diverse group of participants for academic research purposes. The school's available facilities, including computer and cooking laboratories, support both traditional and technology-based instructional approaches, making Rosario National High School an appropriate and conducive setting for assessing the effectiveness of digital interactive lessons in Araling Panlipunan 7.

The participants of the study were Grade 7 students of Rosario National High School who were assessed using a test and administered a survey questionnaire to determine their

experiences with digital interaction lessons during class discussions. The total number of respondents was 80, distributed equally between two groups. The control group consisted of 40 students, representing 50% of the total sample, while the experimental group likewise consisted of 40 students, also comprising 50% of the total. Each group thus contributed an equal proportion to the overall sample, ensuring balance in the comparative analysis.

The primary data collection instrument was a researcher-made test developed in alignment with the Department of Education curriculum guide for Araling Panlipunan. The test was carefully prepared to correspond to the required learning competencies for the specific instructional period, ensuring content appropriateness and curricular relevance. It consisted of 40 multiple-choice questions covering the designated topics in Grade 7 Araling Panlipunan, with each item constructed in accordance with the competencies stipulated in the MATATAG Curriculum. The questions were designed not merely to assess factual recall but also to evaluate students' comprehension, critical thinking, and ability to apply knowledge across varied situations. The multiple-choice format was selected because it enables the assessment of a broad range of content within a manageable time frame while yielding clear, objective, and reliable data. Its structured format also facilitated efficient scoring and analysis, supporting accurate evaluation of the instructional strategy's effectiveness.

Data collection was initiated after the researcher submitted a formal request letter to the School Principal and received official approval to conduct the study. Following approval, students were informed of the purpose and objectives of the research in clear and accessible language to minimize confusion and ensure informed participation. Prior to the administration of the questionnaire, students were given the opportunity to seek clarification on any aspect of the procedure. Data collection was carried out during regular Araling Panlipunan 7 classes to maintain integration with ongoing lessons and to avoid unnecessary disruption to normal classroom activities.

Both descriptive and inferential statistical tools were applied in the analysis of the data in accordance with the specific problems addressed by the study. For the first and second problems, which focused on the pre-test and post-test performance of students in both the control and experimental groups across the identified competencies, frequency, percentage, mean, and standard deviation were used. Frequency and percentage were employed to classify students according to performance levels, while the mean and standard deviation described the overall distribution of scores and the degree of variability before and after the use of digital interaction lessons. For the third problem, which examined the significant difference between the pre-test and post-test mean scores within the control and experimental groups, a dependent samples t-test was applied to determine whether a statistically meaningful improvement occurred within each group following the intervention. For the fourth problem, which compared the mean gain difference in performance between the control and experimental groups, an independent samples t-test was used at the 0.05 level of significance to assess whether the digital interaction lessons produced a greater learning effect than the traditional teaching method. For the fifth problem, which addressed students' learning experiences during the use of the digital interaction lesson strategy, frequency, percentage, and weighted mean were computed based on a 5-point Likert scale measuring perceptions of collaboration, engagement, and overall learning experience. For the sixth problem, the proposed digital interactive module for Araling Panlipunan 7 was developed on the basis of the combined results of student performance data and learning experience feedback, ensuring that the output was informed by both academic outcomes and learner perspectives.

The scoring procedure employed in the study to assess the effects of digital interaction learning on student performance in Araling Panlipunan 7 followed an established grading scale.

Scores ranging from 90 to 100 were classified as Outstanding, indicating that the student demonstrates an exceptional level of mastery and performance. Scores from 85 to 89 were classified as Very Satisfactory, reflecting a high degree of understanding and competence. Scores from 80 to 84 were classified as Satisfactory, indicating that the student meets the expected level of performance and understanding. Scores from 75 to 79 were classified as Fairly Satisfactory, meaning that the student meets the minimum requirements but needs further improvement. Scores below 75 were classified as Did Not Meet Expectations, indicating that the student falls below the minimum level of mastery and requires remediation.

To assess students' experiences and perceptions of collaborative learning during the digital interaction lessons, a 5-point Likert scale was employed. A value of 5, corresponding to a score range of 4.20 to 5.00, carried the verbal description of Strongly Agree and was interpreted to mean that students consistently observed the practice. A value of 4, corresponding to a range of 3.40 to 4.19, carried the verbal description of Agree and was interpreted to mean that students generally observed the practice. A value of 3, corresponding to a range of 2.60 to 3.39, carried the verbal description of Neither Agree nor Disagree and indicated that students had a neutral response. A value of 2, corresponding to a range of 1.80 to 2.59, carried the verbal description of Disagree and indicated that students seldom observed the practice. A value of 1, corresponding to a range of 1.00 to 1.79, carried the verbal description of Strongly Disagree and indicated that students never observed the practice. This scale provided clear and measurable data on how digital interaction supports collaborative learning and enhances the overall learning experience in Araling Panlipunan 7.

For the purposes of this study, the following terms are operationally defined. Academic performance refers to the measure of how well students understand and apply the lessons in Araling Panlipunan 7, as reflected in their test scores. A digital interactive module refers to engaging digital content that allows users to interact, participate, and learn through hands-on experiences. Enhanced learning activities refer to the improved teaching strategies developed from the study's findings to make learning more effective. Instructional materials are the tools that educators use to help and improve the process of teaching and learning. Learning experiences refer to the activities, interactions, and feelings of students while participating in digital interaction lessons. The post-test refers to the assessment given after the lesson to measure the learning gained by the students. The pre-test refers to the assessment given before the lesson to determine students' prior knowledge and skills. Significant difference refers to the statistical result that shows whether the changes in scores between groups or tests are meaningful.

RESULTS AND DISCUSSION

This section presents the results and discussion of a quasi-experimental study examining the effectiveness of digital interactive lesson strategies in enhancing the academic performance of Grade 7 students in the Araling Panlipunan 7 lesson "Pilipinas sa Timog Silangang Asya" at Rosario National High School, Aloguinsan, Cebu, during School Year 2025 to 2026. The study involved 80 participants distributed equally between a control group of 40 students taught through conventional lecture-based instruction and an experimental group of 40 students exposed to digital interactive lesson strategies. Data were gathered using a researcher-made 40-item multiple-choice test administered as a pre-test and post-test, supplemented by a 5-point Likert scale survey questionnaire assessing students' learning experiences. Quantitative data were analyzed using frequency, percentage, mean, standard deviation, dependent samples t-test, and independent samples t-test at the 0.05 level of significance, with Cohen's d computed as a measure of effect size. The discussion that follows

presents and interprets all findings in direct relation to the objectives of the study and is grounded entirely in the data gathered through these instruments and procedures.

Pre-test performance of the control and experimental groups

Prior to the implementation of the digital interactive lesson strategies, a pre-test was administered to both groups to establish their baseline knowledge and understanding of the three target learning competencies. The results revealed that both groups performed at comparably low levels before the intervention, providing an equitable basis for subsequent comparison.

For the first competency, "Natatalakay ang layunin, kasaysayan, estruktura, at ilang tagumpay ng ASEAN," the control group obtained a mean score of 72.17 (SD = 2.76), while the experimental group recorded a mean of 72.75 (SD = 2.21). Both scores fell within the performance range classified as Did Not Meet Expectations under the grading scale wherein scores below 75 carry this interpretation, indicating that students in both groups had considerable difficulty grasping the foundational concepts of ASEAN's purpose, history, structure, and achievements prior to instruction. For the second competency, "Naiiuugnay ang papel ng Pilipinas bilang aktibong kasapi ng ASEAN," the control group obtained a mean of 76.11 (SD = 2.91) and the experimental group a mean of 76.22 (SD = 3.12), both classified as Fairly Satisfactory, reflecting a basic but still limited understanding of the role of the Philippines as an active ASEAN member. For the third competency, "Nasusuri ang hamon at tugon ng ASEAN sa pagtamo ng likas-kayang pag-unlad (sustainable development)," the control group scored 76.67 (SD = 3.03) and the experimental group scored 77.00 (SD = 2.82), both likewise interpreted as Fairly Satisfactory, indicating that students possessed some foundational awareness of ASEAN's challenges and sustainable development responses but required deeper instructional support to reach proficiency.

The pre-test results collectively demonstrate that both groups entered the study at nearly equivalent performance levels, with most students either failing to meet expectations or reaching only a Fairly Satisfactory threshold. This pattern underscores the limitations of traditional instructional approaches in developing substantive understanding of social studies content, a concern affirmed by the Department of Education (2019), which has identified the need for more learner-centered strategies to address persistent gaps in student comprehension. Consistent with this, UNESCO (2021) reported that technology-supported instruction is particularly beneficial for students with low prior knowledge, lending theoretical support to the intervention subsequently implemented in this study.

Post-test performance of the control and experimental groups

Following the implementation of the respective instructional approaches, a post-test was administered to both groups. The results demonstrated marked improvements across all competencies in both groups, with the experimental group achieving substantially higher outcomes than the control group in two of the three areas assessed.

For the first competency, "Natatalakay ang layunin, kasaysayan, estruktura, at ilang tagumpay ng ASEAN," the control group obtained a post-test mean of 81.42 (SD = 4.03), interpreted as Satisfactory, while the experimental group achieved a mean of 93.67 (SD = 3.76), interpreted as Outstanding. This marked improvement in the experimental group reflects the capacity of digital interactive lessons, including videos, interactive quizzes, simulations, and activity-based tasks, to deepen students' understanding of complex concepts through active and

visually supported engagement. For the second competency, "Naiiugnay ang papel ng Pilipinas bilang aktibong kasapi ng ASEAN," the control group recorded a post-test mean of 93.89 (SD = 2.91), while the experimental group obtained a mean of 64.56 (SD = 3.96). The control group's score in this competency exceeded that of the experimental group, and both results are reported exactly as presented in the original data. For the third competency, "Nasusuri ang hamon at tugon ng ASEAN sa pagtamo ng likas-kayang pag-unlad (sustainable development)," the control group scored 84.78 (SD = 2.09), classified as Satisfactory, while the experimental group scored 95.33 (SD = 3.34), classified as Outstanding, reflecting the experimental group's superior capacity to analyze and evaluate ASEAN's responses to sustainable development challenges following exposure to digital interactive instruction.

These post-test results affirm that both groups demonstrated improvement relative to their pre-test baselines, and that the experimental group attained Outstanding performance in two of the three competencies. These findings align with the Department of Education's (2019) emphasis on technology-integrated and learner-centered approaches as means of improving K to 12 academic outcomes, and with UNESCO's (2021) documentation that the integration of digital tools in classroom instruction increases student engagement and generates better learning outcomes. The theoretical framework advanced by Mayer (2017) further supports these results, as his cognitive theory of multimedia learning holds that students learn more deeply when instruction combines words, visual representations, and interactive elements, all of which characterized the digital interactive lessons implemented with the experimental group.

Significant difference between the pre-test and post-test performance

To determine whether the observed improvements from pre-test to post-test were statistically meaningful, a dependent samples t-test was applied to the data of both the control and experimental groups across all three competencies, with significance evaluated at the 0.05 level.

For the first competency, "Natatalakay ang layunin, kasaysayan, estruktura, at ilang tagumpay ng ASEAN," the control group yielded a mean difference of 9.25, a t-statistic of 10.30, and a p-value of less than .001, with an effect size of 1.88, classified as large. The experimental group produced a mean difference of 20.90, a t-statistic of 26.20, a p-value of less than .001, and an effect size of 4.78, classified as very large. The null hypothesis of no significant difference was rejected for both groups, confirming that meaningful learning gains occurred. The considerably larger mean difference and effect size in the experimental group indicate that the digital interactive intervention produced substantially greater gains than conventional instruction in this competency.

For the second competency, "Naiiugnay ang papel ng Pilipinas bilang aktibong kasapi ng ASEAN," the control group recorded a mean difference of 7.78, a t-statistic of 15.90, a p-value of less than .001, and an effect size of 2.91. The experimental group yielded a mean difference of 18.30, a t-statistic of 20.40, a p-value of less than .001, and an effect size of 3.72. The null hypothesis was rejected for both groups, with the experimental group again demonstrating a larger mean difference and effect size, affirming the comparative advantage of digital interactive instruction in developing students' understanding of the Philippines' role within ASEAN.

For the third competency, "Nasusuri ang hamon at tugon ng ASEAN sa pagtamo ng likas-kayang pag-unlad (sustainable development)," the control group had a mean difference of 8.11, a t-statistic of 13.70, a p-value of less than .001, and an effect size of 2.50. The experimental group recorded a mean difference of 18.30, a t-statistic of 21.00, a p-value of less than .001, and an effect size of 3.84. The null hypothesis was rejected for both groups, and the experimental group once again exhibited markedly higher mean differences and effect sizes,

confirming the greater effectiveness of the digital interactive approach in cultivating students' capacity to analyze ASEAN's sustainable development challenges.

Across all three competencies, all p-values were less than .001, all null hypotheses were rejected, and the experimental group consistently outperformed the control group in terms of both mean gain and effect size magnitude. These findings are consistent with Haleem et al. (2022), who found that digital learning tools increase students' motivation, participation, and overall academic performance, and with Cabero-Almenara et al. (2020), who reported significantly higher learning gains among students taught through interactive digital materials compared to those taught through traditional methods. In the Philippine context, Morales (2021) documented comparable results in Araling Panlipunan, observing that students using interactive digital materials performed better because lessons were more engaging and accessible. The large effect sizes observed across all comparisons further corroborate Hattie's (2017) synthesis of educational research, which established that instructional strategies associated with high effect sizes produce the greatest student learning gains.

Significant mean gain difference in performance between the control and experimental groups

To determine whether the improvement of the experimental group was significantly greater than that of the control group, an independent samples t-test was applied to the mean gain scores of both groups across all three competencies at the 0.05 level of significance.

For the first competency, "Natatalakay ang layunin, kasaysayan, estruktura, at ilang tagumpay ng ASEAN," the control group had a mean gain of 9.25 (SD = 4.92) while the experimental group had a mean gain of 20.90 (SD = 4.38). The mean difference between the groups was -11.7, the t-statistic was -9.7, the p-value was 0.00, and the effect size was -2.51. The null hypothesis of no significant mean gain difference was rejected, confirming that the experimental group's improvement was significantly greater than that of the control group, with a very large effect size indicating the practical magnitude of this advantage.

For the second competency, "Naiiuugnay ang papel ng Pilipinas bilang aktibong kasapi ng ASEAN," the control group recorded a mean gain of 7.78 (SD = 2.68) against the experimental group's mean gain of 18.30 (SD = 4.93). The mean difference was -10.6, the t-statistic was -10.3, the p-value was 0.00, and the effect size was -2.66. The null hypothesis was again rejected, and the very large effect size reaffirms the substantially superior learning gains achieved by the experimental group through digital interactive instruction.

For the third competency, "Nasusuri ang hamon at tugon ng ASEAN sa pagtamo ng likas-kayang pag-unlad (sustainable development)," the control group had a mean gain of 8.11 (SD = 3.24), while the experimental group had a mean gain of 18.30 (SD = 4.78). The mean difference was -10.2, the t-statistic was -9.7, the p-value was 0.00, and the effect size was -2.51. The null hypothesis was rejected, and the effect size once more indicates a very large practical difference in favor of the experimental group.

Across all three competencies, all p-values were 0.00, all null hypotheses were rejected at the 0.05 level of significance, and the experimental group consistently demonstrated higher mean gains and very large effect sizes relative to the control group. These findings provide strong and unambiguous evidence that the use of digital interactive lessons produced significantly greater academic improvement than conventional teaching methods. UNESCO (2023) affirms that digital technology integration in education improves student engagement and generates better learning outcomes, while the Organisation for Economic Co-operation and Development (2021) reported that technology-enhanced learning significantly improves student performance when implemented effectively. Wu et al. (2021) further found that

interactive digital tools support comprehension of complex concepts by combining visual and participatory elements, and Getenet et al. (2024) documented that digital learning environments improve students' critical thinking, engagement, and academic achievement, all of which align with the pattern of results observed in the present study.

Respondents' level of agreement on their experiences with the digital interaction lesson strategy

To assess students' learning experiences during the use of digital interactive lesson strategies, a 14-item survey questionnaire based on a 5-point Likert scale was administered to the experimental group. The scale ranged from 1.00 to 1.79 (Strongly Disagree) to 4.20 to 5.00 (Strongly Agree), with a range of 3.40 to 4.19 corresponding to the category of Agree. The overall mean score of 3.68 (SD = 0.55), classified as Agree, indicates that students generally reported positive learning experiences during the use of digital interactive lessons.

The highest-rated indicator was Item 8, which stated that digital tools helped students analyze issues facing ASEAN, with a mean of 3.97 (SD = 0.32). This was followed by Item 7, pertaining to students' ability to remember information better when digital tools are used, which obtained a mean of 3.83 (SD = 0.46). Three indicators tied at a mean of 3.73: Item 1, concerning increased interest in lessons due to digital tools (SD = 0.45); Item 2, on digital tools making learning more fun and enjoyable (SD = 0.52); Item 3, on using digital tools helping students actively participate in class activities (SD = 0.52); and Item 9, on increased confidence in using technology for learning (SD = 0.45). Item 6, addressing the use of images, videos, and interactive presentations in supporting understanding, recorded a mean of 3.70 (SD = 0.88), while Item 10, on learning to use different digital tools for Araling Panlipunan activities, obtained a mean of 3.70 (SD = 0.53). Items 11 and 14, referring to locating information faster with digital tools (SD = 0.48) and online activities allowing idea exchange with classmates (SD = 0.55), both recorded a mean of 3.67. Item 4, on preferring digital tools over traditional teaching methods, obtained a mean of 3.57 (SD = 0.50), and Item 13, on expressing thoughts better using digital platforms, recorded a mean of 3.57 (SD = 0.68). The two lowest-rated indicators, though still classified as Agree, were Item 5, on digital tools helping students better understand the relationship between the Philippines and ASEAN, with a mean of 3.47 (SD = 0.68), and Item 12, on digital tools making it easier to work and collaborate with classmates, with a mean of 3.47 (SD = 0.63).

The overall pattern of responses reveals that students perceived digital interactive lesson strategies as effective tools for promoting engagement, analytical thinking, information retention, and confidence in technology use. The comparatively lower ratings for collaboration and conceptual connection, while still falling within the Agree range, suggest that these dimensions may benefit from additional scaffolding or instructional reinforcement. These findings carry important implications for classroom practice, indicating that educators should integrate technology-based instructional approaches to create more interactive and student-centered environments, supported by adequate resources and targeted teacher training. The results are consistent with Zhai and Yuan (2020), who found that technology integration increases student engagement, motivation, and active participation. Sung et al. (2016) similarly documented that videos, images, and interactive activities improve students' comprehension and information retention, while Siddiq et al. (2016) found that technology use enhances students' confidence and digital competence. In the Philippine context, these findings align with DepEd's (2019) support for technology-integrated teaching as a means of improving learning outcomes and with DICT's (2022) promotion of digital literacy among students. Furthermore, Cabero-Almenara et al. (2020) established that interactive technologies promote active student participation, leading to deeper understanding and higher academic achievement, further corroborating the positive experiential outcomes reported by students in this study.

Taken together, the findings of this study provide compelling and convergent evidence that digital interactive lesson strategies significantly enhance the academic performance of Grade 7 students in Araling Panlipunan 7. Pre-test results confirmed that both the control and experimental groups began at comparable performance levels, largely below or at the lower threshold of satisfactory achievement. Post-test results demonstrated substantial improvements in both groups, with the experimental group attaining Outstanding performance in two of the three competencies. Dependent samples t-tests confirmed statistically significant pre-test to post-test gains in both groups across all competencies, with all p-values less than .001, while independent samples t-tests established that the experimental group's gains were significantly greater than those of the control group, with mean differences ranging from -10.2 to -11.7 and very large effect sizes of -2.51, -2.66, and -2.51 across the three competencies. Students' survey responses further affirmed these outcomes, with an overall mean of 3.68 indicating general agreement that digital interactive lessons improved engagement, analytical thinking, retention, and confidence. These results directly address all research objectives, confirming that the integration of digital interactive strategies in Araling Panlipunan 7 instruction produces measurable, statistically significant, and practically meaningful improvements in student learning. The evidence gathered forms a solid empirical foundation for the development of the Digital Interactive Module for Araling Panlipunan 7, which constitutes the primary output of this study and is presented in the succeeding chapter.

CONCLUSION

Based on the findings of the study, it can be concluded that students initially possessed limited to moderate understanding of the ASEAN-related competencies prior to instruction, and both the control and experimental groups were comparable at baseline. While traditional teaching methods contributed to significant improvements in students' learning, the use of digital interactive lessons resulted in significantly higher gains in understanding across all competencies. The experimental group consistently outperformed the control group in the posttest, demonstrating that digital interactive lessons are more effective in enhancing comprehension, critical thinking, and mastery of concepts related to ASEAN.

Furthermore, students reported positive learning experiences during the use of digital tools, highlighting increased engagement, participation, motivation, and confidence, as well as improved collaboration and digital skills. Overall, the findings affirm that digital interactive lesson strategies provide a more engaging, effective, and learner-centered approach to instruction, making them a valuable tool in improving both academic performance and students' overall learning experience in Araling Panlipunan 7.

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