Research Article

Challenges and Prospects of Utilizing Artificial Intelligence into Teaching and Learning of Technical Education Courses in Tertiary Institutions in Kano State, Nigeria

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Abstract
The study focused on challenges and prospects of utilizing artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria. Two research questions guided the study and two null hypotheses were tested. A descriptive survey research design was adopted. The population of the study consisted of 206 technical educators in government owned tertiary institutions that offer technical education courses in Kano State. No sample was taken, as the population size was manageable. A 18-items structured questionnaire was used and validated by three experts for the study. The reliability of the instrument was ascertained using Cronbach Alpha which showed that the clusters achieved co-efficient values of 0.92 and 0.89 respectively for the clusters B1 and B2, with an overall reliability co-efficient value of 0.91. Data related to the research questions were analyzed using mean and standard deviation, while t-test was used to test the null hypotheses at 0.05 level of significance. The findings of the study revealed that challenges inhibiting the utilization of artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria to include lack of artificial intelligence literacy, access to artificial intelligence resources, inadequate infrastructure among others. The findings further revealed that utilizing artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria yields several prospects including advancements in adaptive learning systems that respond dynamically to individual student progress, enhancement of the personalization of education, among others. It was recommended among others that educational institutions should implement policies and guidelines for the controlled of challenges of utilizing artificial intelligent to ensure effective teaching and learning of technical education.
Keywords: Challenges, Prospects, Utilization, Artificial Intelligence, Technical Education Courses.

Introduction

Technical education refers to the academic and practical preparation of individuals for careers in fields that involve the application of science, technology and related skills. It emphasizes the development of practical skills and technical knowledge needed for specific occupations, often at a semi-professional level and professional level. This type of education prepares students for a wide range of technical and vocational roles in industries like engineering, healthcare, information technology and technical education. To Okoye and Arimonu (2021), technical education encompasses structured learning experiences designed to impart practical skills, technical knowledge and work attitudes necessary for employment in specific occupational fields. Unlike general education's theoretical orientation, technical education emphasizes applied learning through hands-on engagement with tools, materials and equipment (Nwosu and Micah, 2022). Therefore, technical education is one of the most dynamic programmes in tertiary institutions globally.

The dynamism of the technical education programme is driven by technology. Without any equivocation, emerging technologies are constantly altering the nature and scope of the technical education programme. Sira *et al.,* (2024) posited that every emerging technology comes with a new sense of diversity, individuality and professionalism more than ever before, as it opens many doors of opportunity and prepares students for a more challenging and better future. The interaction between lecturers and students usually entails

teaching and learning. Lecturers are expected to teach while students are expected to learn. For the purpose of this paper, teaching can be described as the conscious and deliberate efforts by a lecturer to impart information, knowledge and skills to students using morally acceptable methods with the intention that the learners will become better citizens while learning a motivated individual acquires knowledge, skill and attitude that leads to a permanent change in behavior.

It is noteworthy that there are various methods of teaching that can be adopted by the teachers and there are many learning styles that can be adopted by learners. In today's world, technology is pervasive and students adapt to technology faster than anyone else (Olaitari, 2022). Without any doubt, technical education students are growing up in the digital age. In contemporary times, new technologies such as artificial intelligence (AI) are springing up at a very fast rate and it is imperative that technical educators align with the paradigm shift in pedagogical practices.

Artificial intelligence (AI) is a computer system that includes human-like processes like learning, adapting, synthesizing, self-correcting and using data for complex processing tasks. While numerous artificial intelligence solutions rely heavily on programmable algorithms, a subset of these technologies possesses the advanced capability to learn from data, patterns and make predictive inferences. Artificial intelligence (AI) is an emerging technology that has attracted appreciable attention in all fields of human endeavour and the education sector is not an exception. Ogunode *et al.,* (2023) described artificial intelligence as the development of computer systems and machines capable of performing tasks that typically require human intelligence. These tasks include: learning, reasoning, problem-solving, perception and natural language understanding. Artificial intelligence is an application, collection of systems, packages and programmes designed into digital computers or computer-controlled robots to undertake assignments and task with human-line intelligence (Alagbe, 2021; Ogunode *et al,* 2023). In contemporary times, artificial intelligence is being utilized in education to boost personalized learning, smarter contents, improved learning effectiveness and efficiency administration (Rilwan, 2024).

AI tools have proven firmly and helpful in various fields (technical education inclusive). Some artificial intelligence tools that are suitable for teaching and learning of technical education courses include: computer vision, prediction systems, data mining (Rilwan, 2024), intelligent learning or teaching systems, learning analytics (Ley *et al.,* 2023), facial recognition systems, voice or speech recognition systems, virtual laboratories augmented reality, virtual reality, hearing and sensing technologies, edge computing, virtual personalized assistants, real-time analytics, AI chatbot, image recognition, personalized learning approach, academic analytics and adaptive learning method (al-Zyoud, 2020).

Undoubtedly, there are numerous challenges and prospects from the utilization of artificial intelligence for teaching and learning of technical education courses. The prospects from utilization of artificial intelligence for teaching and learning, according to Ogunode *et al.,* (2023), include personalized learning, adaptive assessments and automated grading systems. Alonta *et al.,* (2024) noted the prospects from the utilization of artificial intelligence for teaching to include improvement of learning outcomes, increase efficiency and provide tailored support to students. Research on the impact of artificial intelligence utilization in the classroom indicates that when teachers effectively integrate artificial intelligence tools, they can improve student engagement, provide personalized learning experiences and optimize administrative tasks (Alagbe, 2021). Technical educators in tertiary institutions can leverage artificial intelligence to automate administrative tasks, provide feedback, enhance content delivery and facilitate collaboration (Manafa and Onyekaba, 2025). Some of the challenges, according to Kabiru and Mohammed (2024), include infrastructure and network connectivity, educational and data ecosystem, policy and ethical considerations, job displacement, educational inequality, ethical concerns, dependency on technology, and changing skill requirements. Others challenges include infrastructure and connectivity barriers, job displacement, educational and data ecosystem, faculty training, policy and ethical considerations, government and industry initiatives, resistance to change, concerns about data privacy and security, students' limited knowledge of the benefits of AI in business education, infrastructural deficit, and poor knowledge of AI utilization (Okoye and Arimonu, 2021). These challenges have yet to be empirically proven within the context of technical education programmes in tertiary institutions in Kano State.

Technical education at the level of tertiary institution is a training programme that produces individuals for the world of work. Technical education is a planned programme of courses and learning that begins with exploration of career potions, supports basic academic and life skills, and enables achievement of high academic standards leadership, preparation for industry defined work, and advanced and continuing

education. Odu (2021) defined technical education to be a subset of technical and vocational education programme characterized as education aimed at producing skilled labour. It is a type of education, training, or retraining designed to prepare individuals for roles in the public sectors or for self-employment in the business sector. According to Amadi and Brown (2023), technical education aims to develop basic skills for future use, contribute to national development, and prepare students for future studies in engineering, computer science, or culinary arts among others.

One issue with the utilization of artificial intelligence in technical education in institutions of higher learning in Kano State may be varying technological experiences among technical educators. Okoye *et al.,* (2022) noted that many educators lack familiarity with advanced educational technologies and this could lead to skepticism about the effectiveness and prospects of AI into teaching and learning. Amadi and Brown (2023) affirmed that there was a significant difference in the views of technical educators with and without teaching experience regarding AI utilization challenges and prospects in the teaching and learning of technical education courses. Accordingly, Olaitari (2022) stated that self-efficacy of technology has significant influence on educators' willingness to utilize such systems, with some maintaining traditional methods and others struggling due to insufficient training or resources. These views have not been empirically proven in technical education in tertiary institutions in Kano State. Following this background, this study was set out to examine the challenges and prospects of utilizing AI into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria.

Statement of the Problem
The problem of the study is that may observations by the researcher seem to show that technical educators are still dependent on traditional methods of delivering lectures in the technical education programme. These traditional systems appear to be burdensome, piling a lot of stress on both students and lecturers. Students are often packed into lecture halls, struggling to make sense of what is being discussed, which affects their ability to grasp key concepts. The researcher wonders if the deployment of artificial intelligence could offer an avenue to improve the situation and potentially enhance students' understanding and engagement in technical education programme. Focusing on the foregoing, the researcher examined the challenges and prospects of utilizing artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria.

Research Questions
The following research questions guided the study:

1) What are the challenges inhibiting the utilization of artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria?
2) What are the prospects of utilizing artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria?

Hypotheses
The following null hypotheses were tested at 0.05 level of significance:

1) There is no significant difference in the mean responses of technical educators who have experience with artificial intelligent and those without experience of artificial intelligent on the challenges inhibiting utilization of artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria.
2) There is no significant difference in the mean responses of technical educators who have experience with artificial intelligent and those without experience of artificial intelligent on the prospects of utilizing artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria.

Method
Descriptive survey research design was adopted for the study. The population for the study comprised 206 technical educators in the five government tertiary institutions in Kano State that run technical education programme. The institutions are the Bayero University Kano (36); Northwest University Kano (26); Kano State Polytechnic (36); Kano State University of Science and Technology (18) and Federal College of Education (Technical), Bichi (90). The whole population was studied with no sampling because of its manageable size. Data for the study were gathered using a structured questionnaire designed by the researcher, titled "Questionnaire on Challenges and Prospects of Utilizing Artificial Intelligence into Teaching

and Learning of Technical Education Courses (QCPUAITLTEC)." The questionnaire instrument was validated by three experts, two experts in Technical Education ATBU Bauchi State, Nigeria. To establish the instrument's reliability, pilot testing was utilized. The internal consistency of the items instrument was established using Cronbach Alpha and yielded reliability co-efficient values of 0.92 and 0.89 respectively for the two clusters with an overall co-efficient value of 0.91.

Data collected in the study regarding the two research questions were analyzed using descriptive statistics of mean and standard deviation. Mean value was used to answer the two research questions while the standard deviation was used to determine the closeness of the mean responses. Decision on the questionnaire items were interpreted on means, any mean score of 2.50 and above were considered agreed while the mean scores below 2.50 were considered disagreed.

In data collection, out of the 206 copies of the questionnaire distributed to the respondents, 201 copies were actually retrieved from the respondents which represented about 98 percent. Five copies were not properly filled and discarded representing 2 percent. The t-test was used to test the null hypotheses at 0.05 level of significance. Where the calculated p-value was less than the 0.05, it means that there was significant difference and the hypothesis was rejected. Conversely, where the calculated p-value was equal to or greater than the table value at level of significance (0.05), it means that there was no significant difference and the hypothesis was not rejected.

Results
Research Question 1: What are the challenges inhibiting the utilization of artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria?

Table 1. Mean ratings of technical educators on the challenges inhibiting the utilization of artificial intelligence into teaching and learning of technical education courses in tertiary institutions Kano State, Nigeria (N = 201).

S/N	Item statements	$\bar{x}$	SD	Remarks
1	Lack of artificial intelligence literacy	2.60	0.60	Agree
2	Access to artificial intelligence resources	3.20	0.49	Agree
3	Insufficient training on utilization of AI into teaching of technical education courses	2.70	0.57	Agree
4	Inadequate infrastructure, like reliable internet and computers to support teaching	2.50	0.64	Agree
5	Absence of collaboration between tertiary institutions and technology companies limits access to AI solutions	3.00	0.54	Agree
6	Balancing artificial intelligence with human skills is a challenge in adopting artificial intelligence in technical education courses	3.49	0.40	Agree
7	Minimize in-person interactions between learners and lecturers which could impede the cultivation of essential communication skills	2.69	0.59	Agree
8	Lack of institutional policy to promote the adoption of AI into teaching technical education courses	3.24	0.46	Agree
9	The danger of excessive reliance on AI that may impede the development of critical thinking skills	3.12	0.51	Agree
10	Fear of potential reduction in student engagement and interaction with human instructors and peers	3.40	0.42	Agree
	Grand mean	**2.99**		**Agree**

Data in Table 1 show that the respondents agree that all the items were challenges inhibiting the utilization of artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria with mean scores ranging from 2.50 to 3.49. This is because its mean score was above 2.50 which is the cut of point. The standard deviations show that there is homogeneity amongst responses indicating a greater consensus of opinions.

Research Question 2: What are the prospects of utilizing artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria?

Table 2. Mean ratings of technical educators on the prospects of utilizing artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria (N = 201).

S/N	Item statements	x̄	SD	Remarks
1	Technical education may witness advancements in adaptive learning systems that respond dynamically to individual student progress	3.50	0.47	Agree
2	Enhancement of the personalization of education	3.10	0.64	Agree
3	Enhancing capabilities to provide real-time feedback	3.60	0.42	Agree
4	Adaption of diverse learning needs	3.57	0.44	Agree
5	Track student progress more effectively	3.43	0.51	Agree
6	Providing instant support to students	3.13	0.62	Agree
7	Foster students' active engagement in the teaching and learning process	3.06	0.67	Agree
8	Improve students' academic performance and overall efficiency in all ramifications	3.40	0.54	Agree
	Grand mean	**3.44**		**Agree**

Data in Table 2 show that the respondents agree that all the items were prospects of utilizing artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria with mean scores ranging from 3.10 to 3.60. This is because its mean score was above 2.50 which is the cut of point. The standard deviations show that there is homogeneity amongst responses indicating a greater consensus of opinions.

Testing of Hypotheses

Null Hypothesis 1: There is no significant difference in the mean responses of technical educators who have experience with artificial intelligent and those without experience of artificial intelligent on the challenges inhibiting utilization of artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria.

Table 3. Summary of t-test analysis on the challenges inhibiting utilization of artificial intelligence into teaching and learning of technical education courses based on experience of technical educators with and without artificial intelligent.

Experience	N	x̄	SD	α	df	t-cal	p-value	Decision
Technical educators with experience	138	3.20	.19	0.05	199	3.11	.002	Significant
Technical educators without experience	63	3.17	.15					

As revealed in Table 3 that technical educators who have experience with artificial intelligent and those without experience in artificial intelligent differ significantly on their mean responses on the challenges inhibiting the utilization of artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria with mean scores of 3.20 and 3.17, while the corresponding standard deviation is .19 and .15. The table indicated t-value of 3.11, at degree of freedom of 199 and the p-value of .002. Testing at alpha level of 0.05, the p-value is significant, since the p-value is less than the alpha value (0.05). Therefore, the null hypothesis is rejected.

Null Hypothesis 2: There is no significant difference in the mean responses of technical educators who have experience with artificial intelligent and those without experience of artificial intelligent on the prospects of utilizing artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria.

Table 4. Summary of t-test analysis on the prospects of utilizing artificial intelligence into teaching and learning of technical education courses based on experience of technical educators with and without artificial intelligent.

Experience	N	x̄	SD	α	df	t-cal	p-value	Decision
Technical educators with experience	138	3.09	.12	0.05	199	1.44	.003	Significant
Technical educators without experience	63	3.02	.10					

As revealed in Table 4 that technical educators who have experience with artificial intelligent and those without experience in artificial intelligent differ significantly on their mean responses on the prospects of utilizing artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria with mean scores of 3.09 and 3.02, while the corresponding standard deviation is .12 and .10. The table indicated t-value of 1.44, at degree of freedom of 199 and the p-value of .003. Testing at alpha level of 0.05, the p-value is significant, since the p-value is less than the alpha value (0.05). Therefore, the null hypothesis is rejected.

Discussion of Findings
Findings of first research question revealed that challenges inhibiting the utilization of artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria included lack of artificial intelligence literacy, access to artificial intelligence resources, insufficient training on utilization of AI into teaching of technical education, inadequate infrastructure, absence of collaboration between tertiary institutions and technology companies limits access to AI solution, balancing artificial intelligence with human skills, minimize in-person interactions between learners and lecturers which could impede the cultivation of essential communication skills among others. This corresponds with Okoye and Arimonu (2021) who revealed that infrastructure and connectivity barriers, educational and data ecosystem, faculty training, policy and ethical considerations, government and industry initiatives as challenges of utilization of artificial intelligence into teaching of technical education programme.

The result of the first null hypotheses revealed that technical educators who have experience with artificial intelligent and those without experience in artificial intelligent differ significantly on their mean responses on the challenges inhibiting the utilization of artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria. The findings agreed with Olaitari (2022) who stated that self-efficacy of technology has significant influence on educators' willingness to utilize such systems, with some maintaining traditional methods and others struggling due to insufficient training or resources. This implies that technical educators with and without experience differ significantly on their mean responses on the challenges inhibiting the utilization of artificial intelligence into teaching and learning of technical education courses.

Findings of second research question revealed that prospects of utilizing artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria yields several prospects including advancements in adaptive learning systems that respond dynamically to individual student progress, enhancement of the personalization of education, enhancing capabilities to provide real-time feedback, adaption of diverse learning needs, tracking student progress more effectively, providing instant support to students, foster students' active engagement in the teaching and learning process, improve students' academic performance and overall efficiency in all ramifications among others. The finding of the study agrees with Ogunode *et al.*, (2023) who revealed that prospects of utilizing AI includes personalized learning, adaptive assessments, intelligent tutoring systems and automated grading systems.

The result of the second null hypotheses revealed that technical educators who have experience with artificial intelligent and those without experience in artificial intelligent differ significantly on their mean responses on the prospects of utilizing artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria. The finding agrees with Amadi and Brown (2023) affirmed that there was a significant difference in the views of technical educators with and without teaching experience regarding AI utilization challenges and prospects in the teaching and learning of technical education courses.

Conclusion
Based on the findings of this study, it is concluded that there is a significant challenges inhibiting the utilization of artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria including lack of artificial intelligence literacy, access to artificial intelligence resources, inadequate infrastructure, absence of collaboration between tertiary institutions and technology companies limits access to AI solution among others.

The findings further revealed the key prospects of utilizing artificial intelligence into teaching and learning of technical education courses are advancements in adaptive learning systems that respond dynamically to individual student progress, enhancement of the personalization of education, enhancing capabilities to provide real-time feedback, adaption of diverse learning needs among others. However, the study revealed

that technical educators who have experience with artificial intelligent and those without experience in artificial intelligent differ significantly on their mean responses on the challenges and prospects of utilizing artificial intelligence into teaching and learning of technical education courses in tertiary institutions in Kano State, Nigeria. This implies that artificial intelligence tools can enhance the teaching and learning of technical education courses if the inherent challenges are adequately surmounted.

Recommendations
The researcher made the following recommendations based on findings of the study:

1) Federal and state governments in collaboration with tertiary institutions and technology companies should set up an endowment fund that will cater for provision of infrastructural facilities, funding, balancing artificial intelligence with human skills and expertise to promote the utilization of artificial intelligent into teaching and learning in tertiary institutions in Kano State, Nigeria particularly technical education courses.
2) Educational institutions should implement policies and guidelines to control the challenges facing utilization of artificial intelligence to ensure effective teaching and learning of technical education courses. This may include regulating the extent to which AI-driven tools are used in teaching and learning processes to maintain a balance between traditional educational practices and technological advancements.

Declarations
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References
1. Alagbe, I.S. 2021. Exploring the potentials of artificial intelligence for student instruction. Instructional Science, 49(6): 631-654.

2. Alonta, G.C., Onwubuya, U.N. and Onwuamaeme, R.O. 2024. Perceived threats of artificial intelligence on the academic retention and critical thinking of business education undergraduates in public universities in Anambra State. International Journal of Research and Scientific Innovation, 11(4): 974-981.

3. al-Zyoud, H.M.M. 2020. The role of artificial intelligence in teacher professional development. Universal Journal of Educational Research, 8(11B): 6263-6272.

4. Amadi, N.S. and Brown, I.E. 2023. Challenges in technical education workshop management: Perspectives from Rivers State, Nigeria. Journal of Vocational Education Research, 47(2): 178-193.

5. Kabiru, A.Y. and Mohammed, U.M. 2024. Unleashing the power of AI in entrepreneurial practices in North-East Nigeria. International Journal of Academic Information Systems Research, 8(4): 120-123.

6. Ley, T., Tammets, K., Pishtari, G., Chejara, P., et al. 2023. Towards a partnership of teachers and intelligent learning technology: A systematic literature review of model-based learning analytics. Journal of Computer Assisted Learning, 39: 1397-1417.

7. Manafa, F. and Onyekaba, M.N. 2025. Utilization of artificial intelligence (AI) in the management of tertiary institutions in Nigeria. Journal of Educational Foundations, 14(1): 119-132.

8. Nwosu, J.C. and Micah, E.M. 2022. Application of situated learning theory in technical vocational education and training in Nigeria. Nigerian Journal of Technology Education, 5(1): 45-58.

9. Odu, K.O. 2021. Facilities and workshop management in technical education: Contemporary approaches for Nigerian technical colleges. African Journal of Educational Research and Development, 15(2): 112-127.

10. Ogunode, N.J., Edinoh, K. and Okolie, R.C. 2023. Artificial intelligence and tertiary education management. Electronic Research Journal of Social Sciences and Humanities, 5(4): 18-31.

11. Okoye, R. and Arimonu, M.O. 2016. Technical and vocational education in Nigeria: Issues, challenges and a way forward. Journal of Education and Practice, 7(3): 113-118.

12. Okoye, R., Esemonu, N.P. and Onyesom, M. 2022. Technical education workshop quality: A systematic review of empirical studies in Nigeria (2010-2022). Vocational Education Studies, 8(4): 318-334.

13. Olaitari, I.D. 2022. Assessment of workshop facilities in technical colleges in Southern Nigeria: Implications for skill acquisition. Journal of Education and Training Studies, 10(3): 62-74.

14. Rilwan, D. 2024. Benefits and challenges of utilizing artificial intelligence for teaching and learning business education courses in colleges of education in Northwest Nigeria. Association of Business Educators of Nigeria Conference Proceedings, 11(1): 318-323.

15. Sira, A.P., Ubulom, W.J. and Okiridu, O.S.F. 2024. Awareness, competence and utilization of artificial intelligence for improved job performance by business educators in universities in South-South Nigeria. International Journal of Advanced Research and Learning, 3(1): 37-49.