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ARTIFICIAL INTELLIGENCE ADOPTION IN PROVIDING MORE ADAPTIVE LEARNING ENVIRONMENTS AND AUGMENTATION OF EDUCATION: A STUDY OF BUSINESS EDUCATION PROFESSIONALS IN AKWA IBOM STATE

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ABSTRACT

The study examined the adoption of Artificial Intelligence (AI) in creating adaptive learning environments and augmenting educational delivery among Business Education professionals in Akwa Ibom State, Nigeria. A descriptive survey design was adopted. The research was carried out in Akwa Ibom State, Nigeria. The targeted population for the study comprised all Business Education Professional in Akwa Ibom State, Nigeria. Stratified sampling technique was used to select a 80 Business Education Professionals from each of the senatorial district this gave a sample size of 240 respondents used to carry out this research. The instrument used for data collection was a structured questionnaire titled "Artificial Intelligence Adoption in Learning Environments and Augmentation of Education Questionnaire (AIALEAEQ)". Face and content validation of the instrument was carried out by an expert in test, measurement, and evaluation in order to ensure that the instrument has the accuracy, appropriateness, and completeness for the study under consideration. The reliability coefficient obtained was 0.93, and this was high enough to justify the use of the instrument. The study showed that there is a significant influence of the role of artificial intelligence in promoting Business Education in Akwa Ibom State and also the study affirmed that the extent to which Artificial Intelligence is adopted in providing more adaptive learning environments is of very high extent in Akwa Ibom State. It was concluded that the integration of Artificial Intelligence in business education holds immense potential for transforming teaching and learning processes, particularly by fostering more adaptive, personalized, and efficient learning environments. One of the recommendations made was that governmental and educational institutions should invest in continuous professional development programs aimed at enhancing the digital competencies of business education professionals.

Keywords: Artificial Intelligence, Adaptive Learning Environments, Augmentation of Education, Business Education Professionals and Akwa Ibom State

Introduction

The growing demand for innovation in education has brought about a dynamic shift in teaching methodologies, with Artificial Intelligence (AI) emerging as a transformative force in the global academic landscape. As the traditional "one-size-fits-all" model of education continues to reveal its inadequacies, particularly in addressing diverse learner needs, AI-powered adaptive learning environments offer a timely and powerful alternative. These systems are capable of personalizing content delivery, pacing, and feedback in real time based on learner behavior, performance, and preferences, thereby increasing engagement, retention, and academic achievement (Kamalov et al. 2023). This transformation is not only reshaping student experiences but also redefining the role of educators as facilitators in AI-augmented classrooms.

In developing regions like Akwa Ibom State, Nigeria, where the integration of advanced digital technologies in education is still at a nascent stage, the adoption of AI in business education presents both significant opportunities and formidable challenges. Business education professionals play a critical role in shaping the digital readiness of future entrepreneurs, managers, and policymakers. Hence, their perception, awareness, and readiness to implement AI in instructional delivery directly impact the effectiveness of AI-driven educational reforms. Studies have shown that while AI technologies such as intelligent tutoring systems, chatbots, and learning analytics tools can enhance the learning process, the extent of their successful implementation largely depends on teachers' digital competencies, institutional support, and infrastructural readiness (Barzilai & Blau, 2014).

Concept of Artificial Intelligence

Artificial Intelligence was officially coined and defined by John McCarthy at the time as "the science and engineering of making intelligent machines" (Collins et al., 2021). Russel & Norvig (2020) referred to it as the "the birth of artificial intelligence." One of the initial paradigms of AI was that it revolved around high-level cognition. Not the ability to recognize concepts, perceive objects, or execute complex motor skills shared by most animals, but the potential to engage in multi-step reasoning, to understand the meaning of natural language, to design innovative artefacts, to generate novel plans that achieve goals, and even to reason about their own reasoning.

AI is a field of computer science that studies how machines can imitate the intelligence of their human counterparts. Over the last decade, definitions of the term have become quite loose and refer to just about any computerized or automated function. However, the difference between an AI system and traditional software packages is the ability to make informed judgments and decisions by responding to patterns in data (Sarmah, 2019). According to Rupali & Amit (2017), Artificial intelligence is an intellect that is much smarter than the best human brain in practically every field, including computer science and linguistic logic. It is a modern method of machines which will do muscle work and illustrate complex questions in an "intellectual" manner. It is concerned with the basic and most important aspects in our life i.e. philosophy, computer science, mathematics, linguistics, biology, neuron science, sociology etc.

According to Chatterjee (2020), Artificial intelligence is an imitation of human cognitive processes with the help of machines. In particular, the unique implementation of AI, including computer systems specialist systems, artificial language processing, voice recognition and artificial intelligence performed by Machine Vision Artificial Intelligence (AI) machines. AI technologies range from simple algorithms to complex neural networks, and they are used in diverse applications such as speech recognition, robotics, autonomous vehicles, and data analysis. The goal of AI is to enable machines to simulate human cognitive functions to improve efficiency and solve problems in various domains.

Concept of Adaptive Learning Environment

An adaptive learning environment is an instructional setting that uses technology and algorithm-driven platforms to modify the presentation of content in response to a learner's performance and learning style. It moves beyond a one-size-fits-all approach by personalizing lessons, pacing, and assessments in real time. According to Papamitsiou & Economides (2020), adaptive learning systems analyze learners' interactions to offer customized resources that match their needs and improve academic engagement. These environments enhance learning by using real-time data to adapt instructional strategies, ensuring that students stay engaged and that their learning gaps are addressed efficiently. This approach is particularly useful in large classrooms or online learning platforms where individual teacher support may be limited.

Adaptive learning environments are built upon the principles of responsiveness and flexibility. They typically incorporate artificial intelligence, learning analytics, and machine learning to interpret data patterns and adapt content delivery. In a study by Khan et al. (2021), it was demonstrated that adaptive learning platforms significantly improved student engagement and knowledge retention in STEM courses. Personalization in learning increased learners' motivation and promoted deep learning. Moreover, adaptive systems empower students to take control of their learning journeys, thereby fostering independent thinking and self-regulation, which are essential competencies in higher education.

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Concept of Analytics and Creative Tools

The concepts of analytics and creative tools have become integral in modern education, enhancing both teaching methodologies and student learning experiences. Analytics involves the systematic computational analysis of data, enabling educators to make informed decisions by identifying patterns, trends, and insights within educational contexts. Creative tools, on the other hand, encompass a range of digital applications and platforms that facilitate innovative thinking, problem-solving, and the expression of ideas in diverse formats. Together, these concepts empower educators and learners to engage in a more interactive and personalized educational journey.

Recent studies have highlighted the significance of integrating analytics and creative tools in educational settings. For instance, Abdul-Jabbar and Farhan (2022) emphasize that data analytics techniques are crucial for managing and interpreting large volumes of educational data, thereby improving the analysis process and data management. They discuss how the evolution of data analytics, particularly when combined with artificial intelligence algorithms, can enhance various applications within the educational sphere. This integration allows for more effective tracking of student progress, identification of learning gaps, and the customization of instructional strategies to meet individual learner needs.

Moreover, the role of creative tools in fostering student engagement and creativity has been underscored in contemporary research. Septiani, Kostakos, and Romero (2023) introduce the #PPai6 framework to assess creative engagement in AI tools used within education. Their analysis of 41 studies reveals that intelligent tutoring systems are commonly employed to support learners' creative engagement, particularly at the second level of the #PPai6 framework. This level involves adaptive behavior based on learners' interactions but does not necessarily engage learners in generating new ideas or solutions. The study highlights the need for AI tools that not only adapt to learners but also actively promote higher levels of creative engagement, encouraging the development of original ideas and collaborative creativity among students and educators.

Roles of AI in Business Education

Artificial Intelligence (AI) is transforming the landscape of business education by introducing smart, efficient, and innovative learning solutions. It supports personalized instruction, real-time data analysis, and intelligent automation of academic tasks. These roles significantly enhance teaching,

learning, and administrative effectiveness in business-related programs (Dabingaya 2022).

- Personalized Learning Experience

AI helps tailor educational content to meet the unique needs of each student. In business education, it can adjust lessons in subjects like marketing, finance, or management based on a student's pace, strengths, and areas needing improvement. This makes learning more effective and engaging by allowing students to focus on what they actually need.

- Automated Grading and Feedback

AI tools can evaluate quizzes, assignments, and even essays, providing instant feedback. In business education, where timely assessment is critical for understanding concepts like economics or business law, this reduces the workload on instructors and helps students quickly identify their mistakes and improve.

- Simulation-Based Learning

AI enables the creation of realistic business simulations where students can practice decision-making in virtual markets or run mock companies. These simulations teach real-world problem-solving and strategic thinking, helping students prepare for complex business environments without real-life consequences.

- Data-Driven Insights

AI can analyze massive amounts of student data to identify patterns in learning behavior. Educators can use this insight to adjust teaching methods, curriculum design, and intervention strategies, ensuring that students in business programs receive the best support to succeed academically and professionally.

- Virtual Teaching Assistants

AI-powered bots can serve as virtual tutors or teaching assistants, answering student questions, guiding them through assignments, and providing study materials. This enhances access to help at any time, especially in large business classes where individual attention from instructors may be limited.

- Skill Assessment and Career Guidance

AI-powered bots can serve as virtual tutors or teaching assistants, answering student questions, guiding them through assignments, and providing study materials. This enhances access to help at any time, especially in large business classes where individual attention from instructors may be limited.

Effects of AI on Creative Tools for Adaptive Learning Environment

Artificial Intelligence (AI) has significantly transformed creative tools within adaptive learning environments, enhancing personalization, engagement, and overall learning outcomes. By integrating AI technologies, educators can offer more tailored and interactive educational experiences that cater to individual student needs.

One of the primary effects of AI in this context is the facilitation of personalized learning experiences. AI-driven systems analyze student performance data to adjust content delivery, ensuring that each learner receives instruction suited to their unique learning style and pace. This personalization not only boosts engagement but also fosters creativity by allowing students to explore concepts in ways that resonate with them (El-Sabagh, 2021).

Moreover, AI contributes to the development of creative skills by offering tools that support the design and production of digital content. In adaptive learning environments, AI can assist students in creating multimedia presentations, simulations, and other digital artifacts that require creative input.

These tools not only aid in the comprehension of complex subjects but also allow students to express their understanding creatively, thereby reinforcing learning through creation. The integration of AI in these processes ensures that students are not passive recipients of information but active participants in their educational journey, engaging with content in innovative ways that stimulate creativity and critical thinking.

Furthermore, AI-powered adaptive learning systems have demonstrated effectiveness in improving learning outcomes. Dabingaya (2022) explained that students using AI-powered platforms exhibit higher engagement metrics and improved post-assessment scores, indicating enhanced mathematical competency. These findings underscore the potential of AI to not only personalize learning but also to elevate the quality and effectiveness of education through adaptive and creative tools.

The integration of AI into adaptive learning environments has revolutionized the educational landscape by enhancing the functionality of creative tools. Through personalized learning paths and support for creative content creation, AI empowers students to engage more deeply with material, fostering an educational experience that is both effective and creatively enriching. As AI technologies continue to evolve, their role in promoting creativity within adaptive learning contexts is likely to expand, offering new opportunities for innovation in education.

Methodology

Descriptive survey design was adopted. The research was carried out in Akwa Ibom State, Nigeria. The targeted population for the study comprised all Business Education Professional in Akwa Ibom State, Nigeria. Stratified sampling technique was used to select a 80 Business Education Professionals from each of the senatorial district this gave a sample size of 240 respondents used to carry out this research. The instrument used for data collection was a structured questionnaire titled "Artificial Intelligence Adoption in Learning Environments and Augmentation of Education Questionnaire (AIALEAEQ)". Face and content validation of the instrument was carried out by an expert in test, measurement, and evaluation in order to ensure that the instrument has the accuracy, appropriateness, and completeness for the study under consideration. The reliability coefficient obtained was 0.93, and this was high enough to justify the use of the instrument.

Results and Discussions

Research Questions 1: The research question sought to find out the extent to which Artificial Intelligence is adopted in providing more adaptive learning environments by the business education professionals in Akwa Ibom State. To answer the research question percentage analysis was performed on the data, (see table 1).

Table 1: Percentage analysis of the extent to which Artificial Intelligence is adopted in providing more adaptive learning environments by the business education professionals in Akwa Ibom State.

ASPECTS	FREQUENCY	PERCENTAGE
VHE	34	42.50**
HE	25	31.25
LE	16	20.00
VLE	5	6.25*
TOTAL	80	100%

** The highest percentage frequency
* The least percentage frequency

SOURCE: Field survey

The above table 1 presents the percentage analysis of the extent to which Artificial Intelligence is adopted in providing more adaptive learning environments by the business education professionals in Akwa Ibom State. From the result of the data analysis, it was observed that the highest percentage (28.47%) of the respondents affirmed that the extent to which Artificial Intelligence is adopted in providing more adaptive learning environments is of VERY HIGH (VHE) in Akwa Ibom State (42.50%) while the least percentage (6.25%) of the respondents affirmed that the extent is VERY LOW (VLE). This finding agrees with the opinion of El-Sabagh, (2021) who stated that AI contributes to the development of creative skills by offering tools that support the design and production of digital content. In adaptive learning environments, AI can assist students in creating multimedia presentations, simulations, and other digital artifacts that require creative input. According to him these tools not only aid in the comprehension of complex subjects but also allow students to express their understanding creatively, thereby reinforcing learning through creation.

Research Questions 2: The research question sought to find out the roles of artificial intelligence in promoting Business Education in Akwa Ibom State. To answer the research percentage analysis was performed on the data, (see table 2).

Table 2: Percentage analysis of the roles of artificial intelligence in promoting Business Education in Akwa Ibom State.

ASPECTS	FREQUENCY	PERCENTAGE
Personalized Learning Experience	36	45**
Automated Grading and Feedback	29	36.25
Simulation-Based Learning	13	16.25
Skill Assessment and Career Guidance	2	2.50*
TOTAL	80	100%

** The highest percentage frequency

* The least percentage frequency

SOURCE: Field survey

The above table 2 presents the result of the descriptive analysis of the roles of artificial intelligence in promoting Business Education in Akwa Ibom State. From the result of the data analysis, it was observed that the highest percentage (45%) of the respondents affirmed that the role of artificial intelligence in promoting Business Education in Akwa Ibom State is "Personalized Learning Experience" while the least percentage (2.50%) of the respondents affirmed that the role is "Skill Assessment and Career Guidance". This finding agrees with the opinion of Dabingaya (2022) who stated that Artificial Intelligence (AI) is transforming the landscape of business education by introducing smart, efficient, and innovative learning solutions. It supports personalized instruction, real-time data analysis, and intelligent automation of academic tasks. According to him, these roles significantly enhance teaching, learning, and administrative effectiveness in business-related programs

CONCLUSION

The integration of Artificial Intelligence in business education holds immense potential for transforming teaching and learning processes, particularly by fostering more adaptive, personalized, and efficient learning environments. As evidenced by this study of business education professionals in Akwa Ibom State, the adoption of AI technologies is gradually gaining ground, though still hindered by infrastructural challenges, limited digital literacy, and institutional hesitance. Addressing these

barriers through targeted policy reforms, investment in teacher training, and the development of AI-ready infrastructure is essential to fully unlock the benefits of AI in education. By equipping educators with the necessary tools and knowledge, and creating a supportive ecosystem for innovation, AI can serve as a catalyst for a more inclusive, responsive, and future-ready educational landscape in Nigeria and beyond.

RECOMMENDATIONS

1. Governmental and educational institutions should invest in continuous professional development programs aimed at enhancing the digital competencies of business education professionals.
2. Educational policymakers should develop clear and supportive frameworks that encourage AI adoption in the curriculum.
3. Educational stakeholders, including the Ministry of Education and local government bodies, to improve technological infrastructure in schools.
4. AI tools and learning platforms should be tailored to reflect local educational needs, cultural context, and curriculum specifications of Akwa Ibom State.

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