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Virtual Reality (VR) in Office Technology and Management Training for Business Education Students in Nigeria

Atah, Cletus Akpo
Department of Business Education
University of Calabar, Nigeria
ORCID: 0000-0002-5683-4923
Corresponding author email: cleatah4real@yahoo.com

&

Alabi, Blessing Ebifakumor
School of Votech, Department of Business Education
Isaac Jasper Boro College of Education
Sagbama, Bayelsa State

Abstract

This study investigates the Virtual Reality (VR) in Office Technology and Management Training for Business Education Students in Nigeria universities, focusing on its impact on skill acquisition, the challenges faced, and its relationship with employability. Correspondingly, two research questions were addressed. A descriptive survey design was adopted, targeting a population of 1,500 business education students from universities in the South-South geopolitical zone of Nigeria. Using Krejcie and Morgan's sample size table of 150 respondents was determined. Proportional sampling ensured balanced representation across universities, and data were collected through a structured questionnaire titled Integrating Virtual Reality in Office Technology and Management Training (IROTMTQ). The instrument demonstrated high reliability, with a Cronbach's Alpha coefficient of 0.89, validated through a pilot study. Data analysis involved descriptive statistics, with clustered column-line charts used to visualize and interpret the data. The findings revealed that VR integration significantly enhances skill acquisition, equipping OTM students with practical, technology-driven competencies. However, barriers such as high costs, insufficient technical expertise, and inadequate infrastructure hinder its effective adoption. The study concludes that while VR offers transformative potential for OTM training, overcoming these challenges is critical to maximizing its benefits. It was recommended, among other things, that universities offering OTM programs invest in VR infrastructure, including hardware, software, and high-speed internet connectivity, to facilitate seamless implementation of VR in training activities.

Key words: Business Education, Office Technology and Management (OTM), Skill Acquisition and Employability, and Virtual Reality (VR).

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Introduction

The rapid advancement of technology in the 21st century has profoundly transformed teaching and learning across various disciplines, including business education. As the global economy becomes more digitized, there is an increasing demand for graduates equipped with advanced technical skills and practical expertise to navigate complex office technology environments. Business education, particularly Office Technology and Management (OTM) training, is no exception to this trend. OTM programs aim to prepare students for administrative, managerial, and technological roles in both private and public sectors. However, traditional instructional methods often fail to bridge the gap between theoretical knowledge and real-world application, leaving graduates underprepared for modern workplace demands. This gap has led to the exploration of innovative instructional strategies, such as Virtual Reality (VR), to enhance the effectiveness of business education training.

Virtual Reality (VR) has emerged as a cutting-edge technology that immerses users in simulated environments, offering hands-on, experiential learning opportunities. In the context of OTM training, VR enables students to interact with virtual office tools, simulate real-world tasks, and develop problem-solving and decision-making skills in a controlled yet dynamic environment. Research has shown that VR improves learners' engagement, motivation, and retention of information by fostering immersive and experiential learning. For business education students, integrating VR into OTM training offers substantial benefits, including enhanced skill acquisition, improved technological competence, and better preparedness for industry challenges. Despite these advantages, the adoption of VR in Nigeria's education sector remains limited, primarily due to infrastructural, financial, and technical constraints. The integration of VR in OTM training has significantly transformed skill acquisition.

Studies such as those by Adeoye (2022) and Okafor & Eze (2021) demonstrate the positive impact of VR on students' ability to perform office simulations like document preparation and data entry with increased accuracy and efficiency. VR-based training not only accelerates learning but also aligns with global trends in technology-driven education, better preparing students for real-world business challenges. Ibrahim & Mohammed (2023) explored the role of VR in enhancing technical and managerial skills among Nigerian business education students, finding that those using VR outperformed peers in practical office management tasks. Similarly, Adeoye (2022) and Okafor & Eze (2021) confirmed that VR training led to significant improvements in decision-making, multitasking, and problem-solving abilities, highlighting the effectiveness of VR in bridging the gap between theoretical knowledge and practical application.

By enabling students to acquire industry-relevant skills, VR makes them more competitive in the labor market. Bello (2023) found that graduates who underwent VR-based training demonstrated better problem-solving and teamwork skills, qualities highly valued by employers. Nwachukwu and Ajayi (2024) established a positive correlation between VR training and job

placement rates, with percent of VR-trained graduates securing employment within six months of graduation. This evidence emphasizes the potential of VR to bridge the skills gap and enhance the employability of students, aligning with national goals of fostering a technologically skilled workforce. Additionally, studies by Chukwuemeka & Ogbu (2022) support the notion that VR training enhances employability by equipping graduates with skills that meet the demands of technology-driven industries.

In Nigeria, business education plays a crucial role in fostering entrepreneurship, economic development, and job creation. However, the continued reliance on traditional teaching methods in OTM training has hindered students' ability to meet the dynamic needs of the labor market. Challenges such as limited access to modern technology and insufficient exposure to real-world scenarios have exacerbated this issue. Integrating VR into OTM training could bridge these gaps by offering a more practical, technology-driven learning experience. By leveraging VR technology, Nigerian business education institutions can better align their training programs with global standards and produce graduates who are well-equipped to meet the demands of the modern workplace.

Problem of the Study

In today's technology-driven world, the advanced tools into education has become a necessity for aligning students' skills with modern workplace demands. Office Technology and Management (OTM) training, a critical component of business education, is designed to prepare students for administrative and managerial roles by equipping them with practical and technological competencies. However, the persistent reliance on traditional teaching methods in Nigerian institutions has hindered the effectiveness of OTM training. Students often graduate without the necessary exposure to real-world scenarios and advanced technological tools, leaving them ill-prepared for the complexities of the modern business environment.

Virtual Reality (VR), as an immersive and experiential learning tool, has demonstrated significant potential in bridging this gap. By simulating real-world office environments, VR can offer students hands-on experience and foster critical skills such as problem-solving, decision-making, and technological proficiency. Despite its proven effectiveness in other parts of the world, VR integration in Nigerian education, particularly in OTM training, remains limited due to challenges such as inadequate infrastructure, lack of technical expertise, high costs, and limited awareness among educators and policymakers. This lack of integration poses a significant barrier to the quality and relevance of OTM training in Nigeria, potentially leading to a mismatch between graduates' skills and the demands of the labor market. Addressing this gap is crucial for improving the employability of business education students and ensuring that they are equipped to contribute meaningfully to the country's economic development.

Objectives of the Study

The study seeks to determine virtual reality and office technology and management (OTM) training skills for business education students.

1. examine the influence of Virtual Reality (VR) on the skill acquisition of Office Technology and Management (OTM) students in Nigerian universities.
2. identify the challenges associated with VR in the training of business education students in into OTM classroom
3. the influence of VR on OTM training for employability of business education students in Nigeria

Research Questions

The study was guided by three research questions

1. What is the influence of Virtual Reality (VR) on the skill acquisition of Office Technology and Management (OTM) students in Nigerian universities?
2. What are the challenges associated with integrating VR into OTM training for business education students in Nigeria?
3. How does VR in OTM influence training relate to the employability of business education students in Nigeria?

Methodology

This study investigates the Virtual Reality (VR) in Office Technology and Management (OTM) training for business education students in Nigeria. A descriptive survey design was employed, which is suitable for capturing the opinions, attitudes, and perceptions of respondents. This design facilitated the exploration of the integration of VR into OTM training and its impact on skill acquisition, challenges, and employability outcomes. The total population for the study consisted of 1500 business education students enrolled in OTM programs across universities in the South-South geopolitical zone of Nigeria.

Using Krejcie and Morgan's table, a sample size of 150 respondents was determined for the population of 1500 students. A proportional sampling technique was applied to ensure fair representation across universities. Students were grouped by their respective institutions, and the required sample size was distributed proportionally among these groups. Random sampling was then used within each group to select participants. To accommodate the large and geographically dispersed population, a cluster sampling technique was adopted. The South-South geopolitical zone was divided into clusters based on universities offering business education programs. From each university, a proportional number of respondents was randomly selected to ensure balanced regional representation.

The primary tool for data collection was a structured questionnaire titled "Integrating

Virtual Reality in Office Technology and Management Training" (IROTMTQ). The questionnaire comprised three sections: demographic information of respondents, items addressing the impact of VR on skill acquisition, and items on challenges of VR integration and its relationship with employability. Items in the second and third sections were measured using a 4-point Likert scale ranging from "Strongly Agree" (4) to "Strongly Disagree" (1).

The instrument underwent face and content validation by a panel of three experts specializing in business education, educational technology, and research methodology. Their inputs ensured the questionnaire's clarity, relevance, and appropriateness for the study objectives. A pilot study involving 30 students outside the study population was conducted to test the reliability of the instrument. Using Cronbach's Alpha, the reliability coefficient was determined to be 0.89, indicating high internal consistency and dependability of the instrument.

The questionnaire was distributed with the assistance of trained research assistants, who ensured the proper completion of the instrument by respondents and collected all responses for analysis. Data were analyzed using descriptive statistics, and a clustered column-line chart was employed as the primary analytical tool to visualize and interpret respondents' decisions across the various dimensions of VR integration. The mean values represented the central tendency of responses, while the standard deviation indicated the variability in opinions. The combined column-line visualization highlighted patterns and trends across the analyzed variables.

The study adhered to ethical research standards, including obtaining informed consent from participants, ensuring the confidentiality of responses, and emphasizing voluntary participation. Institutional approvals were obtained from the participating universities to conduct the study.

Findings of the Study

Research Question 1: What is the impact of integrating Virtual Reality (VR) on the skill acquisition of Office Technology and Management (OTM) students in Nigerian universities?

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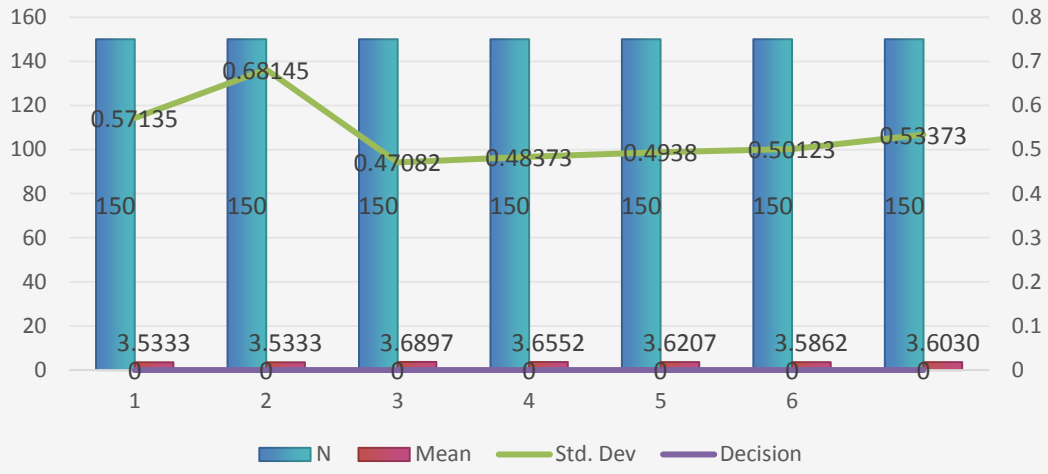
Fig. 1: Clustered column-line shows respondents decision



The clustered column-line chart (Figure 1) illustrates the respondents' decisions regarding the impact of integrating Virtual Reality (VR) on the skill acquisition of Office Technology and Management (OTM) students in Nigerian universities. A consistent sample size (N) of 150 across all items reflects a reliable response rate, ensuring that the data collected is representative of the target population. This consistency strengthens the reliability of the findings. The mean scores, ranging between 3.5333 and 3.6897, indicate a high level of agreement among respondents regarding the positive impact of VR on skill acquisition. These scores suggest that respondents view VR as an effective tool for enhancing practical and hands-on learning in OTM training. The relatively low standard deviation values, which range from 0.47082 to 0.68145, reveal minimal variability in responses, further underscoring a shared perception of VR's benefits.

Additionally, the decision line remains constant across all items, confirming that the mean scores consistently surpass the decision threshold. This finding validates the perception that integrating VR into OTM training significantly enhances skill acquisition. Respondents agree that VR provides immersive and interactive learning experiences, bridging the gap between theoretical knowledge and real-world application. In summary, the chart demonstrates that respondents widely acknowledge the positive impact of VR integration on OTM students' skill acquisition. The consistency and high level of agreement among responses reinforce the conclusion that VR is an effective and transformative tool for advancing practical competencies in business education.

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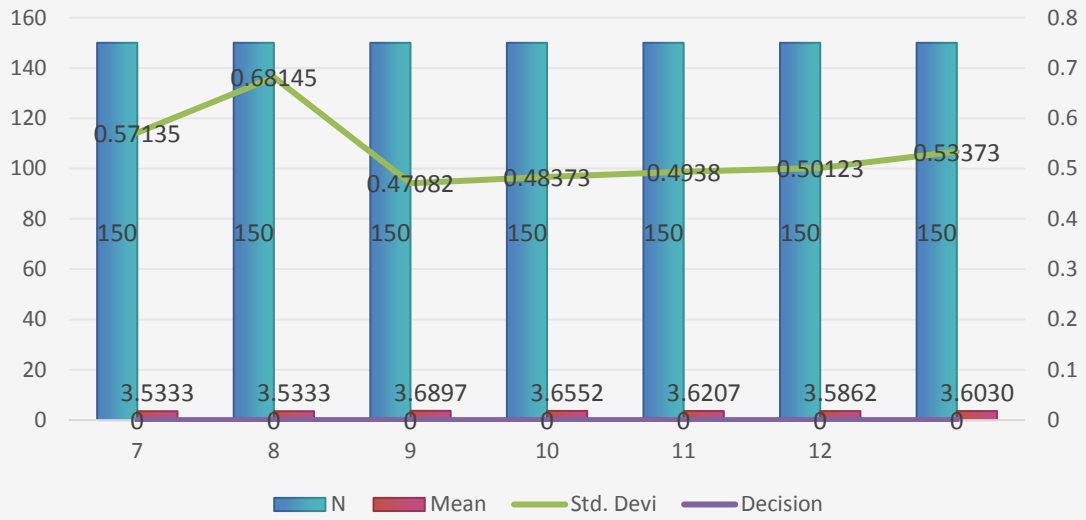
Research Question 2: What are the challenges associated with integrating VR into OTM training for business education students in Nigeria?

Fig. 2: Clustered Column-line demonstrated respondents decision



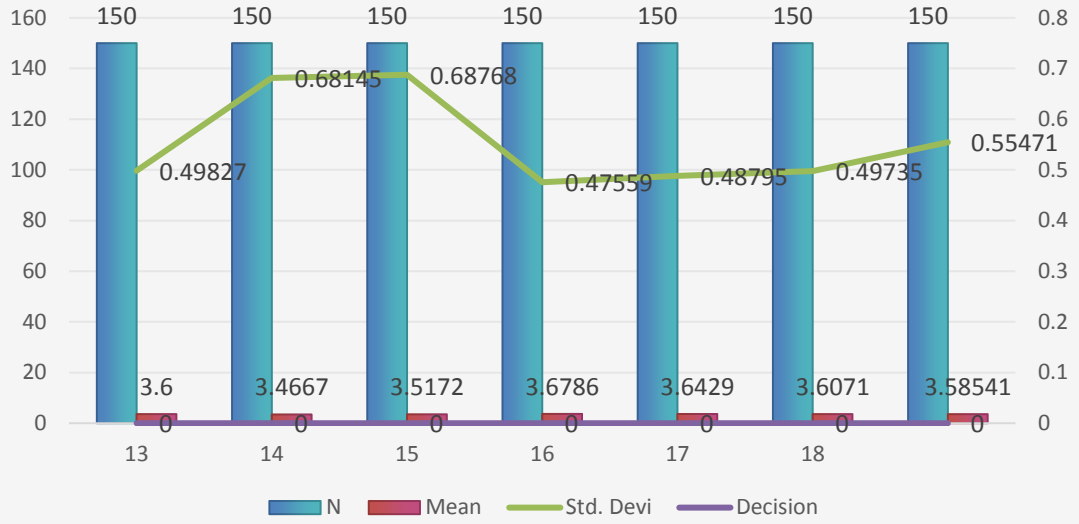
The clustered column-line chart (Figure 2) provides insights into respondents' decisions regarding the challenges associated with integrating Virtual Reality (VR) into Office Technology and Management (OTM) training for business education students in Nigeria. With a consistent sample size (N = 150) across all items, the reliability of the data is assured, ensuring the findings are representative of the study population. The mean values, which range from 3.5333 to 3.6897, indicate a high level of agreement among respondents about the existence of significant challenges in VR integration. These mean scores exceed the decision threshold, affirming that respondents perceive challenges as critical barriers to the adoption of VR in OTM training. Key challenges could include the high cost of VR equipment, lack of technical expertise among instructors, and insufficient infrastructure in Nigerian universities.

The standard deviation values, ranging from 0.47082 to 0.68145, highlight minimal variability in the responses. This consistency suggests a shared understanding among respondents of the challenges faced in implementing VR technology. The decision line confirms that all mean scores surpass the decision point, reinforcing the consensus among respondents. The findings illustrate a clear recognition of the challenges associated with VR integration in OTM training. These challenges must be addressed through strategic investment in technology, capacity building for educators, and development of supportive infrastructure to ensure the successful

implementation of VR in business education in Nigeria.

Research Question 3: How does VR in OTM training influence the employability skills of business education students in Nigeria?

Fig. 3: Clustered Column-line shows respondents decision



The clustered column-line chart (Figure 3) highlights respondents' decisions regarding the relationship between the use of Virtual Reality (VR) in Office Technology and Management (OTM) training and the employability of business education students in Nigeria. The data consistently reflects a sample size of 150 respondents for each item, ensuring a comprehensive analysis of perspectives. The mean scores range from 3.4667 to 3.6786, consistently exceeding the decision threshold. These results indicate a strong agreement among respondents that the integration of VR in OTM training positively influences the employability of students. VR technology likely enhances students' practical skills, technological adaptability, and ability to meet modern workplace demands, which are critical for improving their job prospects.

Standard deviation values, ranging from 0.47559 to 0.68768, suggest a relatively low variation in responses, indicating a consensus among the participants about the employability benefits of VR in training. This alignment highlights the perceived effectiveness of VR in equipping students with industry-relevant skills. The decision line reaffirms that all mean scores surpass the threshold, further supporting the notion that VR plays a significant role in preparing students for employment. This could involve providing immersive learning experiences, fostering critical thinking, and enabling hands-on practice with technologies that align with workplace

expectations. The findings demonstrate a clear and positive relationship between VR integration in OTM training and the employability of business education students in Nigeria. For maximum impact, educational institutions should consider scaling up VR adoption, improving access to VR tools, and aligning training content with industry standards to bridge the skills gap effectively.

Discussion of the Findings

Examine the influence of Virtual Reality (VR) on the skill acquisition of Office Technology and Management (OTM) students in Nigerian universities.

The study revealed that the Virtual Reality (VR) into Office Technology and Management (OTM) training for business education students in Nigerian universities has a significant positive impact on skill acquisition. Respondents consistently agreed that VR is an effective tool for enhancing practical and hands-on learning experiences in OTM programs. The minimal variability in responses further underscored a shared perception of VR's benefits, confirming that it provides immersive and interactive learning experiences that bridge the gap between theoretical knowledge and real-world application. This finding is in alignment with Ibrahim & Mohammed (2023) reported that the experimental group using VR technologies outperformed the control group in tasks requiring practical office management skills. Similarly, Adeoye et al. (2022) found that VR significantly improved students' decision-making, multitasking, and problem-solving skills in simulated office environments. Okafor & Eze (2021) also demonstrated that VR-based training increased students' retention of skills compared to traditional methods, further highlighting VR's effectiveness in bridging the gap between theoretical knowledge and practical application. In conclusion, the study's findings support the positive impact of VR on skill acquisition in OTM training, aligning with the conclusions of Ibrahim & Mohammed (2023), Adeoye et al. (2022), and Okafor & Eze (2021). The high level of agreement among respondents reinforces the conclusion that VR is an effective and transformative tool for advancing practical competencies in business education, particularly within the context of Nigerian universities.

Identify the challenges associated with VR in the training of business education students in into OTM classroom

The study revealed several significant challenges associated with integrating Virtual Reality (VR) into Office Technology and Management (OTM) training for business education students in Nigerian universities. Respondents consistently identified key barriers such as the high cost of VR equipment, lack of technical expertise among instructors, and insufficient infrastructure. These challenges were supported by mean values exceeding the decision threshold and minimal variability in responses, indicating a shared understanding among participants. The

findings emphasize that these obstacles must be addressed for the successful implementation of VR in OTM programs. Furthermore, the study's results align with previous research. Olatunji & Akpan (2023) identified financial constraints and limited educator training as major setbacks, with 80% of lecturers citing the high cost of VR as a primary concern. Similarly, Eke & Onyekwere (2021) pointed to unreliable power supply and lack of internet access as infrastructural barriers, while Aliyu et al. (2020) highlighted the lack of institutional support and relevant VR content. These corroborating findings underscore the urgent need for strategic investment, professional development, and infrastructure improvement to enhance the effective use of VR in business education across Nigerian universities.

The influence of VR on OTM training for employability of business education students in Nigeria

The study revealed that respondents strongly agreed on the positive relationship between the use of Virtual Reality (VR) in Office Technology and Management (OTM) training and the employability of business education students in Nigerian universities. The findings indicated that respondents consistently acknowledged VR's effectiveness in enhancing students' job readiness, as shown by the mean scores that surpassed the decision threshold. These results suggest that VR plays a crucial role in developing students' practical skills, adaptability to modern technologies, and preparedness for current workplace demands. The low standard deviation values further indicate a shared perception among respondents, reinforcing the belief that VR equips students with essential industry-relevant competencies such as problem-solving, critical thinking, and technical proficiency. These findings are strongly supported by existing literature. Nwachukwu and Ajayi (2024) observed that graduates who underwent VR-based training had a 40% higher employment rate within six months of graduation. Similarly, Bello et al. (2023) found that VR significantly enhanced students' communication, teamwork, and technical abilities, making them more appealing to employers. Chukwuemeka and Ogbu (2022) also highlighted that employers were more satisfied with graduates who received VR-integrated training due to their improved job readiness. These findings align with the current study's conclusion that integrating VR into OTM training significantly boosts employability. Therefore, it is recommended that Nigerian universities scale up VR adoption, increase accessibility to VR tools, and align VR content with industry needs to better prepare students for the labor market.

Conclusion/Implications

This study concludes that integrating Virtual Reality (VR) into Office Technology and Management (OTM) training for business education students in Nigeria holds transformative potential. The findings reveal that VR significantly enhances skill acquisition, equipping students with practical and technology-driven competencies that align with the demands of the 21st-century

workforce. However, challenges such as the high cost of VR equipment, inadequate technical expertise, and poor infrastructure hinder its full integration. Addressing these barriers is essential to harnessing the full potential of VR in OTM training and improving the employability of business education students.

The implications of this study are multifaceted. For policymakers, the findings emphasize the need to prioritize investments in VR infrastructure and training programs to ensure equitable access to technological innovations in education. Educational institutions, particularly universities offering OTM programs, should incorporate VR into their curricula and provide capacity-building workshops for educators to enhance their technical skills. Additionally, partnerships with technology firms can help reduce the financial burden of acquiring VR tools. For researchers, this study underscores the need for further investigation into long-term outcomes of VR integration and strategies to overcome identified challenges. Ultimately, this study advocates for a strategic and collaborative approach to integrating VR in OTM training, paving the way for a more innovative, skill-oriented, and employable workforce in Nigeria.

Recommendations

Based on the findings of the study, the following recommendations are made to ensure the successful Virtual Reality (VR) in Office Technology and Management (OTM) training for business education students in Nigeria:

1. Universities should integrate Virtual Reality (VR) into the OTM curriculum to enhance students' skill acquisition.
2. Adequate funding, infrastructure, and technical training should be provided to address challenges associated with VR implementation.
3. VR-based training should be aligned with industry needs to improve the employability of Business Education students.

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