Leveraging Artificial Intelligence for Innovation in Vocational Education: A Catalyst for National Development.

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DOI: https://doi.org/10.47772/IJRISS.2026.100500678

Received: 12 May 2026; Accepted: 18 May 2026; Published: 10 June 2026

ABSTRACT

This study examined the role of artificial intelligence (AI) in promoting innovation within vocational education and its contribution to national development. A descriptive survey research design was adopted, involving 186 respondents drawn from vocational and technical education institutions in Plateau State, Nigeria. Data was collected using a structured questionnaire and analysed using descriptive statistics, including mean scores and standard deviation; regression analysis was used to test the research hypotheses. Findings revealed a high level of awareness and adoption of AI, significant influence of AI on innovation in vocational education, and a strong positive relationship between AI adoption and national development. The study concludes that artificial intelligence is a critical driver of skills development, workforce competitiveness, and economic growth. It recommends increased institutional support, policy frameworks, and capacity building to enhance AI integration in vocational education.

Keywords: Artificial Intelligence, Vocational Education, Innovation, National Development.

INTRODUCTION

Vocational and technical education is one of the many fields where artificial intelligence (AI) is acknowledged as a key technology with revolutionary potential (Sandhu et al., 2024). The design, delivery, and optimisation of vocational training programs have been increasingly impacted by AI applications in recent years (Ran & Han,2023; Shan et al.,2024). AI integration in vocational training is essential as we move closer to achieving the Sustainable Development Goals (SDGs) by 2030 in order to address global issues like poverty alleviation, sustainable economic growth, and decent work for all (Odo, 2023; Ojeaga & Dumbiri, 2023; Sutikno, 2024). To democratise access to high-quality education and offer scalable, reasonably priced training programs that target marginalised communities, AI-driven solutions may be crucial (Javaid et al.,2023).

AI can also increase workforce preparedness, facilitate ongoing learning and skill development, and improve job-matching procedures (Garlinska et al., 2023). AI can assist in developing more robust and adaptive workforces by coordinating vocational training with industry demands and the most recent technological developments. To deliver people with the fundamental skills needed for employment, entrepreneurship, and national productivity, vocational education is crucial. (Prasetya et al., 2023; Wulansari et al., 2024; Fortuna, Prasetya, Samala et al., 2024). It is widely acknowledged that artificial intelligence (AI) is a game-changing technology that has a significant impact on vocational education, helping to align educational methods with the Sustainable Development Goals (SDGs). Vinuesa et al. (2020) demonstrate how AI can support accessibility and quality in education, showing the importance of creating inclusive learning environments. In a similar vein, Adel (2024) believes that AI is revolutionising education and is a vital instrument in the shift from Industry 4.0 to Industry 5.0. AI helps individualised experiences by customising instructional materials to meet the needs of each learner. According to Bhutoria (2022), a comparative analysis of China, India, and the United States explores how AI-based teaching strategies promote individualised learning and help to make education more inclusive. Teachers can improve educational outcomes and accessibility by utilising AI technologies to offer real-time feedback and customised learning pathways that accommodate a range of learning styles and speeds.

To add anything new to a system is called innovation. It entails shifting the current concept by adding some fresh ones. Innovation is crucial for finding novel solutions to challenging issues, which can propel organisations like universities toward growth and success. Innovation is the outcome of scientific research that enhances social activities and carries out social production (Siauliai, 2013). Farniha et al. (2016) believe that physically producing goods and services entails applying fundamental knowledge gained through talent and expertise ventures. Companies must cope with the development of new goods and services, and innovation is a crucial component of managing global competitiveness.

It is vital that learning, investigation, and experience are likely ways to gain this knowledge. This knowledge cannot be regarded as innovation until it is put to practise in the actual production of goods and services and transformed into development. Process and product technologies, as well as the organisation and management of production, are all included in the concept of innovation capability. AI has made a substantial contribution to the creation of vocational education programmes and guarantees that these programmes meet the needs of the labour market.

Statement of the Problem

Nigeria's vocational education system nevertheless faces enduring difficulties, despite the strategic value of vocational education in promoting skill acquisition, job creation, and sustainable development. These difficulties include poor employability, a lack of innovation in teaching and learning methods, poor utilisation of cutting-edge digital technology, and a lack of connections between industry demands and educational institutions. Vocational education has therefore not made a significant contribution to the nation's social inclusion, environmental responsibility, and sustainable economic growth.

Artificial intelligence (AI)-driven technologies, especially intelligent systems with data analytics, automation, smart simulations, and adaptive learning capabilities, have been recognised as potent instruments for revolutionising vocational education through innovation on a global scale. AI's potential to improve learning experiences, increase skill relevance, optimise resource use, and improve instructional delivery is still mostly unrealised in Nigeria. The majority of vocational schools continue to employ traditional teaching strategies, which stifle innovation, creativity, and adaptability to the demands of the contemporary labour market. Policy documents place a strong emphasis on sustainable development and digital transformation. There is no adequate empirical data to show how AI affects innovative outcomes in vocational education, like curriculum modernisation, learner engagement, teaching effectiveness, and employability skills. Furthermore, research has not examined in detail how AI-driven innovations contribute to broader sustainable development objectives, including job creation, youth employment, economic productivity, and environmentally friendly practices. A significant research gap is created by the paucity of empirical studies relating to AI, innovation in vocational education, and sustainable national development in Nigeria. This study examines the relationship among AI, innovation in vocational education, and national development. Hence, examining this problem will show whether leveraging AI in vocational education can catalyse national development in Nigeria. Hence, the study intends to examine the introduction, methodology, analysis, findings, discussion, conclusion, and recommendations.

LITERATURE REVIEW

Concept of Artificial Intelligence

Artificial Intelligence (AI), as defined by Weber (2023), refers to the field of science and technology focused on developing intelligent machines. This encompasses the creation of sophisticated computer programs capable of performing tasks that typically require human intelligence. These tasks include problem-solving, learning, and adapting to new situations. AI aims to replicate or simulate human cognitive functions, leading to the development of systems that can perform complex operations and make decisions based on data analysis and pattern recognition. Sheikh et al. (2023) define AI as a technology designed to enable machines to replicate a wide range of sophisticated human abilities. This includes the capability to perform tasks that typically require human intelligence, such as understanding natural language, recognising patterns, making decisions, and learning from experience. By mimicking these complex cognitive functions, AI systems aim to enhance automation and problem-solving across various domains. Bartneck et al. (2021) define AI as "the study of

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume X Issue V May 2026

intelligent agents that receive percepts from the environment and take actions." In this context, an intelligent agent is a system that perceives its surroundings through sensors and acts upon those perceptions using its internal processes. The key aspect of AI is its focus on creating agents that can make decisions and act autonomously based on the information they receive. Bartneck et al. (2021) also define AI as "the field that studies the synthesis and analysis of computational agents that act intelligently." This definition emphasises AI's focus on creating and understanding computational systems - often referred to as agents - that exhibit behaviours and decision-making capabilities that can be considered intelligent. The term "synthesis" in this context refers to the process of designing and constructing intelligent agents, which involves developing algorithms and systems that mimic aspects of human intelligence. This includes areas such as problem-solving, learning, reasoning, and adapting to new situations. On the other hand, "analysis" pertains to the examination and evaluation of these agents' performances and behaviours. This involves assessing how well these computational agents operate in various scenarios, how effectively they solve problems, and how their decision-making processes align with the intended intelligent behaviour.

Concept of Innovation in Vocational and Technical Education

Innovation in vocational and technical education (VTE) refers to the intentional introduction and effective use of new ideas, technologies, instructional methods, curricula, and organisational practices to improve the quality, relevance, efficiency, and outcomes of skills-based education and training**.** Innovation is not limited to technological change; rather, it encompasses pedagogical, curricular, institutional, and systemic transformations aimed at responding to changing economic, industrial, and societal needs (Cusmono et al,.2018).

Vocational and technical education is designed to equip learners with practical skills, technical knowledge, and competencies required for specific occupations and self-reliance. Innovation in this context focuses on enhancing employability, productivity, entrepreneurship, and lifelong learning**, en**suring that graduates remain adaptable in a rapidly evolving labour market (UNESCO, 2016). According to Billett (2011), innovation in vocational education involves rethinking traditional teaching approaches and adopting learner-centred, workplace-oriented, and competency-based strategies that reflect real industry practices.

Scholars identify curriculum innovation as a core aspect of vocational and technical education. This includes the adoption of competency-based curricula, modular training systems, flexible learning pathways, and outcome-based assessments, all of which emphasise mastery of practical skills rather than rote learning (Schmid & Tritscher-Arcan, 2017). Such innovations ensure that vocational training remains relevant and aligned with current and future occupational standards.

Technological innovation also plays a significant role in transforming vocational and technical education. The integration of digital tools, e-learning platforms, simulation technologies, automation, and artificial intelligence enhances instructional delivery, expands access to training, and improves learning efficiency (OECD, 2021). These technologies support blended and flexible learning models, enabling learners to acquire technical skills in both physical and virtual environments.

From an institutional perspective, innovation in vocational and technical education involves **s**trengthening industry–education partnerships, adopting work-based learning models, improving teacher professional development, and enhancing governance and quality assurance systems (World Bank, 2020). Collaboration with industries ensures that training content reflects real workplace requirements, thereby reducing skills mismatch and improving graduate employability.

In developing countries such as Nigeria, innovation in vocational and technical education is widely regarded as a strategic response to youth unemployment, skills gaps, and economic diversification challenges. Innovative vocational systems support industrial growth, entrepreneurship, and sustainable national development by producing a skilled and adaptable workforce capable of meeting contemporary economic demands (African Development Bank, 2020).

Concept of National Development

The term national development refers to any policy, institution, process, innovation, or intervention that accelerates economic growth, social progress, and structural transformation within a nation without being

exhausted in the process. Borrowed from chemistry, where a catalyst speeds up reactions without undergoing permanent change, the concept in development studies describes mechanisms that stimulate, enhance, and sustain development outcomes across multiple sectors of a country (Todaro & Smith, 2020).

National development is a multidimensional process involving economic growth, human capital development, technological advancement, poverty reduction, social inclusion, and institutional strengthening (Sen, 1999). A catalyst for national development, therefore acts as a driving force that triggers positive change, improves productivity, and enhances a nation's capacity to achieve long-term development goals.

Empirical Review

Leveraging Artificial Intelligence and National Development

A study conducted by Joel Augustus et al. (2025) on Leveraging Artificial Intelligence (AI) for Educational Development in Nigeria: Examining the Challenges and Opportunities. The research adopts an exploratory approach, utilising secondary data sources such as textbooks, published papers, internet resources, and newspaper reports. The data were organised thematically and analysed through content analysis, guided by the connectivism learning theory as the analytical framework. Results: The findings indicate that AI has the potential to customise learning experiences to suit individual student needs, abilities, and learning styles. It can provide personalised support through real-time feedback, enhancing the overall learning process.

Media Awareness Role and Leveraging Artificial Intelligence (AI) for Sustainable Development: Focus on Yenagoa, Bayelsa State, Nigeria by Guanah et al. (2024), adopting a quantitative research method. Findings indicated a growing, but uneven awareness of AI's potential, while the usage level of AI for sustainable development in Nigeria is abysmally low.

Elems-Ikwegbu (2025), leveraging artificial intelligence (AI) in Nigerian tertiary education: ethical benchmarking and policy implications. Findings revealed that while AI has the potential to bridge gaps in access and quality, achieving this requires addressing infrastructural and policy deficiencies, as well as ensuring equitable and ethical deployment.

Costin et al. (2023) supported that the synergy of these technologies has not only revolutionised the learning process but has also facilitated personalised and adaptive approaches catering to the unique requirements of individual learners and adult trainees. The synergy of these technologies has not only revolutionised the learning process but has also facilitated personalised and adaptive approaches catering to the unique requirements of individual learners and adult trainees.

Prasetya et al. (2023), supported by stating that leveraging AI technologies, vocational education can provide learners with the necessary skills to develop and implement environmentally friendly solutions, contributing significantly to sustainable development goals (SDGs). The study explores various AI applications in vocational training, such as smart energy management, eco-friendly manufacturing processes, and sustainable agriculture practices.

Zary and Zary (2025) evaluated that vocational trades show AI-driven simulators enhance hands-on skills. Lee et al. found that an AI-guided XR welding trainer improved welding accuracy and learning rate over traditional VR instruction. An Indonesian "AI teaching factory" boosted students' technical proficiency, efficiency, and industry readiness. Surveys indicate high student satisfaction: Malaysian polytechnic students using an AI-powered robotics trainer saw increased understanding and confidence, while TVET students with ChatGPT reported improved comprehension and engagement. Analytical studies highlight curriculum alignment: a decision analysis in the End-of-Life Vehicle sector identified AI integration, tool training, and industry partnerships as priorities for employability.

Danmaigoro et al. (2025) supported that AI-enabled training infrastructure, capacity building for educators, and stronger public-private partnerships are essential to bridging the skills gap. Leveraging vocational education and AI for entrepreneurship development can reduce unemployment, stimulate inclusive economic growth, and position Nigeria competitively in the global knowledge economy.

Anzizah et al. (2025) supported the view that AI integration enhances skill acquisition, learner engagement, and personalised instruction, while necessitating robust infrastructure and faculty development. Leong (2025) supported the integration of AI and automation into the TVET curriculum and practice as a game-changer for vocational education and training. AI-powered tools are used for personalised learning, intelligent tutoring systems, and virtual simulation of hands-on skills acquisition.

METHODOLOGY

The study adopted the descriptive survey research design because the opinions of the respondents were sought. Osuala (2003) stated that when a survey centres on individuals and their opinions, beliefs, motivation, and behaviour, the survey method is the most appropriate.

The area of this study is Plateau State. The population for the study was 2000 vocational and technical students of the three universities in Plateau State, Nigeria. The sample size of the study was determined using the Krejcie and Morgan 1970 sample size determination table.

The instrument for data collection was a structured questionnaire divided into three sections. The questionnaire was structured on a five-point rating scale of Strongly Agree = 5, Agree = 4, Undecided=3 Disagree = 2, Strongly Disagree = 1, respectively. The instrument was validated by three experts. One from the measurement and evaluation unit of the Department of Psychology and two from the Department of Vocational and Technical Education, educational technology, all in the Federal University of Education, Pankshin, Plateau State. Cronbach's Alpha reliability method was used to test the reliability of the items shown below.

Reliability Test

Table 1

Variables	Items	Crobach Alpha
Artificial intelligence	12	.767
Vocational and technical education	12	.910
National development	11	.702

Table 1 shows the summary of the reliability results. It can be seen from the results of the reliability test that the reliability tests for the variables under investigation are all above

0.70. Consequently, given the established yardstick of 0.70, it can be concluded that all the constructs are reliable. 322 Copies of the questionnaires were distributed with the help of research assistants, and 253 were used, representing 65% of response rate. In line with Nulty (2008), who claimed that a 60% response rate was sufficient for an easy-to-reach paper survey, the data were analysed using mean and standard deviation to answer the research questions and simple regression to test the hypotheses at the 0.05 level of significance, rejecting the null hypothesis if the t-value was less than 1.96 and the p-value was greater than 0.05.

Presentation of Results

Table 1: What is the current level of awareness among tertiary institution students about artificial intelligence and its applications in vocational education?

S/N	Items	Mean	SD	Remark
1	I am aware that Artificial Intelligence platforms are used to support teaching in vocational education	3.90	0.78	Agreed
2	Intelligent tutoring systems improve students' practical skills	3.80	0.81	Agreed
3	AI tools enhance interactive learning experiences	4.30	0.76	Agreed
4	AI-based systems provide instant feedback to students	4.60	0.83	Agreed
5	There is administrative support for AI adoption	4.40	0.85	Agreed
6	Artificial Intelligence is regularly discussed in my lectures or academic material	3.80	0.79	Agreed
7	I can differentiate between Artificial Intelligence and other emerging technologies.	4.60	0.82	Agreed

8	Automated grading improves assessment efficiency	4.40	0.84	Agreed
9	AI helps track students' learning progress effectively	4.90	0.77	Agreed
10	AI helps tailor training to individual student needs	4.10	0.75	Agreed
11	AI enhances industry-relevant skill acquisition	4.20	0.83	Agreed

Source: Field Survey, 2025

Table 1 revealed the responses to items 1-11, the mean ratings, and the standard deviation. The mean ratings of items ranged from 3.80 to 4.90, which implied that there are high levels of awareness in the use of Artificial Intelligence among tertiary institution students, and its applications in business are above 4.24. The standard deviation of the items ranged from 0.76 to 0.85. The clustered mean of 4.24 implied that the respondents are generally aware of Artificial Intelligence and its application in their various academic activities

Table 2: To what extent do students apply Artificial Intelligence for innovation in vocational education?

S/N	**Items**	Mean	SD	Remark
1	AI integration has led to curriculum modernisation	3.90	0.74	Agreed
2	Vocational courses reflect emerging digital technologies	3.80	0.76	Agreed
3	Course content aligns with industry demands	4.30	0.81	Agreed
4	AI has introduced new teaching strategies	4.60	0.79	Agreed
5	Blended and smart learning approaches are adopted	4.40	0.80	Agreed
6	Problem-based learning is enhanced through AI tools	4.70	0.71	Agreed
7	Smart labs and simulation technologies are used	4.25	0.83	Agreed
8	Virtual/ augmented reality supports practical training	4.40	0.63	Agreed
9	Data analytics informs institutional decision-making	4.70	0.57	Agreed
10	AI facilitates stronger industry partnerships	4.25	0.60	Agreed
11	Students receive AI supported internship placement	3.70	0.51	Agreed
12	Industry feedback is integrated into training programmes	3.90	0.61	Agreed

Source: Field Survey, 2025

Table 2 revealed the responses to items 1-12, the mean ratings, and the standard deviation. The mean ratings of items ranged from 3.70 to 4.70, which implied that students at various levels do apply Artificial Intelligence to improve their academic performance, making learning more engaging and interactive, and understanding more complex business concepts. This is above 4.33. The standard deviation of the items ranged from 0.51 to 0.83. The clustered mean of 4.33 implied that the respondents generally apply the use of Artificial Intelligence to solve their academic issues and find solutions to business concepts

Table 3: To what extent can leveraging AI enhance national development?

S/N	Item	Mean	SD	Remark
1	AI integration improves employability skills	3.90	0.76	Agreed
2	Graduates possess industry-relevant digital competencies	3.80	0.77	Agreed
3	AI enhances technical proficiency	4.30	0.79	Agreed
4	AI supported training increases job opportunities	4.60	0.81	Agreed
5	Graduates are more competitive in the labour market	4.40	0.84	Agreed
6	Self-employment opportunities have increased	4.70	0.91	Agreed
7	AI in vocational education supports SME growth	4.40	0.93	Agreed
8	Skilled graduates contribute to national productivity	4.80	0.85	Agreed
9	AI adoption enhances workforce efficiency	3.99	0.78	Agreed
10	AI training promotes digital transformation	4.00	0.80	Agreed
11	AI skills enhance national competitiveness	4.77	0.82	Agreed

Source: Field Survey, 2025

Table 3 revealed the responses to items 1-11, the mean ratings, and the standard deviation. The mean ratings of items ranged from 3.80 to 4.80, which implies that students believe that Artificial Intelligence is very relevant and important in business education and their future careers, it is above 6.21. The standard deviation of the items ranged from 0.80 to 0.93. The grand mean of 6.21 implied that the students generally believe Artificial Intelligence is crucial to national development.

Hypotheses Testing

Hypothesis 1: Artificial intelligence does not have a significant influence on innovation in vocational education in Plateau State

Table 2 Model -Summary

Model	R1	R2	Adjusted R2	Std Error of estimate
1	.481	.232	.229	.61525

@ predictors (constant) leveraging AI

The value of R (0.481) indicates that the correlation between innovation in vocational education is moderate and positive. 23.2% of the variation in vocational education can be explained by AI. This indicates the model fits the data. The adjusted R2 of 0.229 accounts for the number of predictors, but in simple linear regression, it will be close to R.

Table 3 Anova a

Model	Summary of Squares	Df	Mean Square	F	Sig
Regression	28.778	3	28.377	76.026	.000
Residual	95.391	250	.378		
Total	124.169	253			

@ Dependent variable: innovation in vocational education

Predictors (constant) leveraging AI

Regression sum of squares is 28.778; this is the variation in vocational education explained by leveraging AI. Residual sum of squares: This is the unexplained variation (error) in the model. The F statistic calculated value of 76.026 indicates that the model is a good fit; this means that predictive power is moderate. The p-value of less than 0.05 levels of significance shows that the model is statistically significant, meaning that leveraging AI significantly predicts vocational education.

Table 4 Simple Coefficient Tables

Unstandardise coefficient			**Standardise coefficient**		
Model	B	Standard error	Beta	T	Sig
Constant	1.844	.214	-	8.609	.000
V/E	.515	.059	.481	8.719	.000

Results in Table 4 show that leveraging AI is significantly and positively related to vocational education with a (β = .515, t = 8.719, p – 0.000). Since the p-value is less than 0.05, the slope is statistically significant. This means that leveraging AI significantly impacts innovation in vocational education.

Hypothesis 2: Innovation in vocational education does not significantly contribute to national development.

Table 5 Model -Summary

Model	R1	R2	**Adjusted R2**	**Std Error of estimate**
1	.521	.272	.262	.60133

@ predictors (constant) leveraging AI

The value of R (0.521) is the correlation between leveraging AI and innovation in vocational education for national development, which is moderate and positive. 27.2% of the variation in national development can be explained by leveraging AI. This indicates the model fits the data. The adjusted R2 of 0.263 accounts for the number of predictors, but in simple linear regression, it will be close to R2.

Table 6 Anova a

Model	**Sum of squares**	**Df**	**Mean square**	**F**	**Sig**
Regression	33.767	3	11.350	31.129	.000
Residual	90.401	250	.362		
Total	124.169	253			

@ Dependent variable: National development

Predictors (constant) leveraging AI

Regression sum of squares is 33.767; this is the variation in national development is explained by leveraging AI. Residual sum of squares: This is the unexplained variation (error) in the model. The F statistic calculated value of 31.129 indicates that the model is a good fit; this means that predictive power is weak. The p-value of less than 0.05 levels of significance shows that the model is statistically significant, meaning that leveraging AI significantly predicts national development.

Table 7 Simple Coefficient Tables

Unstandardise coefficient			**Standardise coefficient**		
Model	B	**Std error**	**Beta**	T	Sig
Constant	1.319	.275	-	5.524	.000
Leveraging AI	.444	.380	.933	3.177	.002

Dependent variable: national development.

Results in Table 11 show that leveraging AI is significantly and positively related to national development with a (β = .444, t = 3.177, p – 0.002). Since the p-value is less than 0.05, the slope is statistically significant. This means that leveraging AI significantly impacts national development.

Hypothesis 3: There is no significant relationship between the use of artificial intelligence in vocational education and national development outcomes.

Table 8 Model -Summary

Model	R1	R2	**Adjusted R2**	**Std Error of estimate**
1	.502	.252	.243	.60943

@ predictors (constant) leveraging AI

The value of R (0.502) indicates that the correlation between leveraging AI and national development is moderate and positive. 25.2% of the variation in national development can be explained by leveraging AI. This indicates the model fits the data. The adjusted R2 of 0.243 accounts for the number of predictors, but in simple linear regression, it will be close to R 2.

Table 9 Anova a

Model	Sum of squares	Df	Mean square	F	Sig
Regression	31.319	3	10.440	28.107	.000
Residual	92.850	250	.371		
Total	124.169	253			

@ Dependent variable: national development

Predictors (constant) leveraging AI

Regression sum of squares is 31.319; this is the variation in national development that is explained by leveraging AI. Residual sum of squares: This is the unexplained variation (error) in the model. The F statistic calculated value of 28.107 indicates that the model is a good fit; this means that predictive power is weak. The p-value of less than 0.05 levels of significance shows that the model is statistically significant, meaning that leveraging AI significantly predicts national development.

Table 10 Simple Coefficient Tables

Unstandardise coefficient			**Standardise coefficient**		
Model	B	**Std error**	**Beta**	T	Sig
Constant	1.412	.298	-	5.000	.000
Mentoring	.440	.065	.411	6.715	.002

Dependent variable: national development.

Results in Table 14 show that leveraging AI is significantly and positively related to national development, with a (β = .440, t = 6.715, p – 0.002). Since the p-value is less than 0.05, the slope is statistically significant. This means that leveraging AI significantly impacts national development.

DISCUSSION OF FINDINGS

The findings that leveraging AI and innovation in vocational education are positively correlated suggest that good leveraging of AI enhances the ability of vocational education students to innovate in their knowledge. Hence, AI will help vocational students to develop new innovations that can enhance national development.

These results are consistent with the submission of Joel Augustus et al. (2025), that AI has the potential to customise learning experiences to suit individual student needs, abilities, and learning styles. It can provide personalised support through real-time feedback, enhancing the overall learning process. The results further support Parasetya et al. (2025), AI contributes to the achievement of the United Nations Sustainable Development Goals (SDGs) 2030, particularly SDG 4 (quality education access), SDG 8 (decent work and economic growth), and SDG 9 (industry, innovation, and infrastructure).

The result also supports the findings of Onatere-Ubrurhe and Ubrurhe (2025), which reveal that current assessments have a moderate effectiveness in capturing technical skills and a significant gap in evaluating creativity and innovation. While 57.9% of respondents were aware of AI in education, confidence in using AI tools remained moderate. Key AI technologies such as adaptive testing, learning analytics, and automated grading were widely recognized and positively perceived. Ejjami (2024) also emphasises the capacity of AI to enhance educational achievements using tailored learning, adaptable platforms, immediate feedback, and simulations. A paradigm shift in the way skills are taught and learned is necessary, nevertheless, as the demands on vocational education have increased dramatically due to the growing automation and technological power of the global economy. VE is being revolutionized by artificial intelligence (AI), which provides creative ways to improve instruction, training, and skill development by changing pedagogy and learning approaches. (Resmi et al., 2025).

The findings, therefore, align with global studies that emphasise AI as a driver of educational innovation and economic development. AI-enabled vocational education improves skill relevance, enhances employability, and supports national productivity. These results confirm the relevance of AI as a strategic tool for achieving sustainable national development.

CONCLUSION

The study concludes that artificial intelligence significantly enhances innovation in vocational education and contributes to national development. Strategic investment in AI infrastructure and human capacity development is therefore essential. Hence, artificial intelligence is a critical driver of skills development, workforce competitiveness, and economic growth.

RECOMMENDATIONS

The study, therefore, recommended that

1. The government should integrate AI policies into vocational education frameworks.
2. Institutions should provide continuous AI training for educators.
3. Public-private partnerships should support AI infrastructure development.
4. Curriculum reforms should embed AI-driven instructional approaches.

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