Gamification as Catalyst for Enhanced Learning Outcomes in Upper Basic Education in Ilorin Metropolis, Kwara State, Nigeria

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ABSTRACT: Gamification is adding game mechanics into non-game environments, such as a website, online community, learning management system or even business intranet to increase participation. Consequently, the objective of this paper is to evaluate the impact of gamification as a catalyst for enhanced learning outcomes in upper basic education in Ilorin Metropolis, Kwara State, Nigeria using various standard and appropriate techniques. The study revealed that gender does not influence the teachers' perception about gamification's effectiveness as an instructional strategy, male and female teachers had relatively similar challenges in implementing gamification, the challenges faced by teachers in implementing gamification teaching strategy in order of severity include lack of appropriate technology, curriculum alignment issues, insufficient training and professional development, time constraints and it was discovered that gamification contributes significantly to students' academic improvement as gamification increases student engagement and participation in class.

DOI: https://dx.doi.org/10.4314/jasem.v28i11.15

The landscape of education is undergoing a significant transformation, through interactive learning engagements with the intention of impacting the concerned students. As educators strive to meet the diverse needs of 21st-century learners, innovative instructional strategies are being explored to enhance academic achievement and foster a love for learning. One such approach that has garnered significant attention in recent years is gamification – Gamification is the procedure of turning daily activities and environments into games that require creativity, teamwork, and play (Alidas *et al.,* 2023) The concept of gamification in education involves incorporating game elements and design techniques within an educational context (Roszi *et.al.,* 2023). So gamification is an entertaining instructional method that allows for repetition in an environment which is fun to be for the students (Bayat *et al.,* 2014). It is also highlighted that games have always been a tool that draws the attention of many people (Sarı and Altun, 2016). The process of gamification inspires and engages learners in a classroom setting by utilizing game features such as scoring, competition, and accomplishing learning goals (Alidas *et al.,* 2023) as it has emerged as a promising instructional strategy, leveraging the engaging and motivational aspects of

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games to promote deeper learning, increase student participation, and improve academic performance. By incorporating game-like features, such as points, badges, leaderboards, and challenges, educators can create immersive learning environments that simulate real-world scenarios, encourage critical thinking, and develop problem-solving skills. Upper basic education is a critical phase in a student's academic journey, marked by significant cognitive, social, and emotional development. As students transition from elementary to secondary education, they face new challenges, including increased academic rigor, social pressures, and self-discovery. Effective instructional strategies are crucial during this phase to ensure students remain motivated, engaged, and equipped with the skills necessary for success in an ever-evolving world. Education is a dynamic field that must continually evolve to address the needs of students and adapt to shifting societal demands. However, this evolution has been lacking in Nigeria's educational landscape. For instance, many teachers still rely on rote memorization to deliver factual content, which can often feel tedious and unengaging for students. The teaching approach which could also be referred to as expository approach is instruction in which the teacher stands most of the time giving verbal explanations in the form of talk-and-chalk while the students listen and write notes from the chalk-board. The stated expository instructional strategy is not bedeviled with inability to motivate students to learn nor is it able to inculcate problem solving skills in learners (Ibrahim, 2015). In fact, reliance on expository instructional strategy has been identified as one of the leading contributors to low academic performances witnessed in students at various educational levels (Ibrahim, 2015).

Despite the increasing interest in gamification, empirical research is needed to assess its effectiveness in upper basic education. Therefore, this paper aims to evaluate the impact of gamification as a catalyst for improving learning outcomes in upper basic education within Ilorin Metropolis, Kwara State, Nigeria

MATERIALS AND METHODS

Study Area: This study utilized a mixed-methods research design, integrating both quantitative and qualitative approaches, to investigate the target population of Upper Basic Education teachers in Ilorin Metropolis.

Data Collection: A two-stage sampling technique was employed to select participants. Initially, stratified random sampling was used to determine the sample size, ensuring representation from various schools and classes within Ilorin Metropolis. Schools were categorized into strata based on factors like location and school type (public or private), and a random selection of schools was made within each stratum. A total of 100 teachers were purposively selected for the study.

Data Analysis: Data analysis was carried out using statistical software (SPSS) for quantitative data from questionnaires. Descriptive statistics (means, frequencies, percentages and cross tabulations) and inferential statistics (t-test and correlation) were used to analyze quantitative data.

RESULTS AND DISCUSSION

The analyzed results and the discussion of the findings are as follows with descriptive statistics (frequency count and tabulation of percentages) and inferential statistics (t-test of variance) were the method used in analyzing the data. Table 1 shows the respondents' age. The respondents were shown to possess average age of 37.94 and a standard deviation of 5.475 shows that the respondents considerably vary in age between 25 and 55. Also, the respondents were shown to possess average teaching experience of 13.33 and a standard deviation of 6.22 shows that the respondents considerably vary in years of teaching experience between 2 and 29. This show the selected respondents are suitable for the study as they are fair representative sample of the population according to age and teaching experience. Table 2 shows that 55% of the respondents are males while the remaining 45% are females. This shows near equal distribution of the respondents by gender hence suitable for the study. The Table 3 shows that 46% of the respondents were private school, while the remaining 54% were from public school. This shows near equal distribution of the respondents by school type hence suitable for the study.

Table 4 presented shows that in terms of enthusiasm, the teachers were not enthusiastic about using gamification as an instructional strategy in the classroom as higher percentages of them were neutral about their level of enthusiasm for incorporating gamification in class. As pertaining to their perception of gamification's ability to enhance students' engagement and students' learning, gamification was shown to positively enhance students' engagement in the classroom even though higher percentage (72%) believes that the level it only slightly enhances students' engagement which is in agreement with the report of Öztürk (2020) which demonstrated that learning processes enriched by gamification activities contributed to student success. Also, majority (70%) of the teachers believes that gamification is moderately effective in improving students' learning and 14% believe it is highly effective in improving

students' learning. Higher percentages (72%) of the teachers rarely incorporate gamification into their lessons even though, majority (86%) of the teachers were confident of their ability to incorporate gamification teaching strategy into their lessons. As such, the teachers may be inferred as having nonchalant attitude to implementing gamification as an instructional strategy even though they believe it is effective in enhancing students' engagements and improving students' learning. This negates the findings of Amaewhule *et al.,*(2020) which also reported the right perception and ability of teachers to incorporates gamification but highlighted challenges such as relevant approaches, design principles and lack of expertise as the causes.

Table 1: distribution of respondents according to age

	N	Minimum	Maximum	Mean	Std. Deviation
Age	100	25	55	37.94	5.475
teach_exp	100	2	29	13.33	6.222
Valid N (listwise)	100				

Table 2: distribution of respondents according to gender

	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Male	55	55.0	55.0	55.0
Female	45	45.0	45.0	100.0
Total	100	100.0	100.0	

Table 3: distribution of respondents according to school type

	Frequency	Percent	Valid Percent	Cumulative Percent
Private	46	46.0	46.0	46.0
Public	54	54.0	54.0	100.0
Total	100	100.0	100.0	

Table 4*: Reactions of teachers to gamification as an instructional strategy*

ITEM	OPTIONS				
Q1	Very Unenthusiastic	Somewhat Unenthusiastic	Neutral	Somewhat Enthusiastic	Very Enthusiastic
	2%	2%	75%	13%	8%
Q2	Does not enhance at all	Does not enhance	Slightly enhances	Moderately enhances	Significantly enhance
	8%	3%	9%	72%	8%
Q3	Never	Rarely	Sometimes	Often	Always
	11%	65%	3%	9%	12%
Q4	Not effective at all	Not effective	Slightly effective	Moderately effective	Highly effective
	5%	5%	6%	70%	14%
Q5	Not confident at all	Not very confident	Neutral	Confident	Very Confident
	3%	5%	6%	73%	13%

From the analysis in table 5, highest percentages (84%) of the teachers believed that implementing gamification as an instructional strategy was challenging. Only 13% stated believe that implementing gamification as an instructional strategy was not challenging while 3% were neutral about this. This is agrees with the findings of Emin-Martinez and Ney, 2013) which explains the limited adoption of gamification as teachers frequently strive to ensure that game-based learning activities align with their instructional curriculum during lesson planning.

Table 5: Level of Challenge faced in implementing gamification as an instructional strategy

	Frequency	Percent	Valid Percent	Cumulative Percent
Not challenging at all	7	7.0	7.0	7.0
Not very challenging	6	6.0	6.0	13.0
Neutral	3	3.0	3.0	16.0
Challenging	72	72.0	72.0	88.0
Extremely challenging	12	12.0	12.0	100.0
Total	100	100.0	100.0	

Table 6 presented showed that as much as 84% of the teachers believed that implementing gamification as an instructional strategy was challenging while the challenges faced in order of severity included lack of

appropriate technology (93.9%), curriculum alignment issues (93.9%), insufficient training and professional development (89.9%), time constraints (87.9%). Resistance from students (11.1%) was found to be non-challenging at all. As such we would conclude that the teachers found implementing gamification very challenging with such challenges like lack of appropriate technology, curriculum alignment issues, insufficient training and professional development and time constraints which is in agreement with the findings of Molin (2017) which also highlighted Teachers faced challenges such as a lack of time to prepare gameplay sessions, inadequate technical skills, and difficulties in selecting and integrating appropriate games for teaching along with the findings of facilitating student dialogue during game-based learning (GBL) practices, uncertainties about how to integrate GBL into the curriculum, tight class schedules, and the novelty of GBL teaching methods may hinder teachers from adopting this approach (*Chee et al.*, 2014; Jong, 2016). Analysis of table 7 showed that gender does not influence the teachers' perception about gamification's ability to improve student engagement because relatively similar percentages of males and females believe about improvement level gamification had on students' engagement in class. This agreed with the

study of Almusharraf *et al.,* (2023) which also established that gender has no significance with student's engagement. Table 8 presented showed that male and female teachers had relatively similar similar challenges in implementing gamification as Marlissa, Dayana and Fathiyah (2023) asserts that there were no significant gender differences in terms of the difficulties associated with implementing gamification approaches.

H₀1: There is no significance difference between male and female teachers' assessments of gamification as an instructional strategy. Table 9 showed that the male teachers (μ=3.13 on a rating scale of 1 to 5) tend to positively assess gamifcation's effectiveness better compared with the female teachers' (μ=3.08 on a rating scale of 1 to 5). However, there was no significant difference in the male and female teachers' assessments of gamification as an instructional strategy. This is in agreement with the findings Martí-Parreño, Seguí-Mas, and Seguí-Mas (2016), which revealed that the use of gamification remains relatively consistent across different age groups and genders.

H₀2: Gamification does not significantly affect student engagement and learning outcomes in the classroom

Table 6: Challenges faced in implementing gamification as an instructional strategy

		Responses		Percent of Cases
		N	Percent	
$challenges_faced _in_gamification[a]	Lack of appropriate technology	93	24.9%	93.9%
	Insufficient training and professional development	89	23.9%	89.9%
	Time constraints	87	23.3%	87.9%
	Resistance from students	11	2.9%	11.1%
	Curriculum alignment issues	93	24.9%	93.9%
Total		373	100.0%	376.8%

Table 7*: Cross tabulation of Gender and B_Q15 (Where B_Q15 = Perception about gamification's ability to improved student engagement)*

		SEX		Total
		Male	Female	
B_Q15	Made engagement worse	3	0	3
	Has not improved	43	35	78
	Slightly improved	0	2	2
	Moderately improved	4	2	6
	Significantly improved	5	6	11
Total		55	45	100

Table 8*: Challenges faced by male and female teachers in implementing gamification*

ITEMS	GENDER		TOTAL
	MALE	FEMALE	
Lack of appropriate technology	50	43	93
Insufficient training and professional development	47	42	89
Time constraints	50	37	87
Resistance from students	9	2	11
Curriculum alignment issues	51	42	93
TOTAL	54	45	99

Table 9*: Male and female teachers' assessments of gamification as an instructional strategy*

	Sex	N	Mean	Std. Deviation	Test of Sig.
Assessment	Male	55	3.1333	0.64342	0.685
	Female	45	3.0815	0.62424	

Table 10*: Effects of gamification on students' engagement and learning outcomes in the classroom*

	N	Mean	Std. Deviation	Test of Sig.
Students' engagement	100	3.56	1.048	0.00
Learning outcomes	100	3.54	1.105	0.00

In order to test hypothesis 2 (H_02) which states that gamification significantly affect students' engagement and learning outcomes in the classroom, table 10 shows that gamification contributes a factor of 0.56 ($\mu=3.56$ on a rating scale of 1 to 5) on students' engagement levels in class and contribute a factor of 0.54 ($\mu=3.54$ on a rating scale of 1 to 5) to students' learning outcome with both contribution factors been significant ($p < 0.05$). As such, the teachers were shown to believe gamification contribute significantly to students' academic improvement. This is in agreement with Boudad and Gutiérrez-Colón (2020) which stated that gamification become highly appealing to second language teachers, just as there are emphasis on greater benefits on the outcome of gamification especially in the higher education context which improved student attitudes, engagement and performance as reported (Subhash and Cudney, 2018) and positively affect student motivation and behavioral change (de Freitas, 2018).

Conclusion: Based upon the findings of this study, it was concluded that gender does not influence the teachers' perception about gamification's effectiveness as an instructional strategy, male and female teachers had relatively similar challenges in implementing gamification, the challenges faced by teachers in implementing gamification teaching strategy in order of severity include lack of appropriate technology, curriculum alignment issues, insufficient training and professional development, time constraints. Finally gamification contributes significantly to students' academic improvement as gamification increases student engagement and participation in class.

Declaration of Conflict of Interest: The authors declare no conflict of interest

Data Availability Statement: Data are available upon request from the third author (ADIGUN, Joseph Olusegun)

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