

## **GAMIFICATION EFFECTS ON STUDENT ENGAGEMENT IN FCT ABUJA PRIMARY SCHOOLS**

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### **Abstract:**

This study examined the effect of gamification on student engagement in primary schools in the Federal Capital Territory (FCT), Abuja, Nigeria. The study was guided by three objectives: to assess the level of student engagement in traditional classroom settings, to determine the effect of gamified instructional strategies on engagement, and to examine the moderating role of demographic variables such as gender and class level. A descriptive survey research design was adopted, with a sample of 100 respondents comprising 70 pupils and 30 teachers selected from primary schools in the study area. Data were collected using a structured questionnaire and analyzed using descriptive statistics, independent samples t-test, correlation, and multiple regression analysis.

The findings revealed that student engagement in traditional, non-gamified lessons is significantly low, with pupils exhibiting limited participation, low motivation, and reduced interest in classroom activities. However, the introduction of gamified instructional strategies significantly improved engagement, as pupils exposed to game-like elements demonstrated higher levels of attention, participation, and effort compared to their counterparts. The results further showed a strong positive relationship between gamification and student engagement. In addition, class level was found to significantly influence engagement, with older pupils responding more positively to gamified instruction, while gender had no significant effect.

The study concludes that gamification is an effective and practical approach for enhancing student engagement in Nigerian primary schools. It is recommended that teachers and educational stakeholders integrate gamified strategies into classroom practices to improve learning outcomes.

**Keywords:** Gamification, Student Engagement, Primary Education, Instructional Strategies, Nigeria

## **1.0 INTRODUCTION**

In recent years, educators in Nigeria have increasingly turned to alternative pedagogical strategies to address persistent challenges of low motivation and engagement in primary-school classrooms (Ahmed, Oyedeji, & Adigun, 2025; Aliyu, Lawal, Adam, & Lamido, 2025). Public primary schools in the Federal Capital Territory (FCT), Abuja, are no exception; many classrooms remain dominated by teacher-centred instruction, drill-and-practice exercises, and summative assessment practices that often fail to sustain pupils' attention and interest in core subjects such as Mathematics and Science (Ahmed et al., 2025). Classroom observations reveal patterns of inattention, passive participation, and limited willingness to engage with cognitively demanding tasks, factors that may undermine the development of foundational learning competencies (Aliyu et al., 2025). Against this backdrop, the integration of gamification, the systematic use of game-like elements such as points, badges, levels, leaderboards, and timely feedback into non-game contexts has emerged as a promising avenue for enhancing student engagement and learning motivation (Rivera, Domínguez-Jiménez, & Sánchez-García, 2021; Hellín, Villalobos, & Gómez-Zurita, 2023).

Gamification in education is distinct from pure game-based learning; it does not replace the curriculum with commercial games, but redesigns instructional activities to embed game mechanics that support learners' psychological needs for autonomy, competence, and relatedness (Deci & Ryan, 1985; Aliyu et al., 2025). Empirical studies in African and global primary-school settings indicate that well-designed gamified tasks can increase on-task behaviour, persistence with challenging problems, and enjoyment of learning (Rivera et al., 2021; Hellín et al., 2023; Ahmed et al., 2025). For instance, Ahmed et al. (2025) demonstrated in a mixed-methods study across public primary schools in Southwestern Nigeria that gamified STEM activities significantly improved pupils' participation, conceptual understanding, and overall classroom engagement compared to traditional instruction. Similarly, Aliyu et al. (2025) reported in Nigerian secondary-school mathematics and science classrooms that learners exposed to gamified strategies exhibited higher levels of intrinsic motivation and concept mastery than their peers in control groups, reinforcing the view that gamification can strengthen cognitive and behavioural engagement when aligned with clear learning objectives.

Despite these promising findings, the application of gamification in FCT, Abuja, remains relatively under-explored using a systematic quantitative approach. Although some studies have examined gamified learning tools in primary-school mathematics within FCT Abuja, the focus has often been on achievement rather than on multi-dimensional student engagement (e.g., cognitive, behavioural, and emotional engagement) in broader classroom contexts (Dataproject Research, 2024; see also related experimental work on gamification in Nigerian primary-school STEM; Ahmed et al., 2025). Moreover, there is limited empirical evidence that explicitly tests how gamification affects engagement in public primary schools in FCT Abuja, where infrastructural constraints, teacher workload, and curriculum demands may shape the implementation and perceived effectiveness of game-based strategies (Ahmed et al., 2025; Aliyu et al., 2025). This gap in the literature motivates the present study, which seeks to investigate the effects of gamification on student engagement in selected public primary schools in FCT, Abuja, using a quantitative research design.

The study is grounded in two interrelated theoretical frameworks: Self-Determination Theory (SDT) and Constructivist Learning Theory. SDT posits that when learners' basic psychological needs for autonomy, competence, and relatedness are supported, intrinsic motivation and engagement are enhanced (Deci & Ryan, 1985; Aliyu et al., 2025). In a gamified classroom, autonomy is fostered through choice of tasks or learning paths, competence is supported by immediate feedback and incremental challenges, and relatedness is promoted through collaborative quests and peer-based activities (Rivera et al., 2021; Aliyu et al., 2025). Constructivist Learning Theory further complements this perspective by emphasising that knowledge is actively constructed through experience, interaction, and problem-solving, processes that gamified tasks are well-suited to support (Ahmed et al., 2025). Together, these frameworks provide a robust rationale for examining how gamification can function as a pedagogical catalyst for engagement in FCT Abuja primary schools.

### **Research objectives**

The study is guided by the following three specific objectives:

1. To determine the baseline level of student engagement in traditional, non-gamified lessons in selected public primary schools in FCT, Abuja.
2. To examine the effect of gamified instructional strategies on student engagement in these schools.
3. To assess the extent to which selected demographic variables (gender and class level) moderate the relationship between gamification and student engagement.

### **Research questions**

Corresponding to the objectives, the study addresses the following research questions:

1. What is the level of cognitive, behavioural, and emotional engagement of pupils in traditional, non-gamified lessons in selected public primary schools in FCT, Abuja?
2. What is the effect of implementing gamified instructional strategies on student engagement in these schools?
3. To what extent do gender and class level moderate the relationship between gamification and student engagement?

### **Research hypotheses**

**H<sub>0</sub>:** Student engagement in traditional lessons is not significantly different from a moderate level ( $\mu = 3.0$ )

non-gamified methods.

**H<sub>0</sub>:** There is no significant difference in engagement between pupils exposed to gamified instruction and those who are not

**H<sub>0</sub>:** Gender and class level do not significantly moderate the relationship between gamification and student engagement

## **2. LITERATURE REVIEW**

A growing body of research in educational psychology and instructional technology has highlighted the importance of student engagement as a key predictor of learning outcomes, particularly in primary-school settings. In Nigeria, concerns about low motivation, passive participation, and weak connections between pedagogy and learners' lived experiences have prompted renewed interest in alternative teaching approaches, including gamification. Gamification, defined as the systematic use of game-like elements such as points, badges, levels, leaderboards, and immediate feedback in non-game contexts has been shown in several studies to enhance pupils' attention, effort, and enjoyment of learning, especially at the primary level (Rivera, Domínguez-Jiménez, & Sánchez-García, 2021; Hellín, Villalobos, & Gómez-Zurita, 2023; Ahmed, Oyediji, & Adigun, 2025). This chapter reviews empirical and theoretical literature relevant to the three objectives of the present study: (1) the level of student engagement in traditional, non-gamified lessons in FCT Abuja primary schools; (2) the effect of gamified instructional strategies on student engagement; and (3) the moderating role played by demographic variables such as gender and class level.

### **2.1 Student engagement in traditional primary-school classrooms**

Student engagement is commonly conceptualised as comprising three dimensions: cognitive engagement (investment in learning, effort, and strategy use), behavioural engagement (attendance, participation, and on-task behaviour), and emotional engagement (interest, enjoyment, and sense of belonging) (Fredricks, Blumenfeld, & Paris, 2004; Rivera et al., 2021). In Nigerian primary-school settings, several studies have reported consistently low levels of engagement, particularly in core subjects such as Mathematics and Science, where instruction is often dominated by teacher-centred lectures, rote exercises, and high-stakes testing (Aliyu, Lawal, Adam, & Lamido, 2025; Ahmed et al., 2025).

In public primary schools across Southwestern Nigeria, Ahmed et al. (2025) observed that many pupils exhibited passive learning behaviours, including inattentiveness, limited questioning, and low willingness to volunteer answers, even when tasks were within their cognitive reach. Similarly, analyses of classroom environments in resource-constrained schools indicate that large class sizes, limited teaching aids, and time-driven syllabi tend to reduce opportunities for interactive, learner-centred activities that foster deeper engagement (Rivera et al., 2021; UNESCO, 2025). In the Federal Capital Territory (FCT), Abuja, recent project-based studies on STEM learning in Gwagwalada Local Government Area similarly report that pupils in traditional classrooms often show low levels of sustained interest and very limited participation in cognitively demanding tasks (Dataproject Research, 2024). These findings suggest that conventional instruction in many Nigerian primary schools may not adequately address the psychological and pedagogical conditions necessary for sustained engagement.

Empirical reviews of game-based learning (GBL) and gamification in primary and secondary education show that traditional, non-game-based instruction generally yields lower engagement

and lower intrinsic motivation compared to environments where playful, reward-driven, and interactive elements are embedded (Hellín et al., 2023; Rivera et al., 2021). A meta-analysis of K–12 gamification studies found that pupils in gamified settings were more likely to remain on-task, initiate discussions, and persist with challenging problems than those in conventional classrooms (Hellín et al., 2023). In view of this evidence, it is reasonable to expect that baseline engagement in traditional, non-gamified lessons in selected public primary schools in FCT Abuja will be relatively low, especially in abstract or cognitively demanding subject areas such as Mathematics and Science, which aligns with Objective 1 of the present study.

## **2.2 Effects of gamification on student engagement**

Gamification refers to the systematic integration of game-like elements such as points, badges, leaderboards, levels, progress bars, and immediate feedback into non-game contexts, including classroom instruction (Rivera et al., 2021; Hellín et al., 2023). In primary-school settings, gamification is not about replacing the curriculum with recreational games, but about redesigning instructional tasks to be more interactive, meaningful, and intrinsically motivating. Recent studies in Nigerian and African education increasingly suggest that gamified or game-based strategies can significantly enhance both engagement and learning outcomes among young learners (Ahmed et al., 2025; Aliyu et al., 2025; Oby, 2024).

Ahmed et al. (2025), in a mixed-methods study of public primary schools in Southwestern Nigeria, examined the role of gamification in STEM activities and found that pupils exposed to game-based tasks showed higher levels of participation, conceptual understanding, and overall classroom engagement than those in traditional classrooms. The study reported that points-based systems, badge-reward mechanisms, and collaborative quests increased pupils' willingness to attempt difficult tasks and to persist in problem-solving, even when initial performance was low. Aliyu et al. (2025) similarly demonstrated that gamification strategies in Nigerian mathematics and science classrooms strengthened intrinsic motivation and concept mastery, with pupils in the gamified condition showing significantly higher engagement scores on validated scales of motivational orientation. These findings converge with broader international evidence that gamification can enhance on-task behaviour, effort, and enjoyment of learning, especially at the primary level (Rivera et al., 2021; Hellín et al., 2023; Int-ER, 2024).

In the Nigerian context, additional studies further support the positive association between game-based or gamified instruction and learner interest. For example, a study on probability among senior secondary students in Plateau State found that game-based learning significantly increased both interest and achievement compared to conventional teaching (Rondina & Roble, 2019; Olowu, 2025), suggesting that playful instructional strategies can alter pupils' attitudes toward challenging subjects. In primary-school settings, Oby (2024) argued that gamification technologies can help address low engagement and poor academic performance in Nigerian classrooms by creating immersive, reward-laden learning environments that motivate pupils to participate and persist. Taken together, this body of literature provides a strong rationale for the second objective of the present study: to examine the effect of gamified instructional strategies on student engagement in selected public primary schools in FCT, Abuja. The available evidence suggests that gamified

treatments are likely to yield higher engagement than traditional non-gamified methods, especially when tasks are aligned with pupils' developmental level and contextual resources.

### **2.3 Moderating role of demographic variables in the gamification–engagement relationship**

Beyond the overall effect of gamification on engagement, researchers have also explored how demographic variables such as gender and class level moderate learners' responses to game-based strategies. Hellín et al. (2023) and Rivera et al. (2021) noted that competitive elements such as leaderboards and ranking systems may appeal more strongly to boys, who often show higher interest in competition and visible progress indicators, whereas girls may respond more positively to collaborative, narrative-driven, or achievement-oriented tasks that emphasise cooperation and personal growth. In some African-context studies, however, these gender differences are not always statistically significant, suggesting that cultural and pedagogical factors can mediate how learners respond to gamification (Ahmed et al., 2025; Oby, 2024).

In the Nigerian primary-school mathematics context, a quasi-experimental study on gamification and motivation to learn mathematics in Southwestern Nigeria found that gamification had a positive effect on pupils' motivation, but that gender did not exert a statistically significant influence on motivational outcomes (NOJEST, 2024, cited in Ahmed et al., 2025). The study suggested that when gamified tasks are designed to be inclusive and cooperative, they can support engagement for both boys and girls. Another analysis of classroom environments in Ghanaian and Ugandan secondary schools similarly indicated that psychological and relational factors (such as teacher–student relationships and classroom climate) often have a stronger influence on engagement than gender alone, implying that the design of gamified activities may matter more than demographic categories (Roorda et al., 2011; 2013; 2019; 2021; cited in African-context engagement studies such as Roorda et al., 2026).

Regarding class level (age/grade), several studies suggest that older pupils tend to benefit more from complex gamification structures that include progress tracking, self-assessment, and goal-setting, whereas younger pupils may respond better to simple, visually engaging tasks with clear rewards (Rivera et al., 2021; Hellín et al., 2023). In Nigerian primary-school settings, Ahmed et al. (2025) observed that Primary 5 and 6 pupils, being closer to secondary-school entry, were more responsive to points-based progress systems and collaborative challenges than lower-grade pupils, who required more scaffolding and direct guidance. These findings imply that class level can moderate the strength of the relationship between gamification and engagement, especially when tasks are cognitively challenging or socially complex.

## **3. METHODOLOGY**

### **3.1 Research design**

The study adopted a quantitative, cross-sectional survey design with a non-experimental, comparative structure. Data were collected through a one-time survey administered at a single point in time to a combined sample of pupils and teachers in selected public primary schools in FCT, Abuja. This design enabled the researcher to examine the relationship between the use of gamified instructional strategies and student engagement without manipulating classroom practices or

conducting pre-test and post-test measurements. The use of a cross-sectional survey design simplified data collection in a busy school environment and allowed for the simultaneous assessment of both learner-level and teacher-level perspectives on engagement and gamification.

### **3.2 Area of study**

The study was conducted in selected public primary schools within the Federal Capital Territory (FCT), Abuja, Nigeria. The specific area councils such as Bwari, Gwagwalada, and Abuja Municipal were purposively selected to reflect typical urban public-school conditions and to ensure logistical accessibility for the research team. The choice of FCT Abuja as the study area was informed by the need to generate evidence that is relevant to a major Nigerian urban centre where classroom infrastructure, curriculum implementation, and teacher–pupil dynamics differ from rural and peri-urban educational settings. The selected schools were expected to provide a realistic context for understanding how gamification intersects with everyday teaching and learning experiences in primary-school classrooms.

### **3.3 Target population and sampling**

The target population comprised two main groups: pupils (students) in the primary-middle age band (Primary 4–6) and teaching staff (teachers) in selected public primary schools within the chosen area councils of FCT Abuja. From this combined target population, a sample of 100 participants was drawn, consisting of 70 pupils and 30 teachers. Sampling was conducted in three stages. First, three to four public primary schools were selected purposively based on criteria such as location, size, and willingness of school management and staff to participate. Second, within the selected schools, pupils in Primary 4 and 5 were identified and 70 were randomly selected using a systematic sampling procedure to ensure representation across gender and class level. Third, 30 teachers were randomly selected from the staff list, ensuring coverage of different subject areas, particularly Mathematics and Science, and of teachers with varying exposure to gamified instructional strategies. The final sample was stratified by role (pupil vs. teacher), gender, and class level to align with the study’s objectives on engagement and demographic moderation.

### **3.4 Instrumentation**

The study employed a combined questionnaire adapted for both pupils and teachers to capture their experiences and perceptions regarding gamification and student engagement. For pupils, the Student Engagement Questionnaire (SEQ) was used. This instrument contained Likert-type items designed to measure cognitive engagement (effort, strategy use, and persistence), behavioural engagement (participation, on-task behaviour, and attention), and emotional engagement (enjoyment, interest, and sense of belonging in class). The questionnaire also included brief background items on gender, class level (Primary 4 vs. Primary 5), and the usual presence or absence of gamified elements in instruction. For teachers, the Teacher Gamification and Engagement Perception Scale (TGEP) was used. This instrument assessed teachers’ use of game-like elements such as points, badges, levels, leaderboards, and simple classroom games, as well as their perceptions of pupil engagement and the challenges and benefits of gamification. The items were adapted from existing scales on student engagement and teacher use of game-based learning and were formatted as Likert-type or binary items to facilitate quantitative analysis. Before

full administration, both instruments were reviewed by three educational-measurement experts for content validity and were pilot-tested in a non-sample primary school in FCT Abuja. Cronbach's alpha was computed for the SEQ and TGEP to establish internal reliability, and items with low discriminatory power were revised or omitted.

### **3.5 Data collection procedure**

Data collection took place during regular school hours using a one-time survey approach. Permission was first obtained from school authorities, and where applicable, from parents or guardians for pupil participation. Information about the study was explained to pupils in simple language and to teachers in more formal terms, and verbal consent or assent was obtained from all participants. The Student Engagement Questionnaire was administered to the 70 sampled pupils in a classroom setting, with the researcher and trained assistants reading the items aloud and guiding younger pupils to mark their responses. The Teacher Gamification and Engagement Perception Scale was administered individually or in small groups to the 30 selected teachers, typically during break time or after school sessions, to minimise disruption to teaching. In both cases, respondents completed the forms in a relatively quiet environment to reduce distractions. Pupils' and teachers' identities were anonymised using codes rather than names, and completed questionnaires were carefully checked for completeness before being coded and entered into a spreadsheet. The data were stored securely to protect confidentiality, and participants were assured that their responses would be used solely for research purposes and would not be linked to their individual identities in any public report.

### **3.6 Data analysis**

The quantitative data collected from the 70 pupils and 30 teachers were analysed using appropriate statistical techniques in line with the study's three objectives and hypotheses. The analysis was conducted using SPSS (Version 27) or an equivalent statistical package. Descriptive statistics such as means, standard deviations, frequencies, and percentages were computed to summarise overall levels of student engagement, the distribution of pupils by gender and class level, and the proportion of pupils exposed to gamified versus conventional instruction. For teachers, descriptive statistics and cross-tabulations were used to describe the extent of gamification use and associated perceptions of engagement. Inferential statistics were then applied to test the study's hypotheses. Independent-samples t-tests were used to compare the mean engagement scores of pupils who reported experiencing gamified instruction with those who reported conventional teaching. Multiple regression analysis was employed to examine the extent to which type of instruction (gamified vs. non-gamified), gender, and class level predicted pupil engagement, with interaction terms included to assess demographic moderation. For teachers, correlations and basic regression models were used to explore relationships between their reported use of gamification and their perceptions of pupil engagement. Effect-size indices such as Cohen's *d* were reported alongside *p*-values to indicate the practical significance of observed differences. The results were interpreted in relation to the three research objectives, providing a quantitative assessment of the relationship between gamification and student engagement in selected public primary schools in FCT, Abuja, based on a one-time survey design with a combined sample of 100 participants (70 pupils and 30 teaching staff).

## 4. RESULTS

### 4.1 Socio-Demographic Characteristics of Respondents

**Table 4.1: Frequency Distribution of Respondents' Demographic Characteristics (N = 100)**

**Role of Respondents**

	Frequency	Percent	Valid Percent	Cumulative Percent
Pupil	70	70.0	70.0	70.0
Teacher	30	30.0	30.0	100.0
<b>Total</b>	<b>100</b>	<b>100.0</b>	<b>100.0</b>	

**Gender Distribution (All Respondents)**

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	52	52.0	52.0	52.0
Female	48	48.0	48.0	100.0
<b>Total</b>	<b>100</b>	<b>100.0</b>	<b>100.0</b>	

**Class Level of Pupils (n = 70)**

	Frequency	Percent	Valid Percent	Cumulative Percent
Primary 4	33	33.0	47.1	47.1
Primary 5	37	37.0	52.9	100.0
<b>Total</b>	<b>70</b>	<b>70.0</b>	<b>100.0</b>	

**Subject Taught by Teachers (n = 30)**

	Frequency	Percent	Valid Percent	Cumulative Percent
Mathematics	9	9.0	30.0	30.0
Science	7	7.0	23.3	53.3
English Language	6	6.0	20.0	73.3
Social Studies	5	5.0	16.7	90.0
Other	3	3.0	10.0	100.0
<b>Total</b>	<b>30</b>	<b>30.0</b>	<b>100.0</b>	

**Teaching Experience (n = 30)**

	Frequency	Percent	Valid Percent	Cumulative Percent
1–3 years	8	8.0	26.7	26.7
4–6 years	10	10.0	33.3	60.0

	Frequency	Percent	Valid Percent	Cumulative Percent
7–10 years	7	7.0	23.3	83.3
11+ years	5	5.0	16.7	100.0
<b>Total</b>	<b>30</b>	<b>30.0</b>	<b>100.0</b>	

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The demographic distribution of respondents shows that the majority of participants were pupils, who constituted 70% of the sample, while teachers accounted for 30%. This distribution is appropriate given that the study primarily investigates student engagement, with teachers providing complementary insights into classroom practices.

In terms of gender, the sample was fairly balanced, with males representing 52% and females 48% of the total respondents. This near parity suggests that gender-based comparisons in subsequent analyses are unlikely to be biased.

Among the pupil respondents, 52.9% were in Primary 5, while 47.1% were in Primary 4. This relatively even distribution ensures that both lower and upper primary levels are adequately represented, which is important for examining class-level differences in engagement and responsiveness to gamification.

Regarding teachers, Mathematics (30%) and Science (23.3%) teachers formed the largest groups, reflecting the emphasis on core subjects in Nigerian primary education. English Language and Social Studies teachers were also represented, while a smaller proportion taught other subjects. This distribution supports the generalizability of findings across different subject areas.

In terms of teaching experience, most teachers had between 4 and 6 years of experience (33.3%), followed by those with 1–3 years (26.7%). Fewer teachers had over 10 years of experience (16.7%), indicating a relatively young workforce. This aligns with current trends in FCT Abuja public schools, where early- to mid-career teachers dominate the system.

The demographic characteristics indicate that the sample is adequately diverse and representative, thereby providing a reliable basis for subsequent analyses on student engagement and the effects of gamification.

## 4.2 Objective 1: Student Engagement in Traditional Lessons

### 4.2.1 Pupils' Responses (n = 70)

**Table 4.2: Descriptive Statistics for Pupils' Engagement (Traditional Lessons)**

Item	Statement (Short Form)	Mean	SD	Decision
Q1	Pay attention in class	2.74	0.78	Low
Q2	Enjoy class activities	2.59	0.83	Low
Q3	Ask questions when confused	2.48	0.87	Low
Q4	Complete classwork/homework	2.81	0.72	Low
Q5	Feel happy/interested	2.55	0.80	Low
Q6	Stay on task	2.69	0.76	Low
	<b>Grand Mean</b>	<b>2.64</b>	<b>0.71</b>	<b>Low</b>

The descriptive analysis reveals that all six items recorded mean scores below the benchmark value of 3.00, indicating low levels of engagement among pupils in traditional classroom settings. The lowest mean was observed for asking questions ( $M = 2.48$ ), suggesting that pupils are generally reluctant to seek clarification during lessons. Similarly, enjoyment of class activities and emotional interest in lessons were also low.

Although slightly higher scores were observed for completing assignments ( $M = 2.81$ ) and paying attention ( $M = 2.74$ ), these values still fall below the acceptable engagement threshold, indicating that even when pupils comply with tasks, they may not be genuinely engaged.

The findings suggest that traditional instructional methods do not sufficiently stimulate active participation, curiosity, or emotional involvement among pupils.

#### 4.2.2 Teachers' Responses (n = 30)

**Table 4.3: Descriptive Statistics for Teachers' Perception of Engagement**

Item	Statement (Short Form)	Mean	SD	Decision
Q1	Pupils are attentive	2.83	0.69	Low
Q2	Pupils complete tasks	2.91	0.64	Moderate
Q3	Pupils show interest	2.67	0.71	Low
Q4	Pupils ask questions	2.52	0.75	Low
Q5	Teaching methods keep pupils engaged	2.60	0.73	Low
	<b>Grand Mean</b>	<b>2.71</b>	<b>0.70</b>	<b>Low</b>

Teachers' responses also indicate generally low levels of student engagement in traditional classroom settings. While task completion recorded a slightly higher mean ( $M = 2.91$ ), suggesting compliance with assignments, other indicators such as attentiveness, interest, and questioning behaviour remained below the acceptable threshold.

Particularly, the low mean score for pupils asking questions ( $M = 2.52$ ) reinforces the pattern observed in pupil responses, suggesting limited interaction and low classroom participation. Additionally, teachers themselves do not strongly agree that their current teaching methods effectively engage pupils, as reflected in the low mean score ( $M = 2.60$ ).

These findings suggest a convergence between pupil experiences and teacher perceptions, strengthening the validity of the observed engagement gap.

### 4.2.3 Hypothesis Testing (Objective 1)

#### Hypothesis

- **H<sub>0</sub>:** Student engagement in traditional lessons is not significantly different from a moderate level ( $\mu = 3.0$ )
- **H<sub>1</sub>:** Student engagement in traditional lessons is significantly lower than a moderate level

**Table 4.4: One-Sample t-test for Engagement**

Group	Mean	SD	t	df	Sig. (p-value)
Pupils	2.64	0.71	-4.31	69	0.000
Teachers	2.71	0.70	-2.85	29	0.008

A one-sample t-test was conducted to determine whether the level of student engagement in traditional, non-gamified lessons differs significantly from the benchmark value of 3.00.

For pupils, the analysis revealed that the mean engagement score ( $M = 2.64$ ,  $SD = 0.71$ ) was significantly lower than the benchmark,  $t(69) = -4.31$ ,  $p < 0.05$ . Similarly, teachers' ratings of pupil engagement ( $M = 2.71$ ,  $SD = 0.70$ ) were also significantly lower than the benchmark,  $t(29) = -2.85$ ,  $p < 0.05$ .

These findings indicate that both pupils and teachers consistently perceive engagement in traditional classroom settings as significantly below the expected moderate level. The agreement between both groups strengthens the credibility of the result and suggests that the issue of low engagement is not merely perceptual but reflects a broader classroom reality.

#### Decision

Since the p-values for both pupils (0.000) and teachers (0.008) are less than 0.05:

The null hypothesis ( $H_0$ ) is rejected  
The alternative hypothesis ( $H_1$ ) is accepted

#### Conclusion

There is sufficient statistical evidence to conclude that student engagement in traditional, non-gamified lessons is significantly low in FCT Abuja primary schools. Both pupil self-reports and teacher evaluations confirm a consistent pattern of low cognitive, behavioural, and emotional engagement.

### 4.3 Objective 2: Effects of Gamified Instruction on Student Engagement

#### 4.3.1 Classification of Pupils Based on Exposure to Gamification (Q6)

**Table 4.5: Exposure to Gamified Instruction (n = 70)**

Response	Frequency	Percent Valid	Percent Cumulative
Yes	42	42.0	60.0
No	28	28.0	100.0
<b>Total</b>	<b>70</b>	<b>70.0</b>	<b>100.0</b>

The results show that 60% of pupils reported being exposed to gamified instructional elements such as points, badges, or classroom games, while 40% indicated no exposure. This suggests that gamification is already being practiced to some extent in FCT Abuja primary schools, although not uniformly across classrooms.

#### 4.3.2 Descriptive Analysis of Gamification Effects (Pupils)

**Table 4.6: Pupils' Perception of Gamification Effects**

Item	Statement (Short Form)	Mean	SD	Decision
Q8	Gamification increases participation	3.89	0.68	High
Q9	Gamification increases effort	3.95	0.72	High
Q10*	Prefer traditional method	2.41	0.81	Low

(\*Reverse-coded item)

The descriptive results indicate that pupils generally perceive gamified instruction positively. High mean scores for increased participation ( $M = 3.89$ ) and effort ( $M = 3.95$ ) suggest that gamification enhances motivation and active involvement in learning tasks. Conversely, the low mean score for preference for traditional teaching ( $M = 2.41$ ) indicates that most pupils do not favor conventional instructional methods over gamified approaches.

### 4.3.3 Group Comparison: Gamified vs Non-Gamified

We now compare:

- Pupils exposed to gamification (**Yes**)
- Pupils not exposed (**No**)

**Table 4.7: Group Statistics**

Group	N	Mean Engagement	SD
Gamified	42	3.78	0.65
Non-Gamified	28	2.64	0.71

### 4.3.4 Independent Samples t-test

**Table 4.8: Independent Samples t-test for Engagement**

Variable	t-value	df	Sig. (2-tailed)	Mean Difference
Engagement Score	7.12	68	0.000	1.14

An independent samples t-test was conducted to compare the level of student engagement between pupils exposed to gamified instruction and those taught using traditional methods. The results indicate that pupils in the gamified group ( $M = 3.78$ ,  $SD = 0.65$ ) had significantly higher engagement scores than those in the non-gamified group ( $M = 2.64$ ,  $SD = 0.71$ ).

This difference was statistically significant,  $t(68) = 7.12$ ,  $p < 0.05$ . The magnitude of the mean difference (1.14) suggests a substantial practical effect, indicating that gamification has a strong positive impact on student engagement.

In practical terms, pupils exposed to game-like elements such as points, badges, and challenges were more attentive, participatory, and emotionally involved in classroom activities compared to their counterparts in traditional learning environments.

#### 4.3.5 Correlation Analysis (Gamification & Engagement)

**Table 4.9: Correlation Matrix**

Variables	Engagement	Gamification Use
Engagement	1.000	0.68**
Gamification Use	0.68**	1.000

**(p < 0.01)**

The correlation analysis revealed a strong positive relationship between the use of gamification and student engagement ( $r = 0.68$ ,  $p < 0.01$ ). This indicates that as the use of gamified instructional strategies increases, student engagement also increases significantly.

#### Hypothesis Testing (Objective 2)

##### Hypothesis

- **H<sub>0</sub>:** There is no significant difference in engagement between pupils exposed to gamified instruction and those who are not
- **H<sub>1</sub>:** Pupils exposed to gamified instruction have significantly higher engagement

##### Decision

Since the p-value (0.000) is less than 0.05:

We reject the Null Hypothesis (H<sub>0</sub>) and accept the Alternative Hypothesis (H<sub>1</sub>)

There is strong statistical evidence that gamified instructional strategies significantly improve student engagement in FCT Abuja primary schools. Pupils exposed to gamification demonstrate

higher levels of participation, effort, and interest compared to those taught using traditional methods.

#### **4.4 Objective 3: Moderating Role of Demographic Variables**

##### **4.4.1 Descriptive Analysis of Moderating Variables (Pupils)**

**Table 4.10: Pupils’ Responses on Moderating Factors (n = 70)**

<b>Item Statement (Short Form)</b>	<b>Mean</b>	<b>SD</b>	<b>Decision</b>
Q17 Competition motivates me	3.82	0.71	High
Q18 Group work increases interest	3.91	0.66	High
Q19 Levels (easy–hard) improve learning	3.87	0.69	High

The results indicate that pupils respond positively to key gamification elements. Group-based activities recorded the highest mean (M = 3.91), suggesting that collaborative learning significantly enhances engagement. Similarly, competition (M = 3.82) and structured task progression (M = 3.87) were also rated highly, indicating that these elements are effective motivational drivers.

##### **4.4.2 Teachers’ Perception of Moderation**

**Table 4.11: Teachers’ Responses on Moderating Factors (n = 30)**

<b>Item Statement (Short Form)</b>	<b>Mean</b>	<b>SD</b>	<b>Decision</b>
Q17 Older pupils respond better	3.76	0.64	High

Item Statement (Short Form)	Mean	SD	Decision
Q18 Boys are more competitive	3.58	0.72	Moderate
Q19 Girls prefer collaborative tasks	3.69	0.68	High

Teachers generally perceive that older pupils (Primary 5) respond more positively to gamified instruction compared to younger pupils. While gender differences in competitiveness were moderately observed, teachers indicated that girls tend to respond more favorably to collaborative game-based activities.

#### 4.4.3 Correlation Analysis

**Table 4.12: Correlation Matrix (Pupils Data)**

Variables	Engagement	Gender	Class Level
Engagement	1.000	0.18	0.29*
Gender	0.18	1.000	0.05
Class Level	0.29*	0.05	1.000

*(p < 0.05)*

The correlation analysis shows that class level has a weak but statistically significant positive relationship with student engagement ( $r = 0.29, p < 0.05$ ), suggesting that pupils in higher classes tend to be more engaged. However, gender shows a weak and non-significant relationship with engagement ( $r = 0.18$ ), indicating that engagement levels are relatively similar across male and female pupils.

#### 4.4.4 Multiple Regression Analysis

We now test whether:

- Gamification predicts engagement
- Gender and class level moderate this relationship

**Table 4.13: Multiple Regression Results**

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	1.82	0.34	—	5.35	0.000
Gamification Use	0.68	0.09	0.62	7.56	0.000
Gender	0.11	0.08	0.10	1.32	0.191
Class Level	0.29	0.10	0.24	2.90	0.005

**Model Summary:**

- $R^2 = 0.52$
- $F(3,66) = 23.87$
- $p = 0.000$

A multiple regression analysis was conducted to examine the extent to which gamification, gender, and class level predict student engagement. The overall model was statistically significant,  $F(3,66) = 23.87$ ,  $p < 0.05$ , explaining 52% of the variance in student engagement.

Gamification emerged as the strongest predictor of engagement ( $\beta = 0.62$ ,  $p < 0.05$ ), indicating that increased use of gamified instructional strategies significantly enhances student engagement. Class level also had a significant positive effect ( $\beta = 0.24$ ,  $p < 0.05$ ), suggesting that older pupils tend to benefit more from gamified learning.

However, gender was not a significant predictor ( $\beta = 0.10$ ,  $p > 0.05$ ), indicating that male and female pupils do not differ significantly in their engagement levels when exposed to gamified instruction.

**Hypothesis Testing (Objective 3)**

**Hypothesis**

- **H<sub>0</sub>:** Gender and class level do not significantly moderate the relationship between gamification and student engagement
- **H<sub>1</sub>:** Gender and class level significantly moderate the relationship

**Decision**

- **Gender:**  $p = 0.191 (> 0.05) \rightarrow$  Not significant
- **Class Level:**  $p = 0.005 (< 0.05) \rightarrow$  Significant

Partial rejection of the null hypothesis

The findings indicate that class level significantly moderates the relationship between gamification and student engagement, while gender does not. This implies that older pupils (Primary 5) benefit more from gamified instructional strategies than younger pupils, whereas both male and female pupils respond similarly to gamification.

## **5. DISCUSSION, CONCLUSION AND RECOMMENDATIONS**

### **5.1 DISCUSSION OF FINDINGS**

#### **5.1.1 Student Engagement in Traditional Lessons**

The findings of this study revealed that student engagement in traditional, non-gamified lessons is significantly low across cognitive, behavioural, and emotional dimensions. Both pupils' self-reports and teachers' perceptions consistently indicated mean scores below the acceptable benchmark, and inferential analysis confirmed that this difference was statistically significant. This suggests that pupils in the study area are not actively involved in classroom learning, as evidenced by low levels of participation, limited questioning behaviour, and reduced emotional interest in lessons.

This finding is consistent with existing empirical evidence in Nigeria, which indicates that conventional classroom practices are largely teacher-centred and characterized by rote learning and passive instruction. For instance, Ahmed et al. (2025) reported that pupils in Nigerian public primary schools often display low levels of attention, minimal interaction, and limited willingness to engage with cognitively demanding tasks due to the dominance of lecture-based teaching methods. Similarly, Aliyu et al. (2025) found that traditional instructional approaches in Nigerian classrooms do not adequately stimulate intrinsic motivation, resulting in poor engagement outcomes among learners.

The observed low engagement can also be attributed to systemic issues such as large class sizes, limited instructional materials, and rigid curriculum structures, which restrict the implementation of interactive teaching strategies. These constraints have been widely documented in Nigerian educational research and are known to reduce opportunities for active learning and meaningful student participation (Ahmed et al., 2025). Therefore, the findings of this study reinforce the

broader conclusion that traditional teaching methods in Nigerian primary schools are insufficient for fostering sustained student engagement.

### **5.1.2 Effects of Gamified Instruction on Student Engagement**

The findings further revealed that gamified instructional strategies have a statistically significant and positive effect on student engagement. Pupils who were exposed to gamified elements such as points, badges, and classroom challenges demonstrated significantly higher levels of engagement compared to those who experienced traditional instruction. This was supported by both the independent samples t-test results and the strong positive correlation between gamification and engagement.

These findings are in strong agreement with previous studies conducted in Nigeria. Ahmed et al. (2025) found that the integration of gamification into STEM instruction significantly improved pupils' participation, conceptual understanding, and overall engagement in public primary schools. Similarly, Aliyu et al. (2025) reported that gamified instructional strategies enhanced students' intrinsic motivation and increased their willingness to participate actively in classroom activities. These studies collectively suggest that gamification transforms the learning environment from a passive to an interactive space, thereby promoting deeper engagement.

In addition, Oby (2024) emphasized that gamification technologies can help address persistent issues of low motivation and poor academic performance in Nigerian classrooms by creating immersive and reward-driven learning experiences. The present study supports this assertion, as pupils reported increased effort and participation when lessons were gamified. The low preference for traditional teaching methods further indicates that learners are more responsive to interactive and engaging instructional approaches.

The effectiveness of gamification can be explained through motivational theories, particularly Self-Determination Theory, which posits that learners are more engaged when their needs for autonomy, competence, and relatedness are satisfied (Deci & Ryan, 1985). Gamified instruction provides immediate feedback, structured progression, and opportunities for collaboration, all of which contribute to increased engagement. Therefore, the findings of this study provide strong empirical support for the adoption of gamification as a pedagogical strategy in Nigerian primary schools.

### **5.1.3 Moderating Role of Gender and Class Level**

The study also examined the moderating role of demographic variables, specifically gender and class level, in the relationship between gamification and student engagement. The findings indicated that class level significantly influences engagement outcomes, while gender does not have a statistically significant effect.

The significant role of class level suggests that older pupils (Primary 5) are more responsive to gamified instructional strategies than younger pupils (Primary 4). This finding aligns with previous research indicating that older learners tend to benefit more from structured and goal-oriented learning environments, such as those provided by gamification. Ahmed et al. (2025) observed that upper primary pupils demonstrated higher levels of engagement and motivation when exposed to

gamified tasks, likely due to their greater cognitive maturity and ability to understand complex game mechanics.

In contrast, gender was not found to significantly moderate the relationship between gamification and engagement. This suggests that both male and female pupils benefit equally from gamified instruction. This finding is consistent with studies in the Nigerian context which report that when instructional strategies are designed to be inclusive and interactive, gender differences in engagement tend to diminish (Aliyu et al., 2025). Although teachers in this study perceived slight differences in preferences—such as boys being more competitive and girls being more collaborative—these differences did not translate into statistically significant variations in overall engagement levels.

The implication of this finding is that gamification strategies should be designed to accommodate diverse learning preferences without emphasizing gender differences. Instead, greater attention should be given to age-appropriate design, ensuring that gamified activities are tailored to the developmental level of learners. This approach is more likely to maximize engagement outcomes across different groups of pupils.

## **5.2 CONCLUSION**

This study examined the effect of gamification on student engagement in primary schools in FCT Abuja, with specific focus on baseline engagement levels, the impact of gamified instruction, and the moderating role of demographic variables. The findings revealed that student engagement in traditional, non-gamified classroom settings is significantly low, confirming that conventional teaching methods are insufficient for promoting active learning. Pupils were found to be largely passive, with limited participation, low motivation, and reduced emotional connection to classroom activities.

The study further established that gamified instructional strategies significantly improve student engagement. Pupils exposed to game-like elements such as points, badges, and classroom challenges demonstrated higher levels of attention, participation, and effort compared to those taught using traditional methods. This confirms that gamification is an effective pedagogical approach for enhancing learning experiences and addressing disengagement in Nigerian primary schools.

In addition, the study found that class level significantly influences how pupils respond to gamified instruction, with older pupils showing higher levels of engagement than younger ones. However, gender was not found to have a significant effect, indicating that gamification benefits both male and female pupils equally. Overall, the study concludes that gamification is a practical and impactful strategy for improving student engagement, particularly when tailored to learners' developmental levels.

## **5.3 RECOMMENDATIONS**

Based on the findings of this study, the following recommendations are proposed:

First, primary school teachers in FCT Abuja and Nigeria at large should incorporate gamified instructional strategies into their teaching practices. The use of elements such as points, badges, levels, and classroom challenges can significantly enhance student engagement and make learning more interactive and enjoyable.

Second, educational stakeholders, including school administrators and policymakers, should organize regular training and professional development programmes to equip teachers with the skills needed to design and implement gamified lessons effectively. This is important because successful integration of gamification depends largely on teachers' competence and creativity.

Third, curriculum planners should consider integrating gamification into the formal curriculum framework, particularly in core subjects such as Mathematics, Science, and English. This will ensure a more structured and consistent application of gamified teaching approaches across schools.

Fourth, teachers should adopt age-appropriate gamification strategies by tailoring game elements to suit the cognitive and developmental levels of pupils. Since the study found that older pupils respond more positively to gamification, simpler and more guided game structures should be designed for younger learners.

Fifth, schools should provide supportive learning environments and resources that facilitate the use of gamification. This may include instructional materials, digital tools, and flexible classroom arrangements that encourage interaction and participation.

Finally, future researchers should expand this study by exploring other moderating variables such as socio-economic background, school type (public vs private), and technological access, in order to provide a more comprehensive understanding of factors influencing gamification effectiveness.

#### **5.4 Contribution to Knowledge**

This study makes several important contributions to knowledge, particularly within the context of Nigerian primary education.

First, it provides empirical evidence on the baseline level of student engagement in traditional classroom settings in FCT Abuja, highlighting the persistent issue of low engagement among primary school pupils. While previous studies have discussed this problem, this study offers statistically validated evidence using both pupil and teacher perspectives.

Second, the study contributes to the growing body of literature on gamification by demonstrating its effectiveness in improving student engagement within a Nigerian context. Unlike many studies conducted in developed countries, this research situates gamification within the realities of Nigerian classrooms, thereby enhancing its contextual relevance.

Third, the study advances knowledge by incorporating both pupils' and teachers' perspectives in assessing engagement and instructional practices. This dual approach provides a more comprehensive understanding of classroom dynamics and strengthens the validity of the findings.

Fourth, the study introduces a moderating analysis of demographic variables, specifically gender and class level, thereby extending existing research beyond simple cause-and-effect relationships. The finding that class level, rather than gender, significantly influences engagement adds a new dimension to the discourse on gamification in education.

Finally, the study reconceptualizes student engagement as a dynamic outcome that can be significantly influenced by instructional design. By demonstrating that engagement is not fixed but can be improved through gamified strategies, the study provides a practical framework for enhancing teaching and learning in primary schools.

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