Top Educational Review Journal
Volume.16, Number 7; July-2025;
ISSN: 2836-5224 | Impact Factor: 10.18
https://zapjournals.com/Journals/index.php/terj
Published By: Zendo Academic Publishing

DOES TECHNOLOGY PROFICIENCY INFLUENCE STUDENT ATTITUDES IN ACCOUNTING CLASSES ENHANCED BY AUGMENTED REALITY?

[1]Abanum Collins Ifeanyichukwu, [1]Dr. B. O. Alabi, [1]Prof. M.O.A. Akinpelu, [2]Akintula Oluwashina Elijah and [2]Aina Jeremiah Oluwafemi

Email: collins.abanum@lasu.edu.ng; +234 803 338 4408 / laidealabionline@gmail.com; +234 803 344 2457 / biodunakinpelu@gmail.com; +234 803 332 6907/ akintula_oluwashina@lagosstate.gov.ng; +234 802 382 6734 / ainajo@lasued.edu.ng; +234 808 244 4445

Article Info

Keywords: Accounting Education; Augmented Reality Strategy (ARS); Inclusive Learning; Student Attitudes and Technology Proficiency

DOI
10.5281/zenodo.16615822

Abstract

This study investigates the influence of technology proficiency on student attitudes in augmented reality-enhanced accounting classes in Nigerian secondary schools. ARS has emerged as an innovative instructional tool for teaching complex financial concepts, such as partnership and goodwill accounts. However, disparities in digital literacy among students, often driven by socioeconomic factors, raise questions about its inclusivity and effectiveness. Students were categorized into high, average, and low technology proficiency levels using a quasi-experimental design and taught using ARS. Attitude outcomes were measured using the Accounting Student Attitude Questionnaire, while pretest scores were controlled using ANCOVA. The results revealed no statistically significant difference in attitude scores across proficiency levels ($F(2, 37) = 0.550$, $p = .581$, Partial Eta Squared = .029), indicating that ARS fosters positive emotional engagement regardless of students' prior technological skills. The findings underscore the potential of ARS as an inclusive and user-friendly instructional strategy capable of bridging gaps in digital readiness and promoting equitable learning experiences. This study highlights the importance of integrating ARS into educational practices, particularly in resource-constrained environments, to enhance motivation and accessibility for diverse learners.

[1] Department of Science and Technology Education, Faculty of Education, Lagos State University, Ojo, Nigeria
[2] Educational Technology Department, Lagos State University of Education Oto/Ijanikin.

Background of the study

The integration of the augmented reality strategy into accounting instruction has introduced a new dimension to how students interact with complex financial concepts, such as partnership and goodwill accounts (Ziden et al., 2022). However, students' attitudes toward technology-enhanced learning may vary depending on their prior exposure and proficiency with digital tools (Aduba et al., 2022). In Nigerian secondary schools, where disparities in access to technology are common due to socioeconomic factors, it is crucial to understand how technology proficiency influences learner engagement (Tzima et al., 2019).

While ARS offers an intuitive and visually engaging platform, its effectiveness may depend on the familiarity of learners with digital interfaces. Students with high technology proficiency may initially adapt more quickly, whereas those with lower proficiency might experience hesitation or discomfort (Alani et al., 2022). However, research suggests that immersive technologies, such as AR, can reduce anxiety associated with digital learning by focusing on content rather than technical navigation (Guntur et al., 2020). This could help bridge the gap between students who are technologically skilled and less experienced.

Moreover, attitude plays a significant role in academic performance, particularly in subjects perceived as abstract or difficult (Mitchell, 2021). Positive attitudes foster curiosity, motivation, and persistence—key traits needed to master challenging accounting topics. This background sets the stage for examining whether students' varying levels of technology proficiency influence their emotional and motivational responses to AR-based instruction. Understanding this relationship can guide educators in designing inclusive and supportive AR learning environments.

Statement of the problem

As Nigerian secondary schools increasingly adopt technology-enhanced instruction, questions arise about how students' prior technology proficiency affects their engagement and emotional response to new teaching methods, such as the augmented reality strategy (ARS). Students with high digital literacy may adapt more quickly to AR-based environments, whereas those with lower proficiency may experience hesitation or frustration (Aduba et al., 2022). Since attitude plays a key role in learning outcomes, especially in challenging subjects like financial accounting, determining whether ARS fosters positive attitudes across different levels of technology skills is important. This issue can help educators design interventions that ensure equitable emotional and motivational benefits for all students, regardless of their initial digital readiness.

Research Question

Would there be any difference in the mean attitude scores among students with high, average, or low technology proficiency when using ARS to teach partnership and goodwill account?

Research Hypothesis

There would be no statistically significant difference in the mean attitude scores among students with high, average, or low technology proficiency when they are taught partnership and goodwill account using ARS.

Methodology

A 2×3 factorial matrix was used, with instructional method (ARS vs. LM) and technology proficiency level (high, average, and low) as independent variables. The Accounting Student Technology Proficiency Questionnaire (ASTPQ) was used to classify students, whereas the Accounting Student Attitude Questionnaire (ASAQ) was used to measure affective outcomes. Interviews explored how students with varying proficiency levels experienced AR-based instruction. ANCOVA was conducted to assess whether differences in attitude scores could be attributed to technology proficiency.

Result

Response to the Research Question

Would there be any difference in the mean attitude scores among students with high, average, or low technology proficiency when using ARS to teach partnership and goodwill account?

Table 4.6: Descriptive Statistics of Posttest Attitude Scores of Students with High, Average, or Low Technology Proficiency in the Experimental Group

Technology Proficiency	Mean	Std. Deviation	N
Low	44.6667	1.96638	6
Average	42.5500	4.78457	20
High	43.8667	2.99682	15
Total	43.3415	3.89621	41

Table 1 displays the posttest attitude scores of students in the experimental group, categorized according to their level of technology proficiency (low, average, and high). Students with low technology proficiency recorded the highest mean attitude score of 44.67, with the least variation (standard deviation = 1.97). Those with high proficiency were closely followed, with a mean score of 43.87. Students with average proficiency had the lowest mean score of 42.55 and the highest standard deviation of 4.78, indicating more varied responses. Although the differences among the groups were relatively small, students with low and high technology proficiency generally had a more favorable attitude toward the augmented reality strategy (ARS) instruction than those with average proficiency.

Response to the Research Hypothesis

There would be no statistically significant difference in the mean attitude scores among students with high, average, or low technology proficiency when they are taught partnership and goodwill account using ARS.

Table 2 Analysis of Covariance on the Attitude Scores of Students with High, Average, or Low Technology Proficiency with Pretest Attitude Scores as a Covariate

Source	Type III sum of squares	df	Mean Square	F	Sig.	Partial eta squared
Corrected Model	257.441[a]	3	85.814	9.077	.000	.424
Intercept	2432.316	1	2432.316	257.293	.000	.874
Pretest Attitude	230.238	1	230.238	24.355	.000	.397
Technology Proficiency	10.406	2	5.203	.550	.581	.029
Error	349.779	37	9.453			
Total	77625.000	41				
Corrected Total	607.220	40				

a. R Squared = .424 (adjusted R Squared = .377)

Table 2 shows the results of the ANCOVA conducted to test the effect of technology proficiency level (high, average, and low) on attitude scores, while controlling for pretest attitude scores. The main effect of technology proficiency was not statistically significant, with F (2, 37) = 0.550, p = .581, and a Partial Eta Squared of.029. This indicates that only about 2.9% of the variance in students' posttest attitude scores could be attributed to their level of technology proficiency, which is a negligible and practically insignificant effect. The p-value for technology proficiency is greater than 0.05; thus, the null hypothesis is not rejected.

This result implies that students' level of technology proficiency, whether high, average, or low, did not significantly affect their attitudes toward learning partnership and goodwill using the ARS. The low Partial Eta Squared value (.029) further confirms that technology proficiency had a negligible influence on attitude outcomes, that ARS is a user-friendly, accessible, and inclusive instructional strategy. Students benefit emotionally and motivationally, regardless of their prior experience or confidence with technology.

Summary of the Findings

Technology Proficiency and Attitude: There was no significant difference in attitude scores among students with varying levels of technology proficiency. The effect size was very small (partial eta squared = .029). **Implication**: ARS is inclusive and motivates students regardless of their technological abilities.

Discussion of the Findings

The findings from the analysis of covariance (ANCOVA) indicate no statistically significant difference in the attitude scores of students based on their level of technology proficiency. The effect size was very small (Partial Eta Squared = 0.029), that prior technological skills had minimal influence on attitudes toward learning partnership and goodwill when using the augmented reality strategy (ARS).

This result implies that ARS is an inclusive instructional tool that fosters positive attitudes among learners regardless of whether or not they are technologically proficient. This finding is particularly encouraging in Nigerian educational settings, where disparities in digital exposure are common due to socioeconomic differences. This that ARS can be effectively implemented without requiring students to have high levels of prior digital literacy, making it accessible and motivating for various learners. These findings support earlier studies by Yusuf et al. (2023), who emphasized the importance of designing technology-enhanced instruction that does not exclude students with limited access to digital tools. The intuitive and visually engaging nature of AR likely reduced the intimidation factor often associated with TBL, enabling all students to interact comfortably with the content. Similarly, Adedokun and Adu (2022) found that when properly scaffolded, multimedia-based instruction tends to enhance motivation across diverse learner profiles. This aligns with the current study, which shows that ARS not only supports academic achievement but also promotes positive emotional engagement irrespective of students' initial technological skill levels.

Moreover, Nwosu and Umoren (2023) highlighted the need for instructional strategies that bridge rather than widen existing gaps in digital access within Nigerian schools. The fact that ARS produced equally favorable attitudes across different levels of technology proficiency indicates its potential as a democratizing force in education that empowers all students, regardless of background, to engage meaningfully with complex subject matter. This outcome also resonates with broader research in African educational technology, where scholars such as Okeke and Okoro (2022) argue that emerging technologies must be evaluated not only for their cognitive benefits but also for their ability to foster inclusive and equitable learning environments. The negligible effect of technology proficiency on student attitudes in this study demonstrates that ARS meets this criterion.

Abanum (2025) explored whether the augmented reality strategy (ARS) can bridge the gap for students with varying levels of technology proficiency in Nigerian secondary schools, particularly in financial accounting education. Socioeconomic disparities often result in unequal digital exposure, which can hinder the effectiveness of TEI. ARS, with its intuitive interface and accessibility, was tested as an inclusive instructional tool for teaching complex accounting topics, such as partnership and goodwill accounts. Using a quasi-experimental design, students were categorized into high, average, and low technology proficiency levels and taught using either ARS or a conventional lecture method. Results showed no statistically significant difference in achievement scores among students with different proficiency levels when taught using ARS, indicating its equitable impact on

learning outcomes. Students with low and average proficiency even outperformed those with high proficiency, indicating the ability of ARS to reduce intimidation and effectively engage diverse learners. This study concludes that ARS is an inclusive and effective pedagogical approach, particularly in resource-constrained environments. It recommends providing foundational digital literacy training to further enhance AR-based learning outcomes. This study highlights the potential of ARS to support equitable learning opportunities in classrooms with diverse learner profiles.

The lack of a significant relationship between technology proficiency and attitude underscores the user-friendly and emotionally engaging design of ARS. This finding reinforces the idea that AR can serve as an inclusive pedagogical tool that motivates learners regardless of their prior experience with technology. The researcher interprets these results as evidence that ARS can be successfully integrated into Nigerian classrooms, even in contexts where digital infrastructure and learner readiness vary widely. By minimizing the reliance on advanced digital skills, ARS reduces barriers to entry and allows educators to focus on content delivery and learner engagement rather than technical navigation. Therefore, the researcher recommends that curriculum developers and teacher training institutions incorporate AR-based instruction into professional development programs, emphasizing its value not only as a teaching aid but also as a means of promoting equitable and inclusive learning experiences. In conclusion, ARS is a powerful, adaptable, and inclusive instructional strategy that enhances student motivation and interest without privileging those with higher levels of technology proficiency, which is a critical advantage in resource-constrained and digitally diverse educational environments such as Nigeria.

References

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

Adedokun, O. A., & Adu, E. O. (2022). Impact of Multimedia Instructional Strategies on Business Education Students' Performance *Journal of Educational Technology in Nigeria,* 19(2), 45–57. doi:10.1016/j.jet.2013.09.010.

Aduba, D. E., Obot, I. N., & Baro, E. E. (2022). A Comparative Study of Information Literacy Skills among Students of Library and Information Science and Computer Science in Nigerian Universities. *Niger Delta Journal of Library and Information Science*, *3*(1), pp. 57-76.

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. https://doi.org/10.1016/j.ijse.2015.09.010.

Alani, T. R. R., Obielodan, O. O., Onojah, A. O., Omotayo, A. S., Onojah, A. A., and Alasan, N. J. (2022). Relationship between sciences and education lecturers' perceived use of mobile technologies for instruction. *Media Komunikasi FPIPS*, *21*(1), 39-48, (2017).

Guntur, M. I. S., Setyaningrum, W., and Retnawati, H. Marsigit, M. (2020). *Assessing the Potential of Augmented Reality in Education.* In Proceedings of the 2020 11th International Conference on E-Education, E-Business, E-Management, and E-Learning (pp. 93-97).

Mitchell, R. (2021). Exploring the Implementation of an Augmented Reality Curricular Unit by Teachers *Journal of Computers in Mathematics and Science Teaching*, Vol. 30, No. 3, pp. 271-302.

Nwosu, J. O., & Umoren, G. A. (2023). Pedagogical Challenges in Nigerian Accounting Education: A Review *Journal of Curriculum and Instructional Studies,* 15(1), 67–78.

Okeke, B. C., & Okoro, R. N. (2022). Digital Innovation in Education: Prospects and Challenges in Sub-Saharan Africa *African Journal of Educational Technology, vol. 10, no. 3, pp. 210–225*.

Tzima, S., & Styliaras, G. & Bassounas, A. (2019). Augmented reality applications in education: Teachers' point of view. *Educ. Sci*. 2009; 9:99.

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.

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.