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Acceptability of AI-Assisted Gamified Learning among Gen Z Learners: Perceived Learning Value, Engagement, and Responsible-Use Conditions in Philippine Senior High Schools and Higher Education Institutions

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Abstract

The expanding use of artificial intelligence in education has created opportunities for personalized and engaging learning, although its integration with gamification remains limited and raises concerns regarding educational value and responsible implementation. This study examined the acceptability of AI-assisted gamified learning among Generation Z learners based on perceived learning value, motivation and engagement, exposure and use, and responsible-use conditions. A quantitative, cross-sectional, descriptive-correlational survey was conducted among 472 senior high school and higher education students from five anonymized institutions in Batangas, Philippines. Data were collected using a researcher-developed, structured five-point questionnaire and analyzed using descriptive statistics and Pearson correlation. Respondents reported high use of generative AI for schoolwork (M = 4.39), but relatively low exposure to classroom gamification (M = 2.25) and combined AI-gamification experiences (M = 2.17). Perceived learning value was moderate (M = 3.45), while motivation and engagement were high (M = 4.05), responsible-use safeguards were strongly endorsed (M = 4.10), and acceptability for classroom adoption was very high (M = 4.48). Acceptability was positively associated with exposure and use (r = .338), perceived learning value (r = .570), and responsible-use safeguards (r = .311), but not significantly associated with motivation and engagement (r = .090). The findings indicate substantial learner readiness for AI-assisted gamified learning, provided that adoption demonstrates educational value and incorporates equitable access, teacher mediation, transparency, data privacy, and clear academic-integrity provisions.

Keywords: *artificial intelligence in education; gamified learning; learner acceptability; student engagement; responsible AI; educational technology*

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1. Introduction

Artificial intelligence has become increasingly embedded in contemporary educational practice through generative applications, adaptive learning systems, automated feedback mechanisms, and personalized instructional support. These technologies have expanded the ways learners access information, complete academic tasks, and interact with educational content. Alongside this development, gamification has been used to incorporate motivational elements such as feedback, progression, challenges, rewards, and interactive participation into learning activities. The convergence of artificial intelligence and gamification therefore presents a potentially significant pedagogical approach in which learning experiences may become more adaptive, responsive, and engaging.

Research indicates that AI-assisted and gamified learning environments can support academic achievement, retention, participation, and learner motivation. AI-enabled systems may provide individualized feedback, adjust task difficulty, and respond to differences in learner performance, while gamified structures may encourage attention, persistence, and active participation. Chen and Chang (2024), for example, found that AI-assisted game-based learning could influence science learning outcomes, intrinsic motivation, cognitive load, and learning behavior. Similarly,

Dahri et al. (2025) reported that AI-supported gamification was associated with student engagement and academic achievement. These findings suggest that the educational value of AI-assisted gamified learning may arise not merely from the novelty of technology but from the way it structures feedback, interaction, and learner participation.

The growing interest in AI-assisted gamification is particularly relevant to Generation Z learners, who have experienced substantial exposure to digital platforms, mobile applications, and technology-mediated communication. Their familiarity with digital tools may increase their willingness to use AI-supported learning environments. However, familiarity with technology does not necessarily indicate that learners will regard every educational application of AI as useful, credible, or appropriate. Students may distinguish between tools that are entertaining, tools that support immediate task completion, and tools that produce meaningful academic learning. Consequently, learner acceptability should not be interpreted solely as enthusiasm for new technology. It must also be examined in relation to perceived learning value, engagement, and the conditions under which classroom adoption is considered responsible.

Perceived learning value refers to learners' judgments regarding whether an educational tool contributes to understanding, retention, academic performance, and mastery. Studies on AI-assisted and gamified learning have reported favorable outcomes in several educational contexts, including science, language learning, and religious education (Chen & Chang, 2024; Margareta et al., 2025). AI-powered personalization may improve learning by providing content and feedback that respond to individual needs, while gamified structures may organize practice into more interactive and motivating sequences. Nevertheless, the educational benefits of these approaches are not automatic. Their effectiveness depends on instructional alignment, the quality of task design, the appropriateness of feedback, and the extent to which the technology supports rather than replaces meaningful learning activity (Abbes et al., 2024; Bhavani et al., 2025).

Motivation and engagement constitute another major consideration in the adoption of AI-assisted gamified learning. Gamification is commonly intended to sustain attention, encourage participation, and support persistence by making learning activities more interactive and goal-directed. AI can strengthen these mechanisms by providing adaptive challenges, real-time responses, and personalized learning pathways. Research has linked AI-driven gamification with autonomy, participation, motivation, and learner engagement (Alenezi, 2023; Li et al., 2024). However, high engagement does not necessarily produce improved mastery or long-term academic outcomes. Learners may find a system enjoyable or stimulating without perceiving it as educationally valuable. This distinction is important because institutions must determine whether engagement functions as a meaningful pathway to learning or merely as a temporary response to technological novelty.

The acceptability of AI-assisted gamified learning is also shaped by ethical, institutional, and governance considerations. Educational AI may involve concerns related to academic integrity, transparency, data privacy, fairness, accountability, overreliance, and unequal access. Holmes et al. (2022) emphasized the need for a community-wide ethical framework for artificial intelligence in education, while Chan (2023) argued for comprehensive institutional policies governing AI use in university teaching and learning. These concerns are especially important when learners differ in access to devices, internet connectivity, subscriptions, and digital support. Without appropriate safeguards, AI-enhanced learning may reinforce existing educational inequalities rather than reduce them.

Teacher mediation remains central to responsible implementation. AI-assisted gamified systems should not be treated as substitutes for pedagogical judgment. Teachers determine how technologies are aligned with learning outcomes, how student performance is interpreted, and how academic integrity and privacy are protected. Responsible adoption therefore requires clear institutional policies, informed instructional design, explicit guidance for students, and mechanisms that ensure equitable participation. Learner support for AI-assisted gamified learning may consequently depend not only on perceived usefulness but also on whether institutions can establish credible conditions for responsible use.

Despite the expanding literature on artificial intelligence, gamification, and educational technology, several gaps remain. Much of the existing research examines learning outcomes, engagement, or technology use as separate concerns. Fewer studies evaluate how perceived learning value, motivation and engagement, exposure to AI and gamified tools, and responsible-use safeguards collectively relate to learners' willingness to support classroom

adoption. There is also limited empirical evidence concerning these relationships among senior high school and higher education learners in the Philippine context. This gap is significant because the acceptability of educational innovation may vary across institutional environments, levels of technological exposure, and local conditions of access and governance.

This study therefore examined the acceptability of AI-assisted gamified learning among Generation Z learners in selected senior high schools and higher education institutions in Batangas, Philippines. It focused on whether learners regarded these tools as educationally valuable and engaging, and whether their support for adoption was associated with responsible-use conditions such as academic integrity guidance, transparency, data privacy, equitable access, and teacher mediation.

Objectives of the Study

Specifically, the study aimed to:

1. describe the respondents' exposure to and use of artificial intelligence and gamified learning tools;
2. assess their perceptions of AI-assisted gamified learning in terms of perceived learning value, motivation and engagement, responsible-use safeguards, and acceptability for classroom adoption; and
3. determine the relationships among exposure and use, perceived learning value, motivation and engagement, responsible-use safeguards, and acceptability for classroom adoption.

2. Review of Related Literature

2.1 AI-Assisted Gamified Learning and Perceived Learning Value

Artificial intelligence and gamification have increasingly been combined to create learning environments that provide adaptive support, immediate feedback, individualized pathways, and structured interaction. In these environments, AI may adjust instructional content or task difficulty based on learner performance, while gamification introduces mechanisms such as challenges, progression, rewards, and feedback. The educational value of this combination depends on whether these features improve understanding, retention, mastery, and academic performance rather than merely increasing the novelty of the learning experience.

Chen and Chang (2024) found that AI-assisted game-based learning influenced science learning outcomes, intrinsic motivation, cognitive load, and learning behavior. Their findings indicate that AI-supported game environments may contribute to learning by improving both cognitive and behavioral processes. When instructional activities are responsive to learner performance, students may receive more appropriate levels of challenge and support, reducing unnecessary cognitive burden while maintaining participation.

Evidence from other subject areas also suggests that AI-assisted gamification may support academic outcomes. Margareta et al. (2025) examined gamified AI-based learning media in Islamic education and reported improvements in student learning outcomes. These findings demonstrate that AI-assisted gamified learning has been applied across different disciplines, although the strength and character of its effects may vary according to instructional design and subject context.

Personalization is frequently identified as one of the principal mechanisms through which AI may contribute to learning value. Alisoy (2025) reported that AI-powered personalized learning could improve outcomes among English as a second language learners. Personalized systems may identify learner difficulties, provide individualized feedback, and present learning materials at an appropriate pace. When combined with gamified progression, these capabilities may support clearer understanding and sustained practice.

However, positive learning outcomes cannot be attributed to AI or gamification in isolation. Bhavani et al. (2025) emphasized that the educational contribution of AI tools depends on how effectively they are integrated into teaching and learning processes. Zhumbei et al. (2025) likewise described AI and gamified learning as potentially beneficial but dependent on implementation quality. Abbes et al. (2024) further noted that generative AI and gamification present opportunities for personalized learning while also raising unresolved questions regarding long-term effectiveness and instructional alignment.

The literature therefore indicates that AI-assisted gamified learning can provide perceived and measurable learning value, particularly through personalization, feedback, clarification, and adaptive support. Nevertheless, improvements in comprehension or short-term performance should not automatically be interpreted as evidence of mastery or durable learning. The educational value of AI-assisted gamification remains contingent on the quality of instructional design, the alignment of activities with learning outcomes, and the extent to which learners engage in meaningful practice rather than passive dependence on automated support. A related survey across varied educational settings found that AI was perceived as more effective for engagement, content relevance, and learning analytics than for direct academic-performance improvement, reinforcing the distinction between perceived assistance and demonstrated learning gains (Rao et al., 2025).

2.2 Motivation, Engagement, and Adaptive Learning Experiences

Motivation and engagement are among the most frequently cited benefits of gamified educational environments. Gamification seeks to increase learner participation by introducing structured goals, feedback, challenges, rewards, and visible progress. Artificial intelligence may enhance these mechanisms by adapting tasks to individual learner needs and providing immediate responses to learner actions.

Alenezi (2023) examined teacher perspectives on AI-driven gamification and found that educators associated these systems with student motivation, engagement, and learning outcomes. AI-driven gamification may encourage participation by making tasks more interactive and by presenting learners with challenges suited to their abilities. Such environments can support autonomy by allowing students to progress at different rates and receive individualized feedback.

Li et al. (2024) similarly discussed the motivational foundations of AI-driven gamification, emphasizing the interaction of intrinsic and extrinsic motivational processes. Intrinsic motivation may arise when learners experience curiosity, competence, or enjoyment, whereas extrinsic motivation may be encouraged through points, rankings, rewards, or completion indicators. Effective gamified learning requires balance between these forms of motivation. Excessive dependence on external rewards may produce temporary compliance without supporting deeper interest or sustained learning.

Generative AI may further strengthen motivation by increasing responsiveness and interaction. Monzon and Hays (2025) examined the use of generative AI to improve motivation and retrieval among higher education learners. Their work suggests that AI-based systems can make learning activities more responsive and may help students retrieve and engage with information more actively. Narayanan and Kumaravel (2024) likewise proposed a hybrid gamification and AI tutoring framework that combined machine learning with adaptive tutoring. Such models illustrate how AI can be used to personalize both the content and the motivational structure of learning activities.

Dahri et al. (2025) found that AI gamification was associated with student engagement and academic achievement. Their analysis supports the view that engagement may serve as an intermediate mechanism linking instructional technology with learning outcomes. When learners attend to tasks, participate actively, and persist in completing activities, they may have more opportunities to process and apply educational content.

Recent scholarship has also sought to improve the measurement of engagement in AI-enhanced gamified learning. Al-Rousan et al. (2025) developed and validated a scale for assessing engagement and motivation among secondary school students. This reflects a growing recognition that engagement is multidimensional and should not be reduced to enjoyment alone. Attention, participation, persistence, interaction, and willingness to continue using the system may represent distinct but related dimensions of engagement. A comparable pattern in Philippine Generation Z digital behavior shows that intensive platform use may remain largely passive, underscoring the need to distinguish technological exposure from active engagement (Dancel et al., 2026).

Despite these positive findings, the literature cautions against assuming that engagement automatically leads to stronger academic outcomes. Abbes et al. (2024) observed that generative AI and gamification may increase participation but that the durability of these benefits remains uncertain. Engagement may be high when tasks are novel or entertaining, but it may weaken when learners encounter difficult content, repetitive practice, or demanding

assessments. AI-assisted gamification must therefore support persistence under challenge rather than merely stimulate initial interest.

Overall, the literature suggests that AI-assisted gamified learning can strengthen attention, participation, motivation, and interaction. However, engagement should be understood as a means to support learning rather than as an end in itself. Educational institutions must determine whether increased engagement contributes to comprehension, practice, self-regulation, and mastery. Similarly, among college-bound learners in Region IV-A, extensive social-media exposure was less influential than trust in predicting enrollment intention, suggesting that digital engagement alone may not determine consequential adoption decisions (Espelita et al., 2026).

2.3 Responsible AI Safeguards and Conditions for Classroom Adoption

The adoption of AI-assisted gamified learning raises ethical and institutional concerns that extend beyond instructional effectiveness. Educational AI systems may collect learner data, generate automated feedback, influence assessment practices, and shape patterns of academic participation. Responsible implementation therefore requires safeguards concerning privacy, transparency, fairness, accountability, academic integrity, equitable access, and teacher mediation.

Holmes et al. (2022) proposed a community-wide ethical framework for artificial intelligence in education. Their work emphasizes that ethical AI adoption requires the participation of learners, teachers, institutions, developers, and policymakers. Responsibility cannot be assigned solely to the technology provider because educational institutions determine how systems are selected, implemented, monitored, and evaluated.

Teacher mediation is particularly important in AI-supported learning environments. Bearman and Ajjawi (2023) argued that education must prepare learners to work critically with AI systems whose internal processes may not always be transparent. Students should not merely accept AI-generated outputs as correct or authoritative. Instead, teachers must help learners evaluate automated responses, identify errors or bias, and understand the limitations of algorithmic tools. Comparable evidence from Philippine accounting practice suggests that AI is accepted most readily for low-risk assistive tasks, while higher-stakes use remains contingent on verification, human judgment, policy institutionalization, and data readiness (Bendal et al., 2026).

Institutional policy also plays a central role. Chan (2023) developed an AI policy education framework for university teaching and learning that addresses governance, assessment, academic integrity, and AI literacy. Clear institutional policies can help distinguish legitimate educational assistance from inappropriate dependence or misconduct. Such policies should also provide guidance to faculty members regarding acceptable uses of AI in instruction, assessment, and feedback. In an adjacent Philippine senior high school context, peer pressure and difficulty managing academic demands were among the more salient academic-dishonesty-related tendencies, supporting the need for clear integrity guidance and preventive student support (Lolong et al., 2026).

Transparency and accountability are essential because students need to understand when AI is being used and how it may affect their learning experience. Schell et al. (2025) proposed an evidence-based framework for responsible AI chatbot implementation in higher education. Their work highlights the importance of design, monitoring, institutional oversight, and user protection. AI tools should not be introduced solely because they are technologically available; institutions must assess their educational purpose, risks, and suitability for specific learner populations.

Privacy constitutes another major concern. AI systems may process personal information, interaction histories, performance data, and behavioral patterns. Responsible implementation requires clear rules regarding data collection, storage, access, and use. Learners should be informed about what data are collected and how those data may influence system recommendations or institutional decisions.

Equitable access is likewise critical. Zhou (2024) emphasized that the future of gamified education must account for differences in access to devices, connectivity, digital literacy, and technological resources. AI-assisted learning may create additional opportunities for students with strong technological access while disadvantaging those who lack stable internet connections, suitable devices, or paid subscriptions. Equity therefore requires institutional support, accessible platforms, and alternative learning arrangements where necessary.

Chang et al. (2023) identified goal setting, feedback, and personalization as key design principles for AI chatbots supporting self-regulated learning. These functions require instructional oversight to ensure that AI supports learner autonomy rather than creating overreliance.

The literature consequently frames responsible-use safeguards as integral to educational acceptability. Learners may support AI-assisted gamified learning when they perceive that teachers remain actively involved, institutional rules are clear, data are protected, access is equitable, and the technology is aligned with legitimate learning objectives.

2.4 Synthesis and Research Gap

The reviewed literature collectively indicates that AI-assisted gamified learning may contribute to personalized instruction, learner engagement, feedback, participation, and selected academic outcomes. Existing studies suggest that AI can support adaptive learning, while gamification can create motivational structures that encourage attention and interaction (Alenezi, 2023; Chen & Chang, 2024; Dahri et al., 2025). At the same time, the literature emphasizes that engagement does not necessarily guarantee mastery, retention, or improved assessment performance. Educational value depends on instructional alignment, sustained practice, task quality, and teacher support (Abbes et al., 2024; Bhavani et al., 2025).

The literature also demonstrates that responsible-use safeguards are not peripheral concerns. Privacy, transparency, academic integrity, equity, accountability, and teacher mediation influence whether AI-assisted learning can be implemented legitimately and sustainably (Chan, 2023; Holmes et al., 2022; Schell et al., 2025). The effectiveness and ethics of educational AI are therefore interdependent: a system that is engaging but educationally weak or institutionally unsafe may not merit broad classroom adoption.

Despite these developments, limited research has examined learning value, motivation and engagement, responsible-use safeguards, exposure, and acceptability within a single empirical model. Existing studies commonly focus on either performance outcomes, motivational mechanisms, technological design, or ethical governance. Less attention has been given to how learners themselves weigh these considerations when evaluating classroom adoption. A related review of Philippine health professions education further positions leadership as a mediating function in balancing generational responsiveness, digital change, faculty capacity, and program quality (Bermido et al., 2025).

There is also limited evidence from Philippine senior high school and higher education settings, where generative AI use may already be widespread despite comparatively limited exposure to formally designed AI-gamified instruction. The present study addresses this gap by examining whether acceptability is associated primarily with engagement or whether learners place greater weight on perceived learning value, prior exposure, and credible safeguards. In doing so, the study contributes context-specific evidence relevant to educational technology implementation, instructional leadership, and institutional AI governance. Document-based evidence from Philippine higher education institutions similarly indicates that digitalization may be widespread yet remain fragmented or continuity-oriented when it is not embedded in a coordinated institutional strategy (Atento, 2025).

3. Methodology

3.1 Research Design

The study employed a quantitative, cross-sectional, descriptive-correlational research design. The descriptive component was used to determine respondents' exposure to artificial intelligence and gamified learning tools and to assess their perceptions of learning value, motivation and engagement, responsible-use safeguards, and acceptability for classroom adoption. The correlational component examined the relationships among these variables. Because the study collected data at a single point in time and did not manipulate the learning environment, the findings were interpreted as associations rather than causal effects.

3.2 Research Setting and Respondents

The respondents were senior high school and higher education students from five anonymized institutions, designated as Schools A-E, located in Sto. Tomas, Tanauan, and Malvar, Batangas, Philippines. The combined student

population of the participating institutions was approximately 22,300, comprising 14,650 senior high school students and 7,650 higher education students.

A total of 472 valid responses were included in the analysis. Of these, 256 respondents, or 54% of the sample, were senior high school students, while 216 respondents, or 46%, were enrolled in higher education institutions. The sample also included learners from science, technology, engineering, medical and allied health programs; business, accountancy, and finance programs; and arts, communication, psychology, and education programs.

3.3 Sampling Technique

The study used a site-based non-probability sampling procedure. The five participating institutions served as the research sites, and respondents were recruited through convenience sampling while maintaining representation from both senior high school and higher education levels.

An initial sample-size benchmark of approximately 378 respondents was computed using a 95% confidence level, a 5% margin of error, a 50% response distribution, and finite population correction. The final sample of 472 exceeded this target. However, because participants were selected through convenience sampling rather than random probability sampling, the sample-size calculation was treated as a recruitment benchmark and not as a guarantee of population-level representativeness.

3.4 Research Instrument

Data were collected using a researcher-developed structured questionnaire consisting of respondent-profile items and statements measuring the study variables. The instrument covered exposure to and use of generative AI and gamified learning activities; perceived learning value in terms of understanding, retention, assessment performance, and mastery; motivation and engagement in terms of attention, participation, persistence, feedback, and interaction; responsible-use safeguards, including academic integrity, transparency, data privacy, equitable access, and teacher mediation; and acceptability and intention to support classroom adoption. The questionnaire was reviewed for face validity by two experts with doctoral qualifications in education. No content-validity coefficient was computed.

Responses were recorded on a five-point scale, with higher scores indicating greater exposure, more frequent use, or stronger agreement and acceptability, depending on the item. For descriptive interpretation, mean scores were classified as very low (1.00-1.80), low (1.81-2.60), moderate (2.61-3.50), high (3.51-4.20), and very high (4.21-5.00).

3.5 Data-Gathering Procedure

The questionnaire was administered to eligible senior high school and higher education students from the participating institutions. Respondents were informed of the purpose of the study and participated voluntarily. Completed questionnaires were reviewed for completeness, and only valid responses were included in the statistical analysis.

The participating institutions were anonymized to protect their identities. The dataset was consolidated and organized according to educational level, program or strand grouping, age, sex, academic standing, exposure indicators, and the four principal study constructs.

3.6 Data Analysis

The data were analyzed using descriptive and inferential statistical techniques. Frequencies and percentages were used to summarize the demographic characteristics of the respondents. Means and standard deviations were computed to describe exposure to AI and gamified learning and to determine the respondents' perceptions of learning value, motivation and engagement, responsible-use safeguards, and acceptability.

Pearson's product-moment correlation coefficient was used to examine the relationships among exposure and use, learning value, motivation and engagement, responsible-use safeguards, and acceptability for classroom adoption. Statistical significance was evaluated at the .05 level.

3.7 Ethical Considerations

The study protocol received approval from the institutional ethics committee of a university in Manila. Participation was voluntary, and informed consent was obtained before data collection. For respondents below 18 years of age, written parental or guardian consent and student assent were secured.

Respondent anonymity was maintained, and no personally identifying information was included in the reported results. The collected data were stored securely and reported only in aggregate form. The names of the participating institutions were withheld and replaced with coded designations to preserve institutional confidentiality.

4. Results and Discussion

4.1 Characteristics of the Respondents

A total of 472 valid responses were included in the analysis. Senior high school students comprised 54% of the sample (n = 256), while students from higher education institutions accounted for 46% (n = 216). This distribution provided substantial representation from both educational levels.

In terms of academic program or strand, 189 respondents (40%) belonged to science, technology, engineering, medical, and allied health fields. Another 145 respondents (31%) were enrolled in arts, communication, psychology, and education, while 138 respondents (29%) came from business, accountancy, and finance. The sample therefore represented multiple disciplinary clusters rather than being concentrated in a single academic field.

Most respondents were between 16 and 21 years old. Those aged 16-18 constituted 47% of the sample (n = 223), while those aged 19-21 accounted for 42% (n = 198). The remaining 11% were aged 22-24 (n = 51). Female respondents represented 52% of the sample (n = 247), while male respondents comprised 48% (n = 225).

Regarding self-reported academic standing, 356 respondents (75%) classified themselves as average-performing students. Seventy-six respondents (16%) reported relatively low academic standing, while 40 respondents (9%) classified themselves as high-performing. The findings therefore largely reflected the perceptions of students who considered themselves to be within the mainstream range of academic performance.

4.2 Exposure to Artificial Intelligence and Gamified Learning

Table 1 presents respondents' reported exposure to generative AI, gamified learning activities, and the combined use of AI and gamification.

Table 1. *Exposure to Artificial Intelligence and Gamified Learning*

Exposure indicator	Mean	SD
Use of generative AI tools for schoolwork	4.39	0.62
Use of gamified learning activities in class	2.25	0.75
Experience with combined AI and gamification	2.17	0.81
Frequency of AI use	3.71	0.89
Frequency of gamified activities	2.03	0.74
Composite mean	2.91	-

The results show a clear difference between respondents' exposure to generative AI and their experience with formal gamified instruction. The highest mean was recorded for the use of generative AI tools for schoolwork (M = 4.39, SD = 0.62), indicating that AI had already become a common component of students' academic practices. The frequency of AI use was also relatively high (M = 3.71, SD = 0.89), suggesting that respondents used these technologies regularly rather than only on isolated occasions.

In contrast, the use of gamified learning activities in formal classes was relatively limited (M = 2.25, SD = 0.75). Experience with the deliberate integration of AI and gamification was similarly low (M = 2.17, SD = 0.81), while the frequency of gamified activities received the lowest rating (M = 2.03, SD = 0.74).

The composite mean of 2.91 reflects an uneven exposure pattern. Respondents were familiar with AI as an individual academic support tool, but they had substantially less experience with instructor-designed gamification and structured AI-gamified learning environments. This distinction is important because respondents' evaluations of AI-assisted gamified learning may have been influenced more by their familiarity with standalone AI tools than by sustained exposure to fully integrated instructional systems.

The results suggest that AI use among learners may be developing more rapidly than institutionally designed AI pedagogy. Students may already be using generative AI for explanations, drafting, retrieval, and task completion even when their schools have not yet systematically incorporated AI into gamified classroom activities. Consequently, high acceptance of AI-assisted gamified learning should be interpreted partly as readiness or anticipated acceptance rather than as an evaluation based exclusively on extensive direct experience.

4.3 Perceived Learning Value, Engagement, Safeguards, and Acceptability

Table 2 summarizes respondents' assessments of the four principal study constructs.

Table 2. *Descriptive Statistics for the Principal Study Constructs*

Construct	Indicator domain	Mean	SD	Interpretation
Perceived learning value	Achievement, understanding, retention, and mastery	3.45	0.80	Moderate
Motivation and engagement	Attention, persistence, participation, and interaction	4.05	0.54	High
Responsible-use safeguards	Conditions for responsible classroom adoption	4.10	0.53	High
Acceptability and intention	Support for classroom adoption	4.48	0.66	Very high

Note. Interpretive labels are retained from the source manuscript.

Perceived Learning Value

Perceived learning value received the lowest composite rating among the four constructs (M = 3.45, SD = 0.80). Although the result remained favorable, respondents were more cautious in evaluating the extent to which AI-assisted gamified learning could directly improve achievement, retention, and mastery.

The highest-rated learning-value item concerned the general improvement of academic learning outcomes (M = 4.03). Respondents also rated clearer understanding of lessons favorably (M = 3.75), followed by retention of important concepts (M = 3.64). These findings suggest that learners primarily viewed AI-assisted gamified learning as a tool for clarification, reinforcement, and immediate academic support.

Ratings were lower for improvement in quizzes and examinations (M = 3.17) and for effective practice until mastery (M = 2.64). The relatively low mastery rating indicates that respondents did not necessarily associate current AI use with systematic, progressive, or assessment-aligned practice. Their experience with AI may have been oriented more toward answering questions, explaining concepts, generating examples, or completing tasks than toward structured repetition and calibrated mastery.

The difference between perceived assistance and perceived mastery is educationally significant. AI can make content more understandable without necessarily producing deeper or durable learning. Mastery normally requires progressive difficulty, repeated application, feedback based on performance, and alignment with intended learning outcomes. The low exposure to integrated AI-gamified instruction observed in Table 1 may partly explain why respondents were less confident that these tools could support sustained mastery.

Motivation and Engagement

Motivation and engagement received a high composite rating (M = 4.05, SD = 0.54). Respondents strongly agreed that AI-assisted gamified learning could increase their involvement in academic activities.

The highest engagement rating was recorded for the general statement that AI-assisted gamified learning strengthens engagement (M = 4.25). Sustained attention during learning tasks was also rated highly (M = 4.21), followed by increased interest in participating in classroom activities (M = 4.17). These results indicate that respondents regarded AI-supported gamified environments as potentially effective in attracting attention and encouraging active involvement.

The item concerning feedback and interaction remained favorable (M = 3.89), suggesting that responsive features may contribute to motivation. However, persistence when lessons become difficult received the lowest engagement rating (M = 3.71). Although this rating was still positive, it indicates that engaging features may be less effective when students encounter demanding content or prolonged academic difficulty.

This pattern distinguishes initial and situational engagement from sustained academic persistence. A learning tool may attract attention and make participation more appealing without necessarily strengthening self-regulation during complex tasks. Gamified features therefore need to be integrated with scaffolding, progressive challenge, meaningful feedback, and teacher support if they are to contribute to persistence rather than only short-term stimulation.

Responsible-Use Safeguards

Respondents strongly endorsed responsible-use safeguards as conditions for acceptable adoption (M = 4.10, SD = 0.53). The findings show that learners did not regard AI-assisted gamified learning as an innovation that should be adopted without institutional protections.

Equitable access received the highest item rating (M = 4.39). Respondents therefore appeared particularly concerned that differences in devices, internet connectivity, subscriptions, and technological resources could create unequal opportunities. This result is especially relevant in educational contexts where access to stable connectivity and advanced digital tools may vary substantially among learners.

Teacher guidance and mediation also received a high rating (M = 4.17), followed by data privacy protection (M = 4.14) and transparency regarding the use of AI in learning activities (M = 4.07). These findings indicate that students expected teachers and institutions to remain actively involved in the implementation process. Learners did not appear to support a model in which AI systems operate independently of instructional oversight.

Academic-integrity guidance received the lowest safeguard rating (M = 3.67), although it still reflected general agreement. This comparatively lower rating may indicate that integrity rules are less immediately visible to students than access, privacy, or teacher involvement. It may also reflect uncertainty regarding how acceptable and unacceptable AI use should be distinguished across different types of assignments.

Taken together, the safeguard findings show that acceptance was conditional. Respondents supported AI-assisted gamified learning, but they also expected institutions to address fairness, privacy, transparency, and instructional responsibility.

Acceptability and Intention to Support Adoption

Acceptability and intention to support classroom adoption received the highest composite rating (M = 4.48, SD = 0.66). Respondents therefore demonstrated substantial openness to the use of AI-assisted gamified learning in formal education.

The highest-rated item concerned the general acceptability of the approach (M = 4.82). Willingness to use the tools when available was similarly high (M = 4.75). Respondents also expressed willingness to recommend broader use across academic subjects (M = 4.46) and supported integration into regular classroom teaching (M = 4.32).

The lowest acceptability item concerned support conditional on the presence of safeguards (M = 4.03). Although still favorable, this result suggests that support became somewhat more cautious when adoption was explicitly linked with integrity, transparency, privacy, and teacher-guidance requirements. This does not necessarily imply opposition to safeguards. Instead, the conditional wording may have required respondents to consider implementation constraints that were less salient in the more general acceptability items.

The very high acceptability ratings should nevertheless be interpreted alongside the low direct exposure to integrated AI-gamified learning. Respondents appeared ready to support the approach, but their judgments may partly represent expectations about its potential rather than evaluations of extensive classroom experience.

4.4 Relationships Among the Study Variables

Table 3 presents the Pearson correlations among exposure and use, perceived learning value, motivation and engagement, responsible-use safeguards, and acceptability.

Table 3. *Pearson Correlations Among the Principal Study Variables*

Variable	1	2	3	4	5
1. Exposure and use	-				
2. Perceived learning value	.208***	-			
3. Motivation and engagement	.302***	.253***	-		
4. Responsible-use safeguards	.260***	.478***	.020	-	
5. Acceptability and intention	.338***	.570***	.090	.311***	-

Note. Values are Pearson's r. Two-tailed significance tests were based on n = 472. ***p < .001.

Exposure and use were positively related to perceived learning value (r = .208), motivation and engagement (r = .302), and responsible-use safeguards (r = .260). These relationships suggest that respondents with greater experience using AI or gamified tools were more likely to perceive educational benefits, report stronger engagement, and recognize the importance of responsible-use conditions.

Perceived learning value was positively related to motivation and engagement (r = .253). Respondents who viewed AI-assisted gamified learning as beneficial to comprehension, retention, or performance also tended to report stronger motivational and engagement benefits. However, the relationship was modest, indicating that students could perceive a tool as engaging without necessarily regarding it as highly effective for learning.

Perceived learning value also showed a relatively strong positive relationship with responsible-use safeguards (r = .478). This finding indicates that respondents who placed greater value on the educational benefits of AI-assisted gamification were also more likely to endorse safeguards. Rather than treating educational effectiveness and responsible governance as competing considerations, learners appeared to regard them as related.

Acceptability was most strongly associated with perceived learning value (r = .570). This was the largest correlation in the matrix and indicates that respondents' support for classroom adoption was closely connected to whether they believed the approach would provide meaningful educational benefits.

Acceptability was also positively related to exposure and use (r = .338) and responsible-use safeguards (r = .311). Greater familiarity with AI or gamified tools was therefore associated with stronger support for adoption, while endorsement of safeguards was likewise associated with acceptance.

In contrast, motivation and engagement were not significantly related to acceptability (r = .090). This finding is notable because engagement received a high descriptive rating. Respondents generally believed that AI-assisted gamified learning would be engaging, but this perception did not substantially differentiate those who were more or less supportive of classroom adoption.

The results suggest that engagement may have been regarded as an expected feature of the technology rather than as the principal basis for institutional adoption. Learners appeared more likely to support adoption when they believed that the tools could produce legitimate learning value and when responsible-use conditions were present.

4.5 Discussion

The findings reveal a central tension in the adoption of AI-assisted gamified learning. Respondents were highly familiar with generative AI, strongly receptive to classroom adoption, and optimistic about its motivational potential. However, they had comparatively little direct exposure to formal gamification or fully integrated AI-gamified instruction. Their acceptance therefore appears to reflect both actual experience with standalone AI tools and expectations concerning what more structured instructional applications might provide.

The high use of generative AI for schoolwork is consistent with the rapid normalization of AI-assisted academic practices. Students increasingly encounter AI as an accessible tool for explanation, drafting, idea generation, retrieval, and feedback. However, the low ratings for classroom gamification and AI-gamification integration indicate that institutional implementation has not necessarily progressed at the same rate as student-level adoption.

This gap has implications for educational leadership and instructional planning. When students independently adopt AI faster than institutions establish pedagogical frameworks, technology use may become fragmented, inconsistent, and weakly aligned with learning outcomes. Schools may respond through prohibition, permissive use, or structured integration. The present findings support the third approach: deliberate instructional design that connects AI use with clear learning objectives, teacher guidance, and responsible-use policies.

The moderate rating for learning value provides an important qualification to the very high acceptability result. Respondents were more confident that AI-assisted gamified learning could clarify lessons and improve general learning experiences than that it could strengthen examination performance or produce mastery. This finding is compatible with studies indicating that AI-assisted game-based environments may improve learning behavior, intrinsic motivation, cognitive load, and selected outcomes when appropriately designed (Chen & Chang, 2024). AI-enabled personalization may also improve learning by adapting feedback and content to learner needs (Alisoy, 2025).

Nevertheless, the benefits of AI and gamification depend on instructional integration rather than on technological presence alone. Bhavani et al. (2025) and Abbes et al. (2024) emphasized that personalization and engagement do not automatically lead to durable academic gains. The present findings reinforce this qualification. Learners appeared to recognize immediate support for understanding and retention but were less convinced that current applications promoted mastery through sustained practice.

The high motivation and engagement rating is consistent with research describing AI-driven gamification as a mechanism for strengthening participation, attention, autonomy, and interaction (Alenezi, 2023; Dahri et al., 2025; Li et al., 2024). Adaptive challenges, responsive feedback, and visible progress can make learning activities more interactive and personally relevant.

However, persistence under difficulty received the lowest engagement rating. This suggests that the motivational advantages of AI-assisted gamification may weaken when students face cognitively demanding tasks. Engagement features may encourage learners to begin or participate in an activity, but persistence requires additional factors such as self-regulation, instructional scaffolding, meaningful feedback, and manageable progression.

The absence of a significant relationship between engagement and acceptability further clarifies this distinction. Although respondents generally regarded AI-assisted gamified learning as engaging, engagement alone did not appear to determine whether they supported broader classroom adoption. One explanation is that engagement had become an expected attribute and therefore did not differentiate adoption judgments. Another possibility is statistical restriction: consistently high engagement ratings may have reduced variability and weakened the observed correlation.

More substantively, respondents may have distinguished between an activity that is enjoyable and one that is educationally justified. The strongest correlate of acceptability was perceived learning value. This indicates that learners were more likely to support adoption when they believed the approach could improve understanding, retention, or academic outcomes. Institutions should therefore avoid presenting gamification merely as a strategy for making classes more entertaining. The design must demonstrate that engagement serves a clear educational purpose.

The strong endorsement of safeguards further indicates that acceptance was not unconditional. Equity, teacher mediation, privacy, and transparency were regarded as important requirements. This finding is consistent with ethical

frameworks that treat educational effectiveness and responsible governance as interdependent (Chan, 2023; Holmes et al., 2022).

The high rating for equitable access is particularly important. AI-assisted gamification may require reliable internet access, compatible devices, subscriptions, and technical support. If implementation depends heavily on resources available only to some students, it could intensify rather than reduce educational inequality. Institutional adoption should therefore include provisions for shared access, platform compatibility, alternative participation methods, and financial support where necessary.

The strong rating for teacher mediation likewise demonstrates that learners did not regard AI as a replacement for educators. Teachers remain responsible for instructional alignment, assessment design, feedback interpretation, and the identification of erroneous or biased AI-generated content. Bearman and Ajjawi (2023) emphasized the need to prepare learners to work critically with AI systems rather than treating automated outputs as unquestionable. The present findings support this pedagogical position.

The positive relationship between perceived learning value and safeguards is also notable. Learners who more strongly believed in the educational value of AI-assisted gamification were more likely to endorse responsible-use conditions. This suggests that respondents did not view regulation as incompatible with innovation. Instead, credible safeguards may strengthen the legitimacy of educational AI by increasing trust and clarifying acceptable use.

For AJELMP's educational leadership and management orientation, the results imply that adoption decisions should be based on three interconnected considerations. First, instructional leaders must require demonstrable learning value rather than relying on novelty or engagement alone. Second, schools must support teachers in designing activities that move beyond basic AI assistance toward progressive, assessment-aligned learning. Third, institutional policies must address access, privacy, transparency, integrity, and teacher oversight before implementation is expanded.

The study therefore contributes a learner-centered perspective to AI adoption. Gen Z respondents were highly receptive to AI-assisted gamified learning, but their support was most strongly associated with perceived educational value and was reinforced by responsible-use safeguards. Engagement remained important as a perceived benefit, but it did not independently explain adoption support. The findings suggest that sustainable implementation will depend less on whether AI-assisted gamification is attractive and more on whether institutions can demonstrate that it is educationally purposeful, ethically governed, and equitably accessible.

5. Conclusions, Recommendations, and Implications

5.1 Conclusions

The study examined the acceptability of AI-assisted gamified learning among Generation Z learners in selected senior high schools and higher education institutions in Batangas. The findings show that respondents were already highly exposed to generative AI for schoolwork, but their experience with formal classroom gamification and integrated AI-gamified learning remained limited. This indicates that student use of AI had advanced more rapidly than institutionally designed applications of AI-supported gamified pedagogy.

Respondents perceived AI-assisted gamified learning as moderately valuable for academic learning. They were more confident in its capacity to improve lesson clarity, general learning outcomes, and retention of key concepts than in its ability to strengthen examination performance or support mastery through sustained practice. The findings therefore suggest that learners primarily viewed AI-assisted gamified learning as a supplementary tool for comprehension and reinforcement rather than as a complete system for achieving mastery.

Motivation and engagement were rated highly, particularly in terms of attention, participation, and general involvement in learning activities. However, persistence during difficult lessons received a comparatively lower rating. This indicates that AI-assisted gamification may be effective in attracting and maintaining learner attention, but engagement features alone may not be sufficient to sustain effort when tasks become cognitively demanding.

Respondents strongly endorsed responsible-use safeguards as conditions for adoption. Equitable access, teacher mediation, data privacy, and transparency were given particular importance. These results demonstrate that learners did not support the unrestricted use of AI-assisted gamified learning. Instead, they expected educational institutions to provide clear policies, instructional oversight, privacy protections, and fair access to technological resources.

Acceptability for classroom adoption was very high. Nevertheless, the correlational findings indicate that acceptability was most strongly associated with perceived learning value, followed by exposure and use and responsible-use safeguards. Motivation and engagement, despite their high descriptive ratings, were not significantly associated with acceptability. Learners therefore appeared to base their support for adoption more on whether the technology could provide legitimate educational benefits and operate under responsible conditions than on whether it was merely engaging.

Overall, the study concludes that Generation Z learners are receptive to AI-assisted gamified learning, but sustainable adoption requires more than technological novelty. The approach must demonstrate educational value, support structured learning and mastery, preserve teacher involvement, protect learner data, and ensure that access is not determined by differences in devices, connectivity, or financial resources.

5.2 Recommendations

1. Educational institutions should develop structured guidelines for the classroom use of AI-assisted gamified learning. These guidelines should define acceptable and unacceptable uses of generative AI, establish expectations for transparency, clarify academic-integrity requirements, and specify how learner data should be collected, stored, and protected.
2. Schools should move beyond incidental or individual student use of AI by designing planned instructional activities that combine AI support with purposeful gamified structures. These activities should be aligned with learning outcomes and should include progressive tasks, calibrated difficulty, repeated practice, and feedback mechanisms that help learners move from basic understanding toward mastery.
3. Teachers should remain central to the implementation process. Faculty-development programs should equip educators to evaluate AI-generated outputs, design pedagogically appropriate gamified activities, monitor student dependence on automated tools, and distinguish meaningful engagement from superficial participation. Training should also address the ethical, assessment, and privacy implications of educational AI.
4. Institutions should prioritize equitable access before expanding implementation. Students should not be disadvantaged because they lack suitable devices, stable internet connectivity, paid subscriptions, or advanced digital literacy. Schools may provide shared devices, institutionally licensed platforms, connectivity support, or alternative activities that preserve equivalent learning opportunities.
5. Instructional designers and teachers should not rely primarily on points, badges, rankings, or entertainment features. Gamification should be linked to formative assessment, feedback, reflection, problem solving, and progressive learning. Engagement should function as a pathway toward deeper learning rather than as the final measure of instructional success.
6. Academic-integrity policies should be written in clear, task-specific language. Students should be informed when AI use is permitted, when disclosure is required, how AI-assisted work should be acknowledged, and which uses constitute inappropriate substitution for independent effort. Rules should be accompanied by examples rather than expressed only through general prohibitions.
7. Pilot implementation is recommended before institution-wide adoption. Selected courses or subject areas may introduce AI-assisted gamified learning under controlled conditions, followed by evaluation of learning outcomes, engagement, access, privacy, teacher workload, and student experiences. Decisions to expand implementation should be based on evidence from these pilots.
8. Future studies should examine actual learning outcomes rather than relying exclusively on perceptions. Experimental, quasi-experimental, or longitudinal designs may determine whether AI-assisted gamified learning improves retention, performance, persistence, and mastery over time. Comparative studies between

senior high school and higher education students may also be conducted once complete statistical outputs are available.

9. Further research should investigate whether factors such as academic discipline, prior AI experience, digital access, self-regulation, academic standing, and teacher support influence acceptance and learning outcomes. Qualitative research may also clarify why students value some safeguards more strongly than others and why engagement does not necessarily translate into adoption support.

5.3 Implications of the Study

The study has practical implications for classroom instruction. It indicates that learners are likely to accept AI-assisted gamified learning when they perceive it as educationally useful, but enthusiasm should not be mistaken for evidence of effectiveness. Teachers and instructional designers must ensure that gamified elements serve specific pedagogical purposes and that AI assistance contributes to comprehension, application, and mastery.

The findings also have institutional implications. Educational leaders must recognize that student AI use may already be widespread even when formal institutional policies and instructional models remain underdeveloped. Schools therefore need coherent governance frameworks that align technological innovation with curriculum requirements, academic integrity, data protection, teacher responsibilities, and learner support.

For educational leadership, the results suggest that successful adoption requires coordinated decision-making rather than isolated experimentation. Administrators, faculty members, information-technology personnel, student-support units, and learners should participate in selecting, testing, and evaluating AI-assisted learning systems. Adoption should be treated as an organizational change process involving policy, capacity building, infrastructure, and quality assurance.

The study also contributes to discussions on responsible AI in education. The positive relationship between safeguards and acceptability indicates that governance does not necessarily discourage innovation. Clear protections may instead strengthen trust and make adoption more legitimate. Ethical safeguards should therefore be integrated into instructional design from the beginning rather than introduced only after problems emerge.

Theoretically, the findings distinguish engagement from adoption. Although respondents viewed AI-assisted gamified learning as engaging, engagement was not significantly related to acceptability. Perceived learning value was the strongest correlate of adoption support. This suggests that models of educational technology acceptance should not assume that engagement alone produces willingness to adopt. Instrumental value and responsible-use conditions may be more decisive in institutional learning contexts.

Finally, the study provides context-specific evidence from Philippine senior high school and higher education institutions. It shows that Generation Z learners may be technologically receptive while remaining attentive to equity, privacy, teacher guidance, and educational legitimacy. These conditions should be central to the design of AI policy, instructional innovation, and institutional quality-assurance systems in Philippine education.

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