International Journal of Multidisciplinary Research and Publications
ISSN (Online): 2581-6187

Students' Learning Engagement and Mathematical Achievement Through Gamification Method

Maree Glaydell Sison Santillana
Laguna State Polytechnic University Sta. Cruz Laguna 4009 PHILIPPINES
Email address: sisonmareeglaydell@gmail.com

Abstract*—This study determined the effect of the gamification method on the learning engagement and mathematical achievement of Grade 9 students in Geometry, specifically on Similar Polygons, at Miriam College Nuvali during the School Year 2025–2026. Specifically, it examined the level of gamification in terms of game elements, design, function, and quality of game; the level of students' learning engagement in terms of positive classroom culture, meaningful instruction, strong relationship, and value and support; and the level of students' mathematical achievement based on written assessments. It also investigated the significant relationship between the gamification method and students' learning engagement, as well as the significant effect of gamification on mathematical achievement. A descriptive-predictive-correlational research design was used, involving sixty-six (66) Grade 9 students of Miriam College Nuvali was selected through purposive sampling. The findings revealed that the gamification method obtained a very high level across all dimensions, particularly in game design and quality of game. Students' learning engagement was likewise rated at a very high level in terms of classroom culture, meaningful instruction, relationship, and value and support. In addition, the written assessment results showed satisfactory to very satisfactory mathematical achievement among the respondents. Statistical analyses further indicated a significant relationship between the gamification method and students' learning engagement, as well as a significant effect of gamification on students' mathematical achievement. The gamification method shows a significant relationship on the students' learning engagement that leads to the rejection of the null hypothesis. This concludes that the use of gamification method in Mathematics, influences the interest and initiative of students in the class discussion. On the other hand, the findings also revealed that there was no significant effect between the method and achievement in terms of written examination, leading to the acceptance of the null hypothesis. It concludes that the achievement of the students is not only focusing on the teaching strategies but may also depend on other contributing factors such as the students' study habits, prior knowledge, instructional method and assessment practices. The paper recommends that mathematics teachers continue integrating gamified strategies to sustain students' engagement and interest. School administrators are encouraged to support professional development programs focused on gamification and technology-enhanced learning. Future researchers may explore similar studies using experimental designs, larger and more diverse populations, and other mathematics topics to further validate and expand these findings.*

***Keywords*—** *Gamification Method, learning engagement, mathematical achievement, descriptive-correlational, Grade 9 Mathematics*

I. INTRODUCTION

Gamification has emerged as an innovative instructional strategy that integrates game-based elements such as points, rewards, badges, leaderboards, levels, and challenges into educational settings to enhance student participation and motivation. In recent years, educators have increasingly used gamification in mathematics instruction to address learners' declining interest and engagement in the subject. Studies have shown that gamified learning environments positively influence students' motivation, participation, and academic performance because they promote active and enjoyable learning experiences (Zainuddin et al., 2020).

Likewise, Sailer and Homner (2020) stated that gamification encourages learners to become more actively involved in classroom activities by stimulating collaboration, curiosity, and goal-oriented behavior. Through interactive and student-centered activities, gamification transforms traditional mathematics instruction into a more meaningful and engaging learning experience.

Mathematical achievement remains a major concerns in basic education due to students' difficulties in understanding abstract concepts, solving mathematical problems, and sustaining interest in mathematics lessons. In the Philippine educational context, mathematics is often considered one of the least mastered learning areas among secondary students. Low achievement in mathematics has been associated with weak problem-solving skills, low motivation, and insufficient engagement during classroom instruction.

According to the Department of Education (2022), students' performance on mathematics assessments underscores the need for innovative teaching strategies that can strengthen conceptual understanding and critical thinking skills. Mathematical achievement refers to students' performance in mathematics as reflected through assessments, problem-solving tasks, and mastery of mathematical concepts. Improving achievement in mathematics is important because it contributes to learners' academic success and logical reasoning skills.

The connection between gamification and mathematical achievement lies in the ability of gamified instruction to intensify students' engagement in learning. Gamification promotes engagement through immediate feedback, collaborative activities, achievable goals, and motivating rewards. According to Toda et al. (2019), gamification enhances learners' participation and persistence, which may contribute to improved academic performance. Through active participation and enjoyable learning experiences, students are more likely to develop deeper understanding and better performance in mathematics. Hence, this study aims to determine the intensification of students' learning engagement

Maree Glaydell Sison Santillana, "Students' Learning Engagement and Mathematical Achievement Through Gamification Method," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 9, Issue 2, pp. 184-190, July 2026.

and mathematical achievement through gamification among Grade 9 students.

1.1 Statement of the Problem

Problem/s which were addressed by the research

This study aimed to determine the effect of gamification on students' learning engagement and mathematical achievement. Specifically, it sought to answer the following questions:

1. What is the level of Gamification Method in terms of:
   1.1 Game Elements
   1.2 Game Design
   1.3 Quality of Game
   1.4 Game Function
2. What is the level of Students' Learning Engagement in terms of:
   2.1 Positive Classroom Culture
   2.2 Meaningful Instruction
   2.3 Strong relationship
   2.4 Value and Support
3. What is the level of Students' Mathematical Achievement in terms of Written Assessments
4. Is there a significant relationship between the Gamification Method and the Students' Learning Engagement?
5. Is there a significant effect between the Gamification Method and the Students' Mathematical Achievement?

II. Methodology

A descriptive-predictive-correlational research design was used, involving sixty-six (66) Grade 9 students of Miriam College Nuvali was selected through purposive sampling.

III. Results and Discussion

This part dealt with the presentation, analysis, and interpretation of the data gathered. It presented the data gathered about the Gamification Method on the Students' Learning Engagement and Mathematical Achievements.

Level of Gamification Method

In this study, the application of game-design elements and principles in nongame contexts, has garnered considerable interest in the field of education. The level of Gamification Method in terms of game elements, game design, quality of game and game function, was treated statistically using mean, standard deviation, remarks and verbal interpretation from the perspective of respondents.

Table 1 shows the level of the gamification method in terms of game elements.

The level of Gamification Method in terms of game elements, that indicated "motivates when points, badges, or rewards are used" got the highest rated statement, which garnered a (M = 4.47, SD = 0.79), interpreted as Strongly Agree. While the indicator that got the lowest rating was the "excites when levels or ranks are introduced in lessons'', which only garner a (M = 3.97, SD = 0.99) which is interpreted as Agree.

The results revealed that game elements were perceived very positively by the students. Game elements like levels/ranks excited students during class. Points, badges and rewards were a source of motivation, participation and provided feelings of accomplishment while completing math assignments.

Seeing scores or progress motivated students to do better. The weighted mean of 4.29 with an SD of 0.83 supports a very high level of gamification in terms of game elements, which reflects how effective these elements are at improving student learning experiences.

Table 1. Level of Gamification Method in Terms of Game Elements

Statements The elements of the games . . .	MEAN	SD	REMARKS
…excites when levels or ranks are introduced in lessons.	3.97	0.99	Agree
…motivates when points, badges, or rewards are used.	4.47	0.79	Strongly Agree
…encourages participating because of rewards and incentives.	4.27	0.80	Strongly Agree
…accomplishes earning points for completing math activities.	4.38	0.74	Strongly Agree
…challenges to do better when scores or progress are shown.	4.35	0.83	Strongly Agree
Weighted Mean	4.29		
SD	0.83		
Verbal Interpretation	Very High		

In summary, this implies that integrating game elements within instruction greatly improves student motivation, participation, and engagement in mathematics. Game elements are consistently rated at a very high level, showing that gamification increases the level of interactivity and reward associated with student learning experiences, and encourages students to be proactive and engaged in learning mathematics.

Table 2 shows the level of gamification method in terms of game design.

Table 2. Level of Gamification Method in Terms of Game Design

Statements The game design is . . .	MEAN	SD	REMARKS
…attracts and engages players visually.	4.59	0.63	Strongly Agree
…demonstrates clear step-by-step progression.	4.32	0.71	Strongly Agree
…shows clear rules and instructions.	4.38	0.63	Strongly Agree
…helps me to stay focused on the lesson.	4.27	0.92	Strongly Agree
…makes learning Mathematics more enjoyable.	4.52	0.75	Strongly Agree
Weighted Mean	4.42		
SD	0.73		
Verbal Interpretation	Very High		

All five indicators were rated Strongly Agree, with game design is attracting and engaging players visually, obtaining the highest mean of 4.59 (SD = 0.63), and "helps me to stay focused on the lesson" receiving the lowest mean of 4.27 (SD = 0.92). The overall weighted mean of 4.42 (SD = 0.73) indicates a Very High level, suggesting that students found the gamified instructional design visually appealing, well organized, and conducive to sustained focus and enjoyment in mathematics.

Maree Glaydell Sison Santillana, "Students' Learning Engagement and Mathematical Achievement Through Gamification Method," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 9, Issue 2, pp. 184-190, July 2026.

The results indicate that game design elements are effective in creating an engaging and focused learning environment. The strong agreement across all indicators suggests that when game design is clear, organized, and visually appealing, students are more likely to stay attentive and enjoy their mathematics lessons. The highest-rated indicator on visual engagement highlights the importance of aesthetics in gamified learning.

In summary, effective game design contributes to a more engaging and enjoyable learning experience. A well-designed gamified environment supports student focus and makes mathematics more accessible and enjoyable.

Table 3 shows the level of gamification in terms of game quality and demonstrates how it is effective in developing the necessary skills and learning objectives aligned with the subject matter. It is shown here how the game matched the lesson objectives and the quality of the game in helping them understand the lesson

All indicators were rated Strongly Agree, indicating a consistently positive perception among students. The quality of the game matched the lesson objectives in Mathematics, which obtained the highest mean of 4.68 (SD = 0.66).

While the quality of the game in terms of helping me understand mathematical concepts better received the lowest mean of 4.32 (SD = 0.88). The overall weighted mean of 4.67 (SD = 0.59) reflects a Very High level, suggesting that the gamified activities were viewed as relevant, well-structured, and aligned with the intended learning outcomes.

Students' responses indicate that the quality of the gamified activities was evident across different aspects of instruction. The strong rating for alignment with lesson objectives confirms that the activities were not merely engaging but were also purposeful in supporting learning goals. The high ratings related to collaboration affirm that gamification encouraged meaningful interaction among students, allowing them to learn from one another while participating in the activities.

Table 3. Level of Gamification Method in Terms of Quality of Game

Statements The gamified activities used in Mathematics class…	MEAN	SD	REMARKS
..are well-prepared and organized	4.45	0.61	Strongly Agree
…match the lesson objectives in Mathematics.	4.68	0.66	Strongly Agree
…help me understand mathematical concepts better.	4.32	0.88	Strongly Agree
…provide meaningful learning experiences.	4.41	0.82	Strongly Agree
…encourage collaboration with my classmates.	4.67	0.59	Strongly Agree
Weighted Mean	4.67		
SD	0.59		
Verbal Interpretation	Very High		

In summary, the findings highlight the importance of careful design in implementing gamification in mathematics. When activities are thoughtfully planned, clearly connected to the curriculum, and meaningful to learners, students are more likely to stay engaged and actively participate in the learning process.

Table 4 presents the level of gamification by game function.

Table 4. Level of Gamification Method in Terms of Game Function

Statements The gamification method used in Mathematics class…	MEAN	SD	REMARKS
…helps me apply mathematical concepts correctly.	4.29	0.84	Strongly Agree
...improves my problem-solving skills.	4.26	0.86	Strongly Agree
…allows me to receive immediate feedback on my answers	4.32	0.81	Strongly Agree
…supports my learning pace and progress	4.15	0.92	Agree
…helps me perform better in Mathematics activities and tasks	4.05	1.00	Agree
Weighted Mean	4.21		
SD	0.88		
Verbal Interpretation	Very High		

The indicators were rated on a scale from Agree to Strongly Agree. Among the items, “allows me to receive immediate feedback on my answers” obtained the highest mean of 4.32 (SD = 0.81), while “helps me perform better in Mathematics activities and tasks” recorded the lowest mean of 4.05 (SD = 1.00). The overall weighted mean of 4.21 (SD = 0.88) indicates a Very High level, suggesting that students generally viewed the functional features of gamification as beneficial to their learning.

The responses confirm that the functional aspects of gamified instruction play a key role in supporting students' learning experiences. Immediate feedback is particularly valuable, as it allows students to recognize and correct their mistakes in real time.

Features that support problem-solving and application of concepts contribute to a more interactive and responsive learning environment.

In summary, the results affirm the importance of designing gamified activities that are not only engaging but also functionally effective in guiding learning. Features such as timely feedback and support for individual pacing enhance students' understanding and confidence in mathematics.

Students’ Learning Engagement

In this study, this refers to the level of participation, interest, and effort students’ display in learning activities. It encompasses behavioral, cognitive, and emotional dimensions that reflect how students interact with Mathematics lessons delivered through game-based learning.

The level of students’ learning engagement in terms of positive classroom culture, meaningful instruction, strong relationship and, value, and support was treated statistically using mean and standard deviation.

Table 5 presents the level of students’ learning engagement in terms of positive classroom culture.

The indicator “enjoy learning Mathematics in a friendly classroom environment” obtained the highest mean of 4.35 (SD = 0.79), while “feel safe to make mistakes while learning” received the lowest mean of 3.71 (SD = 1.12). The overall

Maree Glaydell Sison Santillana, “Students’ Learning Engagement and Mathematical Achievement Through Gamification Method,” *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 9, Issue 2, pp. 184-190, July 2026.

weighted mean of 4.07 (SD = 0.91) indicates a High level of engagement, suggesting that students generally perceived the classroom environment as supportive and engaging.

Table 5. Level of Students' Learning Engagement in Terms of Positive Classroom Culture

Statements	MEAN	SD	REMARKS
When Mathematics lessons are gamified, I …			
…learn at my own pace through the flexibility it provides.	3.94	0.97	Agree
…feel respected by my teacher and classmates.	4.32	0.75	Strongly Agree
…am encouraged to share my ideas and answers.	4.02	0.92	Agree
…enjoy learning Mathematics in a friendly classroom environment.	4.35	0.79	Strongly Agree
…feel safe to make mistakes while learning.	3.71	1.12	Agree
Weighted Mean	4.07		
SD	0.91		
Verbal Interpretation	High		

The findings imply that gamified mathematics instruction helped foster a positive, student-friendly classroom atmosphere that encouraged participation and engagement.

Table 6 shows the level of students' learning engagement in terms of meaningful instruction.

Indicators were rated between Agree and Strongly Agree. The students' learning engagement in terms of Meaningful instruction that make learning Mathematics interesting and relevant obtained the highest mean of 4.64 (SD = 0.69), while the indicator am connected to real-life situations received the lowest mean of 3.88 (SD = 0.87). The overall weighted mean of 4.17 (SD = 0.86) indicates a High level of engagement in this dimension.

Table 6. Level of Students' Learning Engagement in Terms of Meaningful Instruction

Statements	MEAN	SD	REMARKS
When Mathematics lessons are gamified, I . . .			
…am connected to real-life situations.	3.88	0.87	Agree
…help me understand difficult math concepts.	4.09	0.92	Agree
…make learning Mathematics interesting and relevant.	4.64	0.69	Strongly Agree
…help me see the value of Mathematics in daily life.	3.91	0.91	Agree
…allow me to apply what I learned in activities and games.	4.33	0.88	Strongly Agree
Weighted Mean	4.17		
SD	0.86		
Verbal Interpretation	High		

The results confirm that gamified instruction generally makes mathematics more interesting, meaningful, and applicable to students' daily lives. The highest-rated item on making learning interesting and relevant shows that gamification effectively increases learners' perceived value of mathematics.

The highest-rated item on making learning interesting and relevant demonstrates that gamification effectively increases the perceived value of mathematics among learners. The consistent ratings across all indicators reflect that gamified activities contribute positively to students' sense of instructional meaningfulness.

In summary, gamified mathematics instruction successfully fosters meaningful learning experiences by increasing students' interest and sense of relevance in the subject.

Table 7 presents the level of students' learning engagement in terms of strong relationship.

Table 7. Level of Students' Learning Engagement in Terms of Strong relationship

Statements	MEAN	SD	REMARKS
During Mathematics classes that use gamification, I…			
…feel supported by my teacher in learning Mathematics.	4.53	0.64	Strongly Agree
…can raise questions to my teacher when confused.	4.36	0.83	Strongly Agree
…feel encouraged by my classmates during activities.	4.11	0.96	Agree
…feel motivated because of positive teacher-student interaction.	4.50	0.64	Strongly Agree
…feel confident because my efforts are recognized.	4.24	0.88	Strongly Agree
Weighted Mean	4.35		
SD	0.79		
Verbal Interpretation	Very High		

The indicator "feel supported by my teacher in learning Mathematics" obtained the highest mean of 4.53 (SD = 0.64), while "feel encouraged by my classmates during activities" received the lowest mean of 4.11 (SD = 0.96). The overall weighted mean of 4.35 (SD = 0.79) indicates a Very High level of engagement. The findings suggest that gamified instruction strengthened student-teacher and student-peer relationships in the mathematics classroom, creating a supportive and connected learning environment.

Table 8 presents the level of students' learning engagement in terms of value and support.

Table 8. Level of Students' Learning Engagement in Terms of Value and Support

Statements	MEAN	SD	REMARKS
Learning Mathematics through gamification helps me…			
…feel that my learning is important.	4.48	0.73	Strongly Agree
…receive support when I have difficulty with lessons	4.35	0.79	Strongly Agree
…stay motivated to complete Mathematics tasks.	4.26	0.85	Strongly Agree
…show determination to improve my Mathematics skills.	4.30	0.78	Strongly Agree
…appreciate the effort given to help me learn better.	4.61	0.68	Strongly Agree
Weighted Mean	4.40		
SD	0.77		
Verbal Interpretation	Very High		

All indicators were rated Strongly Agree, with "appreciate the effort given to help me learn better" obtaining the highest mean of 4.61 (SD = 0.68), and "stay motivated to complete Mathematics tasks" receiving the lowest mean of 4.26 (SD =

Maree Glaydell Sison Santillana, "Students' Learning Engagement and Mathematical Achievement Through Gamification Method," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 9, Issue 2, pp. 184-190, July 2026.

0.85). The overall weighted mean of 4.40 (SD = 0.77) reflects a Very High level of engagement in this dimension.

The results affirm that students highly value the support provided through gamified instruction and feel that their learning is important. The strong appreciation for the effort put into helping them learn better confirms that students are aware of and responsive to the intentional instructional design behind gamification. The consistently high ratings across all indicators reflect that gamification effectively reinforces students' sense of being valued and supported throughout the learning process.

In summary, gamification effectively conveys to students that their learning is valued and that they are supported throughout the process.

Students' Mathematical Achievement

In this study, this refers to the extent of knowledge and skills acquired in mathematics. Operationally, this term refers to the application of mathematical concepts.

The level of students' mathematical achievement in written assessments was analyzed statistically using frequency and percentage.

Table 9 presents the level of students' mathematical achievement in written assessments, including the distribution of scores, their corresponding frequencies, percentages, and descriptive remarks.

The results show that the majority of students performed well on the written mathematics assessments.

Table 9. Level of Students' Mathematical Achievement in Terms of Written Assessments

Scores	Frequency	Percentage	Description Equivalent
29-35	23	34.85%	Outstanding
22-28	30	45.45%	Very Satisfactory
15-21	13	19.70%	Satisfactory
8-14	0	0.00%	Fairly Satisfactory
1-7	0	0.00%	Did Not Meet Expectation
Total	66	100%	

Weighted Mean = 25.67
SD=4.69

Specifically, 45.45% of the students received a Very Satisfactory score, 34.85% received an Outstanding score, and 19.70% received a Satisfactory score. Notably, no student fell into the Fairly Satisfactory or Did Not Meet Expectation categories, indicating that all students performed at or above the expected proficiency level.

The weighted mean of 25.67 with a standard deviation of 4.69 confirms that the majority of students performed at a Very Satisfactory level on the written mathematics assessments.

In summary, students demonstrated strong performance on written mathematics assessments. The absence of any student below the Satisfactory level reflects a generally high level of mathematical mastery among the respondents. The considerable proportion of Outstanding and Very Satisfactory ratings further affirms that a significant number of students have developed a solid understanding and skill in mathematics through gamified instruction.

Test of Significant Relationship between Gamification Method and the Students' Learning Engagement

To test the significant relationship between the gamification method and students' learning engagement in terms of positive classroom culture, meaningful instruction, strong relationships, and value and support, the data were analyzed statistically in Jamovi 2.3.28 using the Pearson correlation coefficient.

Table 10 presents the relationship between the gamification method and students' learning engagement in terms of positive classroom culture, meaningful instruction, strong relationships, and value and support using the Pearson correlation coefficient.

The results revealed that moderate positive correlation between game elements and student Learning Engagement across all dimensions of student learning engagement, with the strongest correlations being with the positive class culture ($R = 0.64$, $p < 0.001$), meaningful instruction ($R = 0.56$, $p < 0.001$), value and support ($R = 0.57$, $p < 0.001$), and strong relationship dimensions ($R = 0.51$, $p < 0.001$). This indicates that, on average, gamifying learning will produce a more positive class environment and greater student engagement outcomes.

Table 10. Gamification Method and the Students' Learning Engagement

Gamification Method	Students' Learning Engagement			
	Positive Classroom Culture	Meaningful Instruction	Strong relationship	Value and Support
Game Elements:	Pearson Correlation	0.64***	0.56***	0.51***	0.57***
	Significance(2-Tailed)	<.001	<.001	<.001	<.001
	N	64	64	64	64
Game Design:	Pearson Correlation	0.56***	0.59***	0.50***	0.58***
	Significance(2-Tailed)	<.001	<.001	<.001	<.001
	N	64	64	64	64
Quality of Game:	Pearson Correlation	0.57***	0.65***	0.54***	0.62***
	Significance(2-Tailed)	<.001	<.001	<.001	<.001
	N	64	64	64	64
Game Function:	Pearson Correlation	0.72***	0.65***	0.56***	0.66***
	Significance(2-Tailed)	<.001	<.001	<.001	<.001
	N	64	64	64	64

Note: *p<.05, ** p<.01, ***p<.001

The game design exhibited similar moderate positive correlations across the four dimensions of student learning engagement, with the meaningful instruction ($R = 0.59$, $p < 0.001$) and value and support ($R = 0.58$, $p < 0.001$) dimensions exhibiting the strongest correlation; the positive classroom culture ($R = 0.56$, $p < 0.001$) and strong relationship ($R=0.50$,$p<0.001$) dimensions exhibited slightly lower levels of correlation.

This indicates that well-designed gamification strategies improve instructional effectiveness and increase students' perceived support and connectedness in the classroom.

Research shows that the quality of a game has moderate but positive correlations to each of the dimensions of student engagement, with the highest correlations found with "meaningful instruction" ($r = 0.65$; $p < .001$) and "value and support" ($r = 0.62$; $p < .001$), followed by "positive classroom culture" ($r = 0.57$; $p < .001$) and "strong relationship" ($r =$

Maree Glaydell Sison Santillana, "Students' Learning Engagement and Mathematical Achievement Through Gamification Method," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 9, Issue 2, pp. 184-190, July 2026.

0.54; p < .001). This supports the conclusion that higher-quality game features create opportunities for more meaningful and supportive learning experiences.

In addition, the game function has the strongest moderate to strong positive correlations with all variables, especially with "positive classroom culture" (r = 0.72; p < .001) and "value and support" (r = 0.66; p < .001), followed by "meaningful instruction" (r = 0.65; p < .001) and "strong relationship" (r = 0.56; p < .001). This indicates the functional design of gamification is a key element in increasing student engagement in mathematics.

In summary, this implies that the method of gamification is significantly correlated with students' engagement in the mathematics learning process. All of the components studied showed moderate positive correlations; therefore, the game elements, design, quality, and function directly contribute to increased positive classroom culture, meaningful instruction, strong relationships, and the level of value and support expressed by students toward their learning experience.

Test of Significant Effect of Gamification Method on the Students' Mathematical Achievement

The significant effect of the gamification method on students' mathematical achievement in written assessments was statistically analyzed using Real Statistics Data Analysis Tools and multiple regression. A multiple regression analysis was conducted to determine whether the gamification method, in terms of game elements, game design, game quality, and game function, could significantly predict students' mathematical achievement on written assessments.

Table 11. Regression Analysis on the Effect of Gamification Method on the Students' Mathematical Achievement in Terms of Written Assessments

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1.36	4	0.34	0.62	0.647
Residual	33.13	61	0.54		
Total	34.49	65			

a. Dependent Variable: Written Assessments

b. Predictors: Game Elements, Game Design, Quality of Game and Game Function

Coefficients

	Unstandardized Coefficients			
Model	B	Std. Error	t	Sig.
(Constant)	4.01	0.87	4.59	<.001
Game Elements	0.15	0.20	0.75	0.454
Game Design	-0.14	0.33	-0.43	0.667
Quality of Game	-0.19	0.34	-0.57	0.573
Game Function	0.24	0.27	0.91	0.366

The results revealed that the overall model did not show a statistically significant effect (F(4, 61) = 0.62, p = 0.647), indicating that the gamification method did not significantly predict students' written assessment scores in Mathematics. Among the indicators, Game Function obtained the highest coefficient (B = 0.24, t = 0.91, p = 0.366), while Game Quality had the lowest coefficient (B = -0.19, t = -0.57, p = 0.573). However, all predictors had p-values greater than 0.05, indicating non-significant effects.

The findings imply that although gamification may improve student engagement its direct effect on measurable academic performance through written assessments may be limited.

IV. Conclusion and Recommendations

There is a significant positive relationship between the gamification method and students' learning engagement. Therefore, the null hypothesis is rejected. This implies that the gamification method in teaching mathematics creates a learning environment conducive to sustained student engagement.

Consequently, findings also indicate that the Gamification Method does not have a significant predictive effect on students' mathematical achievement in written assessments. Hence, the null hypothesis is accepted. This suggest that gamification is not sufficient on its own to predict improvement in written assessment. It may still be influenced by other factors such as prior knowledge, study habits, and the alignment between gamified activities and formal assessment demands.

Based on the conclusions drawn, the following recommendations are offered:

Students are encouraged to actively participate in gamified learning activities and take advantage of feedback, challenges, and collaborative opportunities to improve both their engagement and understanding of mathematical concepts.

Teachers are encouraged to continue integrating gamification strategies in Mathematics instruction to enhance students' engagement, motivation, and participation. They may also strengthen the alignment between gamified activities and assessment tasks by incorporating assessment-oriented challenges, problem-solving tasks, and performance-based activities to help translate engagement into measurable academic achievement.

School leaders should support the implementation of gamified instruction by providing professional development, training programs, and resources that enable teachers to design effective gamified learning environments.

Instructional material developers have to create innovative and curriculum-aligned gamified learning materials that promote active participation, collaboration, and deeper understanding of mathematical concepts among students.

Future researchers may explore additional variables such as self-efficacy, prior knowledge, and study habits that may influence mathematical achievement. They may also consider longer intervention periods or experimental research designs to further examine the impact of gamification on academic performance.

Reference

[1]. Department of Education. (2020). DepEd Order No. 31, s. 2020: Policy guidelines on the implementation of grades 1 to 12 based on the revised assessment, grading, and reporting policy in the K to 12 basic education program. Republic of the Philippines.

[2]. Sailer, M., & Homner, L. (2020). The gamification of learning: A meta-analysis. Educational Psychology Review, 32(1), 77–112. https://doi.org/10.1007/s10648-019-09498-w

[3]. Toda, A., Cristea, A. I., & Isotani, S. (Eds.). (2019). Gamification design for educational contexts: Theoretical and practical contributions. Springer. https://doi.org/10.1007/978-3-031-31949-5
[4]. Zainuddin, Z., Chu, S. K. W., Shujahat, M., & Perera, C. J. (2020). The impact of gamification on learning and instruction: A systematic review. Educational Research Review, 30, 100326. https://doi.org/10.1016/j.edurev.2019.05.003

Maree Glaydell Sison Santillana, "Students' Learning Engagement and Mathematical Achievement Through Gamification Method," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 9, Issue 2, pp. 184-190, July 2026.