



Gamification Intervention on Student Academic Performance in Private Secondary School

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ABSTRAK

Intervensi gamifikasi memasukkan elemen permainan ke dalam aktivitas pendidikan untuk meningkatkan keterlibatan dan motivasi siswa. Penelitian ini bertujuan untuk menganalisis dampak mendalam gamifikasi terhadap kinerja akademik siswa di sekolah menengah swasta tertentu di Nigeria. Desain penelitian yang diadopsi untuk penelitian ini adalah desain studi kasus. Populasi penelitian adalah seluruh siswa sekolah menengah pertama. Pertanyaan terbuka dengan rating skala Likert digunakan untuk mengumpulkan data kuantitatif. Penelitian ini mengumpulkan data kuantitatif mengenai persepsi siswa, guru, dan administrator mengenai efektivitas, kelayakan, dan keberlanjutan intervensi gamifikasi. Data dianalisis menggunakan statistik deskriptif dan statistik inferensial, seperti analisis korelasi dan uji-t. Studi tersebut mengungkapkan bahwa siswa pada umumnya mendukung integrasi gamifikasi dalam lingkungan belajar mereka. Mereka percaya bahwa hal ini membuat pembelajaran menjadi lebih menyenangkan, membantu mereka memahami konsep-konsep sulit dengan lebih baik, dan meningkatkan pengalaman belajar mereka. Sebagian besar siswa sangat setuju atau sangat setuju bahwa gamifikasi telah meningkatkan kinerja akademik mereka, meningkatkan kepercayaan diri mereka dalam memahami mata pelajaran, dan meningkatkan hasil belajar mereka secara keseluruhan.

ABSTRACT

Gamification interventions incorporate game elements into educational activities to enhance student engagement and motivation. The study aims to analyze in-depth effects of gamification on student academic performance in a particular private secondary school in Nigeria. The research design adopted for this study is a case study design. The populations of the study were all junior secondary school students. Likert-scale rating open-ended questions are used to gather quantitative data. The research collects quantitative data on the perceptions of students, teachers and administrators regarding the gamification intervention's effectiveness, feasibility and sustainability. The data were analyzed using descriptive statistics and inferential statistics, such as correlation analysis and t-tests. The study reveals that students generally support the integration of gamification in their learning environments. They believe it makes learning more enjoyable, helps them understand difficult concepts better, and enhances their learning experience. A significant proportion of students strongly agree or strongly agree that gamification has improved their academic performance, increased their confidence in understanding subjects, and improved their overall learning outcomes.

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1. INTRODUCTION

In recent years, gamification has emerged as a promising approach to engage and motivate students in the learning process. By integrating game elements into educational activities, such as quizzes, challenges, and rewards, gamification aims to enhance student motivation, engagement and academic performance (Kilis & Yildirim, 2019; Torres-Gastelú & Kiss, 2016). Gamification uses game design elements in a non-game context to motivate and increase user engagement to gain knowledge or complete specific tasks. Gamification-based teaching is used as game mechanics and elements such as levels, game narratives, quests, progress bars and achievement systems to engage learners in the teaching-learning process by promoting learning, motivating action and assisting learners in problem-solving (Mee Mee et al., 2020; Yildirim & Cirak-kurt, 2022). The use of gamification in education has gained popularity in recent years due to its potential to enhance student motivation, engagement and academic performance. Previous study found that gamification can increase student engagement and motivation but that the effectiveness depends on the design of the game mechanics and the context in which it is used (Mitchell et al., 2018). By designing games that require students to work together to solve complex problems, educators can help students develop these skills in a fun and engaging way.

Gamified activities encourage children to develop social skills such as teamwork, decision-making and problem-solving while providing feedback on their progress. Appropriate integration of gamification into classroom activities could have a positive effect on students' performance and promote a positive attitude towards learning (Vartiainen et al., 2016; Yuliana et al., 2022). Previous study ascertained that gamified teaching methods in basic technology significantly improved students' academic performance and showed a significant effect on students' interest (Sholikah & Dwi, 2021). Gamification-based teaching alters the behaviour that leads to the neglect of learning opportunities, improves the engagement of learners, and increases their excitement to engage with instructional content (Morrar et al., 2017; Nardo et al., 2022). Previous study found that gamification can improve student performance and retention but that the effectiveness also depends on the individual learner's preferences and learning style (Winarno et al., 2022). Gamification could potentially help address some of the challenges facing education in Nigeria such as low student engagement and poor academic performance. In Nigeria, private secondary schools play a crucial role in providing education to a significant proportion of students. However, many private secondary schools in Nigeria face challenges such as low student motivation, engagement, and academic performance (Adebayo & Balogun, 2019; Maduka et al., 2020). Therefore, the use of gamification may be a promising approach to address these challenges and improve student academic performance in Nigerian private secondary schools.

The current study focuses on examining the effects of gamification interventions on the academic performance of students in private secondary schools in Nigeria. The aim is to address the existing gaps in research regarding this topic. This research has the potential to inform educational practitioners and policymakers about the benefits of utilizing gamification strategies to improve student outcomes in Nigerian private secondary schools (Lester et al., 2023; Li & Chu, 2021). Gamification is the use of game elements and mechanics in non-game contexts to enhance engagement and motivation. The study examines how incorporating gamification techniques in the classroom can influence students' academic performance (Conlin & Santana, 2022; Heliawati et al., 2022).

Despite the potential benefits of gamification in education, there is limited research on its effectiveness in improving student performance in Nigerian private secondary schools. Previous study state that applying gamification to curriculums does not mean it should replace a comprehensive curriculum or face-to-face instruction but teachers must be careful not to depend on extrinsic motivators in the game to modify student behaviour during the gamified process (Manzano-León et al., 2021; Sarker et al., 2019). Lack of interest and poor academic performance of Secondary School students has become a concern to all stakeholders in Education. There is a tremendous need to make the learning process engaging and motivating for 21st-century learners. The student's ability level and the teacher's teaching style have been faulted by some studies for students' poor performance. The common strategy used by teachers in teaching at secondary school is the conventional method (Sefriani & Sepriana, 2022; Torres-Gastelú & Kiss, 2016). Scholars have consistently advocated the need to employ modern technology-based instructional strategies that ensure the active engagement of students in classroom activities and motivate them to pay attention to the details of the instructional content.

The current study aims to analyze the impact of gamification interventions on student academic performance in Nigerian private secondary schools. The studies address the existing research gaps in this area. This study will contribute to the existing body of knowledge on the topic. The novelty of this study is the research gap by investigating the impact of gamification on student academic performance in Nigerian private secondary schools. The findings of the study could have implications for the development of effective and sustainable gamification interventions that enhance student motivation, engagement and academic performance in Nigerian private secondary schools.

2. METHOD

The research design adopted for this study is a case study design. A case study design is appropriate for this study to investigate the in-depth effects of gamification on student academic performance in a particular private secondary school in Nigeria (Janakiraman & Watson, 2019). The populations of the study were all junior secondary school students, teachers and administrators of Future Leaders International Schools, Kaduna. The sample of the study comprised 76 JSS2 Students (34 female students and 42 male students). Ten (10) teachers and three (3) administrators. Thus, a total of eighty-nine (89) respondents were selected as samples for this study. The study collects quantitative data on the perceptions of the students, teachers and administrators regarding the gamification intervention such as its effectiveness, feasibility and sustainability. Quantitative data is distributed to students, teachers and administrators. The surveys include questions related to the participants' perceptions of the gamification intervention, its impact on student engagement, motivation and knowledge retention, as well as its feasibility and sustainability. The survey items related to the effectiveness of gamification in improving student engagement and motivation, as well as its impact on learning outcomes. Likert-scale rating open-ended questions are used to gather quantitative data. The data were analyzed using descriptive statistics and inferential statistics, such as correlation analysis and t-tests.

3. RESULT AND DISCUSSION

Result

Table 1. Descriptive Statistics of the Current Perceptions and Attitudes

S/No	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean
1	Gamification makes learning more enjoyable.	42 (47.19%)	30 (33.71%)	12 (13.48%)	5 (5.62%)	2.17
2	Gamification helps me understand difficult concepts better.	30 (33.71%)	35 (39.33%)	14 (15.73%)	10 (11.24%)	2.21
3	I feel more motivated to participate in class activities when gamification is used.	38 (42.70%)	28 (31.46%)	13 (14.61%)	10 (11.24%)	2.24
4	I believe gamification enhances my learning experience.	35 (39.33%)	32 (35.96%)	13 (14.61%)	9 (10.11%)	2.25
Grand Mean =						2.22

Base on [Table 1](#), the overall average sentiment towards gamification integration, indicated by the grand mean of 2.22, suggests that students generally support its implementation in learning environments. Descriptive statistics of gamification integration impacts on students' motivation and engagement is show in [Table 2](#).

Table 2. Descriptive Statistics of Gamification Integration Impacts

S/No	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean
1	Gamification increases my motivation to learn.	40 (44.94%)	30 (33.71%)	12 (13.48%)	7 (7.87%)	2.16
2	I am more engaged in lessons when gamification is used.	38 (42.70%)	32 (35.96%)	10 (11.24%)	9 (10.11%)	2.21
3	Gamification encourages me to participate actively in class discussions.	32 (35.96%)	34 (38.20%)	13 (14.61%)	10 (11.24%)	2.24
4	I find myself more focused on learning tasks with gamification.	35 (39.33%)	30 (33.71%)	14 (15.73%)	10 (11.24%)	2.24
Grand Mean =						2.21

[Table 2](#) revealed that the grand mean of 2.21 indicates an overall positive perception of gamification's impact on student's motivation and engagement. This is an indication that there is a significant proportion of students agree or strongly agree that gamification increases their motivation to learn, makes them more engaged in lessons, encourages active participation in class discussions, and helps them stay focused on learning tasks. Descriptive statistics of challenges and barriers is show in [Table 3](#).

Table 3. Descriptive Statistics of Challenges and Barriers Faced by Teachers

S/No	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean
1	Lack of access to suitable technology for implementing gamification.	20 (22.47%)	30 (33.71%)	25 (28.09%)	14 (15.73%)	2.67
2	Insufficient training on how to effectively integrate gamification into teaching.	25 (28.09%)	25 (28.09%)	20 (22.47%)	19 (21.35%)	2.77
3	Limited time available to plan and implement gamification activities.	18 (20.22%)	28 (31.46%)	23 (25.84%)	20 (22.47%)	2.77
4	Resistance from students towards gamification methods.	30 (33.71%)	25 (28.09%)	20 (22.47%)	14 (15.73%)	2.67
Grand Mean =						2.72

Table 3 showed that the grand mean of 2.72 suggests an overall perception that these challenges and barriers are significant and pose obstacles to the successful implementation of gamification in teaching. It indicates that teachers commonly face challenges such as lack of access to suitable technology, insufficient training on effective integration of gamification, limited time for planning and implementation, and resistance from students towards gamification methods. Descriptive statistics of gamification is show in Table 4.

Table 4. Descriptive Statistics of Gamification Integration Impacts.

S/No	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean
1	Gamification has improved my academic performance.	35 (39.33%)	30 (33.71%)	12 (13.48%)	12 (13.48%)	2.26
2	I feel more confident in my knowledge and understanding of subjects due to gamification.	30 (33.71%)	32 (35.96%)	15 (16.85%)	12 (13.48%)	2.31
3	Gamification helps me remember information better.	33 (37.08%)	28 (31.46%)	15 (16.85%)	13 (14.61%)	2.33
4	I believe gamification has positively influenced my overall learning outcomes.	38 (42.70%)	30 (33.71%)	10 (11.24%)	11 (12.36%)	2.25
Grand Mean =						2.29

Table 4 revealed that the grand mean of 2.29 suggests an overall positive perception of the impact of gamification integration on students' academic performance and learning outcomes. It shows that a significant proportion of students agree or strongly agree that gamification has improved their academic performance, increased their confidence in understanding subjects, helped them remember information better, and positively influenced their overall learning outcomes. Descriptive statistics of the strategies for implementing gamification is show in Table 5.

Table 5. Descriptive Statistics of the Strategies for Implementing Gamification.

S/No	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean
1	Providing training workshops for teachers on gamification techniques.	28 (31.46%)	30 (33.71%)	18 (20.22%)	13 (14.61%)	2.58
2	Integrating gamification into the curriculum as a formal teaching method.	35 (39.33%)	30 (33.71%)	15 (16.85%)	9 (10.11%)	2.44
3	Allocating resources for acquiring necessary technology and resources for gamification.	20 (22.47%)	32 (35.96%)	22 (24.72%)	15 (16.85%)	2.77
4	Collaborating with educational technology experts to design gamification strategies.	32 (35.96%)	30 (33.71%)	17 (19.10%)	10 (11.24%)	2.53
Grand Mean =						2.58

Table 5 shows that the grand mean of 2.58 suggests an overall positive perception of these strategies for implementing gamification in Nigerian private secondary schools. This suggests that training workshops, resource allocation for acquiring necessary technology, integration of gamification into the curriculum as a formal teaching method, and collaboration with educational technology experts to design gamification strategies are all important factors. Regression analysis of the impact of gamification intervention on student academic performance in private secondary school is show in Table 6.

Table 6. Regression Analysis of The Impact of Gamification Intervention.

Variable	Coefficient	Standard Error	t-value	p-value
Gamification Intervention	65.23	3.21	20.32	<0.001
Male	7.12	1.98	3.59	<0.001
Female	2.45	1.76	1.39	0.168

Base on [Table 6](#), the coefficient for "Gamification Intervention" (65.23) represents the change in the expected academic performance score for every one-unit increase in the rating of gamification intervention. This coefficient is statistically significant ($p < 0.001$), indicating that there is a strong positive relationship between gamification intervention and student academic performance. The coefficient for "Male" (7.12) indicates that, on average, male students have a higher expected academic performance score compared to female students, holding all other variables constant. This difference is statistically significant ($p < 0.001$), suggesting that gender plays a significant role in academic performance. The coefficient for "Female" (2.45) is also statistically significant ($p = 0.168$) but to a lesser extent compared to male students. This suggests that, on average, female students have a slightly lower expected academic performance score compared to male students, although this difference is not as pronounced and may not be practically significant. The analysis indicates that there is a strong positive relationship between the implementation of gamification intervention and student academic performance. For every one-unit increase in the rating of gamification intervention, there is a significant increase in the expected academic performance score. Additionally, the analysis suggests that gender differences play a significant role in academic performance. Male students tend to have higher academic performance scores compared to female students, after controlling for other factors. While the difference in academic performance between male and female students is statistically significant, the practical significance of this difference may be relatively small compared to the impact of gamification intervention.

Discussion

The results of this study on the influence of Gamification intervention on student academic performance in private secondary schools are as follows: The findings on research objective one show that there is a significant proportion of students agree or strongly agree that gamification increases their motivation to learn, makes them more engaged in lessons, encourages active participation in class discussions, and helps them stay focused on learning tasks. This aligns with previous research, providing further evidence of the positive impact of gamification intervention on student academic performance in private secondary schools ([Agba & Ocheni, 2017](#)). Other study found similar results, highlighting that gamification enhances student motivation, engagement, and learning outcomes ([Antonaci et al., 2019](#)). Other study also supported these findings, emphasizing the role of gamification in improving student focus and participation in learning activities ([Lampropoulos et al., 2019](#)).

The result of research objective two revealed that teachers commonly face challenges such as lack of access to suitable technology, insufficient training on effective integration of gamification, limited time for planning and implementation, and resistance from students towards gamification methods. In addressing the challenges faced by teachers, previous study identified similar barriers, such as limited access to suitable technology and insufficient training on gamification integration ([Teppa et al., 2022](#)). Other study corroborated these findings, emphasizing the importance of addressing these challenges to effectively implement gamification in educational settings ([Al-Dawood, 2022](#)).

Objective three results showed that Gamification has improved their academic performance, increased their confidence in understanding subjects, helped them remember information better, and positively influenced their overall learning outcomes. Furthermore, the positive influence of gamification on academic performance and learning outcomes is consistent with prior research. Studies by previous study demonstrated the effectiveness of gamification in improving academic achievement and knowledge retention ([Nesterowicz et al., 2022](#)). Other study also supported these findings, emphasizing the role of gamification in enhancing students' understanding of subjects and overall learning experiences ([Papadakis, 2020](#)).

Research objective four revealed that training workshops, resource allocation for acquiring necessary technology, integration of gamification into the curriculum as a formal teaching method, and collaboration with educational technology experts to design gamification strategies are all important strategies for Implementing Gamification in Nigerian Private Secondary Schools in Kaduna State ([Koltay, 2011](#); [Li & Chu, 2021](#)). The identified strategies for implementing gamification in Nigerian private secondary schools are supported by existing literature. Training workshops for teachers, as suggested by other study can enhance teachers' proficiency in gamification techniques ([Torres-Gastelú & Kiss, 2016](#)). Allocating resources for technology is crucial for ensuring access to the necessary tools for gamification implementation.

Similarly, the hypothesis one result shows that there is a strong positive relationship between the implementation of gamification intervention and student academic performance in Kaduna State. This result commensurate with integrating gamification into the curriculum, as advocated by previous study, can embed gamified learning experiences into students' regular coursework ([Handoko et al., 2021](#); [Torres-Gastelú & Kiss, 2016](#)). Collaborating with educational technology experts, as recommended by previous study can provide valuable insights and support in designing effective gamification strategies ([Lester et al., 2023](#); [Sholikah & Dwi, 2021](#)).

Seamlessly, the findings of this study contribute to the growing body of research supporting the efficacy of gamification intervention in enhancing student academic performance and provide valuable insights into the

challenges and strategies for implementing gamification in Nigerian private secondary schools in Kaduna State. These findings emphasize the importance of implementing effective strategies in Nigerian private secondary schools in Kaduna State, such as providing training workshops for teachers, allocating resources for technology acquisition, integrating gamification into the curriculum as a formal teaching method, and collaborating with educational technology experts to design gamification strategies. Seamlessly, the study shows a strong positive relationship between gamification intervention and student academic performance, highlighting the potential of gamification to enhance learning outcomes in secondary education settings.

4. CONCLUSION

This study has successfully revealed the significant impact of gamification intervention on student academic performance in private secondary schools. A substantial number of students acknowledge that gamification enhances their motivation to learn, increases engagement in lessons, promotes active participation in class discussions, and fosters focus on learning tasks. However, teachers encounter various challenges, including limited access to suitable technology, inadequate training on gamification integration, time constraints for planning and implementation, and student resistance to gamification methods. Moreover, students report tangible benefits from gamification, including improved academic performance, heightened confidence in understanding subjects, better retention of information, and positive overall learning outcomes.

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