

Ekonoquiz: Teachers' Assessment and its Effectiveness in Students Learning

Rigin S. Dayag

Polytechnic University of the Philippines

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Email of Corresponding Author: rigindayag@gmail.com

Abstract

This study examined the effectiveness of Ekono-Quiz, a gamified assessment tool, in improving the academic performance and engagement of Grade 9 students in Araling Panlipunan, particularly in least mastered competencies such as elasticity of demand, elasticity of supply, and demand–supply interaction. Anchored on the ADDIE Model (Branson et al., 1975; Molenda, 2003; Branch, 2009), the study employed a quasi-experimental research design involving seventy-two (72) teachers and eighty (80) students from selected public secondary schools in Caloocan City. Non-probability sampling was used, with intact groups assigned as control and experimental groups. Data were gathered using the Ekono-Quiz, a validated survey instrument adapted from the LRMDs Evaluation Tool, and 50-item pretest and posttest assessments. Statistical analyses included mean, frequency, percentage, and independent samples t-test. Findings revealed that Ekono-Quiz was rated Very Satisfactory across content, instructional, and technical quality, as well as freedom from errors. Teachers reported minimal challenges, indicating high usability of the tool. Pretest results showed low and comparable baseline performance between groups, while posttest results demonstrated significant improvement, particularly in the experimental group. Statistical analysis confirmed a significant difference between pretest and posttest scores, indicating that the gamified tool effectively enhanced learners' academic performance and engagement. The study concluded that Ekono-Quiz is an effective instructional and assessment tool, with recommendations for continuous improvement, teacher training, and systematic integration into instruction. This study aligns with SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), and SDG 9 (Industry, Innovation and Infrastructure) by promoting technology-enhanced learning and economic literacy. It contributes to educational, technological, and socio-economic sustainability by improving instructional practices, supporting digital integration, and strengthening learners' competencies for informed economic participation.

Keywords: academic performance, Araling Panlipunan, Ekono-Quiz, gamified assessment, Grade 9 learners, learning outcomes, technology integration

1. Introduction

Economic education plays a critical role in preparing learners to navigate complex socio-economic environments and contribute to sustainable development. However, persistent challenges in teaching abstract economic concepts, particularly in Araling Panlipunan, necessitate innovative, technology-integrated instructional approaches. This study examines the effectiveness of a gamified assessment tool, Ekono-Quiz, in improving Grade 9 students' academic performance and engagement, while addressing instructional and technological gaps in economics education.

1.1 Background of Grade 9 Learners' Economic Competencies in Araling Panlipunan

The learning of economics is essential for developing financial literacy, informed citizenship, and sustainable economic participation (Sitra, 2017; Hernandez, 2020). In the Philippine context, teaching Araling Panlipunan presents challenges due to diverse socio-economic conditions, limited instructional resources, and the complexity of economic concepts (Rosales, 2020). Among the least mastered competencies are Elasticity of Demand, Elasticity of Supply, and the Interaction of Demand and Supply, which require analytical reasoning, mathematical computation, and graphical interpretation. Traditional lecture-based instruction often leads to misconceptions and low comprehension, highlighting the need for innovative and engaging instructional strategies. To address these issues, Ekono-Quiz was developed as a gamified assessment tool integrating interactive simulations, challenges, and rewards to enhance engagement and understanding. Its implementation aligns with DepEd Memo No. 029, s. 2023 on technology integration in education (DepEd, 2023), and is supported by findings that digital platforms improve engagement and academic performance (Gutib, 2022).

1.2 Technology Integration, Gamification, and Assessment in Economics Learning

Literature emphasizes three key themes: technology integration, digital assessment, and gamification. Technology integration has been shown to improve student engagement and learning outcomes (Acharya, 2020; Limin, 2021), though its success depends on teacher readiness, professional development, and institutional support (Leung, 2020; Luneta, 2020; Janer, 2022; Ozofo, 2022). Digital assessment tools, including data analytics, artificial intelligence, and virtual platforms, enhance personalized learning, feedback, and academic achievement (Maschietto, 2019; Surya, 2019; White, 2018;

Rikhotso, 2022). Gamified assessments further promote motivation, participation, and deeper understanding through interactive and reward-based systems (Ozel, 2018; Deterding, 2020; Hamari, 2020; Kapp, 2021; Liu, 2021; Domínguez, 2020). Studies on teaching materials indicate high satisfaction with technology-based tools due to their interactivity, curriculum alignment, and effectiveness in explaining complex concepts (Jung, 2019; Bhack, 2020; Adolla, 2018; Ching, 2020; Araza, 2019; Gonzales, 2020; Shiro, 2021). High content, instructional, and technical quality significantly enhance learning outcomes and engagement (Khan, 2018; Mel, 2019; Rick, 2021; Andras, 2020; Verdani, 2021; Siti, 2020; Grand, 2021; Repsi, 2019; Tod, 2021; Schimidt, 2022; Grill, 2021; Gonzalo, 2018; Angeles, 2020; Naburni, 2020; Sarayti, 2019). In economics education, students commonly struggle with abstract concepts, terminology, and lack of real-world application, necessitating learner-centered and innovative instructional strategies (Viola, 2020; Prima, 2018; Geronimo, 2020; Belarmino, 2020).

1.3 Philippine and Global Context of Technology-Integrated Araling Panlipunan Instruction

Globally, education systems emphasize economic literacy as a foundation for sustainable development and informed decision-making (Sitra, 2017; Hernandez, 2020). Technology integration has become a key strategy in enhancing teaching effectiveness and learner engagement across educational levels (Acharya, 2020; Kaminski, 2020). Nationally, the Philippine education system promotes digital transformation in teaching through policies such as DepEd Memo No. 029, s. 2023 (DepEd, 2023). However, challenges persist, including limited access to technology, insufficient teacher training, and resistance to digital adoption (Shiro, 2021; Ozofor, 2022). Locally, students continue to face difficulties in mastering economic competencies due to abstract concepts and traditional instructional approaches, reinforcing the need for contextualized and technology-supported learning tools (Viola, 2020; Prima, 2018; Geronimo, 2020).

1.4 ADDIE-Based Development of Ekono-Quiz for Economics Assessment

This study is anchored on the ADDIE Model, a systematic instructional design framework consisting of Analysis, Design, Development, Implementation, and Evaluation (Branson et al., 1975; Molenda, 2003; Branch, 2009). The model guides the development and evaluation of technology-integrated instructional materials. In this study, the Analysis phase identified learning gaps and technological readiness; Design structured objectives and gamified elements; Development produced and validated the tool; Implementation integrated Ekono-Quiz into classroom instruction; and Evaluation assessed effectiveness through performance data and feedback. Conceptually, the study employs a quasi-experimental design comparing control and experimental groups, where the use of Ekono-Quiz serves as the independent variable and learners' performance as the dependent variable.

1.5 Rationale for Evaluating Ekono-Quiz in Improving Elasticity and Demand–Supply Competencies

Despite extensive research on technology integration and gamification, gaps remain in their application within specific least mastered competencies in Araling Panlipunan, particularly elasticity and demand–supply interaction. Existing studies highlight benefits but also identify challenges such as limited access, inadequate teacher training, and inconsistent implementation (Shiro, 2021; Janer, 2022). There is also limited empirical evidence on the effectiveness of gamified assessment tools in improving academic performance in Philippine secondary education. This study addresses these gaps by evaluating Ekono-Quiz as both an assessment and instructional support tool, providing data-driven insights for improving economics education.

1.6 SDG Alignment of Gamified Economics Assessment for Secondary Education

This study aligns with: SDG 4 – Quality Education, by promoting innovative, technology-enhanced teaching strategies that improve learning outcomes and engagement. SDG 8 – Decent Work and Economic Growth, by strengthening economic literacy and preparing learners with competencies relevant to economic participation. SDG 9 – Industry, Innovation and Infrastructure, through the integration of digital tools and gamified learning platforms in education. The research supports educational and technological sustainability by enhancing instructional practices and fostering digital learning environments.

1.7 Multidisciplinary Sustainability Contribution of Ekono-Quiz in Araling Panlipunan

This study contributes to educational sustainability by improving teaching strategies and learner outcomes in economics. It supports technological sustainability through the effective integration of digital and gamified tools in classroom instruction. It also advances socio-economic sustainability by strengthening learners' economic understanding, which is essential for informed decision-making and participation in economic systems. Additionally, the study promotes institutional sustainability by informing policy, teacher training, and curriculum development aligned with technology-driven education.

2. Materials and methods

2.1 Research Design

The study utilized a quasi-experimental research design to determine the effectiveness and level of satisfaction of the Ekono-Quiz. This design compared learners' performance before and after exposure to the gamified tool without random assignment, making it suitable for natural classroom settings. Pretests and posttests were administered to measure learning gains attributable to the implementation guidelines while maintaining regular classroom structures. In addition to measuring learning outcomes, the design enabled the assessment of satisfaction in terms of content quality, instructional quality, technical quality, and freedom from errors, as well as challenges encountered during implementation. This approach provided both quantitative evidence of effectiveness and qualitative insights from teachers and master teachers regarding usability and instructional value, resulting in a comprehensive evaluation of the Ekono-Quiz.

2.2 Locale of the Study

The study was conducted in selected public secondary schools in Caloocan City, namely Camarin High School (CHS), Cielito Zamora Junior High School (CZJHS), and Kalayaan High School (KHS), during the Academic Year 2024–2025. These schools served as the primary sites for data collection involving both teacher and student respondents.

2.3 Respondents of the Study

The respondents included seventy-two (72) Araling Panlipunan teachers and eighty (80) Grade 9 students from the selected schools. Teacher respondents were public school teachers who had utilized the Ekono-Quiz in their classes and provided documentation of its integration. Student respondents were divided into two groups: forty (40) students in the control group (Grade 9–Indium), who received traditional instruction, and forty (40) students in the experimental group (Grade 9–Rhodium), who used the Ekono-Quiz. These respondents were selected to assess the tool's effectiveness in improving learning outcomes through pretest and posttest measures.

2.4 Sample and Sampling Procedure

The study employed non-probability sampling techniques. For teacher respondents, total population sampling was used, including all seventy-two (72) Araling Panlipunan teachers from the selected schools to ensure comprehensive representation of their perspectives. For student respondents, intact group sampling was applied, utilizing existing class sections without random assignment to preserve classroom integrity and avoid disruption. This approach enabled a realistic comparison between the control group receiving traditional instruction and the experimental group using the Ekono-Quiz.

2.5 Research Instrument

The primary instrument was the Ekono-Quiz, a gamified assessment tool designed to evaluate and enhance learners' understanding of Elasticity of Demand, Elasticity of Supply, and the Interaction of Demand and Supply. It incorporated interactive questions, immediate feedback, and structured levels, and was aligned with the Most Essential Learning Competencies (MELCs) for Grade 9 Araling Panlipunan. To assess satisfaction, a survey questionnaire adapted from the LRMDs Evaluation Tool for non-print materials was used with permission from the Department of Education. The instrument consisted of four components: content quality, instructional quality, technical quality, and other findings, each measured using a 4-point Likert scale ranging from "Not Satisfactory" to "Very Satisfactory." Pretest and posttest instruments consisting of 50 multiple-choice items were developed to measure student learning outcomes. These were aligned with curriculum competencies and constructed using a Table of Specifications (TOS) and Budget of Work to ensure content validity and balanced coverage of least mastered competencies. The research instrument underwent validation by experts, including professors and English master teachers, and was pilot-tested among teachers not included in the study. Revisions were made based on feedback to ensure clarity, validity, and reliability before final administration.

2.6 Data Gathering Procedure

The data gathering procedure followed the ADDIE Model. In the Analysis phase, instructional needs, learning gaps, and technological readiness were identified through a needs assessment. The Design phase involved planning the structure of Ekono-Quiz and developing data collection instruments. During Development, the tool and instruments were produced, tested, and refined based on expert feedback. In the Implementation phase, the experimental group used the Ekono-Quiz while the control group received traditional instruction. Pretests were administered before implementation, and posttests were conducted afterward. Teachers and master teachers evaluated the tool using the LRMDs instrument. In the Evaluation phase, data from tests, surveys, and feedback were analyzed to determine effectiveness and satisfaction, as well as to identify challenges and inform recommendations. Prior to data collection, permission was secured from the Schools Division Superintendent and school principals. The researcher personally administered the instruments, ensured minimal disruption to school activities, and organized and tabulated the collected data. Ethical considerations such as voluntary participation, confidentiality, and anonymity were strictly observed.

2.7 Data Analysis Techniques

The study employed frequency and percentage distribution to describe respondent profiles. Mean was used to determine levels of satisfaction and overall assessment of the Ekono-Quiz. For the quasi-experimental component, an independent samples t-test was utilized to determine whether there was a significant difference between the pretest and posttest scores

of the control and experimental groups. This statistical method enabled comparison of group means to evaluate the effectiveness of the gamified tool in improving student performance.

3. Results and Discussion

3.1 Teachers' Assessment of Ekono-Quiz Quality

3.1.1 Content Quality of Ekono-Quiz

The results showed that the Ekono-Quiz obtained a grand mean of 3.57 with a standard deviation of 0.48, interpreted as Very Satisfactory, indicating a high level of agreement among teachers regarding content quality. The highest-rated indicator was the promotion of positive values ($M = 3.65$, $SD = 0.44$), followed by alignment with DepED competencies, contribution to mastery, and logical organization ($M = 3.60$). The lowest-rated indicator was content currency ($M = 3.44$, $SD = 0.53$), though still within the Very Satisfactory range. These findings indicate that the tool effectively delivers accurate, organized, and curriculum-aligned content while promoting values formation. The slightly lower rating for content currency suggests the need for regular updates. This aligns with Ozofor (2022), who emphasized that gamified tools with strong curricular alignment and value integration enhance engagement and learning outcomes.

3.1.2 Instructional Quality of Ekono-Quiz

The results revealed a grand mean of 3.47 with a standard deviation of 0.53, interpreted as Very Satisfactory, indicating that teachers perceived the instructional design as effective. The highest-rated indicator was clarity of purpose ($M = 3.61$, $SD = 0.42$), followed by achievement of objectives and appropriate use of multimedia ($M = 3.58$ and 3.54). The lowest rating was for learner control over pacing and sequence ($M = 3.30$, $SD = 0.65$), along with creativity stimulation and integration of prior experience. These findings suggest that the tool effectively supports instruction through clear objectives and engaging multimedia, though improvements are needed in learner autonomy and personalization. This supports Shiro (2021), who found that gamified tools are most effective when instructional goals are clear but require enhanced flexibility to support learner control and autonomy.

3.1.3 Technical Quality of Ekono-Quiz

The findings showed a grand mean of 3.42 with a standard deviation of 0.56, interpreted as Very Satisfactory, indicating that the tool's technical features were generally effective and reliable. The highest-rated indicators included ease of navigation ($M = 3.51$), effectiveness of support materials ($M = 3.50$), and independent usability ($M = 3.48$). The lowest rating was for sustaining user interest through visuals ($M = 3.33$, $SD = 0.68$), with moderate variability observed in audio and visual elements. These results indicate that the tool is user-friendly and accessible, though visual and multimedia elements may require refinement to enhance engagement. This is consistent with Repsi (2019), who emphasized that usability and navigation improve acceptance, while weak visual design can reduce engagement.

3.1.4 Freedom from Errors in Ekono-Quiz

The results indicated a grand mean of 3.36 with a standard deviation of 0.58, interpreted as Very Satisfactory, suggesting that the tool is generally accurate and reliable. The highest-rated indicator was freedom from grammatical and typographical errors ($M = 3.40$, $SD = 0.52$), while the lowest ratings were for conceptual accuracy ($M = 3.31$) and factual accuracy ($M = 3.33$). These findings suggest that while the tool is largely error-free, minor conceptual and factual inconsistencies may exist and require refinement. This supports Tod (2021), who emphasized that minimizing errors enhances trust and effectiveness, while even minor conceptual inaccuracies can affect learning outcomes.

3.2 Challenges Affecting the Use of Ekono-Quiz

The results showed an overall grand mean of 1.43 with a standard deviation of 0.39, interpreted as Not Challenging, indicating that teachers generally found the tool easy to implement. The most notable challenge was addressing diverse learning paces ($M = 2.07$, $SD = 0.48$), followed by integrating the tool into the curriculum ($M = 1.79$) and interpreting data from the tool ($M = 1.50$). Other challenges, such as maintaining motivation, balancing game elements, and accommodating learning styles, were rated as not challenging. These findings indicate that Ekono-Quiz is highly usable, with only minor concerns related to differentiation, integration, and data interpretation. This aligns with Schmidt (2022), who found that gamified tools are generally easy to implement but require support in managing diverse learners and interpreting performance data.

3.3 Learners' Academic Performance Before and After Using Ekono-Quiz

3.3.1 Pretest Performance of Learners

The results showed that both control and experimental groups had low and comparable pretest performance. The control group had a mean score of 22.50 ($SD = 0.69$), while the experimental group had a mean of 23.00 ($SD = 0.75$), with minimal difference between groups. Scores were closely clustered, indicating similar baseline knowledge levels.

These findings confirm that both groups started with low proficiency in the targeted competencies, establishing a valid baseline for comparison. This supports Guitierrez (2021), who emphasized the importance of baseline equivalence in evaluating instructional interventions.

3.3.2 Posttest Performance of Learners

The results revealed that the control group improved modestly, with a mean score of 27.10 (SD = 2.15), while the experimental group showed substantial improvement, achieving a mean score of 41.20 (SD = 1.79). The experimental group demonstrated a significantly larger increase in performance compared to the control group. These findings indicate that the Ekono-Quiz significantly enhanced learners' academic performance and engagement. The results support Guitierrez (2021), which highlighted that interactive and innovative instructional strategies improve learning outcomes more effectively than traditional methods.

3.3.3 Significant Difference in Pretest and Posttest Scores

The results showed statistically significant differences between pretest and posttest scores for both groups. The control group improved from 22.50 to 27.10 ($t = 5.12$, $p = 0.00001$), while the experimental group improved from 23.00 to 41.20 ($t = 18.45$, $p = 0.0002$), leading to the rejection of the null hypothesis. The experimental group demonstrated a substantially greater increase in scores compared to the control group. These findings confirm that the Ekono-Quiz had a significant positive effect on learners' academic performance. The greater improvement in the experimental group supports the effectiveness of gamified learning, consistent with Wolf (2020), who emphasized that interactive assessment tools enhance conceptual understanding and mastery.

4. Conclusion & Recommendations

The findings of the study revealed that the Ekono-Quiz was rated Very Satisfactory across all domains, including content quality, instructional quality, technical quality, and freedom from errors, indicating its effectiveness as a gamified assessment tool. Teachers perceived the tool as highly relevant, well-organized, and aligned with learning competencies, with only minor areas for improvement such as content updating, learner control, visual enhancement, and conceptual accuracy. The tool posed minimal challenges in classroom implementation, confirming its usability and practicality. Furthermore, learners initially demonstrated low proficiency in the targeted competencies; however, posttest results showed significant improvement, particularly in the experimental group exposed to the Ekono-Quiz. Statistical analysis confirmed a significant difference between pretest and posttest scores, establishing that the gamified tool effectively enhanced learners' academic performance, engagement, and mastery of the subject matter.

Based on the findings, it is recommended that the Ekono-Quiz be continuously improved through regular content updates, enhanced learner control, improved visual design, and increased conceptual accuracy to sustain its effectiveness. Teachers are encouraged to continue integrating the tool into instruction while addressing minor challenges such as accommodating diverse learning paces, aligning it with the curriculum, and interpreting learner data. The use of gamified tools should be strengthened as a primary instructional approach to improve engagement and understanding, supported by targeted interventions for learners who require additional assistance. Furthermore, the systematic integration of the tool in Araling Panlipunan instruction is recommended, along with the implementation of teacher training and continuous evaluation to ensure consistent and effective utilization in improving learner outcomes.

The study was limited to selected public secondary schools in Caloocan City and involved a specific group of Araling Panlipunan teachers and Grade 9 learners, which may restrict the generalizability of the findings to other contexts. The use of intact groups in a quasi-experimental design without random assignment may also limit the control of external variables. Additionally, while the findings showed significant improvement in learner performance, variations in individual outcomes suggest that further instructional support may be needed to achieve consistent results across all learners.

Compliance with ethical standards

The researcher conducted the study in accordance with established research procedures and ethical considerations, including securing formal permission from the Schools Division Superintendent and the principals of the participating public secondary schools prior to data collection. The research process ensured minimal disruption to school activities, and all data gathered were properly organized, handled, and used solely for academic purposes.

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