Scientia Causa Journal of Contemporary Pedagogy and Learning Science
Vol 1 No 3 August 2026, Hal 257-269
ISSN: 3125-1218 (Print) ISSN: 3125-1226 (Electronic)
Open Access: https://researchfrontiers.id/scientiacausa

The Application of Gamification in Learning Assessment to Increase Students' Interest in Learning

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Article Info :
Received:
13-07-2026
Revised:
28-07-2026
Accepted:
05-08-2026

Abstract

This study examines students' learning interest and responses to the implementation of gamification in learning assessment activities in Sociology, Geography, and Biology. A mixed-methods approach was employed involving five eleventh-grade students who participated in game-based assessment activities. Quantitative data were collected through a 24-item questionnaire consisting of four learning interest indicators: enjoyment, interest, attention, and student involvement, while qualitative data were obtained through semi-structured interviews. The findings revealed that the enjoyment score increased from 2.53 during general learning activities to 2.67 during game-based assessment. In contrast, the interest score decreased from 3.00 to 2.27, attention decreased from 2.93 to 2.07, and student involvement decreased from 3.00 to 2.33. The overall mean score across the four indicators decreased from 2.87 to 2.33. Interview findings provided a more nuanced interpretation, indicating that several students perceived the game-based assessment as more fun, interactive, and capable of stimulating curiosity toward subsequent questions and challenges. However, visual elements and point systems could also create distraction and pressure for some students. These findings indicate that gamification did not produce an overall increase in students' learning interest in the present implementation, although it demonstrated potential to improve the emotional experience of assessment. The effectiveness of gamified assessment depends on careful integration of game elements with learning objectives, assessment content, and students' characteristics.

Keywords: *Gamification, Learning Assessment, Learning Interest, Student Involvement, Student Motivation.*

INTRODUCTION

Learning interest is widely recognized as an important psychological factor underlying students' success in educational settings because it shapes the extent to which learners attend to, engage with, and persist in learning activities. The learning system experienced by students constitutes one of the important contextual factors that can influence the development of learning interest, particularly when instructional activities are designed to accommodate students' needs and active participation (Nisa, 2017). Empirical evidence also indicates that learning interest and motivation are closely associated with academic achievement, suggesting that students' psychological engagement should be considered an integral component of effective educational practice rather than a secondary outcome (Kpolovie, 2014). Students with low levels of interest and motivation tend to demonstrate withdrawal from learning activities, absenteeism, anxiety, and poorer academic performance, indicating that disengagement can have consequences extending beyond temporary classroom participation (Sturges et al., 2016). Evaluation is an essential component of the learning process because it provides information about students' understanding and learning achievement while also influencing how students experience the instructional process. Conventional paper-based assessment has historically been widely used to measure learning outcomes, yet the limitations of traditional assessment practices have increasingly encouraged the adoption of information and communication technology to support more flexible assessment processes (Hamid, 2016).

The shift from conventional assessment toward digital evaluation reflects a broader transformation in educational practice in which assessment is increasingly expected to provide not only valid measurements of learning outcomes but also learning experiences that encourage active

participation. Paper-based testing may generate psychological pressure and anxiety among learners, particularly when assessment is perceived as rigid, repetitive, and disconnected from interactive learning experiences (Kuncahyono et al., 2020). This condition indicates that the effectiveness of evaluation cannot be assessed exclusively through the accuracy of measurement but should also consider students' responses, engagement, and willingness to participate throughout the assessment process. Less varied evaluation activities may reduce students' interest in completing assessment tasks, creating a need for approaches that integrate measurement with more engaging forms of interaction. Gamification has consequently emerged as a prominent approach because it incorporates game-design elements into non-game contexts to stimulate motivation, engagement, and sustained participation (Deterding et al., 2011). Research on gamification in education has shown that elements such as points, challenges, rewards, and competition can contribute to more engaging learning experiences, although their effectiveness depends strongly on the instructional context and the way individual game elements are integrated into learning activities (Dicheva et al., 2015). Recent research further indicates that digital learning media incorporating gamification can influence the development of students' learning interest, reinforcing the relevance of gamified approaches for contemporary educational environments (Astuti et al., 2025).

The growing adoption of gamification has been supported by empirical studies demonstrating its potential to influence motivational, behavioral, and cognitive dimensions of learning, although the evidence does not suggest that gamification produces uniformly positive effects across all educational contexts. A meta-analysis found that gamification can generate positive effects on cognitive learning outcomes, motivation, and behavior, while also demonstrating that the magnitude and stability of these effects vary according to the design and implementation of gamified activities (Sailer & Homner, 2020). This variation is important because the mere presence of game elements does not automatically guarantee increased engagement or learning effectiveness. Systematic evidence has similarly shown that gamified learning strategies have been increasingly implemented across secondary and higher education to support student motivation, while their effectiveness remains contingent on learner characteristics, learning objectives, and implementation design (Ratinho & Martins, 2023). Other reviews have emphasized that gamification in e-learning encompasses diverse applications and mechanisms, making it necessary to distinguish between the presence of game features and the actual educational value generated through their use (Saleem et al., 2022). Evidence from classroom-based research also suggests that the effects of game metaphors and individual game elements on learning performance can differ, reinforcing the need for context-sensitive evaluation rather than assuming that all gamified interventions produce comparable outcomes (Sanchez et al., 2020). Gamification has therefore developed from a relatively novel instructional strategy into a broader digital learning approach whose effectiveness needs to be examined through both measurable learning outcomes and students' experiences of the assessment process.

The empirical literature increasingly demonstrates that gamified assessment can provide meaningful benefits when its design corresponds with the psychological and pedagogical characteristics of learners. Studies of gamification have reported positive associations with student motivation, indicating that interactive challenges and game-oriented structures can encourage learners to participate more actively in educational activities (Buckley & Doyle, 2016). Research involving Quizizz-based gamification has likewise demonstrated its potential to strengthen students' motivation during assessment, particularly by transforming evaluation into a more interactive activity (Ccoa et al., 2023). Gamified assessment tools have also been developed to enhance learning motivation in specific subject areas, indicating that the approach can extend beyond general learning activities into assessment-oriented contexts (Fahruddin & Saefudin, 2025). Evidence from learning management systems suggests that gamification can simultaneously support learning outcomes and self-directed learning, illustrating that digital game-based mechanisms may influence broader dimensions of learner participation rather than merely increasing short-term enjoyment (Ferdiansyah et al., 2025). Research on gamified learning environments further indicates that motivation and engagement can be strengthened when digital learning experiences are structured around meaningful interaction and appropriate game mechanics (Hellín et al., 2023). These findings suggest that the value of gamified evaluation lies not simply in making assessment resemble a game, but in creating an interactional environment capable of sustaining students' attention, interest, and active participation.

Despite these developments, important conceptual and empirical gaps remain in understanding how students actually experience gamified evaluation, particularly when the outcome of interest is learning interest rather than achievement alone. Research involving Generation Alpha emphasizes the growing relevance of gamification and game-based learning for digitally oriented learners, yet the effectiveness of such approaches remains dependent on how game characteristics correspond with learners' expectations and educational contexts (Fernando & Premadasa, 2024). Systematic reviews have identified substantial interest in gamification for improving motivation and academic outcomes, but variations in intervention design, learning environments, assessment instruments, and learner characteristics limit the extent to which findings can be generalized across contexts (Nurhayati & Fathurrohman, 2025). Research on gamification in elementary education has also reported positive motivational effects, although the findings reinforce the importance of considering developmental and contextual differences when evaluating students' responses to game-based learning activities (Sappaile, 2024). Similarly, recent research on gamification-based reading comprehension has demonstrated potential improvements in learning outcomes, critical thinking, and self-directed learning, indicating that gamification may influence multiple dimensions of learning beyond immediate motivation (Ikhwan et al., 2025). At the same time, the literature has cautioned that gamification can produce unintended or negative effects when competitive mechanisms, rewards, or other game elements are poorly designed or become more salient than the learning objectives themselves (Toda et al., 2019). The unresolved issue is therefore not whether gamification can be implemented in education, but under what conditions its implementation produces a genuinely engaging assessment experience and how students' interest can be systematically captured through indicators that reflect their psychological and behavioral responses.

Within this context, learning interest provides a relevant analytical perspective because it captures students' responses to an assessment experience through dimensions that extend beyond test scores, including feelings of enjoyment, attraction toward the activity, attention during participation, and involvement in completing learning tasks. These dimensions have been used to conceptualize students' learning interest and provide a basis for examining whether digital and gamified learning environments are experienced positively by learners (Agustin et al., 2024). Recent research on digital learning media likewise demonstrates that students' interest can be examined through their affective and participatory responses, making learning interest a meaningful indicator for evaluating the educational quality of technology-mediated learning experiences (Fitria & Nuroh, 2025). Evidence from gamification research further indicates that student engagement and academic achievement may improve when gamified mechanisms are appropriately integrated into case- and project-based online learning, although the relationship remains sensitive to implementation conditions (Suartama et al., 2024). A gamified examination and assessment application has also been shown to provide opportunities for stimulating student engagement and interest, supporting the relevance of evaluating gamification specifically within assessment contexts rather than treating it only as a general instructional technique (Gianni & Antoniadis, 2023). Against this background, the present study positions the implementation of gamified evaluation as an educational innovation whose effectiveness should be examined through students' actual experiences rather than inferred solely from the technological features of the application. The study therefore uses the dimensions of enjoyment, interest, attention, and involvement to obtain a more comprehensive account of students' responses after participating in game-based evaluation, while questionnaire data are complemented by interviews to explain the reasons underlying students' affective and participatory responses. The objective of this study is to evaluate students' learning interest following the implementation of gamification-based evaluation and to generate theoretical and methodological insight into how students' experiences can be used to assess the educational value of digital assessment innovation.

RESEARCH METHODS

This study employed an empirical mixed-methods approach with a descriptive design to examine students' responses and learning interest after participating in gamification-based evaluation activities. The study involved eight Grade XI students at Cherish Academy, who participated in evaluation activities covering Sociology/Geography and Biology, with participants selected through purposive sampling based on their direct participation in the gamified evaluation. The evaluation presented questions in a game-oriented format incorporating points, challenges, game rules, and

achievement targets while maintaining alignment with the learning materials and instructional objectives, as gamification is more effective when game elements are appropriately integrated into pedagogical activities (Sailer & Homner, 2020). Data were collected sequentially through the implementation of the gamification-based evaluation, administration of a post-survey questionnaire, and semi-structured interviews conducted after the evaluation. The questionnaire consisted of 12 statements representing four learning-interest indicators, namely enjoyment, interest, attention, and student involvement, with three statements assigned to each indicator. Each statement used a four-point Likert scale ranging from 1 = strongly disagree to 4 = strongly agree, while the interview guide contained four principal questions corresponding to the same indicators, which were selected based on established conceptualizations of learning interest in digital learning contexts (Agustin et al., 2024). The immediate administration of the questionnaire following the evaluation was intended to capture students' perceptions while their experiences with the gamified assessment remained current, whereas interviews provided complementary explanations of their individual experiences and responses.

Table 1. Distribution of Questionnaire Items Based on Learning Interest Indicators

Learning Interest Indicator	Number of Statements
Enjoyment	3
Interest	3
Attention	3
Student Involvement	3
Total	**12**

Quantitative data were analyzed descriptively by calculating the mean score for each learning-interest indicator, with the scores of the corresponding statements summed and divided by the number of participants to obtain an overall representation of students' responses. Qualitative data obtained through interviews were analyzed descriptively by categorizing students' responses according to enjoyment, interest, attention, and involvement and identifying recurring themes and explanations within each category. The quantitative and qualitative findings were then integrated so that interview evidence could provide contextual explanations for the numerical patterns identified in the questionnaire, particularly because gamified assessment may influence students' motivation and engagement through interactive assessment experiences (Ccoa et al., 2023). The research instruments were aligned directly with the research focus and were administered using consistent procedures to support methodological coherence, while the use of questionnaire and interview data provided a form of methodological triangulation. Given the small number of participants and the descriptive orientation of the study, the analysis was intended to characterize students' responses within the research setting rather than produce population-level statistical generalizations. Ethical procedures included voluntary participation, explanation of the research purpose and procedures, protection of participant confidentiality, and use of the collected data exclusively for academic research. The overall methodological framework was designed to provide both a numerical description and an interpretive understanding of students' learning interest following gamification-based evaluation, consistent with evidence that gamification can support students' motivation and engagement when implemented through appropriately designed learning environments (Hellín et al., 2023).

RESULTS AND DISCUSSION

Questionnaire Results and Overall Learning Interest

A questionnaire was administered to five students after they completed the gamification-based learning evaluation. The instrument consisted of 24 statements divided into two sections, with 12 statements addressing students' experiences in general learning activities and 12 statements addressing their experiences during the game-based evaluation. Both sections covered four indicators of learning interest, namely enjoyment, interest, attention, and student involvement. This structure enabled the study to compare students' perceptions of their ordinary learning experiences with their perceptions after participating in a gamified evaluation activity. The comparison was particularly relevant because learning interest represents an important psychological component associated with students'

participation and learning outcomes (Agustin et al., 2024). The questionnaire results are presented in Table 1.

Table 1. Comparison of Students' Learning Interest in General Learning and Game-Based Evaluation

Indicator	General Learning	Game-Based Evaluation
Enjoyment	2.53	2.67
Interest	3.00	2.27
Attention	2.93	2.07
Involvement	3.00	2.33
Average	**2.87**	**2.33**

The results indicate that enjoyment was the only indicator showing an increase, rising from an average score of 2.53 during general learning to 2.67 during the game-based evaluation. In contrast, interest decreased from 3.00 to 2.27, attention decreased from 2.93 to 2.07, and involvement decreased from 3.00 to 2.33. The overall average response consequently declined from 2.87 in general learning to 2.33 following the game-based evaluation. These findings indicate that the implementation of gamification did not produce a uniform improvement across all dimensions of students' learning interest. The pattern is consistent with evidence that gamification may produce different effects across motivational and behavioral dimensions depending on the design and implementation of the learning activity (Sailer & Homner, 2020). The numerical findings therefore suggest that the game format generated a more positive emotional response without necessarily strengthening students' broader interest, attention, and involvement.

Table 2. Comparison of Students' Enjoyment Responses between General Learning and Game-Based Evaluation

Indicator	General Learning Mean	Game-Based Evaluation Mean	Direction	Interpretation
Enjoyment	2.53	2.67	Increase	More positive emotional experience
Interest	3.00	2.27	Decrease	Reduced overall interest score
Attention	2.93	2.07	Decrease	Potential concentration difficulties
Involvement	3.00	2.33	Decrease	Participation was not consistently strengthened
Overall	**2.87**	**2.33**	**Decrease**	Gamification produced mixed responses

The decline in the overall average should not be interpreted as evidence that gamification was entirely ineffective because the qualitative findings reveal positive experiences that were not fully represented by the aggregate scores. Several students described the game as more enjoyable, interactive, and capable of generating curiosity toward subsequent questions. Such responses suggest that students may distinguish between enjoying the format of an activity and developing sustained interest in the learning content itself. This distinction is important because gamification can create immediate motivational stimulation without necessarily producing equivalent changes in all dimensions of learning engagement (Buckley & Doyle, 2016). The quantitative findings consequently provide an important general pattern, whereas the interview data are necessary to explain the individual experiences underlying that pattern. The mixed-methods interpretation is particularly relevant because students may respond differently to the same game mechanics depending on their existing preferences and participation patterns.

The decrease in interest, attention, and involvement also indicates that transforming conventional evaluation into a game does not automatically make the entire learning experience more engaging. The game format may attract students initially, but the effect can diminish when students recognize that the underlying questions and learning objectives remain similar to conventional assessment. This interpretation is consistent with research showing that gamification effectiveness depends not merely on the presence of game elements but on the relationship between those elements and the intended learning activity (Ratinho & Martins, 2023). The findings therefore challenge the assumption that digital or game-based presentation alone is sufficient to improve students' learning interest. Instead, the instructional value of gamification appears to depend on how the game mechanics interact with the content, assessment demands, and students' psychological responses. This provides a basis for examining each learning-interest indicator separately.

The questionnaire findings further demonstrate that enjoyment represents a distinct dimension from interest, attention, and involvement. Students could perceive the evaluation as more enjoyable while simultaneously reporting lower levels of interest and attention, suggesting that positive affect does not necessarily translate into sustained cognitive engagement. Previous research similarly indicates that the motivational effects of gamification can vary according to the specific game elements and the learning context in which they are implemented (Saleem et al., 2022). The distinction is important for interpreting the present findings because a game can successfully alter the emotional atmosphere of an evaluation without substantially changing students' underlying engagement with the academic task. The results therefore support a more cautious interpretation of gamification as an instructional strategy. Rather than assuming a direct positive relationship between game-based presentation and learning interest, the findings indicate that individual dimensions of interest need to be examined separately.

Overall, the questionnaire results show that the implementation of game-based evaluation generated a mixed pattern of learning-interest responses among the participating students. Enjoyment increased slightly, whereas interest, attention, and involvement decreased, producing an overall reduction in the average score from 2.87 to 2.33. The findings suggest that gamification may have been more successful in changing the emotional character of the evaluation than in strengthening students' broader engagement with the learning activity. This interpretation is compatible with systematic evidence indicating that gamification can support motivation but that outcomes vary according to intervention characteristics and learner context (Nurhayati & Fathurrohman, 2025). The interview findings discussed in the following sections provide further insight into these differences. They are particularly important for explaining why students experienced the same game-based evaluation in substantially different ways.

Enjoyment and Interest in Gamified Evaluation

Enjoyment was the only learning-interest indicator that demonstrated an increase in the questionnaire results. The mean score increased from 2.53 during general learning to 2.67 during the game-based evaluation, representing a change of +0.14. Although the magnitude of the increase was relatively small, the direction of change indicates that the game format created a somewhat more positive emotional experience for the students. This finding suggests that the transformation of assessment from a conventional question-answer activity into a game-oriented experience may influence how students emotionally perceive the evaluation. The result corresponds with previous evidence that gamification can support positive motivational responses when game elements are appropriately integrated into learning activities (Sailer & Homner, 2020). The qualitative responses provide additional evidence that the increase was associated primarily with the experience of participating in a different form of evaluation.

P1 reported that the game made the evaluation "slightly more enjoyable," although the difference was not substantial because the questions themselves remained essentially the same. P1 explained that the main difference was that "the difference is only because it is in the form of a game," indicating that the emotional effect originated primarily from the presentation format rather than a fundamental transformation of the learning content. P2 expressed a more positive response by describing the satisfaction experienced after successfully answering a question, including the feeling of "eh, I'm right, I'm really good." P3 similarly described the game-based activity as "more included in the game" and considered the experience "fun." These responses indicate that enjoyment was associated with novelty, successful task completion, interactivity, and immersion in the game environment. Such

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experiences support the view that game elements can provide motivational stimulation by introducing immediate feedback and a more interactive learning atmosphere (Fitria, 2023).

Table 3. Comparison of Students' Interest Responses between General Learning and Game-Based Evaluation

Participant	Main Response	Source of Enjoyment	Observed Pattern
P1	Slightly more enjoyable	Game-based presentation	Limited emotional difference
P2	Felt satisfied after correct answers	Achievement and successful responses	Positive emotional response
P3	Considered the activity fun and interactive	Immersion and interaction	Stronger positive response

The different responses among participants demonstrate that enjoyment was not experienced uniformly. P1 perceived only a limited difference because the academic questions remained unchanged, whereas P2 associated enjoyment with successful performance and P3 emphasized interaction and immersion. This variation suggests that the same gamification elements may activate different motivational mechanisms across students. Previous research has similarly indicated that the effectiveness of gamification depends on the characteristics of learners and the design of the gamified environment (Fernando & Premadasa, 2024). The qualitative findings therefore explain why the increase in the quantitative enjoyment score was modest rather than substantial. Enjoyment appears to have been enhanced by the game format, but its intensity depended on how individual students interpreted and interacted with that format.

The indicator of interest produced a different pattern from enjoyment because its mean score declined from 3.00 during general learning to 2.27 during game-based evaluation. Nevertheless, the interviews revealed that several students experienced curiosity toward the questions and challenges presented through the game. P1 stated that the game made the student "quite interested," particularly because of the desire to answer subsequent questions if a similar activity were conducted again. P2 similarly explained that the game created greater curiosity because the questions were not presented immediately in the same manner as conventional evaluation. P3 associated interest with the way the materials and questions were presented, describing them as being delivered "in a more exciting way." These responses indicate that the game generated situational curiosity even though the aggregate questionnaire score for interest decreased.

The difference between the quantitative and qualitative findings can be understood by distinguishing interest in the game activity from interest in the learning material. Students may become curious about what happens next in a game, seek to answer the following question, or enjoy the presentation format without developing a stronger desire to understand the underlying subject matter. This distinction is consistent with research showing that gamification can enhance motivation while the magnitude of its effect depends on the particular game mechanics and learning objectives involved (Buckley & Doyle, 2016). The present findings therefore suggest that curiosity generated by game progression should not automatically be equated with deeper academic interest. The reduction in the questionnaire score may reflect the fact that students were evaluating their broader interest in the learning activity rather than only their curiosity about the game itself. This interpretation provides a more nuanced explanation of why qualitative enthusiasm could coexist with a lower quantitative score.

The findings on enjoyment and interest collectively indicate that gamification can modify the affective character of assessment without necessarily producing parallel changes in students' broader learning interest. The slight increase in enjoyment demonstrates that the game format offered an experience perceived as more positive by at least some students. At the same time, the lower interest score indicates that enjoyment and curiosity generated by game mechanics did not automatically translate into sustained academic interest. Research on gamified assessment similarly emphasizes that game-based evaluation can stimulate engagement and interest, but the outcome remains dependent on the design of the application and the relationship between game mechanics and learning objectives (Gianni & Antoniadis, 2023). The implication is that future implementation should not focus exclusively on making assessment entertaining. Game mechanics should also be deliberately connected

to the intellectual substance of the material so that students' curiosity about the game can support rather than replace curiosity about learning.

Attention and Student Involvement in Gamified Evaluation

Attention showed the largest negative change among the four indicators, declining from 2.93 during general learning to 2.07 during the game-based evaluation. This result indicates that although the game format could attract students' attention, it did not consistently support sustained concentration on the questions and learning content. The interview data provide evidence of both increased focus and distraction, demonstrating that the effect of gamification on attention was highly individual. P2 reported becoming more focused because the game was interesting and stated that there were no significant distractions during participation. P3, however, explained that the same game could simultaneously increase focus and generate distraction through visual elements such as "dragons, robots, or cars." The contrasting responses indicate that attention toward the game environment should not automatically be interpreted as attention toward the academic task.

Table 4. Comparison of Students' Attention Responses between General Learning and Game-Based Evaluation

Participant	Attention Response	Positive Element	Potential Distraction
P1	Slightly distracted	Points created awareness of performance	Concern about points/results
P2	More focused	Interesting game format	No major distraction reported
P3	Focused but distracted	Interactive game environment	Visual elements such as dragons, robots, and cars

P3's response illustrates the dual role of visual game elements in the evaluation process. Visual features can capture attention and make the activity appear more attractive, but excessive visual stimulation may shift attention away from the questions themselves. P3 described being distracted by thoughts such as "oh, that is cool, there is a dragon," indicating that the game object became an attentional target in its own right. Such a response is important because successful educational gamification requires attention to be directed toward learning-relevant activity rather than merely toward visually salient game features. Research examining game elements in classroom environments similarly emphasizes the importance of balancing entertainment-oriented features with the intended learning task (Sanchez et al., 2020). The present findings therefore suggest that visual attractiveness should be treated as a pedagogical tool rather than an independent indicator of effective learning.

P1 experienced another form of distraction related to the point system. Rather than being motivated by points, P1 reported thinking about the result and experiencing discomfort, including the feeling of "how is this, it is already like that," which reduced concentration. This response suggests that achievement-oriented mechanics may produce psychological pressure for some students even when they are intended to encourage participation. The effect is consistent with broader concerns that gamification may generate unintended negative experiences when competitive or reward-oriented elements become overly salient (Toda et al., 2019). The finding demonstrates that points cannot be assumed to function uniformly as motivational stimuli across learners. Their effects may depend on students' perceptions of achievement, failure, evaluation pressure, and personal expectations.

Student involvement also declined in the quantitative results, decreasing from 3.00 during general learning to 2.33 during the game-based evaluation. Nevertheless, the interviews indicate that specific game mechanics could stimulate more active participation under particular conditions. P1 explained that the presence of a score or target could encourage greater activity in answering questions, stating that if a score had to be achieved in the game, the student would become more active. P2 reported that the game might increase activity but also acknowledged that the student was already active in answering questions even without gamification. P3 provided a stronger positive response by describing the game as "more fun" and explaining that students could "work together to achieve the same goal." These findings indicate that involvement was influenced not only by the presence of gamification but also by students' pre-existing participation levels and the specific mechanics incorporated into the activity.

Table 5. Comparison of Students' Involvement Responses between General Learning and Game-Based Evaluation

Game Element	Potential Positive Effect	Potential Negative Effect	Implication
Points	Encourage active responses	Create pressure about performance	Use carefully and transparently
Challenges	Encourage persistence	May increase performance anxiety	Match difficulty with student ability
Visual Elements	Increase attraction	May distract from questions	Keep visuals learning-relevant
Shared Goals	Encourage participation	May not affect all students equally	Support meaningful collaboration

The contrasting findings for attention and involvement indicate that gamification operates through multiple mechanisms rather than through a single motivational pathway. A game can increase attention to the activity while simultaneously reducing attention to the learning content, just as points can encourage participation for one student while creating pressure for another. This pattern is consistent with evidence that gamification effects vary according to game design, learner characteristics, and learning context (Ratinho & Martins, 2023). The present study therefore reinforces the importance of distinguishing engagement with game mechanics from engagement with learning objectives. Such a distinction is particularly important in assessment because students' primary task remains the demonstration of subject knowledge rather than successful interaction with decorative or competitive game features. The results suggest that future gamified evaluations should prioritize learning-relevant interaction and minimize elements that unnecessarily compete for students' cognitive attention.

Taken together, the findings on attention and involvement demonstrate that gamification has both facilitative and disruptive potential. Interactive features, points, challenges, and shared goals can encourage students to participate, but visual stimuli and performance-oriented mechanics can also generate distraction or pressure. Similar evidence has shown that gamification can improve student engagement and academic participation when game mechanics are appropriately integrated into the learning environment (Suartama et al., 2024). The decline in the quantitative scores therefore does not eliminate the potential value of gamification but indicates that its implementation in the present setting was not sufficiently consistent to improve these dimensions across students. The qualitative findings reveal that certain students benefited from the game mechanics while others experienced limited or counterproductive effects. Attention and involvement consequently appear to require more deliberate instructional design than simply adding game elements to existing assessment activities.

Integration of Questionnaire and Interview Findings

The integration of questionnaire and interview data reveals that students' responses to gamified evaluation were complex rather than uniformly positive or negative. The questionnaire showed an increase only in enjoyment, while interest, attention, and involvement declined. The interviews, however, identified several positive experiences, including greater enjoyment, curiosity, interactivity, successful task completion, and motivation associated with points or shared goals. These findings demonstrate that aggregate numerical scores alone cannot fully explain students' experiences with gamified evaluation. The mixed-methods design was therefore useful because qualitative responses provided contextual explanations for patterns that appeared contradictory in the quantitative data. Such an approach is particularly relevant to gamification research because motivational and behavioral outcomes may vary across students and implementation contexts (Sailer & Homner, 2020). The integrated findings are summarized in Table 6.

Table 6. Integration of Questionnaire and Interview Findings

Indicator	Questionnaire Result	Interview Finding	Overall Interpretation
Enjoyment	Increased	Game perceived as fun and interactive by some students	Positive but limited improvement
Interest	Decreased	Curiosity toward subsequent questions and challenges emerged	Game curiosity did not necessarily increase academic interest
Attention	Decreased	Game increased focus for some students but visual elements caused distraction for others	Attention effect was inconsistent
Involvement	Decreased	Points, scores, and shared goals encouraged participation for some students	Engagement depended on individual conditions

The strongest convergence between the two datasets occurred in the enjoyment dimension. The quantitative results showed a modest increase, while interview responses from P1, P2, and P3 identified different sources of positive emotional experience. P1 perceived the game as somewhat more enjoyable because of its presentation, P2 experienced satisfaction after successfully answering questions, and P3 valued the interactive and entertaining nature of the activity. These findings indicate that gamification successfully altered the emotional atmosphere of the evaluation for at least some participants. Previous research similarly reports that game-based learning environments can strengthen motivational experiences when students interact with meaningful game mechanics (Hellín et al., 2023). The convergence suggests that enjoyment may represent the most immediate benefit of the gamified evaluation implemented in this study.

The findings concerning interest were more complex because the questionnaire indicated a substantial decrease while interviews revealed increased curiosity among several students. The discrepancy can be explained by the distinction between curiosity toward the game progression and sustained interest in the academic learning content. P1 wanted to answer subsequent questions, P2 became more curious because the questions were presented differently, and P3 valued the more exciting presentation of the material. These responses demonstrate that gamification generated situational curiosity even though it did not produce a higher aggregate interest score. Previous systematic evidence has shown that gamification can support motivation and engagement while its effects remain dependent on the structure and purpose of the intervention (Nurhayati & Fathurrohman, 2025). The present findings therefore indicate that curiosity generated by game mechanics should be intentionally connected to learning content if it is expected to develop into deeper academic interest.

The attention findings similarly demonstrate the importance of examining the quality rather than merely the quantity of attention generated by gamification. P2 experienced greater focus because the game was interesting, whereas P3 experienced distraction from visual game objects and P1 experienced distraction related to points and performance. These contrasting responses explain why the quantitative attention score declined despite the presence of students who reported positive attentional experiences. The result supports the argument that game elements can have both supportive and disruptive effects depending on how they interact with students' cognitive processing and perceptions of the activity (Toda et al., 2019). Gamified assessment should therefore be designed so that visual, competitive, and reward-oriented features reinforce the academic task rather than compete with it. The effectiveness of a game-based evaluation should consequently be judged by whether students remain cognitively oriented toward the learning objectives throughout the activity.

Table 7. Summary of the Effects of Gamification on Students' Learning Interest

Dimension	Positive Mechanism Identified	Limitation Identified	Design Implication

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Enjoyment	Novelty, interaction, successful completion	Positive response differed among students	Maintain enjoyable but relevant game features
Interest	Curiosity and anticipation	Curiosity may focus on game rather than content	Link challenges directly to learning objectives
Attention	Interactive format	Visual elements and points may distract	Reduce irrelevant visual stimulation
Involvement	Scores, targets, and shared goals	Effects depended on individual participation	Use meaningful and inclusive participation mechanics

The involvement findings provide further evidence that gamification does not operate independently of students' existing behavioral tendencies. P1 became more active when points or achievement targets were present, whereas P2 reported being active even without gamification, indicating that the intervention may have had limited additional influence for students who were already highly participatory. P3 responded positively to the shared goal and perceived the game as more exciting, suggesting that collaborative objectives may provide an additional pathway toward involvement. This pattern is consistent with evidence that gamified learning can enhance engagement when game mechanics correspond with students' motivational conditions and learning activities (Suartama et al., 2024). The results indicate that a single gamification strategy may not be equally effective for all learners. More flexible designs that accommodate individual motivation, collaboration, achievement, and autonomy may therefore be more appropriate than relying on a single dominant game mechanic.

Overall, the integrated findings demonstrate that the effectiveness of gamification in the present evaluation context should be understood as conditional rather than universal. The intervention produced a modest improvement in enjoyment and generated qualitative evidence of curiosity and participation, yet the quantitative results showed declines in interest, attention, and involvement. This pattern is consistent with the broader literature showing that gamification can produce positive educational outcomes while also generating inconsistent or unintended effects when game mechanics are poorly matched with instructional objectives (Sanchez et al., 2020). The central finding is not that gamification failed, but that converting an evaluation into a game was insufficient to improve all dimensions of learning interest among the participating students. The findings also demonstrate the value of combining quantitative measurement with qualitative accounts because several positive experiences would have been obscured if interpretation had relied exclusively on questionnaire scores. From a practical perspective, gamified evaluation should prioritize learning-relevant challenges, controlled visual stimulation, meaningful feedback, and carefully designed achievement mechanisms so that enjoyment, curiosity, attention, and involvement can develop in a more balanced manner.

CONCLUSION

Based on the findings from five students, the implementation of gamification in learning evaluation for Sociology, Geography, and Biology produced varied responses across the four indicators of learning interest. The questionnaire results showed that the enjoyment indicator increased from a mean score of 2.53 during general learning to 2.67 during game-based evaluation, representing an increase of 0.14 points. In contrast, the interest indicator decreased from 3.00 to 2.27, attention decreased from 2.93 to 2.07, and student involvement decreased from 3.00 to 2.33. Overall, the mean score across the four indicators declined from 2.87 in general learning to 2.33 in game-based evaluation, indicating that gamification did not produce an overall increase in students' learning interest. Nevertheless, the interview findings revealed that game-based evaluation generated positive experiences for some students, particularly through perceptions that the activity was more enjoyable, interactive, and capable of stimulating curiosity about subsequent questions or challenges. At the same time, visual elements and point systems could function as sources of distraction or pressure, demonstrating that gamification may produce both supportive and unintended effects on students' learning experiences. These findings indicate that the effectiveness of gamification should not be judged solely by the presence of game elements, but by how those elements are designed and aligned with students' characteristics, learning objectives, and the specific function of evaluation.

The study therefore concludes that gamification has potential as an alternative evaluation approach for creating a more enjoyable and interactive assessment experience, although its

implementation in the present context has not yet demonstrated an improvement across all dimensions of learning interest. The decline in interest, attention, and involvement suggests that transforming conventional evaluation into a game format alone is insufficient to strengthen students' engagement with learning. Future implementation should focus on proportionally integrating visual elements, points, challenges, rewards, and other game mechanics so that they reinforce the learning objectives rather than diverting attention from the content being assessed. Teachers should also consider students' individual preferences and existing levels of engagement when selecting and configuring gamification elements. The findings further suggest that evaluation design needs to balance emotional enjoyment with cognitive focus and meaningful participation. For practical implementation, gamified assessment should be continuously refined through student feedback and observation of how specific game elements influence concentration, curiosity, and participation. Future research may involve larger and more diverse samples and examine the effects of different gamification designs over longer implementation periods to provide stronger evidence regarding the conditions under which gamified evaluation can effectively support students' learning interest.

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