



An Investigation into the Influence of Artificial Intelligence on Pedagogical and Learning Processes among Academic Staff of Federal Polytechnic Wannune, Benue State Nigeria

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Abstract

This study investigated the influence of Artificial Intelligence on pedagogical and learning processes among academic staff of Federal Polytechnic Wannune. The study was guided by three research questions; the influence of AI on pedagogical and learning processes, the level of awareness and usage of AI tools among academic staff and the challenges limiting the use of AI for teaching and learning. A descriptive survey research design was adopted for the study. The population comprised 274 academic staff of Federal Polytechnic Wannune. All the 274 academic staff were sampled using Census sampling technique. A structured questionnaire using a 4-point Likert scale was used to collect data. Data were analyzed using Mean and Standard Deviation with 2.50 as the criterion mean for decision. The major findings of the study revealed that: Academic staff agreed that AI has a positive influence on pedagogical and learning processes. Also, the level of awareness and usage of AI tools among academic staff was moderate to high as staff demonstrated familiarity with AI tools such as ChatGPT, Grammarly, and AI-powered LMS features and understood their application in teaching. However, there was disagreement that management has created awareness on the use of AI, indicating that awareness is largely self-driven. The major challenges limiting the use of AI for teaching and learning are infrastructural and institutional. These include absence of training/workshops by management, lack of access to technology such as PCs and tablets, irregular electricity supply, poor internet connectivity, and resistance to change amongst others. Based on these findings, it was concluded that while academic staff recognize the benefits of AI and are personally aware of it, its effective adoption is being hindered by poor infrastructure and lack of institutional support. Consequently, it was recommended that the management of Federal Polytechnic Wannune should provide adequate ICT infrastructure, organize regular training on AI, develop policies to guide AI use, and create awareness to ensure effective integration of AI into teaching and learning.

Keywords: Artificial Intelligence, ChatGPT, Grammarly, Pedagogy, Learning Process, Academic Staff.

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Introduction

Historically, humans have always dreamed of nonhuman creatures that could solve problems beyond human capabilities (Griffey, 2019). Actualizing such dreams would make humans accomplish tasks that they perceive to be beyond their capabilities. Such dreams then resulted in a sequence of inventions and automation activities that were witnessed by individuals like Ad Lovelace and Charles Babbage, who sought to utilise the growth of computing technology to manage complex problems confronting humanity. This led to the development of technologies that provide platforms for machines to learn like humans, to interpret and employ information to execute tasks with capabilities traditionally associated with human experts. Thus the advent of these technologies, called Artificial Intelligence.

To Ahmed and Amao (2025), Artificial intelligence refers a machine's or computer's ability to replicate human intelligence and behavior. Artificial intelligence is the development of computers with intelligence and the capacity to perform human-like tasks, including cognition, learning, decision-making, and environmental adaptation. Miller (2024) defines AI as the advancement of computer systems that can execute tasks typically requiring human intelligence. These systems strive to emulate human-like cognitive functions such as learning, problem-solving, decision-making, and language comprehension. Artificial intelligence encompasses intelligent systems focused on acquiring abilities, such as language comprehension, learning, logical reasoning, and problem-solving that are conventionally linked with the human mind (Saveliev&Zhurenkov, 2021).

Computers or robots with "artificial intelligence" can perform intelligent tasks. This phrase generally refers to the construction of AI systems with human-like thinking, semantic comprehension, generalisation and experience learning. Since the 1940s, digital computers have successfully proven mathematical theorems and played chess. Despite greater computer processing

speed and capacity, programmes can only match human flexibility in jobs requiring considerable baseline knowledge. AI machines outperformed human experts in various domains. This limits AI applications in speech and handwriting recognition, search engines, and medical diagnostics (Roll & Wylie, 2016). According to Sadikuet *al.* (2021), a computer system may execute human cognitive skills, such as reasoning and learning, normally reserved for humans. AI technology gives education a new degree of adaptability and versatility, changing the educational environment and simplifying the jobs of instructors.

AI plays a pivotal role in providing solutions across diverse fields, including but not limited to health, education, and engineering. In recent years, AI applications have attracted increasing interest and considerable attention in education (Taş, 2021; Zawacki-Richter *et al.*, 2019). Although, AI presents numerous opportunities to enhance teaching and learning, it also introduces fresh ethical considerations and potential risks (Zawacki-Richter *et al.*, 2019). Incorporating AI into education (AIEd) represents a two-sided phenomenon capable of yielding unintended outcomes and prompting a reevaluation of our perspectives on learning, knowledge, skills, performance, creativity, and innovation (Gibson *et al.*, 2023). Indeed, integrating AI opportunities with pedagogical components can drive a transformative paradigm shift in education. In this regard, the crucial emphasis lies not in attempting to exclude artificial intelligence from the teaching process by instructional designers and practitioners but rather in reimagining learning activities by incorporating AI advancements.

Zhai(2023) asserts that Generative Artificial Intelligence (GAI) such as ChatGPT is poised to revolutionise various sectors, including education. AI, characterised by its human-like cognitive functions across diverse tasks, offers significant potential to revolutionise teaching, learning, and research methodologies (Polat, 2023; Rahman &Watanobe, 2023). AI encompasses various approaches, methodologies, and techniques aimed at mimicking human intelligence in machines. Of

course AI technologies operate according to specific models.

In a similar vein, Chen *et al* (2020) posited that AI is rapidly reshaping higher education, making significant improvements in teaching, learning, research, and administrative functions. As AI tools and technologies become more integrated into academic environments, higher institutions can increase their operational efficiency, reduce the burden of administrative tasks, and offer students more personalised ways of learning. These developments not only improved traditional educational models but also led institutions to rethink their approach to teaching and learning (Chen *et al.*, 2020). AI is autonomous, such that it can make decisions without requiring human intervention to accomplish a task- or purpose-related objective. It also possesses adaptability, indicating that the system can perceive its surroundings and modify its behaviour in response to environmental shifts (Dignum, 2021).

Furthermore, AI in the educational system is due to the increasing workload of teachers and the need to increase teacher productivity. AI in higher education helps identify the gaps in teaching and learning and increases education proficiency (Van der Vorst & Jellicic, 2019). AI helps the education system in evaluation, assessment, prediction, personification, intelligent tutoring, and adaptive systems. Administrative tasks, such as monitoring students, are made easier through automated systems, and the desktop computer has been joined in the classroom by an increasing number of gadgets (Johnson *et al.*, 2016). A huge rise in data generation and computational power has occurred in tandem with the development of digital technologies and their growing interconnectedness. This has led to the widespread use of intelligent systems that can learn from themselves, reason like humans and generalise from massive datasets (Xu *et al.*, 2021). One of the most important applications of AI in higher education is the development of AI-supported tutoring systems that provide real-time, personalised support to students. Indeed, integrating AI opportunities with pedagogical components can drive a transformative paradigm shift in education. In this regard, the crucial emphasis lies not in

attempting to exclude AI from the teaching process by instructional designers and practitioners but rather in reimagining learning activities by incorporating AI advancements.

AI has found applications within the education sector, contributing to the creation of curricula, educational materials, and lesson plans. These educational resources leverage on various tools and technologies, including virtual reality, web-based platforms, robotics, video conferencing, audiovisual materials, and 3-D technology. This integration of AI tools has resulted in more efficient and effective teaching practices, leading to more personalised and comprehensive learning experiences for students (Aldosari, 2020). Furthermore, a deeper examination of various sources has uncovered noteworthy insights. AI's has become apparent that AI's application in education can transcend the physical limitations imposed by national and international borders. This can be achieved by hosting learning resources on the Internet and the World Wide Web, allowing access from virtually anywhere. The incorporation of AI features, such as language translation tools, enables students to learn in a manner that aligns with their unique abilities and language preferences. Educational content has become readily accessible to learners across the globe through online learning or web-based educational platforms (Jain & Jain, 2019).

Academic staff in this research refers to lecturers. A lecturer is an academic instructor primarily responsible for delivering lectures, facilitating learning, and supporting students' academic progress at a higher education institution. Lecturers engage in activities such as preparing and delivering lectures, assessing student performance, and often contributing to curriculum development (Gosling & Moon as cited in Hassan, Sulaiman, Abdullahi, Mukailu & Badamasi (2024)). Their role may vary depending on institutional requirements but typically focuses on fostering a conducive learning environment and facilitating students' comprehension and knowledge acquisition.

Despite the benefits of artificial intelligence, its adoption among lecturers remains largely intermediate. Factors such as insufficient training, concerns about reliability, and limited experience with AI tools may hinder full integration. Understanding lecturers' experiences with AI, including perceived usefulness, ease of use, impact on teaching performance, and attitudes toward AI, is essential for promoting effective integration of AI in higher education for teaching and learning. This study therefore seeks to explore the impact of artificial intelligence for teaching and learning by academic staff of Federal Polytechnic Wannune, Benue State Nigeria.

Statement of the Problem

The adoption and integration of artificial intelligence in tertiary education has the possibility to revolutionise teaching and learning methods, yet the full impact of AI on lecturers remained underexplored. While AI technologies are being increasingly adopted in various educational settings, there is limited understanding of how these tools are reshaping the role of lecturers, influencing pedagogical practices and enhancing the learning experiences of students in higher institutions of learning. On the other hand students may experience varying degrees of benefit from AI-driven learning tools, ranging from personalized learning experiences to potential over-reliance on automated systems. Additionally, the ethical implications of AI, such as bias in algorithms, data privacy concerns, and the potential dehumanization of the learning process are also critical issues that need addressing.

Despite the growing dependence on AI technologies in education, a preliminary observation by the researchers in the study area revealed that lecturers are faced with the challenges of effectively integrating AI into their teaching methods maybe, due to insufficient training, lack of resources and resistance to change in traditional structures among others. There is need to critically assess both the positive and negative impacts of AI on teaching and

learning and to understand the extent to which AI is currently being used by lecturers in teaching, the challenges they face and the implications for students' academic experience in the evolving landscape of education. Thus, this study seeks to investigate the influence of Artificial Intelligence on pedagogical and learning processes among academic staff of Federal Polytechnic Wannune.

Purpose of the Study

The general purpose of the study is to investigate the influence of Artificial Intelligence on Pedagogical and Learning Processes among Academic Staff of Federal Polytechnic Wannune.. Specifically, the study seeks to:

- i. Examine the impact of AI for teaching and learning among academic staff
- ii. Examine the level of awareness and usage of AI tools among academic staff
- iii. Evaluate the challenges limiting the use of AI for teaching and learning by academic staff

Research Questions

The study is guided by the following the research Questions

- i. What is the impact of AI for teaching and learning among academic staff?
- ii. What is the level of awareness and usage of AI tools among academic staff?
- iii. What are the challenges limiting the use of AI for teaching and learning by academic staff?

Literature Review

Many academic definitions and studies of AI highlight similar qualities. Vermaet *al.*, (2021) call AI "devices that can approximate human reasoning". Similar to this, AI requires decades of study and development. System designers, data scientists, product designers, statisticians, linguists,

cognitive scientists, psychologists, education experts, and others collaborated to create intelligent education systems that could support teachers and students (Nagao, 2019). AI is based on enhanced software and programme skills, such as algorithmic machine learning, which allows computers to perform activities that require human intelligence and environmental adaptability (Nguyen *et al.*, 2021).

Ertel (2017) added that definitions of Artificial Intelligence seem to vary from one text to the other but generally, it is described as a computer system that can think and act on its own with no supervision. Often writers have described AI as a study of how to make computers do things which at the moment people can do better (Ertel, 2017). This enables computers or computer-controlled robotics to solve problems that are normally associated with higher intellectual capabilities of humans.

The development of artificial intelligence has had a profound impact on education and teaching practice. It is changing the teaching methods of teachers and the learning methods of students (Xue and Wang, 2022). The generative AI tool – ChatGPT remarkably perform complex tasks within the field of education has caused mixed feelings among educators, as this advancement in AI seems to revolutionize existing educational praxis. Benefits of ChatGPT include but are not limited to promotion of personalized and interactive learning, generating prompts for formative assessment activities that provide ongoing feedback to inform teaching and learning (Baidoo-Anu and Ansah, 2023). Their study offers recommendations on how ChatGPT could be leveraged to maximize teaching and learning. Policy makers, researchers, educators and technology experts could work together and start conversations on how these evolving generative AI tools could be used safely and constructively to improve education and support students' learning.

Furthermore, D'Mello&Graesser (2012) posited that there is growing interest in leveraging AI to enhance teaching and learning outcomes. Bates *et al.* (2020) found that much of the applications and research in the educational

application of AI did not offer the desired benefits and changes. Other researchers also found supportive results to these findings, including AI quality, user preferences, and ethical issues (Pasupuleti&Thiyyagura, 2024). One important aspect would be the emphasis placed in the educational sector on a techno-centric approach. This method emphasizes the significance of AI while disregarding the agency of educators, who play an important role in deciding what, when, and how AI technologies are used (Sanusi *et al.*, 2024). Teachers are important players in the successful implementation of AI in schools because they serve as an interphase between student needs and school AI policy (Cingillioglu *et al.*, 2024). Many teachers might still be unprepared for AI-enhanced instruction even though they are aware of the potential advantages of AI.

Similarly, Dahri *et al* (2024) observed that teachers who are exceptionally ready for AI are generally considered to possess the knowledge and skills needed to re-imagine their profession by investigating and adjusting to the opportunities presented by AI. These innovative attempts may improve their work experience, leading to higher job satisfaction (Woodruff *et al.*, 2023). Individuals with poor levels of AI readiness (RedAI) may feel threatened, express concerns about potential interruptions to their work, and hence alienate themselves from AI technology (Molefi *et al.*, 2024). While a high level of RedAI is regarded as critical for effective incorporation of AI into teaching (Cingillioglu *et al.*, 2024), there is no empirical evidence on how RedAI affects instructors' work. Furthermore, little is known about whether and how RedAI differs among teachers from different demographic backgrounds, especially in the context of gender and socioeconomic status, which have frequently been linked to disparities in the use of traditional technologies (Chakraborty & Al Rashdi, 2018; Tarhini *et al.*, 2024). The importance of AI has grown significantly, particularly since the closing of educational institutions caused by the COVID-19 epidemic. The many functions that AI plays in the teaching-learning process and its varied components indicate a significant and palpable impact on both

current and future learners (Mahmoud, 2020). The key developments that have evolved because of this integration have made it easier for students and teachers to access information. As a result, including AI applications into curriculum design, teaching methods, and evaluations is critical for achieving successful learning outcomes (Eltabakh, 2019).

Recent literature emphasize that AI is driving a paradigm shift in higher education globally (Anjali & Sreerekha, 2024). Research emphasizes that AI technologies are transforming fundamental practices in teaching, evaluation, and research while offering chances and ethical dilemmas for instructors and institutions (Yadav, 2024). Fuchs and Aguilos, (2023) points out that the successful integration of AI involves not only technological but also algorithmic literacy, along with systematic guidelines and teacher training. Excessive use of AI, nonetheless, threatens to dilute academic proficiency and teamwork, making balanced adoption measures more crucial (George & Wooden, 2023). Wu et al. (2025) integrates findings of 99 studies, which indicate general acceptance of AI across students and teachers, who appreciate its ability for individualized learning and instant feedback. However, serious concerns remain over data protection, bias in algorithms, and the potential to deepen digital inequities. Klimova et al. (2025) highlight the need for institutions to ensure human-centered pedagogy while benefitting from AI's potential for personalized and democratized learning. Policy-oriented scholarship recommends that universities are called to transition from reactive, integrity-based frameworks to proactive, comprehensive models that cover culture, regulation, access, familiarity, and trust the CRAFT model (Vartiainen&Tedre, 2023). This change guarantees that integration of AI promotes academic excellence, equity, and ethical strength, basically reshaping the delivery of higher education in an AI era.

The incorporation of AI in university education shows considerable promise for transformatively improving teaching methods and student learning results. A significant approach included the use of AI-driven platforms that enabled

collaborative learning and customised instruction designed to address the varied needs of students (Alonso, 2020). These innovative systems tailored educational content to align with individual student preferences and learning styles while enhancing classroom engagement levels, a crucial factor for effective learning (Awadet *al.*, 2022). Moreover, a further study emphasised that with the backing of sophisticated AI tools, project-based learning approaches enabled educators to enhance their lesson plans and elevate classroom discussions, fostering a more vibrant and engaging learning atmosphere (Alamet *al.*, 2022). A recent study of an AI-based adaptive learning Moodle plugin involving 102 Moroccan high school students highlighted its considerable effect on student engagement and academic performance when compared to traditional learning methods (Ezzaimet *al.*, 2024). This study highlights the effectiveness of AI in promoting an active learning environment, emphasising that carefully integrated AI not only improves instructional strategies but also significantly transforms science education. This approach fosters an environment that is attuned to learners' needs, promoting critical skills development through teamwork and exploration. It encourages students to actively engage in their educational experiences, equipping them with the vital competencies to tackle future challenges. The continuous advancement of AI in education has the potential to enhance and deepen the teaching environment in classrooms in high schools. Incorporating AI into the curriculum can markedly improve student engagement and learning outcomes. Some educators acknowledge the promise of AI, even while confronting obstacles such as insufficient training and technological infrastructure (Nugrohoet *al.*, 2024).

The educational effects of emerging technologies on how educational institutions teach and how students learn were investigated in a study by Fahimirad&Kotamjan (2018) on the advent of using artificial intelligence in teaching and learning in education. The goal of this study is to forecast how artificial intelligence will affect education in the future. It is thought that using artificial intelligence techniques well can raise the standard

of instruction and learning. Nonetheless, the difficulties associated with incorporating AI in educational settings are discussed. Additionally, the difficulties that students encounter in using artificial intelligence with regard to administration, instruction, learning, and student support (Fahimirad&Kotamjani, 2018).

In a quantitative study, teachers' opinions about GAI and its possible application in the classroom were investigated (Kaplan-Rakowski, 2023). In a validated survey, a representative sample of 147 teachers expressed their opinions about GAI technology, including its potential, integration, use, and drawbacks. Generally speaking, regardless of their method of instruction, the teachers have positive opinions on GAI. The study's conclusions imply that instructors' viewpoints got more optimistic the more GAI they employed. Teachers said GAI may be a useful tool for pupils and improve their professional growth. Another study evaluated AI's impact on education, focusing on administration, instruction, and learning (Hwang, et al., 2020). The findings indicated extensive AI adoption in education, evolving from computer-based technologies to web-based intelligent education systems and humanoid robots. AI has enabled efficient administrative tasks like grading, improved teaching quality, and personalized learning content, enhancing the overall learning experience (Chen et al., 2020).

For the effective adoption of artificial intelligence (AI) in education in Nigerian higher institutions, it is crucial to solve many obstacles and impediments. The ubiquitous infrastructural restrictions in several educational institutions nationwide are a major obstacle. Lack of sufficient access to technology, such as PCs or tablets, impedes the efficient use of AI-powered instructional aids (Ainaet *al.*, 2023). In addition, the irregular provision of electricity and insufficient internet access in many schools present substantial challenges, hindering the smooth use of AI applications and obstructing the educational progress of students.

The necessity for through teacher training and ongoing professional development is an

essential component in incorporating AI into education (Al-Zyoud, 2020). With the rise of innovative technologies in educational settings, educators must possess the necessary knowledge and skills to effectively leverage these tools. Present educational programmes frequently fall short of providing adequate training materials, resulting in inadequately equipped teachers (Guo& Liu, 2022). Educators often lack the essential knowledge required to effectively adopt these emerging technologies which can negatively impact the learning environment. Promoting the allocation of more resources towards education infrastructure; fostering partnerships with both public and commercial sectors; and creating AI apps that can function without an internet connection or with limited bandwidth are viable methods to address these infrastructure difficulties.

Another crucial obstacle is the preparation and competence of teachers in integrating AI into the educational system. Several educators may lack sufficient training in using AI tools in the classroom, impeding their capacity to successfully harness new technology. Resistance to change, which originates from a lack of familiarity or scepticism over the efficacy of AI, is another obstacle. The limited access to continuous professional development opportunities worsens the problem, hindering instructors from enhancing their abilities and remaining up-to-date with breakthroughs in AI-driven teaching. To tackle these issues, it is necessary to execute extensive training programmes, cooperate with educational institutions for ongoing professional growth, and create mentoring programmes to allow the exchange of information among educators (Adeyemi, 2020).

Research Methods

The study employed a descriptive research design. Descriptive research design according to Akuezulo as cited in Agwu (2012) is one which seeks to find out and describe the condition or opinions held by a population by collecting and analyzing data from people who are considered to be representative of the entire group. Descriptive research design is therefore adopted in this study to

investigate the influence of Artificial Intelligence on pedagogical and learning processes among academic staff of Federal Polytechnic Wannune. The study area is Federal Polytechnic Wannune, located in Tarka Local Government Area of Benue State, Nigeria. Established in 2021 by President Muhammadu Buhari, the Federal Polytechnic, Wannune in Benue State was created to boost technological education. Under the Pioneer Rector Dr. Terlumun Utsev, the institution rapidly developed infrastructure, including new academic blocks and laboratories. It has since introduced 24 new NBTE-accredited courses under Dr. Ashinya Tyover and remains one of the fast rising polytechnics in the North Central Nigeria.

The population of the study comprised all the Lecturers (Academic Staff) teaching in Federal Polytechnic Wannune. Available data to the researchers by the Director Academic Planning shows a total number of **(274) Academic Staff (source: Academic Planning Unit, FPW, 2026)**. The study adopted Census Sampling Technique. The population of 274 Academic Staff of Federal

Polytechnic Wannune was considered small and manageable by the researchers. According to Taherdoost (2022), Census sampling is recommended for small populations to ensure complete coverage and reduce sampling error.

A structured questionnaire on “the Influence of Artificial Intelligence on Pedagogical and Learning Processes among Academic Staff (IAIPLPAS)” was developed by the researchers and used as instrument for data collection. Data was collected by the researchers through physical administration to the lecturers in their offices during work hours. The researchers would visit the office of the lecturer, administer the questionnaire and allowed them time to fill and return it. This method was employed by the researcher to ensure a high return rate of the instrument.

Data was collected, coded and analyzed using Statistical Package for Social Science (SPSS). Descriptive statistics was used to calculate for mean and standard deviation with a bench mark of 2.50. Any item that scored above 2.50 was “Agreed” and below was “Disagreed”.

Results

Table 1 Return Rate

No of Questionnaires Administered	Number of Questionnaires Returned	Percentage
274	179	65.3%

Source: Field Survey, 2026

Table 1 presents respondents’ response rate. The table show that two hundred and seventy four (274) representing (100%) questionnaires were administered to the respondents and 179 (65.3%) were

returned and used for the study. The high return rate of the instrument was a result of the researchers diligence in the administration of the instrument.

Rq1. Influence of AI on Pedagogical and Learning process Among Academic Staff

S/No.	Item Statement	Mean	STD	Remark
1	AI-generated materials help deliver clearer explanations	3.37	0.65	Agreed
2	AI assists in creating engaging learning resources	3.06	1.03	Agreed
3	AI helps improve students' understanding of course content	3.04	1.16	Agreed
4	AI tools can help teachers conduct research.	3.43	0.73	Agreed
5	AI algorithms may inherit biases from the training data.	2.81	0.99	Agreed
Cluster Mean		2.84	1.05	

Source: Field Survey, 2026

To answer Research Question 1, data on the influence of AI on pedagogical and learning processes were collected and analyzed. Table 1 presents the mean and standard deviation of respondents' responses. The cluster mean of 2.84 (SD=1.05) indicates that academic staff generally agreed that AI has a positive influence on pedagogical and learning processes, as all item means were above the criterion mean of 2.50. Specifically, respondents agreed most strongly that AI helps improve students' understanding of course content (M=3.08, SD=1.00). This suggests that academic staff perceive AI as a tool

that can enhance clarity and comprehension in the classroom. Respondents also agreed that AI-generated materials help deliver clearer explanations (M=3.00, SD=1.04) and that AI tools can help teachers conduct research (M=2.94, SD=1.14). The item with the lowest agreement was AI assists in creating engaging learning resources (M=2.51, SD=1.08), indicating moderate conviction. Furthermore, respondents acknowledged that AI algorithms may inherit biases from the training data (M=2.65, SD=0.97), showing awareness of the limitations of AI.

RQ2: Awareness and Usage of AI Tools among Academic Staff

S/No	Statement	Mean	STD	Remark
6	I am aware of artificial intelligence tools that can be used for teaching and learning	3.06	1.01	Agreed
7	I can identify examples of AI tools such as Chatgpt, Grammerly, Quilibot and AI powered LMS features	2.92	1.13	Agreed

8	I understand how AI can be applied in lesson planning, content delivery and assessment	3.00	1.12	Agreed
9	I am familiar with the benefits of using AI in teaching and learning	3.14	1.03	agreed
10	The management has created awareness on the use of AI for teaching	1.95	0.96	Disagreed
Cluster Mean		2.84	1.05	

Source: Field Survey 2026

Research Question 2 examined academic staff's awareness and usage of AI tools. As shown in Table 2, the cluster mean was 2.81 (SD=1.05), indicating a moderate to high level of awareness. Respondents reported the highest level of agreement on familiarity with the benefits of using AI in teaching and learning (M=3.14, SD=1.03). They also agreed that they are aware of AI tools that can be used for teaching and learning

(M=3.06, SD=1.01), understand how AI can be applied in lesson planning, content delivery and assessment (M=3.00, SD=1.12), and can identify examples of AI tools such as ChatGPT, Grammarly, Quillbot and AI powered LMS features (M=2.92, SD=1.13). However, respondents disagreed that the management has created awareness on the use of AI for teaching (M=1.95, SD=0.96).

RQ3: Challenges limiting the use of AI for teaching and learning

S/No	Challenges limiting the Use of AI for Teaching and Learning	Mean	STD	Remark
10	Lack of sufficient access to technology, such as PCs or tablets impedes efficient use of AI	3.37	0.65	Agreed
11	Irregular provision of electricity making it difficult to use PCs or tablets	3.06	1.03	Agreed
12	Lack of internet access/connectivity in the school for teacher's use	3.04	1.16	Agreed
13	Absence of training/workshops on the use of AI technologies by the management of the institution	3.43	0.73	Agreed
14	Resistance to change by lecturers	2.81	0.99	Agreed
15	Lack of IT skills/technical know how to use the technologies for teaching	2.38	1.03	Agreed
Cluster Mean		3.02	0.93	

Source: Field Survey, 2026

To address Research Question 3, respondents rated various challenges to AI use. Table 3 shows a cluster mean of 3.02 (SD=0.93), indicating agreement that multiple challenges exist. The most highly rated challenges were absence of training/workshops on the use of AI technologies by the management of the institution (M=3.43,SD=0.73) and lack of sufficient access to technology, such as PCs or tablets (M=3.37,SD=0.65). Other agreed challenges included irregular provision of electricity (M=3.06,SD=1.03), lack of internet access/connectivity (M=3.04,SD=1.16), and resistance to change by lecturers (M=2.81,SD=0.99). Conversely, respondents disagreed that lack of IT skills/technical know-how is a major challenge M=2.38,SD=1.03).

Discussion of Findings

The discussion of findings of the study is presented in relation to the research questions that were formulated to guide the study.

The findings revealed that academic staff generally agreed that AI has a positive influence on pedagogical and learning processes, with a cluster mean of 2.84. Specifically, AI was perceived to be most effective in improving students' understanding of course content and delivering clearer explanations. This finding corroborates the study of Zawacki-Richter et al. (2019) who reported that AI applications such as intelligent tutoring systems and automated feedback enhance students' comprehension and personalized learning experiences. Similarly, Holmes et al. (2022) noted that AI-generated materials help lecturers simplify complex concepts, thereby making instruction more accessible. However, the moderate agreement on AI assisting in creating engaging learning resources and the acknowledgment of bias in AI algorithms align with Selwyn (2020), who cautioned that while AI offers pedagogical benefits, issues of algorithmic bias, data privacy, and content quality must be addressed to avoid reinforcing inequities in education.

On research question, the results showed a moderate to high level of awareness and usage of AI tools among academic staff, with a cluster mean of 2.81. Respondents demonstrated familiarity with tools like ChatGPT, Grammarly, and AI-powered LMS features, and understood their application in lesson planning and assessment. This is consistent with Chaudhry and Kazim (2022) who found that lecturers in higher institutions are increasingly self-exposed to generative AI tools for academic purposes despite limited formal training. Likewise, Davis and Chansanam (2021) reported that academic staffs in developing context are aware of AI's potential benefits, particularly for content creation and assessment. Conversely, the disagreement on management creating awareness aligns with Akgun and Greenhow (2022), who argued that institutional adoption of AI in education is often slow due to lack of policy direction, training, and leadership support. This suggests that while individual lecturers are exploring AI, institutional frameworks are lagging behind.

And finally, the study identified infrastructural and institutional challenges as the major barriers to AI use, with a cluster mean of 3.02. The most critical challenges were absence of training/workshops and lack of access to technology, followed by irregular electricity and poor internet connectivity. These findings corroborate Owan et al. (2023) who identified poor ICT infrastructure, epileptic power supply, and inadequate training as the primary obstacles to AI adoption in Nigerian tertiary institutions. Similarly, Mhlanga (2023) emphasized that in sub-Saharan Africa, lack of devices, internet, and institutional support significantly limit the integration of AI in education. The disagreement that lack of IT skills is a major challenge is supported by Tadesse and Muluye (2020), who found that digital literacy among lecturers is improving, but adoption is still constrained by environmental factors rather than competence. This implies that capacity building alone will not solve the problem without addressing infrastructure and policy gaps.

Key Findings

1. **Positive influence of AI on pedagogy and learning:** Academic staff agreed that AI positively influences pedagogical and learning processes as AI was perceived as most beneficial for improving students' understanding of course content, delivering clearer explanations, and supporting teachers' research.
2. **Staff demonstrated moderate to high awareness and familiarity with AI tools and their benefits for teaching and learning.** Most staff could identify AI tools and understood their application in lesson planning, delivery, and assessment. However, there was strong disagreement that management has created awareness on AI use. This indicates that current awareness is self-driven rather than institutionally supported.
3. **Infrastructural and institutional challenges are the major barriers.** The study identified several challenges limiting AI use. The most critical were: Absence of training/workshops by management; lack of access to technology such as PCs and tablets. Other significant challenges included irregular electricity supply, poor internet connectivity, and resistance to change by lecturers. Notably, lack of IT skills/technical know-how was not considered a major challenge, suggesting that staff competence is not the primary barrier.
4. **organized to sensitize academic staff on AI tools, benefits, and responsible use.**
2. **Provision of Adequate ICT Infrastructure:** The study identified lack of access to technology, irregular electricity, and poor internet connectivity as major barriers. Therefore, the institution, in collaboration with government and TETFund, should invest in the provision of computers, tablets, stable internet, and alternative power sources such as solar. This will address the infrastructural deficits
3. **Regular Training and Capacity Building Workshops:** Since the absence of training/workshops was rated the highest challenge, management should organize periodic training programs on AI applications for teaching, lesson planning, assessment, and research. The training should focus on practical, discipline-specific AI tools to improve adoption.
4. **Encouragement of AI Integration in Pedagogy:** As academic staff already perceive AI as beneficial for improving understanding and delivering clearer explanations, departments should be encouraged to integrate AI tools into course delivery. Teaching and learning committees can identify AI tools suitable for different courses and share best practices among lecturers.

Recommendations

In line with the findings of this study, the following recommendations are made:

1. **Institutional Sensitization and Policy Development on AI Use:** Given that awareness of AI is currently self-driven and management has not created adequate awareness, the management of Federal Polytechnic Wannune should develop clear policies and guidelines on the ethical and pedagogical use of AI. Regular seminars, workshops, and communiques should be

Summary

This study investigated the influence of Artificial Intelligence on pedagogical and learning processes among academic staff of Federal Polytechnic Wannune. The study was guided by three research questions which focused on: the influence of AI on pedagogical and learning processes; the level of awareness and usage of AI tools among academic staff, and the challenges limiting the use of AI for teaching and learning. A descriptive survey research design was adopted for the study. The population comprised academic staff of Federal Polytechnic Wannune. A structured

questionnaire using a 4-point Likert scale was used to collect data. Data were analyzed using Mean and Standard Deviation with 2.50 as the criterion mean for decision. The major findings of the study revealed that: Academic staff agreed that AI has a positive influence on pedagogical and learning processes. Also, the level of awareness and usage of AI tools among academic staff was moderate to high as staff demonstrated familiarity with AI tools such as ChatGPT, Grammarly, and AI-powered LMS features and understood their application in teaching. However, there was disagreement that management has created awareness on the use of AI, indicating that awareness is largely self-driven. The major challenges limiting the use of AI for teaching and learning are infrastructural and institutional. These include absence of training/workshops by management, lack of access to technology such as PCs and tablets, irregular electricity supply, poor internet connectivity, and resistance to change amongst others. Based on these findings, it was concluded that while academic staff recognize the benefits of AI and are personally aware of it, its effective adoption is being hindered by poor infrastructure and lack of institutional support. Consequently, it was recommended that the management of Federal Polytechnic Wannune should provide adequate ICT infrastructure, organize regular training on AI, develop policies to guide AI use, and create awareness to ensure effective integration of AI into teaching and learning.

Conclusion

This study examined the influence of Artificial Intelligence on pedagogical and learning processes among academic staff of Federal Polytechnic Wannune. Based on the data analyzed and findings discussed, the following conclusions are drawn. First, academic staff generally perceives AI as having a positive influence on teaching and learning. AI is seen as a useful tool for improving students' understanding of course content, delivering clearer explanations, and supporting research. However, staff also demonstrated awareness of the limitations of AI, particularly

regarding engagement and potential algorithmic bias. Second, the level of awareness and usage of AI tools among academic staff is moderate to high. Staff are familiar with AI tools such as ChatGPT, Grammarly, and AI-powered LMS features, and understand how AI can be applied in lesson planning and assessment. Nevertheless, this awareness is largely self-driven, as the institution has not provided adequate sensitization or institutional support. Third, the adoption of AI for teaching and learning is primarily constrained by infrastructural and institutional challenges rather than by lack of staff competence. The major barriers identified include absence of training and workshops, inadequate access to technology, irregular electricity supply, poor internet connectivity, and resistance to change. In conclusion, while AI holds significant potential to enhance pedagogy and learning outcomes at Federal Polytechnic Wannune, its full benefits cannot be realized without deliberate institutional investment in infrastructure, policy, training, and ethical guidelines. Addressing these gaps will position the institution to leverage AI effectively for improved teaching and learning in line with 21st century educational demands.

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