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Does Augmented Reality Strategy (ARS) Outperform Lecture Method (LM) in Teaching Goodwill Account?

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ABSTRACT

This study investigates whether the use of Augmented Reality Strategy (ARS) leads to better academic achievement in goodwill account compared to the traditional Lecture Method (LM). Guided by one research question and its corresponding null hypothesis, the study employed a quasi-experimental design with pretest-posttest experimental and control group arrangement. The sample consisted of Senior Secondary School II students from Lagos State, Nigeria, who were taught using either ARS or LM. Achievement scores were measured using Partnership and Goodwill Account Achievement Test (PGAAT). Analysis of covariance (ANCOVA) revealed a statistically significant difference in favor of ARS, with the instructional strategy accounting for approximately 41.9% of the variance in student achievement. These findings suggest that ARS significantly enhances students' understanding and retention of complex accounting concepts compared to traditional lecture-based instruction. This study contributes to the growing body of evidence supporting the integration of immersive technologies in financial accounting education and provides insights for educators and curriculum planners seeking innovative teaching approaches.

Keywords: Academic Achievement, Augmented Reality Strategy, Financial Accounting, Lecture Method, Goodwill Account, Technology-Enhanced Learning.

Background of the Study

The traditional Lecture Method (LM), which dominates many Nigerian secondary school classrooms, has long been criticized for promoting passive learning and rote memorization rather than deep conceptual understanding (Damodharan & Rengarajan, 2016). This is particularly evident in the teaching of abstract concepts like goodwill valuation in financial accounting, where students often struggle to grasp theoretical principles and apply them in practical contexts (Adedokun-Shittu et al., 2020). The reliance on LM has led to consistently poor student performance in areas such as partnership and goodwill account, especially during standardized examinations like WASSCE (Ogunu, 2015).

In contrast, emerging technologies offer promising alternatives. Augmented Reality Strategy (ARS), an immersive and interactive instructional method, has shown potential in transforming how complex topics are taught by providing learners with visual, contextual, and dynamic representations of abstract ideas (Ziden et al., 2022). ARS enables students to engage with 3D models and simulations that enhance comprehension, memory retention, and problem-solving skills—critical competencies for mastering financial accounting concepts (Belda-Medina & Calvo-Ferrer, 2022). Unlike conventional 2D teaching materials, ARS allows students to manipulate virtual objects and explore multiple perspectives, making it particularly effective for visualizing intricate financial transactions.

Given the increasing technological readiness of students and the urgent need for innovative pedagogical approaches in Nigerian schools, this study explores whether ARS significantly enhances student achievement

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in goodwill account compared to the traditional lecture method. It aligns with global calls for education reform that prioritize learner-centered, technology-enhanced strategies capable of improving both knowledge acquisition and application in real-world settings (Akçayir & Akçayir, 2017).

Statement of the Problem

The traditional Lecture Method (LM), which remains widely used in teaching Financial Accounting in Nigerian secondary schools, has been found to be ineffective in promoting deep understanding of abstract concepts such as goodwill valuation (Dima & Obunadike, 2017). Students taught using this method often struggle to apply theoretical knowledge to real-life financial situations, resulting in poor academic performance (Ogunu, 2015). This problem is further exacerbated by the passive learning environment created by LM, which limits student engagement and conceptual mastery. There is a growing need for innovative instructional strategies that can enhance comprehension and retention of complex accounting topics. Augmented Reality Strategy (ARS) offers an immersive and interactive alternative that may bridge this gap. However, empirical evidence comparing the effectiveness of ARS and LM in teaching goodwill account remains limited in the Nigerian educational context.

Research Question

Would there be any difference in the mean achievement scores of students taught partnership and goodwill account using ARS and LM?

Research Hypothesis

There would be no statistically significant difference in the mean achievement scores of students taught partnership and goodwill account using ARS and LM.

METHODOLOGY

Design

The study adopted an explanatory sequential mixed-methods design, integrating quantitative and qualitative approaches. The quantitative phase utilized a quasi-experimental method with pre-tests and post-tests for experimental (ARS) and control (LM) groups. The qualitative phase involved in-depth interviews to contextualize quantitative findings, incorporating three independent variables: Teaching Method (ARS vs. LM) and Gender (male vs. female) with dependent variables being academic performance.

Population and Sampling

The target population comprised Senior Secondary School II (SSII) students offering Financial Accounting in Education District V, Lagos State. Two schools, Gaskiya Senior College (control, n=76) and Ajeromi Ifelodun Senior High School (experimental, n=41), were purposively selected from four zones (Ajeromi-Ifelodun, Amuwo-Odofin, Badagry, Ojo). Intact classes were used to ensure robust data, with geographical separation minimizing intergroup contact.

Instruments

Three instruments were developed:

Partnership and Goodwill Account Achievement Test (PGAAT): 40 multiple-choice items from past WASSCE questions, assessing academic performance.

Accounting Student Technology Proficiency Questionnaire (ASTPQ): Assessed technology proficiency, with scores categorized as high (≥60), average (40–59), or low (<40).

Students' Perception of ARS Interview Guide: Captured qualitative insights on ARS experiences.

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Instrument Validation and Reliability

All instruments underwent rigorous validation for construct, content, and face validity through peer reviews, supervisor evaluations, and pilot testing. Reliability was established as follows:

PGAAT: Guttman Split-Half Coefficient of 0.793.

ASTPQ: Cronbach's alpha of 0.82.

ARS Interview Guide: Cohen's Kappa of 0.82 for inter-rater reliability.

Procedures and Analysis

Data collection spanned eight weeks. Permissions were secured from schools, and research assistants were trained over five days to implement ARS (experimental) and LM (control). The experimental group accessed AR content via mobile devices and the accosmart website, with real-time support through social media. Pre-tests and post-tests (PGAAT and ASTPQ) were administered to both groups, with the experimental group using online tests and the control group using paper-based tests. Qualitative interviews were conducted with 10 experimental group students (5 male, 5 female) in week eight.

Quantitative data were analyzed using descriptive statistics and Analysis of Covariance (ANCOVA) in SPSS Version 23, controlling for covariates like technology proficiency. Parametric assumptions (normality, homogeneity, linearity) were verified. Qualitative data underwent thematic analysis to derive insights from interviews. Null hypotheses were tested at a 0.05 significance level.

RESULT

Research Question

Would there be any difference in the mean achievement scores of students taught partnership and goodwill account using ARS and LM?

Table 1: Descriptive Statistics of Posttest Achievement Scores of Students in Experimental and Control Groups

Group	Mean	Std. Deviation	N
Experimental	26.4634	7.26670	41
Control	11.5132	3.66058	76
Total	16.7521	8.84240	117

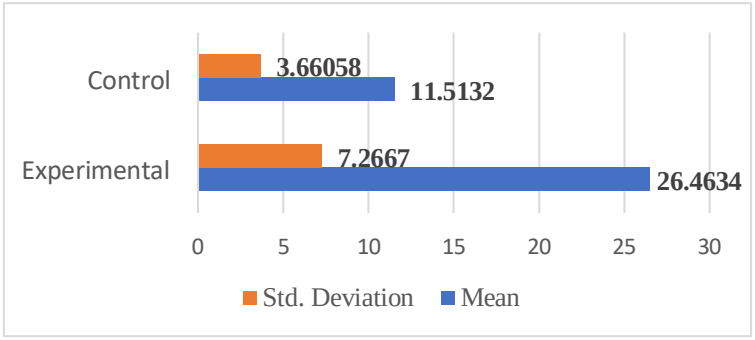

Figure 1: Means and SD of Posttest Achievement Scores of Students in Experimental and Control Groups

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The experimental group (taught with ARS) scored a mean of 26.46, which is considerably higher than the control group (taught with Lecture Method), which scored a mean of 11.51. The standard deviation for the experimental group is 7.27, indicating some variability in scores, while the control group's standard deviation is lower (3.66), suggesting more consistency in their (lower) performance. The difference in means between the two groups is 14.95, which is substantial. The results suggest that students who were taught partnership and goodwill account using the ARS method performed significantly better, on average, than those taught using the traditional Lecture Method (LM). This implies that the ARS strategy may be more effective in facilitating achievement, attitude, and information literacy of partnership and goodwill account concepts.

Research Hypothesis

There would be no statistically significant difference in the mean achievement scores of students taught partnership and goodwill account using ARS and LM.

Table 2: Analysis of Covariance on the Achievement Scores with Pretest Achievement Scores as Covariate

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	6770.244[a]	2	3385.122	167.816	.000	.746
Intercept	946.146	1	946.146	46.905	.000	.292
Pretest Achievement	817.614	1	817.614	40.533	.000	.262
Group	1656.489	1	1656.489	82.120	.000	.419
Error	2299.568	114	20.172			
Total	41904.000	117				

Table 2 presents the results of the Analysis of Covariance (ANCOVA) conducted to test the effect of instructional strategy (ARS vs. LM) on students' achievement scores, while controlling for pretest scores. The main effect of group (ARS vs. LM) is statistically significant, with $F(1, 114) = 82.120$, $p = .000$, and a partial eta squared of .419. This indicates a large effect size, suggesting that the instructional method accounted for approximately 41.9% of the variance in students' achievement scores after controlling for their pretest performance. Since the p-value is less than .05, the null hypothesis is rejected. This means there is a statistically significant difference in the achievement scores of students based on the instructional strategy used. The result implies that the Augmented Reality Strategy (ARS) had a significant positive impact on students' achievement in partnership and goodwill account compared to the Lecture Method (LM), even after accounting for prior knowledge or ability.

DISCUSSION

Instructional Strategy and Achievement: There was a statistically significant difference in students' achievement scores based on the instructional strategy used. Students taught using ARS outperformed those taught with LM. The instructional strategy accounted for approximately 41.9% of the variance in achievement scores, indicating a large effect size. It implies that ARS significantly enhances student achievement in partnership and goodwill account.

The findings from the analysis of covariance (ANCOVA) indicate that the Augmented Reality Strategy (ARS) significantly enhances students' achievement in partnership and goodwill account compared to the traditional Lecture Method (LM). This result aligns with the growing body of evidence suggesting that technology-enhanced instructional strategies can positively influence academic outcomes, particularly in abstract or complex subject areas such as accounting (Ezeudu et al., 2023). Specifically, the result showed that ARS

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accounted for approximately 41.9% of the variance in students' achievement scores, indicating a large effect size. This suggests that integrating immersive and interactive tools like augmented reality into classroom instruction can lead to substantial improvements in students' understanding and retention of difficult accounting concepts such as goodwill valuation and partnership accounts. This finding corroborates earlier studies by Okoye and Okeke (2021), who found that Nigerian secondary school students exposed to multimedia-based teaching methods performed significantly better than their peers taught using conventional approaches.

These findings also support the assertion by Adedokun and Adu (2022) that experiential learning facilitated through emerging technologies like AR enhances learners' engagement and conceptual clarity. The visual and interactive nature of AR may help students visualize abstract transactions and relationships in financial reporting, which are often challenging when delivered via traditional lecture formats. Furthermore, this study's outcome resonates with research conducted across sub-Saharan Africa, where scholars have emphasized the need to adopt innovative pedagogies to improve STEM and business education outcomes (Okeke & Okoro, 2022; Yusuf et al., 2023). In Nigeria, where there is increasing pressure to modernize the educational system and align it with global standards, these findings offer empirical support for the integration of AR-based learning in teacher training and curriculum development. It is also worth noting that while the Lecture Method remains widely used due to its familiarity and ease of implementation, especially in resource-constrained settings, it appears less effective in fostering deep understanding of complex accounting topics. This echo concerns raised by researchers like Nwosu and Umoren (2023), who argue that passive learning models fail to meet the demands of today's digitally native learners. In summary, this study affirms that instructional strategy plays a critical role in shaping students' academic performance, particularly in technical subjects like accounting. The use of ARS not only improves knowledge acquisition but also makes learning more engaging and meaningful factors that are essential for long-term academic success.

Abanum, Falade, and Aina (2024) investigated the impact of instructional board games on the academic performance of primary school pupils in Lagos State, Nigeria. The study employed a quasi-experimental design with a sample of primary school students. Results indicated that pupils exposed to instructional board games demonstrated significantly higher academic performance in core subjects compared to those taught using conventional methods. The interactive and engaging nature of board games fostered active participation, enhancing retention and understanding of concepts. This suggests that game-based approaches can improve learning outcomes by making abstract concepts more tangible, a principle potentially applicable to ARS in Financial Accounting education.

In another study, Abanum, Aina, and Akintula (2024) explored the effect of puzzle games on students' academic performance in Lagos State. Using a mixed-methods approach, the study found that puzzle games significantly improved students' problem-solving skills and academic achievement in various subjects. The engaging format of puzzles encouraged critical thinking and sustained student interest, leading to better performance compared to traditional teaching methods. These findings highlight the potential of interactive, game-based strategies to enhance cognitive engagement, which aligns with the immersive and interactive qualities of ARS in teaching complex Financial Accounting topics such as partnership and goodwill accounts.

Abanum and Akintula (2022) examined the relative effect of games and simulations on primary school mathematics performance in Educational District V, Lagos State. The study utilized a quasi-experimental design, comparing groups taught with game-based simulations to those using traditional methods. Results showed that students in the experimental group exhibited superior performance in mathematics, attributed to the simulations' ability to contextualize abstract concepts and foster active learning. The study underscores the effectiveness of interactive strategies in improving comprehension and engagement, providing a relevant parallel to ARS's capacity to visualize financial concepts interactively.

Ajana, Abanum, and Afolabi (2022) investigated the impact of virtual learning on the academic performance of junior secondary school students in Ojo, Lagos State. The study employed a quasi-experimental design, finding that virtual learning significantly enhanced students' academic outcomes compared to traditional classroom instruction. The flexibility and accessibility of virtual platforms improved student engagement and allowed for personalized learning experiences. These findings suggest that technology-enhanced methods, like

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ARS, can improve learning outcomes by offering dynamic and student-centered environments, particularly relevant for Financial Accounting, where visualization of abstract concepts is critical.

Oyeyemi and Abanum (2022) explored the effects of projector-mediated and demonstration methods on students' academic performance in Business Studies in Apapa, Lagos State. The study compared these methods to conventional teaching, finding that projector-mediated instruction significantly improved students' understanding and performance due to its visual and interactive nature. Demonstration methods also enhanced learning by allowing students to observe practical applications of concepts. These results highlight the efficacy of technology-driven and hands-on approaches, supporting the potential of ARS to enhance Financial Accounting education through immersive visualizations and interactive learning experiences.

The body of reviewed studies consistently demonstrates that innovative instructional strategies such as board games, puzzle-based learning, simulations, virtual learning environments, and projector-mediated techniques outperform traditional teaching methods in enhancing students' academic performance and engagement across various subjects and educational levels in Lagos State. These approaches emphasize interactivity, visualization, and student-centered learning, fostering deeper comprehension and improved retention, particularly when dealing with complex or abstract concepts.

These findings are highly relevant to the present study on the use of Augmented Reality Systems (ARS) in Financial Accounting education. Like the successful strategies identified in prior research, ARS leverages interactive and visual technologies to transform abstract and challenging topics such as partnership and goodwill accounting into dynamic, experiential learning experiences. The proven effectiveness of such methods in promoting both cognitive achievement and student engagement provides strong support for the hypothesis that ARS can significantly enhance students' academic performance, attitudes toward learning, and information literacy in Financial Accounting through immersive, technology-enhanced instruction.

From the researcher's perspective, these results highlight the transformative potential of augmented reality in reshaping the pedagogy of accounting education. In the Nigerian context, where students often struggle with abstract subject matter, AR-based instruction offers a promising solution to bridge the gap between theoretical knowledge and practical understanding. This study contributes meaningfully to the growing discourse on educational technology (EdTech) integration in African educational settings by providing empirical evidence that digital innovations like AR can enhance learning outcomes in traditionally difficult disciplines.

As Akintayo and Adeyemi (2023) assert, the future of education in Nigeria depends on embracing emerging technologies not merely as supplementary tools, but as integral components of modern pedagogy. Therefore, the researcher advocates for a gradual yet deliberate transition toward technology-integrated teaching approaches in accounting education. To ensure successful implementation, policymakers, curriculum developers, and educators must collaborate to provide schools and tertiary institutions with the necessary technological infrastructure, teacher training, and institutional support for scalable and sustainable adoption of AR-enhanced learning environments.

REFERENCES

1. Abanum, C. I. (2025). Can the augmented reality strategy bridge the gap in accounting classrooms for students with low tech skills? Advanced Journal of Education and Social Sciences, 10 (7), 77-83. https://aspjournals.org/ajess
2. Abanum, C. I., & Akintula, E. O. (2022). Relative effect of games and simulation on primary school mathematics in educational district v of Lagos state, Nigeria. International Organization of Scientific Research (IOSR) Journal of Research & Method in Education, 12(3), 42-44.
3. Abanum, C. I., Aina, J. O., Akintula, O. E. (2024). Enhancing students 'academic performance through puzzle game. LAJOCSE: Lagos Journal of Contemporary Studies in Education, 2(3) 170-181
4. Abanum, C. I., Alabi, B. O., Akinpelu, M. O. A., Akintula, O. E., & Aina, J. O. (2025). Does technology proficiency influence student attitudes in accounting classes enhanced by augmented

reality? Top Educational Review Journal (TERJ), 16(7), 11–16. https://doi.org/10.5281/zenodo.16615822

5. Abanum, C. I., Falade, E. O., & AINA, J. (2024). Assessment of Instructional Board Games on Academic Performance of Primary School Pupils, Lagos State, Nigeria. Educational Perspectives, 12(1). 281-291
6. Adedokun, O. A., & Adu, E. O. (2022). Impact of Multimedia Instructional Strategies on Students' Performance in Business Education. Journal of Educational Technology in Nigeria, 19(2), 45–57.
7. Adedokun-Shittu, N.A., Ajani, A.H., Nuhu, K.M., & Shittu, A.J. (2020). Augmented Reality Instructional Tool in Enhancing Geography Learners' Academic Achievement and Retention in Osun State, Nigeria. Education and Information Technologies, 25, 3021-3033.
8. Ajana, O. E., Abanum, C. I., & Afolabi, T. K. (2022). Virtual learning and academic performance of junior secondary school students in Ojo local government area in Lagos State. International Journal of Arts and Social Science Education, 1(1), 25-36.
9. Akçayir, M. & Akçayir, G. (2017). Advantages and challenges associated with augmented reality for education: A systematic review of the literature. Educ. Res. Rev. 20, 1–11.
10. Akintayo, A., & Adeyemi, T. O. (2023). Reimagining Education in Nigeria: The Role of Emerging Technologies in Curriculum Delivery. Nigerian Journal of Educational Technology, 11(1), 1–14.
11. Belda-Medina, J. & Calvo-Ferrer, J.R. (2022). Integrating augmented reality in language learning: Pre-service teachers' digital competence and attitudes through the TPACK framework. Educ. Inf. Technol., 27, 12123–12146.
12. Damodharan, V. S., & Rengarajan, V. (2016). Innovative methods of teaching. In Learning Technologies and Mathematics Middle East Conference, Sultan Qaboos University, Muscat, Oman (pp. 1-16).
13. Dima, R. M., & Obunadike, G. N. (2017). Sequresql–a framework for query optimization and privacy on outsourced data. Fudma Journal of Sciences, 1(1), 49-57
14. Eberechi, R. U., Ezichi-Obasi, J. & Obasi, C. D. (2024). The Role of Artificial Intelligence in Enhancing Administrative and Learning Efficiency in Higher Education: Insights from Abia State University, Uturu. International Academy Journal of Administration, Education and Society, Volume 6, Issue 3, PP 189-202
15. Nwosu, J. O., & Umoren, G. A. (2023). Pedagogical Challenges in Accounting Education in Nigeria: A Review. Journal of Curriculum and Instructional Studies, 15(1), 67–78.
16. Ogunu, M.A. (2015), Strategies for UBE Programme in Awabor. D & Aghenta J.A. (Ed) 155. Proceedings of the 15th annual congress of the Nigerian academy of education. Benin City: Ambik Press Ltd
17. Okeke, B. C., & Okoro, R. N. (2022). Digital Innovation in Education: Prospects and Challenges in Sub-Saharan Africa. African Journal of Educational Technology, 10(3), 210–225.
18. Okoye, M. A., & Okeke, B. C. (2021). Effect of Multimedia-Based Instruction on Students' Academic Performance in Business Education in Anambra State, Nigeria. Global Journal of Educational Research, 20(1), 123–130.
19. Oyeyemi, K., & Abanum, C. (2022). Effects of projector mediated and demonstration methods on students' academic performance in business studies in public secondary schools in apapa zone of Lagos state. FUOYE Journal of Education, 5(2) 129 - 134.
20. Yusuf, M. O., Babatunde, R. O., & Osafehinti, Y. (2023). Integration of Technology in Teaching and Learning: Implications for Teacher Education in Nigeria. Educational Research and Reviews, 18(2), 45–53.
21. Ziden, A.A., Ziden, A.A.A. & Ifedayo, A.E., (2022). Effectiveness of Augmented Reality (AR) on Students' Achievement and Motivation in Learning Science. EURASIA Journal of Mathematics, Science and Technology Education, 18(4), p.90-97.