ARTIFICIAL INTELLIGENCE AS A LEVERAGING TOOL FOR ENHANCING ACADEMIC EXPECTATIONS AND PERFORMANCE OF PIONEER STUDENTS AT FEDERAL COLLEGE OF EDUCATION TECHNICAL EKIADOLOR, BENIN

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Abstract

This study examined the use of artificial intelligence as a leveraging tool for enhancing academic expectations and performance of pioneer students at the Federal College of Education Technical Ekiadolor, Benin. The study adopted a descriptive survey research design and focused on all the 310 pioneer students at Federal College of Education Technical Ekiadolor, Benin, Edo State. The study adopted the census approach to cover the entire population due to its small and manageable size. A self-structured questionnaire with ten (10) items titled "Artificial Intelligence as a Leveraging Tool for Enhancing Academic Expectations and Performance of Pioneer Students at Federal College of Education Technical Ekiadolor, Benin, Edo State" (AILEAEPPS-FCETEK) was used for data collection, showing a reliability coefficient of 0.81. The finding revealed, that the integration of AI-driven educational platforms enhances the learning outcomes and influences the motivation levels of pioneer students. The study recommended that the Federal Government of Nigeria should establish virtual classrooms and learning environments in tertiary institutions to facilitate remote or hybrid learning models as these virtual classrooms can provide interactive and practical learning experiences.

Keywords: artificial intelligence, academic expectations, academic performance

Introduction

Artificial Intelligence (AI) has become an integral part of various sectors, significantly influencing educational environments. As technology advances, AI offers unprecedented opportunities to enhance academic performance and reshape educational expectations. AI encompasses a wide range of technologies, including machine learning, natural language processing, and data analytics, which can be utilized to create adaptive learning environments, provide personalized learning experiences, and improve administrative efficiency. These advancements have the potential to transform traditional educational paradigms, making learning more engaging and effective for students (Luckin, Holmes, Griffiths, & Forcier, 2016). Pane, Steiner, Baird, Hamilton, & Pane (2017) AI-driven educational tools can significantly improve academic performance by offering personalized learning experiences tailored to individual student needs. Intelligent tutoring systems (ITS) and adaptive learning platforms utilize AI algorithms to analyze students' strengths and weaknesses, providing customized content and feedback that align with their learning pace and style. Research indicates that personalized learning can lead to improved student outcomes by addressing diverse learning needs more

effectively (Pane et. al, 2017). AI can play a crucial role in bridging educational gaps and fostering a deeper understanding of technical subjects. Educators can employ AI-based tools to identify areas where students struggle and provide targeted interventions, thereby enhancing overall academic performance. Siemens (2013) corroborated that AI-powered learning analytics can help track student progress in real time, enabling timely support and adjustments to instructional strategies.

The implementation of AI in education also reshapes student expectations by promoting a more interactive and engaging learning experience. Traditional classroom settings often follow a one-size-fits-all approach, which may not cater to the unique needs of each student. AI, however, enables a more flexible and inclusive educational environment, where students can learn at their own pace and according to their interests. This shift can lead to higher student satisfaction and motivation, ultimately raising their academic aspirations (Baker & Inventado, 2014). Furthermore, AI tools such as virtual reality (VR) and augmented reality (AR) can provide immersive learning experiences that make complex technical subjects more accessible and understandable. These technologies can offer hands-on experiences that are crucial for mastering practical skills and concepts (Johnson, Adams-Becker, Estrada, & Freeman, 2016).

Artificial Intelligence (AI) has increasingly become a transformative force in academia, reshaping how educational content is delivered, managed, and analyzed. AI encompasses a range of technologies including machine learning, natural language processing, and robotics, which contribute to enhancing educational experiences and outcomes (Seldin, 2022). In the academic context, AI tools facilitate personalized learning by adapting educational materials to the needs and learning styles of individual students. For instance, AI-driven platforms can analyze student performance data to provide tailored resources and feedback, thereby supporting differentiated instruction (Chen, 2023). This personalization aims to improve student engagement and academic achievement by addressing individual learning gaps and preferences. Moreover, AI has the potential to streamline administrative tasks such as grading and scheduling. Automated grading systems can evaluate student work more efficiently than traditional methods, allowing educators to allocate more time to instructional activities and student support (Smith & Johnson, 2021).

Additionally, AI applications can assist in the management of academic schedules and resource allocation, optimizing institutional operations (Taylor, 2022). AI also plays a role in research by assisting with data analysis and pattern recognition, which can lead to new insights and discoveries. Advanced algorithms can process large volumes of data more quickly and accurately than human researchers, facilitating the advancement of knowledge across various academic fields (Lee, 2023). The integration of AI in academics also raises concerns, such as data privacy and the potential for algorithmic bias. Ensuring ethical use of AI technologies and addressing these challenges is crucial for maximizing the benefits of AI in education (Williams, 2023). However, the implementation of AI in education is not without challenges. There are concerns related to the digital divide, data privacy, and the readiness of educators and institutions to adopt and effectively utilize AI tools (Luckin et al., 2016). In the context of the Federal College of

Education Technical Ekiadolor, these challenges are compounded by infrastructural limitations, lack of technical expertise, and insufficient funding. The problem, therefore, lies in identifying and overcoming the barriers to the effective implementation of AI in enhancing the academic performance and expectations of Pioneer Students at the Federal College of Education Technical Ekiadolor.

Addressing this issue requires a comprehensive understanding of the specific needs of the students, the current state of educational technology in the institution, and the potential impacts of AI integration on student outcomes. Furthermore, there are limited studies on artificial intelligence in technical colleges: most studies on artificial intelligence in education focus on universities and secondary schools. There is a lack of research specifically targeting technical colleges, such as the Federal College of Education Technical Ekiadolor Benin, Edo State, and how artificial intelligence can be utilized to enhance academic performance and expectations, it is against this background that this paper seeks to explore the background information on artificial intelligence as a leveraging tool for enhancing academic expectations and performance of pioneer students at Federal College of Education Technical Ekiadolor, Benin, Edo State, and potential solutions to address them. The outcome of the research will unravel the understanding of the specific needs of the students, evaluate the current technological capabilities of the institution, and explore feasible AI solutions that align with the institution's resources and goals.

Research Questions

The following research questions were raised and answered in this study:

1. How can the integration of AI-driven educational platforms enhance learning outcomes for pioneer students at the Federal College of Education (Technical) Ekiadolor Benin, Edo State?
2. In what ways do AI-based academic support systems influence the motivation levels of pioneer students at the Federal College of Education (Technical) Ekiadolor Benin, Edo State?

Methodology

The study adopted a descriptive survey research design and focused on the 310 pioneer students at Federal College of Education Technical Ekiadolor, Benin, Edo State. The study adopted the census approach to study the entire population due to its small and manageable size. A self-structured questionnaire with ten (10) items entitled "Artificial Intelligence as a Leveraging Tool for Enhancing Academic Expectations and Performance of Pioneer Students at Federal College of Education Technical Ekiadolor, Benin, Edo State" (AILEAEPPS-FCETEK) was used for data collection, showing a reliability coefficient of 0.81. The face and content validity of the research instruments were validated by measurement and evaluation experts in the Department of Educational Evaluation and Counselling Psychology, University of Benin, Edo State. Data was analyzed using frequency counts, percentages, mean, and standard deviation.

Results

Research Question 1: How can the integration of AI-driven educational platforms enhance learning outcomes for pioneer students at the Federal College of Education (Technical) Ekiadolor Benin, Edo State?

Table 1: *Ways that the integration of AI-driven educational platforms enhances learning outcomes for pioneer students at the Federal College of Education (Technical) Ekiadolor Benin, Edo State*

S/N	STATEMENTS	SA (%)	A (%)	U (%)	D (%)	SD (%)	$\bar{x}$	Std Dev.	Decision
1	AI-driven educational platforms provide personalized learning experiences that enhance my understanding of course material.	136 (43.9)	142 (45.8)	13 (4.2)	8 (2.6)	11 (3.5)	4.24	.921	High perception
2	The use of AI-driven tools in the classroom makes it easier for me to track my progress and performance.	157 (50.6)	117 (37.7)	23 (7.4)	8 (2.6)	5 (1.6)	4.33	.849	High perception
3	AI-driven educational platforms offer more engaging and interactive content compared to traditional teaching methods.	140 (45.2)	122 (39.4)	10 (3.2)	27 (8.7)	11 (3.5)	4.14	1.066	Low perception
4	I feel that AI-driven educational platforms support my learning needs better than standard educational resources.	143 (46.1)	97 (31.3)	22 (7.1)	15 (4.8)	33 (10.6)	3.97	1.299	Low perception
5	The integration of AI-driven educational platforms helps me develop skills that are relevant to current technological trends and future job markets.	164 (52.4)	88 (28.4)	13 (4.2)	32 (10.3)	13 (4.2)	4.15	1.158	Low perception
	WEIGHTED AVERAGE						**4.16**		

The findings from Table 1 show that the majority of the respondents appeared to believe that AI-driven educational platforms provide personalized learning experiences that enhance their understanding of course material, they also perceived that the use of AI-driven tools in the classroom makes it easier for them to track their progress and performance. This is consistent with the report by Pane et al., (2017) which found that students using AI-driven personalized learning tools outperformed their peers in traditional settings, demonstrating significant gains in mathematics and reading proficiency and that AI has a substantial positive impact on student academic performance. Through personalized learning, intelligent tutoring, automated feedback, enhanced engagement, and predictive analytics, AI provides tools that cater to individual learning needs and help students achieve better outcomes**.** On the other hand, the majority of the respondents had a low perception that AI-driven educational platforms offer more engaging and

interactive content compared to traditional teaching methods, they also had a low perception that AI-driven educational platforms support their learning needs better than standard educational resources, they also had a low perception that the integration of AI-driven educational platforms helps them develop skills that are relevant to current technological trends and future job markets. This is in line with a study by Zhou, Lin, & Xue, (2020) which found that many students were not adequately informed about how AI tools could facilitate their research processes. The study revealed that only 25% of students surveyed were not aware of AI applications in academic research, indicating a significant knowledge gap.

Research Question 2: In what ways do AI-based academic support systems influence the motivation levels of pioneer students at the Federal College of Education (Technical) Ekiadolor Benin, Edo State?

Table 2: *Ways AI-based academic support systems influence the motivation levels of pioneer students at the Federal College of Education (Technical) Ekiadolor Benin, Edo State*

S/N	STATEMENTS	SA (%)	A (%)	U (%)	D (%)	SD	x̄	Std. Dev.	Decision
1	AI-based academic support systems make me feel more confident in my ability to succeed in my courses.	61 (19.7)	226 (72.7)	10 (3.2)	2 (.6)	11 (3.5)	4.05	.758	Low perception
2	The personalized feedback provided by AI-based academic support systems increases my motivation to complete assignments and study.	190 (61.3)	78 (25.2)	21 (6.8)	8 (2.6)	13 (4.2)	4.37	1.015	High perception
3	Using AI-based academic support systems helps me stay more engaged and interested in my coursework.	198 (63.9)	81 (26.1)	15 (4.8)	8 (2.6)	8 (2.6)	4.46	.901	High perception
4	The availability of AI-based academic support systems encourages me to set higher academic goals for myself.	161 (51.9)	110 (35.5)	15 (4.8)	12 (3.9)	12 (3.9)	4.28	.999	Low perception
5	AI-based academic support systems provide resources that motivate me to improve my academic performance.	230 (74.2)	62 (20.0)	10 (3.2)	8 (2.6)	- -	4.63	.780	High perception
	WEIGHTED AVERAGE						**4.35**		

The findings from Table 2 show that the majority of the respondents had a high perception that the personalized feedback provided by AI-based academic support systems increases their motivation to complete assignments and study. they also had a high perception that using AI-based academic support systems helps them stay more engaged and interested in their coursework, also they perceived that AI-based academic support systems provide resources that motivate them to improve their academic performance, this is consistent with the report by Park and Kim (2021) which found that students who used AI-driven educational tools had higher academic aspirations and expected better academic performance compared to those who did not

use such tools. Additionally, research by Woolf, Burleson, Arroyo, Dragon, Cooper, & Picard, (2013) demonstrated that students using AI-enhanced learning environments showed increased intrinsic motivation. The study indicated that features such as personalized feedback, real-time progress tracking, and engaging learning activities contributed to higher levels of motivation. On the other hand, the majority of the respondents had a low perception that AI-based academic support systems make them feel more confident in their ability to succeed in my courses. They also had a low perception that the availability of AI-based academic support systems encourages them to set higher academic goals for themselves, this is in line with a study by Siau and Wang (2018), which highlighted that students expressed concerns about the accuracy and dependability of AI tools. The study found that 50% of students were skeptical about the reliability of AI-generated recommendations and feedback, which negatively impacted their willingness to use these systems.

Discussion of findings

Based on the research findings. the study revealed that the integration of AI-driven educational platforms enhances the learning outcomes of pioneer students at the Federal College of Education (Technical) Ekiadolor Benin, Edo State and also that AI-based academic support systems influence the motivation levels of pioneer students at the Federal College of Education (Technical) Ekiadolor Benin, Edo State. The findings of this study are corroborated by the findings of Smith, Adams, & Clarke (2022) that students using AI-based platforms exhibit improved academic performance, engagement, and retention rates, and that of Garcia, Lopez, & Rodriguez (2021) that such systems can boost students' confidence, reduce anxiety, and foster a more engaging learning environment.

Conclusion

The study demonstrates that artificial intelligence is a leveraging tool for enhancing academic expectations and performance of pioneer students at Federal College of Education Technical Ekiadolor, Benin, Edo State. AI-driven tools facilitated personalized learning experiences, provided instant feedback, and adapted to individual learning paces, thus addressing specific student needs more effectively. This study confirms that AI has the potential to revolutionize educational practices by helping students identify their strengths and weaknesses, offering targeted support, and enriching the overall learning experience. Future research should investigate the long-term effects of AI on academic achievement and its application across various educational settings and disciplines.

Recommendations

Based on the findings of the study it was recommended that:

1. Tertiary institutions should implement enhanced learning materials through the use of AI to develop and curate high-quality learning materials, including interactive simulations, virtual labs, and multimedia content. Engaging and diverse materials can cater to different learning preferences and improve overall student engagement and understanding.

2. Educational administrators should provide training for educators on how to effectively integrate AI tools into their teaching practices, this will empower them with the knowledge and skills in AI that can enhance their ability to leverage technology for improving student outcomes.
3. The Federal Government of Nigeria should build or establish virtual classrooms and learning environments in tertiary institutions in Nigeria as these virtual classrooms will be useful for remote or hybrid learning models. These classrooms can simulate real-world scenarios, making learning more interactive and practical.

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