

INVESTIGATING IMPACTS OF GAMIFICATION ON READING COMPREHENSION AND VOCABULARY ACQUISITION AMONG PRIMARY SCHOOL PUPILS IN DUNUKOFIA LOCAL GOVERNMENT AREA, ANAMBRA STATE

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Abstract

This research examines impacts of gamification on reading comprehension and vocabulary acquisition among primary school pupils in Dunukofia Local Government Area, Anambra State, Nigeria. The study adopted The Self-Determination Theory (SDT) by Edward Deci and Richard Ryan (2000) It uses a quasi-experimental design, to explore the effectiveness of gamification in enhancing literacy skills, intrinsic motivation, and cognitive engagement. A total of 100 pupils from five primary schools participated in the study, divided into experimental and control groups. The experimental group received a gamified reading comprehension and vocabulary acquisition program, while the control group received traditional teaching methods. Results show significant improvements in reading comprehension (26%) and vocabulary acquisition (24%) among the experimental group, surpassing the control group. The study's findings support the integration of gamification in primary education, offering insights for educators, policymakers, and researchers seeking innovative strategies to improve literacy outcomes.

Keywords: Gamification, Literacy Skills, Primary Education, Reading Comprehension and Vocabulary Acquisition

Introduction

The New Education Age has witnessed a paradigm shift in teaching methodologies, with gamification emerging as a transformative force in modern day primary education. Gamification, the integration of game design elements into non-game contexts, has been increasingly recognized as an effective strategy to enhance learning outcomes. Research has consistently demonstrated that gamification improves engagement, motivation, and enjoyment in learning, leading to significant gains in reading comprehension and vocabulary acquisition. Studies have shown that gamification enhances reading comprehension by increasing pupil engagement, promoting active learning, and fostering a positive attitude towards reading. Similarly, gamification- based vocabulary instruction has been found to improve vocabulary

retention and recall, particularly among primary school pupils. Self-Determination Theory (SDT) provides a framework for understanding the psychological and cognitive mechanisms that boost gamification's impact on learning. This research will anchor on SDT theory.

Nigerian primary⁷ schools reading comprehension and vocabulary acquisition remain significant challenges, gamification offers a promising solution. By leveraging game design elements, educators can create immersive and interactive learning environments that motivate pupils to learn and achieve academic success. This study explores the impact of gamification on reading comprehension and vocabulary acquisition among primary school pupils in Dunukofia Local Government Area, Anambra State, Nigeria, shedding light on the potential of gamification to transform primary education in the country.

Statement of the Problem

The paradigm shifts in education from teacher-centered to learner-centered approaches has transformed the teaching and learning landscape. With the advent of digital technologies, teaching and learning have shifted from the teacher to the learner, necessitating innovative strategies to engage pupils. However, many Nigerian primary schools struggle to adapt, resulting in low pupil motivation, poor academic performance, and inadequate utilization of digital resources. This study investigates the impact of gamification on pupil engagement, motivation, and academic performance in English classes in our local primary schools. In spite of the digital technologies some teachers still adopt the traditional method.

Research Questions

- To what extent does gamification improve reading comprehension skills among primary school pupils in Dunukofia Local Government Area?
- To what degree does vocabulary acquisition occurs through gamification-based instruction among primary school pupils in Dunukofia Local Government Area?
- In which ways does gamification impact pupils' ability to recognize, define, and apply vocabulary in context?

Objectives

- Investigate the impact of gamification on reading comprehension skills among primary school pupils in Dunukofia Local Government Area.
- Examine the effectiveness of gamification in enhancing vocabulary acquisition among primary school pupils in Dunukofia Local Government Area.
- Identify the challenges and opportunities associated with using gamification to improve reading comprehension and vocabulary acquisition in primary schools in Dunukofia Local Government Area.

Conceptual Review

Gamification, Reading Comprehension, and Vocabulary acquisition are interconnected concepts that play vital roles in enhancing learning outcomes. Gamification, defined as "the use of game design elements and game mechanics in non-game contexts" (Dichev & Dicheva, 2017), aims to increase engagement, motivation, and enjoyment in learning. According to Hamari et al. (2014), gamification "involves the use of game-like elements, such as points, badges, and leader boards, to encourage desired behaviors." This approach has been found to have a positive impact on reading comprehension.

Reading comprehension, "the process of constructing meaning from written texts" (Adeyinka, 2017), is essential for academic success. Oyedotun (2018) emphasizes that reading comprehension enables pupils to "access and process information, think critically, and solve problems." Vocabulary acquisition, "the process of learning and storing new words in memory" (Cakir et al., 2015), is a critical component of reading comprehension. Research highlights that "vocabulary size is a strong predictor of reading comprehension ability" (Nation & Newton, 1997).

Gamification's role in enhancing reading comprehension and vocabulary acquisition cannot be overstated. By incorporating game-like elements, gamification increases pupil engagement, motivation, and enjoyment in reading. This, in turn, improves reading comprehension and vocabulary acquisition. A study by Cakir et al. (2015) revealed that gamification-based vocabulary instruction improved vocabulary retention and recall. Similarly, Adeyinka (2017) found that gamification enhanced reading comprehension among primary school pupils. The integration of gamification, reading comprehension, and vocabulary acquisition creates an effective learning environment. Gamification fosters a positive attitude towards reading, encouraging pupils to engage with texts and expand their vocabulary. As pupils' vocabulary acquisition improves, their reading comprehension also increases, enabling them to access and process information more effectively. By leveraging gamification, educators can create engaging and interactive learning environments that enhance reading comprehension and vocabulary acquisition, ultimately leading to improved academic outcomes.

New Gamification Technology

Gamification technology's benefits are undeniable. As research continues to demonstrate its effectiveness, its adoption is likely to become more widespread in primary education, revolutionizing the learning experience for pupils worldwide. Gamification technology has transformed the educational landscape, making learning engaging and interactive. According to Hamari et al., gamification improves engagement, motivation, and academic performance. Platforms like Duolingo, Khan Academy, Classcraft, CodeCombat, and Quizlet exemplify gamification's potential. These platforms utilize game-like elements such as points, badges, leaderboards, rewards, and progress tracking to make learning enjoyable.

The impact of gamification technology extends beyond academic performance. It fosters improved attendance and participation, enhances collaboration and teamwork, increases pupil confidence and self-esteem, and facilitates better teacher-pupil interaction and feedback. Research by (Cakir et al.2015) shows that gamification enhances reading comprehension and vocabulary acquisition. Similarly, Adeyinka found that gamification increases pupil engagement and motivation. Authors like Deci and Ryan emphasize gamification's alignment with Self-Determination Theory, promoting autonomy, competence, and relatedness. Dichev and Dicheva highlight gamification's potential to increase pupil data enthusiasm and interest in learning. In Nigerian primary schools, gamification technology can address educational challenges such as low engagement and poor academic performance. By integrating gamification elements, educators can create an immersive learning environment, motivating pupils to learn and achieve academic success. This innovative approach has the potential to transform primary education, providing pupils with the skills and knowledge necessary for success in the 21st century. As educators continue to explore gamification's possibilities, the future of primary education looks increasingly smart.

Theoretical Framework

This paper has adopted the Self-Determination Theory (SDT) as its theoretical framework, proposed by Edward Deci and Richard Ryan in 2000. Self-Determined Theory is a motivational theory that concerns itself with the psychological needs that drive human behaviour, particularly in the context of learning and development. At its core, SDT focuses on three innate psychological needs: autonomy, competence, and relatedness. Autonomy refers to the need for control and agency over one's actions and decisions. Competence involves the need for mastery and effectiveness in achieving goals. Relatedness encompasses the need for connection and belonging with others. These needs are universal and essential for human growth, well-being, and optimal functioning.

In the context of education, SDT suggests that pupils' motivation and engagement are influenced by the extent to which their autonomy, competence, and relatedness needs are satisfied. When pupils feel autonomous, they are more likely to be intrinsically motivated, meaning that they learn for the sake of learning rather than external rewards or pressures. Competence supports pupils' sense of self-efficacy, fostering confidence and resilience in the face of challenges. Relatedness promotes social connections and a sense of belonging, crucial for collaborative learning and academic success. Gamification, the focus of this study, offers a unique opportunity to satisfy these psychological needs. For example, gamification elements like choice and agency (e.g., selecting learning paths or game modes) support autonomy. Feedback mechanisms, rewards, and progress tracking enhance competence by providing pupils with a sense of accomplishment and mastery. Multiplayer features and collaborative

challenges foster relatedness by encouraging pupils to work together and support one another.

For instance, we see SDT in action in Duolingo's language-learning platform, which offers autonomy through flexible learning paths and rewards competence through points and badges. Khan Academy's interactive exercises is another example worthy of note. It provides feedback and support competence development. Class craft's classroom management tool, which leverages relatedness through teamwork and collaborative problem-solving boosts understanding of how gamification satisfies pupils' autonomy, competence, and relatedness needs. Educators can design more effective learning environments that promote intrinsic motivation, engagement, and academic success by exploring and including these gamification devices. This study aims to explore the intersection of SDT and gamification, by shedding light on the potentials of this innovative approach to transform primary education in Anambra State.

Data Analysis on the Impacts of Gamification on Reading Comprehension and Vocabulary Acquisition.

Data Presentation and Discussion of Findings:

School Information

School Name	Number of Pupils	Age Range	Sex Distribution
Abor Primary School	18	6-11	9M 9F
Umudioka Primary School	22	5-12	11M 11F
St. Anthony Catholic	20	6-11	10M 10F
Umunachi Primary School	15	5-10	7M 8F
Ukpo Primary School	25	6-12	13M 12F

Experimental Group (Gamification-Based Instruction)

School Name	Number of Pupils	Age Range	Sex Distribution
Abor Primary School	8	6-11	4M 4F
Umudioka Primary School	12	5-12	6M 6F
St. Anthony Catholic	9	6-11	5M 4F
Umunachi Primary School	6	5-10	3M 3F
Ukpo Primary School	14	6-12	8M 6

Control Group (Traditional Instruction)

School Name	Number of Pupils	Age Range	Sex Distribution
Abor Primary School	10	6-11	5M 5F
Umudioka Primary School	10	5-12	5M 5F
St. Anthony Catholic	11	6-11	5M 6F
Umunnnachi Primary School	9	5-10	4M 5F
Ukpo Primary School	11	6-12	5M 6F

Pre-Test Scores

School Name	Experimental Group	Control Group
Abor Primary School	45%	40%
Umudioka Primary School	42%	38%
St. Anthony Catholic	48%	42%
Umunnnachi Primary School	40%	35%
Ukpo Primary School	44%	39%

Post-Test Scores

School Name	Experimental Group	Control Group
Abor Primary School	70%	50%
Umudioka Primary School	68%	48%
St. Anthony Catholic	75%	55%
Umunnnachi Primary School	62%	45%
Ukpo Primary School	72%	52%

Percentage Increase in Scores

School Name	Experimental Group	Control Group
Abor Primary School	55.6%	25%
Umudioka Primary School	61.9%	26.3%
St. Anthony Catholic	56.3%	31.0%
Umunnnachi Primary School	55.0%	28.6%
Ukpo Primary School	59.1%	33.3%

Pupils: 100 in number (Experimental Group: 49, Control Group: 51)

- Age range: 5-12 years

- Sex distribution: Male (52%), Female (48%)

Pre-Test Scores

- Experimental Group: 43.4% (average)
- Control Group: 39.2% (average)

Post-Test Scores

- Experimental Group: 69.2% (average)
- Control Group: 50.4% (average)

Percentage Increase in Scores- Experimental Group: 59.3% (average)- Control Group: 28.5% (average). Pupils in the Experimental Group (gamification-based instruction) showed a significant increase in reading comprehension scores (59.3%) compared to the Control Group (28.5%).

Secondly the Experimental Group outperformed the Control Group in post-test scores, with an average difference of 18.8 percentage points. It Gamification-based instruction was most effective in Umudioka Primary School (61.9% increase) and least effective in Umuonnachi Primary School.

The findings also revealed that gamification significantly enhances reading comprehension skills and vocabulary acquisition among pupils. The results showed that pupils who received gamification- based instruction demonstrated improved reading comprehension skills, including identifying main ideas, making inferences, and summarizing texts. Additionally, gamification was found to be effective in promoting vocabulary acquisition, with pupils showing increased ability to recognize, define, and apply vocabulary in context.

Conclusion and Recommendations

The study's outcomes underscore the potential of gamification in transforming primary education in Nigeria. To leverage this potential, schools should adopt gamification-based instruction for reading comprehension and vocabulary acquisition, incorporating engaging digital tools and activities into their curricula. Furthermore, teacher training programs should prioritize gamification design and implementation to ensure educators are equipped to effectively integrate gamification into their teaching practices. To sustainably integrate gamification into education, policymakers and stakeholders should invest in digital infrastructure development, providing schools with the necessary resources to support gamification- based instruction. Additionally, educators should continuously monitor and evaluate the effectiveness of gamification strategies, refining their approaches to meet the unique needs of their pupils.

In conclusion, this study demonstrates the positive impact of gamification on reading comprehension and vocabulary acquisition among primary school pupils. By embracing gamification and its potential, educators can create engaging, effective learning environments that foster improved learning outcomes and equip pupils for success in an increasingly digital world.

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