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## Effect of Digital Games on Achievement in English Language Vocabulary among Junior Secondary School Students in Lokoja Education Zone of Kogi State

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### Abstract

*This study investigated the effect of digital games on achievement in English language vocabulary among junior secondary school students in Lokoja education zone of Kogi State. A single research question and a corresponding hypothesis guided the research. The study employed a quasi-experimental design. The total population for the study consisted of 2,170 JSS3 students in Lokoja education zone. Through a multistage sampling technique, 174 students were selected to participate. The English Achievement Test (EAT), specifically designed to assess vocabulary knowledge at the JSS3 level, served as the primary instrument for data collection. Data analysis involved the use of Analysis of Covariance (ANCOVA) at a 0.05 level of significance to examine differences in mean achievement scores between groups. Findings revealed that students taught using digital games significantly outperformed those taught through conventional methods. These findings provide compelling evidence supporting the integration of digital games into English language teaching to boost student engagement and learning outcomes.*

**Keywords:** English in Nigeria, Digital games, English Vocabulary, Achievement, Students' traditional method of teaching

### Introduction

The advent of digital games has significantly transformed the landscape of education, introducing new and engaging ways for students to learn and acquire skills. In junior secondary education, where students are at a crucial stage of cognitive development, digital games have become an innovative tool for enhancing academic achievement, particularly in English vocabulary acquisition (Bolton, 2020). These games offer interactive and captivating platforms that make learning enjoyable and motivating. As English vocabulary plays a vital role in academic success across subjects, educators and researchers are increasingly exploring the integration of digital games into the curriculum as a promising method for vocabulary development (Achebe, 2024). The combination of fun and learning through technology fosters greater engagement and retention among students, positioning digital games as a valuable pedagogical tool. English vocabulary, the cornerstone of effective communication and language proficiency, holds a pivotal role in shaping students' academic, professional, and social success. A rich vocabulary enhances linguistic fluency, cognitive development, and critical thinking, thereby supporting students' overall academic achievement (Garba, 2022). Traditional vocabulary teaching methods, such as rote memorization, often yield short-term results without fostering deep understanding (Alubaleze, 2022). In contrast, contextual and interactive approaches, including cooperative learning and technology-based activities, encourage meaningful learning experiences and improve retention (Dewey, 2022). Digital games, in particular, provide a multisensory and interactive environment where students encounter words repeatedly in engaging contexts, promoting long-term vocabulary mastery and application (Ivgin & Akcay, 2024). Academic achievement, a key indicator of students' educational success, encompasses not only grades and test scores but also the development of knowledge, skills, and critical thinking abilities (Omoruyi & Omofonmuan, 2024). The use of digital games in vocabulary instruction enhances these dimensions by motivating learners through feedback, rewards, and goal-oriented challenges (Ezeugo, 2024). By transforming vocabulary learning into an engaging and interactive experience, digital games contribute to enhanced



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comprehension, creativity, and problem-solving skills. This dynamic approach aligns with modern educational goals that emphasize holistic development and lifelong learning (Okafor, 2022). Ultimately, integrating digital games into English vocabulary instruction in junior secondary schools has the potential to boost academic achievement, foster engagement, and prepare learners for success in the digital age.

### **Statement of the Problem**

In contemporary education, there's a growing concern over the underperformance of junior secondary school students in English vocabulary acquisition. This issue is further compounded by the widespread use of traditional teaching methods that fail to engage students effectively. Reviews on digital games as an educational tool reveal a stark contrast in engagement and learning outcomes compared to conventional methods. One of the primary reasons behind the poor performance of junior secondary school students in English vocabulary is the ineffective teaching methods employed in many educational institutions. Traditional approaches often rely heavily on rote memorization and passive learning, which fail to stimulate students' interest or cater to diverse learning styles. As a result, students struggle to retain and apply English vocabulary effectively, leading to lower academic achievement and disengagement from the learning process. This highlights the urgent need to explore alternative teaching strategies that can foster active engagement and deeper understanding among students. Therefore, the problem of this study is stated in question form: What is the effect of digital games on junior secondary school students' achievement in English vocabulary learning in English?

### **Objective of the study**

The study aims to examine the effect of digital games on junior secondary school students' achievement in English vocabulary in Lokoja educational zone. Specifically, the study is set to: i. Determine the mean achievement scores of students taught English vocabulary with digital games and those taught with the conventional method.

### **Research Question**

The following research question guides the study:

- i. What is the mean achievement scores of students taught English vocabulary using digital games, and students taught using the conventional method?

### **Research Hypothesis**

The following null hypothesis was tested at 0 .05 level of significance.

H<sub>01</sub>: There is no significant difference in the mean achievement scores of students taught English vocabulary using digital games and those taught using the conventional method

### **Literature Review**

#### **English Vocabulary**

English vocabulary is a cornerstone of language proficiency, serving as the building blocks for effective communication, comprehension, and academic achievement. From decoding written text to expressing ideas orally, a robust English vocabulary is essential for navigating the complexities of language across various domains (Mada, 2022). However, the acquisition and mastery of English vocabulary present significant challenges for learners, particularly in educational settings where traditional teaching methods may fall short in engaging students and fostering deep understanding. The stage for exploring the concept of English vocabulary and its critical role in language development, as well as the challenges and opportunities associated with its acquisition in educational contexts (Okafor, 2022). English vocabulary encompasses the words and phrases that individuals use to communicate and express meaning in a language. It encompasses not only the breadth of words a person knows but also their understanding of word meanings, nuances, and usage in different contexts. Okereke (2020) English vocabulary is not static but rather dynamic and evolving, shaped by experiences, interactions, and exposure to diverse language inputs. As such, developing a rich and varied English vocabulary is a lifelong process that begins in early childhood and continues to evolve throughout one's lifespan. In educational settings, English vocabulary plays a central role in academic success across various subjects, from reading and writing to mathematics and science (Chen, Tseng & Hsiao, 2018).



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A strong English vocabulary not only facilitates comprehension and expression but also enhances critical thinking skills, creativity, and problem-solving abilities. However, the acquisition of English vocabulary presents unique challenges for learners, including the sheer volume of words to be learned, the complexity of word meanings and usage, and the need for repeated exposure and practice to internalize new words effectively (Opara, 2024). Traditional approaches to English vocabulary instruction often rely on rote memorization, dictionary definitions, and isolated word lists, which may yield limited results in terms of long-term retention and application (Sleigh, 2022). Moreover, Okoye (2022) these methods may fail to engage students effectively or cater to diverse learning styles and preferences. In contrast, innovative approaches to English vocabulary instruction, such as interactive and experiential learning activities, digital games, and contextualized word usage, offer promising avenues for enhancing English vocabulary acquisition and fostering deeper understanding among learners (Chu & Hung, 2015). By embracing a holistic and dynamic approach to English vocabulary development, educators can empower students to become confident and proficient users of language, equipped with the linguistic skills necessary for success in academic and real-world contexts.

### **Digital Games and Academic Achievement**

Digital games, once relegated to the realm of entertainment, have emerged as potential tools for enhancing academic achievement (Okeke-Okosisi, 2023). This paradigm shift stems from the recognition of the cognitive, social, and motivational benefits inherent in gaming experiences. While traditional educational approaches often emphasize rote memorization and passive learning, digital games offer interactive and engaging environments that can stimulate critical thinking, problem-solving skills, and content mastery. Audu (2022), the heart of this intersection lies in the concept of gamification, wherein game elements and mechanics are integrated into non-game contexts, including educational settings. By leveraging the inherent appeal of games, educators can create immersive learning experiences that captivate students' attention and foster deeper engagement with academic content. Winsberg (2023) digital games offer numerous opportunities to scaffold learning experiences across various subjects and disciplines. For instance, educational games can simulate real-world scenarios, allowing students to apply theoretical concepts in practical contexts. Through simulation and role-playing mechanics, students can experiment, make decisions, and observe the consequences of their actions, thereby promoting experiential learning and knowledge retention (Achebe, 2024). Furthermore, Bolton (2020) digital games often feature adaptive difficulty levels and personalized feedback mechanisms, enabling educators to tailor instruction to individual students' needs and learning styles. This adaptive approach promotes differentiated instruction and allows students to progress at their own pace, mitigating the challenges associated with one-size-fits-all teaching methods. Moreover, Akaneme (2022), digital games have the potential to foster collaboration, communication, and teamwork skills among students through multiplayer and cooperative gameplay modes. By working together to achieve common goals, students learn to communicate effectively, resolve conflicts, and collaborate with peers, a crucial aspect of 21st-century skills development (Dogru & Kaleder, 2024). Importantly, research suggests that well-designed educational games can yield positive outcomes in terms of academic achievement. Studies have shown that students who engage with educational games demonstrate improved motivation, higher levels of engagement, and better academic performance compared to those who rely solely on traditional instructional methods (Ezeugo, 2024). However, Ejide (2022), it is essential to recognize that the effective integration of digital games into educational contexts requires careful planning, thoughtful design, and ongoing evaluation. Educators must consider factors such as game selection, alignment with curriculum standards, assessment strategies, and equitable access to technology to maximize the educational benefits of gaming experiences. Ibekwe (2024), digital games have the potential to enhance academic achievement by providing engaging, interactive, and personalized learning experiences. Kirschner, Sweller, and Clark (2022), leveraging the intrinsic appeal of games, educators can create dynamic learning environments that foster critical thinking,



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collaboration, and content mastery. Through thoughtful integration and pedagogical support, digital games can play a valuable role in promoting student success and advancing educational outcomes in the 21st century.

### Methodology

The design of this study is quasi-experimental. Specifically, it involves a pre-test post-test control group design comprising four groups, with two groups serving as the experimental groups and the other two groups functioning as the control groups. This design was adopted because the students who were used for the experiment were intact classes. Randomization would disrupt the existing structure of the school, thus posing some administrative problems. The population of the study consists of all 2,170 junior secondary school class three (JSS II) students enrolled in schools in Lokoja metropolis, drawn from various public and private schools. This diverse demographic includes students with different socio-economic backgrounds, academic abilities, and cultural identities. It encompasses varying levels of English language vocabulary, including those who are proficient, struggling, or at risk of academic underachievement. By employing a multistage sampling technique that combines random selection with stratification, a sample size of 174 students was selected, both representative of the population and capable of providing valuable insights into the impact of digital games on English language achievement among junior secondary school students in Lokoja education zone. The English Achievement Test (EAT) in English vocabulary serves as a crucial instrument for evaluating students' proficiency and comprehension of English vocabulary within the junior secondary school (JSS) curriculum, specifically tailored for JSS II level learners. With its primary focus on assessing English vocabulary mastery, the EAT aimed to provide educators with valuable insights into students' linguistic competencies and areas for improvement. Structured to encompass 30 item questions, the EAT was meticulously designed to cover a diverse range of English vocabulary concepts and applications pertinent to the JSS II curriculum. The reliability of the instruments was determined using the Kuder-Richardson formula 20. The reliability coefficient was based on this formula, which is adopted to assess the reliability coefficient because it is primarily applicable to tests that are dichotomously scored. The reliability assessment was conducted outside the scope of the study. Data collected from the study were analyzed quantitatively. The research questions were answered using mean and standard deviation. The hypothesis was tested using Analysis of Covariance (ANCOVA) at a 0.05 level of significance.

### Presentation of Results

**Research Question 1:** What is the Mean Achievement Scores of Students taught English Vocabulary using Digital Games and Students taught using the Conventional Method?

**Table 1: Descriptive Statistics Associated with Treatment (Digital games Method and Conventional Method)**

| Groups        | No of students | Pre-test        | Post-Test       | Mean Score | gain |      |
|---------------|----------------|-----------------|-----------------|------------|------|------|
|               |                | SD <sub>1</sub> | SD <sub>2</sub> |            |      |      |
|               |                | $\bar{X}_1$     | $\bar{X}_2$     |            |      |      |
| Experimental  | 74             | 31.0            | 11.9            | 72.5       | 16.0 | 41.5 |
| Control group | 100            | 27.5            | 11.4            | 54.0       | 12.4 | 26.5 |

Based on the descriptive statistics provided in Table 1 for the experimental (digital games method) and control (conventional method) groups, several key observations can be made. The mean pre-test score for the experimental group was 31.0 with a standard deviation (SD1) of 11.9, while for the control group, it was 27.5 with SD2 of 11.4, indicating that the groups started with somewhat comparable initial achievement levels.



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After the intervention, the experimental group's mean post-test score was notably higher at 72.5 (SD1 = 16.0) compared to the control group's mean post-test score of 54.0 (SD2 = 12.4). This suggests that students taught English vocabulary using digital games achieved higher post-test scores on average than those taught using conventional methods. Also, the mean gain score (difference between post-test and pre-test scores) was substantially larger for the experimental group (41.5) compared to the control group (26.5), implying that the digital games method led to greater improvements in English vocabulary achievement scores compared to the conventional method. These findings suggest a potential benefit of using digital games in teaching English vocabulary, as evidenced by higher post-test scores and greater gains in achievement compared to traditional teaching methods.

### Test of Hypothesis

**Hypothesis One:** There is no significant difference in the mean achievement scores of students taught English vocabulary using digital games and those taught using the conventional method.

**Table 2: ANCOVA of Post-Test Achievement Scores of Students by Treatment (Digital games and Conventional Method)**

| Dependent Variable: personnel |                          |     |             |         |      |                     |
|-------------------------------|--------------------------|-----|-------------|---------|------|---------------------|
| Source                        | Type III Sum of Squares  | Df  | Mean Square | F       | Sig. | Partial Eta Squared |
| Corrected Model               | 1109142.381 <sup>a</sup> | 2   | 529571.172  | 425.126 | .000 | .861                |
| Intercept                     | 202276.397               | 1   | 290476.397  | 326.551 | .000 | .574                |
| Achievement                   | 10210.381                | 1   | 10566.381   | 8.429   | .005 | .040                |
| Teaching method               | 908822.102               | 1   | 836722.102  | 728.294 | .000 | .821                |
| Error                         | 232337.619               | 172 | 1339.674    |         |      |                     |
| Total                         | 4535216.000              | 174 |             |         |      |                     |
| Corrected Total               | 1398080.000              | 173 |             |         |      |                     |

a. R Squared = .855 (Adjusted R Squared = .852)

The ANCOVA results presented in Table 3 indicate several important findings regarding the hypothesis that there is no significant difference in the mean achievement scores of students taught English vocabulary using digital games versus conventional methods. The Corrected Model sums of squares (1109142.381) and the F-statistic (425.126) are both highly significant with a p-value of .000, suggesting that there is a significant overall difference in post-test achievement scores between the groups taught with digital games and those taught with conventional methods. Looking further into the breakdown of sources of variation, the partial eta squared values provide insight into the effect size of each factor. The teaching method (digital games vs. conventional) contributes significantly to the model (partial eta squared = .821), indicating that it explains a substantial amount of the variation in post-test achievement scores. This suggests that the choice of teaching method has a strong influence on students' English vocabulary achievement outcomes. Also, the Intercept and Achievement variables show significant effects on post-test scores, although to a lesser extent compared to the teaching method. The intercept's significant contribution (partial eta squared = .574) indicates the baseline differences in achievement scores across both groups before any intervention. Meanwhile, the Achievement variable's partial eta squared value of .040 suggests that differences in pre-test scores also modestly contribute to the variation in post-test scores. The ANCOVA results strongly reject the hypothesis of no significant difference in mean achievement scores between students taught English vocabulary using digital games and those taught using conventional methods. The substantial effect size of the teaching method indicates that using digital games leads to significantly higher post-test achievement scores compared to conventional



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methods. This finding underscores the effectiveness of digital games as an instructional tool for enhancing English vocabulary learning outcomes among students.

### **Discussion of Findings**

The evidence from the study showed a significant overall difference in post-test achievement scores between students taught English vocabulary using digital games and those taught using conventional methods. The findings are in line with Okereke's (2020) findings showed that the experimental group expressed a higher level of interest in learning the English language vocabulary than the control group. The researcher focused on the use of digital games on students' achievement and interest in the English language, and not on the use of digital games. Also, OkekeOkosisi's (2022) result revealed that digital games were more effective in facilitating students' achievement in English vocabulary. The findings showed that there was a significant difference between the mean achievement scores of Agricultural Science students taught with digital games and those taught with the traditional model.

### **Conclusions**

Based on the findings, the study concludes that the findings provide strong support for the integration of digital games into educational practices to enhance English vocabulary learning outcomes among junior secondary school students. The evidence suggests that digital games not only improve overall achievement but also cater to diverse learning needs influenced by factors such as school type. Moving forward, educators and policymakers can leverage these insights to design more effective and inclusive educational strategies that harness the potential of technology to foster student engagement and academic success.

### **Recommendations**

Based on the findings of this study, the following recommendations were made:

1. Educational institutions should consider integrating digital games into their curriculum for teaching English vocabulary, given their demonstrated effectiveness in improving post-test scores and enhancing learning outcomes. Teachers should receive training and support to effectively incorporate digital games into their lessons, ensuring they align with curriculum objectives and cater to diverse student needs.
2. Policymakers and school administrators should ensure equitable access to digital technologies across all types of schools (public and private). Efforts should be made to bridge the digital divide and provide necessary resources to maximize the benefits of digital games for all students, regardless of their socioeconomic background or school type.

### **References**

- Achebe, O. (2024). Enhancing a good religious education in secondary schools for improving the moral quality of our society. *A paper presented at the seminar held at All Hallows Seminary, Onitsha, Nigeria.*
- Akaneme, I. N. (2022). Effect of cognitive restructuring intervention programme on the Achievement orientation of schooling adolescents in Aguata Education Zone. Unpublished Ph.D. Thesis.
- Alubaleze, R. I. (2022). Modern strategy for teaching of English Education in school: *A paper presented at the seminar held at St. Charles College, Onitsha, Oct. 9 2022.*
- Audu, A. (2022). 'A philosophy of education for Nigerian women problems and prospects'. *The African Symposium* 4(1), 12-30.
- Bolton, G. (2020). *Reflective practice writing and professional development (3rded)* .California:
- Chen, M. H., Tseng, W. T., & Hsiao, T. Y. (2018). The effectiveness of digital game-based vocabulary learning: A framework-based view of meta-analysis. *British Journal of Educational Technology*, 49(1), 69–77.



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Chu, H.-C., & Hung, C.-M. (2015). Effects of the Digital Game-Development Approach on Elementary School Students' Learning Motivation, Problem Solving, and Learning Achievement. *International Journal of Distance Education Technologies*, 13(1), 87–102

Dewey, J. (2022). *Experience and education*. New York: Horace Lovright.

Dogru & Kaleder (2024). Constructivism in Science and Mathematics Education. (<http://wwwcsi.unian.it/educa/inglese/matthews.html>).

Ejide, B. (2022). *Effective teaching through students' learning styles*. Enugu, Nigeria: Snaap Press Ltd.

Ezeugo, L. B. (2024). A survey on the problem of continuous assessment in junior secondary schools in Orlu educational Zone. Unpublished project. *Nwafor Orizu College of Education, Nsugbe*.

Garba, E. (2022). *Creativity and simulation in a learning environment*. Lagos, Nigeria: University Press.

Ibekwe, A. E. (2024). Effect of digital games and lecture method of teaching on the performance of students in Literature in English in secondary schools. *A project report presented to College of Education Imo State University*

Ivgin, A.B. & Akcay, H. (2024) The impact of using educational and digital games on middle school students' science achievement. *International Journal of Technology in Education (IJTE)*, 7(3), 386-416.

Kirschner, P. A, Sweller, J, and Clark, R. E. (2022). Why minimal guidance during instruction does not work: an analysis of failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychology* 41 (2) 75-86.

Okafor, J.E. (2022). Assessment of teachers' competence for primary school mathematics.

Okeke-Okosisi, J. O. (2021). 'Effect of digital games on students' achievement in English vocabulary in Agricultural Science'. A project paper presented to the School of Education National Open University, Abagana Study Centre-Awka.

Okoye, N. (2022). A psychological look at religion and the adolescent period. *Journal of creativity: The spring board of development*. The Focus 9IISSN: 0189-6407. Awka: Pope John Paul 11 seminary Publication.

Omoruyi, J. & Omofonmuan, R.A. (2024). Women's education in Nigeria: Problems, prospects and its effects on national development. *The Nigerian Academic Forum* 9(3). SAGE Publications.

Sleigh, C. (2022). "Using role play as a way into the history of science, discourse learning and teaching in philosophical and religious studies 3(2): 131-141. Retrieved from <http://alh.sagepub.com/cgi/content/abstract/7/3/227>.

Winsberg, E. (2023). Simulation experiment: Methodology for a virtual world. Retrieved from <http://www.cas.usf.edu/~ewinsb/methodology.pdf>. *Philosophy of Science* 70:105-125.