THE NIGERIAN EDUCATOR,
Phoebe Joshua Chundusu & Margaret Nyaro Emmanuel
Artificial Intelligence in Vocational Education and Teacher Training in Plateau State: Prospects and Challenges
Vol. 13, No. 1, May 2026, p198-202, ISSN: 699-3-7
https://www.thenigerianeducator.com/

ARTIFICIAL INTELLIGENCE IN VOCATIONAL EDUCATION AND TEACHER

TRAINING IN PLATEAU STATE: PROSPECTS AND CHALLENGES

Phoebe Joshua Chundusu
Department of Business/Entrepreneurship Education
Federal University of Education, Pankshin, Plateau State phoebejoshua71@gmail.com
07038511270

AND

Margaret Nyaro Emmanuel
Department of Vocational and Technology Education
Taraba State University, Jalingo. Taraba State margaretnyaro1@gmail.com
08030748885

Abstract

The main objective of this study was to explore the challenges and opportunities of integrating artificial intelligence (AI) in vocational education and teacher training in tertiary institutions in plateau state, Nigeria. The study employed a mixed-methods (qualitative and quantitative) approaches. The population for the study includes vocational teachers, students, and educational policymakers in institutions of higher learning in Plateau State. A stratified random sampling technique was used. 200 subjects, comprising 100 teachers, 50 students, and 50 policymakers constituted the sample for the study. Survey instrument was used to collect data on demographics, AI literacy and experiences with AI integration in vocational education. Utilizing a qualitative approach, data were collected through experts' interview. The Quantitative data was analyzed using T- tests, and ANOVA as statistical tools. A semi-structured qualitative interview was conducted with 20 vocational teachers and trainers who participated in the survey to gather more in-depth insights into their experiences with AI integration in vocational education. The qualitative data from interviews was subjected to thematic analysis approach. A conceptual research model was developed based on the Technology Acceptance Model (TAM), which examined perceived usefulness and ease of use as key determinants of AI adoption. The findings revealed among others that while AI can significantly improve learning outcomes and administrative efficiency, its implementation requires strategic planning, teacher training, and regulatory frameworks. AI integration in vocational education could provide opportunity for students to develop skills in emerging technologies and improve their employability. The findings have implications for the teacher training programs, which need to priorities AI literacy and integrating skills.

Keywords: Artificial Intelligence, Vocational Education, Teacher Training, Challenges, Opportunities.

Introduction

The integration of Artificial Intelligence in vocational education is basically transforming the way we learn and teach. The rapid advancement of Artificial Intelligence (AI) has transformed various sectors, including education. AI-driven technologies have revolutionized learning processes by enabling personalized instruction, adaptive assessments, and intelligent tutoring systems (Luckin et al, 2016). However, the adoption of AI in vocational education depends on the effectiveness of integrating technology into practice. The digital transformation of

Vocational Education and Training (VET) has gained global traction via policy initiatives and reforms within institutions. Nonetheless, there are still significant hurdles regarding technological infrastructures, faculty readiness, and curriculum integration.

However, despite its potential, the integration of AI in vocational educational settings poses challenges such as ethical considerations, data privacy concerns, and technological disparities (Holmes et al, 2021). Even with increasing investment and interest in AI applications for VET, the research field remains fragmented and less developed than AI studies in tertiary education settings and corporate training contexts (Holmes et al., 2021; Zawacki-Richter et al., 2023). Existing literature consists of disconnected technological pilot projects, perception studies, and theoretical frameworks, but it lacks a thorough synthesis of empirical results across vocational areas. This knowledge gap hinders evidence-based policymaking and strategic implementation at a time when VET systems are under increasing pressure to incorporate AI-related competencies.

One of the primary concerns regarding AI adoption in vocational education is the ethical and privacy implications associated with data collection and usage (Holmes et al., 2021). Selwyn (2019) stated that AI systems rely on vast amounts of students' data to generate personalized learning experiences, raising questions about data security and algorithmic bias. Additionally, Zawacki-Richter et al. (2019) observed that the lack of standardized regulations governing AI applications in education presents a significant challenge. Despite these challenges, AI presents significant opportunities to bridge educational gaps and improve accessibility to quality learning resources (Chen et al., 2020). According to Luckin et al. (2016), AI-driven language processing tools assist students with disabilities by providing speech-to-text and text-to-speech functionalities, enabling inclusive learning experiences.

This study therefore, aims at exploring the challenges and opportunities associated with the integration of artificial intelligence in vocational education and teacher training in tertiary institutions in plateau state, emphasizing the need for ethical guidelines, teacher preparedness, and regulatory policies. By addressing these aspects, this research seeks to provide insights into the sustainable adoption of AI technologies in educational settings. The findings will contribute to the existing literature by offering practical recommendations for optimizing AI-driven learning solutions while mitigating associated risks.

Literature review

The integration of AI in vocational education has gained a significant attention recently. Several researches have shown that AI can enhance teaching and learning processes, improve student outcomes and also increase efficiency in educational institutions (Zawacki-Ritcher, 2019). Ifenthaler (2020) stressed that AI can be used in vocational education to personalize learning, simulate real-world environments and also provide real-time feedback. However, Broughan and Prinsloo (2020) observed that the adoption of AI in vocational education also presents a lot of challenges which includes the following: the need for qualified teachers of vocational education to develop new skills and competencies concern about job displacement and issues related to equity and access. Furthermore, Facias and Salmanca (2020) stated that the effective integration of AI in vocational education requires a deep pedagogical and social implication of its use. Teacher training is critical to the successful adoption of AI in vocational education. Researches have shown that teachers who receive adequate training and support are more likely to effectively integrate AI into their practice and improve student outcomes (Knez 2020).

However, Howard and Mozjeiko (2020) observed that many teachers report feeling unprepared to integrate AI into their teaching practices, highlighting the need for targeted professional development programs. Previous research has explored the role of AI in education, emphasizing its benefits and challenges. Holmes et al. (2021) discuss how AI-driven analytics can predict student performance and tailor learning experiences, improving overall academic outcomes. Similarly, Zawacki-Richter et al. (2019) highlight AI's potential in automating

administrative tasks, allowing educators to focus on teaching. However, they also caution against over-reliance on AI, stressing the importance of human oversight in educational decision-making. Recent studies have also examined ethical concerns related to AI in education. Selwyn (2019) explores issues of data privacy, algorithmic bias, and the digital divide, urging policymakers to establish robust regulatory frameworks. Moreover, Chen et al. (2020) emphasized the need for AI literacy among educators to ensure responsible AI implementation. This study aims at contributing to the growing body of research on AI in vocational education, with a focus on the challenges and opportunities associated with its integration, as well as the implications on teachers training.

Theoretical review

The integration of AI in education is supported by several theoretical frameworks that explain its impact on teaching and learning processes. One of the most relevant theories is the Constructivist Learning Theory, which posits that learners construct knowledge through experiences and interactions (Piaget, 1954). AI technologies, such as intelligent tutoring systems, support constructivist learning by providing personalized instruction and adaptive feedback (Luckin et al., 2016). This aligns with Vygotsky's (1978) Social Development Theory, which emphasizes the role of social interactions in learning. AI-powered collaborative learning platforms facilitate another pertinent theoretical framework is the Technology Acceptance Model (TAM), which examines user acceptance and utilization of technology (Davis, 1989). According to TAM, perceived usefulness and ease of use significantly influence educators' and students' willingness to adopt AI-based educational tools (Chen et al., 2020). Understanding these factors helps in designing AI solutions that align with user expectations and promote seamless integration into educational settings. Given these theoretical foundations and empirical studies, this research aims to provide a comprehensive analysis of AI's role in education. By addressing theoretical, practical, and ethical considerations, the study seeks to contribute to ongoing discussions on optimizing AI for effective and inclusive learning environments.

Research methodology

This study employed a mixed-methods approach to explore the challenges and opportunities of integrating Artificial Intelligence (AI) in vocational education and its implications for teacher training. The research incorporates both qualitative and quantitative designs to obtain a holistic understanding of the subject matter (Creswell and Plano 2017). The study was carried out in tertiary institutions in Plateau State. The population for the study includes educators, students, and educational policymakers in institutions of higher learning in Plateau State. A stratified random sampling technique was used to ensure representation across different levels of AI adoption in vocational education (Bryman, 2016). The sample for the study was 200 subjects, comprising 100 teachers, 50 students, and 50 policymakers The survey instrument was used to collect data on demographics, AI literacy and experiences with AI integration in vocational education. Thematic analysis was used to analyze the qualitative data. Quantitative data was analyzed using T- tests, and ANOVA as statistical techniques to compare perceptions among different respondent groups, while semi-structured qualitative interviews were conducted with 20 vocational teachers and trainers who participated in the survey to gather more in-depth insights into their experiences with AI integration in vocational education. Qualitative data from interviews and document analysis was subjected to thematic analysis following Braun and Clarke's (2006) approach. A conceptual research model is developed based on the Technology Acceptance Model (TAM) (Davis, 1989), which examines perceived usefulness and ease of use as key determinants of AI adoption. Findings

The findings are therefore presented into two sections namely- quantitative and the qualitative interviews results. The survey results showed that the majority of vocational teachers and trainers which constitute 80 percent had limited knowledge of AI and its applications in vocational education. About 60 percent respondents

reported that they had not received any training on AI integration in vocational education. The results also showed that the top challenges of AI integration in vocational education were: lack of infrastructures - 70 percent, lack of training - 65 percent, and lack of technical support 55 percent. The survey results also revealed that the majority of respondents (85 percent) believed that AI integration would enhance teaching and learning in vocational education.

The qualitative results revealed that vocational teachers and trainers had mixed feelings about AI integration in vocational education. While some saw it as opportunity to enhance teaching and learning, others were concerned about job displacement and the need for new skills. The results also showed that AI integration in vocational education could provide opportunity for students to develop skills in emerging technologies and improve their employability. Discussions

The findings from this study highlighted the challenges and opportunities associated with AI integration in vocational education. The results show that many vocational teachers and trainers lack the knowledge and skills to effectively integrate AI in the teaching practices. This is consistently with previous researchers Knez (2020), and Howard and Mozeijko (2020) who highlighted the need for teachers training support in AI integration. The study also reveals that lack of infrastructure and resources is a significant barrier to AI integration in vocational education. This is supported by Ifenthaler et al (2020) who stated that AI has the potentials to enhance teaching and learning in vocational education, particularly in areas such as skills development and simulationbased training.

The findings from this study have implications for the teacher training programs, which need to priorities AI literacy and integrating skills. The results also highlight the need for policymakers and educators to invest in infrastructure and resources to support AI integration in vocational education. Conclusion and recommendations

In conclusion, the study highlights the potentials, challenges and opportunities of integrating Artificial intelligence (AI) in vocational education. The results suggests that while there are significant challenges to be addressed, AI also has the potentials to enhances personalized teaching and learning in vocational education.

Based on the findings, the following recommendations were made:

1.Tertiary institutions should focus on AI literacy programs integrating Artificial Intelligence in vocational education and policy development to facilitate smooth adoption.

2.Teacher training programs should priorities AI literacy and integration of skills as well as investment on infrastructure to support AI integration.

3.There should be collaboration between educators, policymakers, and technology developers for designing AI tools that align with pedagogical goals.

References

Broughon, C., & Prinsloo, P. (2020). The role of AI in vocational education: A

Systematic review. Journal of Vocational Education Research 20 (1)1-15

Howard, S.K., & Mozejiko, A. (2020). Teachers' perception of AI in education: A systematic review. Journal of Educational Computing Research, 58 (4), 419-437

Ifenthaler, D., Gibson, D., & Liu, Z. (2020). AI in vocational Education: A Delphi study. Journal of Vocational Education Research, 20 (2) 1-18

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3 (2), 77-101.

Bryman, A. (2016). Social Research Methods. Oxford University Press.

Chen, X., Xie, H., Zou, D., & Hwang, G. J. (2020). Application and theory gaps during the rise of Artificial Intelligence in Education. Computers and Education: Artificial Intelligence, 1, 100002.

Creswell, J. W., & Plano Clark, V. L. (2017). Designing and Conducting Mixed Methods Research. SAGE Publications.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13 (3), 319-340.

Field, A. (2018). Discovering Statistics Using IBM SPSS Statistics. SAGE Publications.

Farias, M., Salamanca, J. (2020). AI in Education: A review of the literature in Educational Technology & Society, 23 (1),15-28

Holmes, W., Bialik, M., & Fadel, C. (2021). Artificial Intelligence in Education: Promises and Implications for Teaching and Learning. Center for Curriculum

Redesign.

Knez, I., (2020). Teacher Training for AI integration in Education: A systematic review. Educational Technology. Research & Development. 68(2)531-554

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence Unleashed: An Argument for AI in Education. Pearson Education.

Piaget, J. (1954). The Construction of Reality in the Child. Basic Books.

Selwyn, N. (2019). Should robots replace teachers? AI and the future of education. Social Science Research Network. https://doi.org/10.2139/ssrn.3421577

Vygotsky, L. S. (1978). Mind in Society: The Development of Higher Psychological

Processes. Harvard University Press.

Zawacki-Richter, O., Marin, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on Artificial Intelligence applications in higher education. International Journal of Educational Technology in Higher Education, 16 (1), 39