

## ARTIFICIAL INTELLIGENCE IN BUSINESS EDUCATION: PROSPECTS AND CHALLENGES

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### Abstract

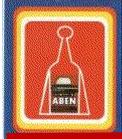
*This paper discussed the concept of Artificial Intelligence, branches of Artificial Intelligence and Artificial Intelligence in business education. The paper further explores the potential benefits and challenges of integrating Artificial Intelligence into business education programmes. It delves into the ways AI can enhance learning experiences, improve teaching efficiency, and prepare students for the future workforce. Furthermore, the paper discussed the ethical considerations and technical challenges associated with AI implementation. By understanding the prospects and challenges, educational institutions can make informed decisions about integrating AI into their school curricula to create a more effective and innovative learning environment. Recommendations were made among others that there is the need for collaborative effort involving business educators, researchers, and policy-makers to ensure the ethical and responsible use of AI in education; and the need for training and retraining of business educators in the use of artificial intelligence in delivering of their services in order to achieve improved operational efficiency in business education programme where the technology is to be adopted.*

**Keywords:** Artificial Intelligence, Business Education, Personalized Learning and Machine Learning

### Introduction

Business education programme is concerned with the teaching of skills, attitudes and knowledge necessary for a successful career in the office and business world. The programme has the responsibility to prepare students for success in the constantly changing and fast-paced business world. It is pivotal for the programme to persistently adjust to the most recent trends and changes in the business sphere, ensuring that their curricula stay relevant and aligned with these fluctuations. In recent years, Artificial Intelligence (AI) has become a rapidly emerging technology that is transforming various industries, and education is no exception. According to Robinson (2018) Artificial Intelligence (AI) is the ability of a digital computer, computer-controlled machine or robot to perform tasks commonly associated with intelligent beings like humans. Roshanaei (2023) saw Artificial intelligence as the simulation of human intelligence in machines that are programmed to think and act like humans. AI in education initially involved the use of computers and computer-related systems. It has advanced further with the emergence of web-based and online education platforms. The embedded systems enable the use of robots as colleagues or independent instructors and chatbots to perform teacher-like functions.

In the word of Motlagh and et al in Peras and et al (2023) Artificial Intelligence (AI) in education significantly influence how the curriculum is designed and how the students are engaged. Artificial Intelligence in education has brought dramatic developments in the digital age, changing instructional strategies, curriculum design and students' involvement. Chiu and et al in Surugiu (2023) opined that AI represents progress in education, offering benefits on multiple levels, and stimulates the evolution of teaching and learning through technologies like chatbots, robots, automated assessment, digitized artefacts, and



intelligent tutoring systems, despite the challenges. According to Olufemi (2023) AI has continued to lead the way in education with its ability to provide personalized tutoring. Traditional classrooms are often challenged with catering to individual student needs due to time and other constraints whereas, AI-powered virtual assistants simply fit in with each student's peculiar learning style and pace, offering custom guidance that improves better understanding and information retention. Based on the premise that business education programme is being saddled with the responsibility to acquaint its recipients with skills and competencies essential for effective economic system, there is need to embrace Artificial Intelligence to perform the task effectively.

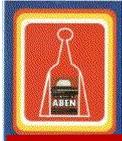
### **Artificial Intelligence**

Artificial intelligence (AI) is a concept that has been in use since the 1950s, when it was defined as a machine's ability to perform a task that would have previously required human intelligence such as self-driving cars, robots, ChatGPT or other AI chatbots, and artificially created images, (Diaz, 2023). Artificial intelligence (AI), sometimes called machine intelligence, is intelligence demonstrated by machines in contrast to natural intelligence displayed by humans and other animals (McCorduck, 2004). This implies that machines can be made to perform tasks commonly associated with intelligent beings like humans and animals. It is an area of computer science with the help of digital electronics that emphasizes the creation of intelligent machines that work and react like humans. The term is frequently applied to the project of developing systems endowed with the intellectual processes and characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experiences. Since the development of the digital computer in the 1940s, it has been demonstrated that computers can be programmed to carry out very complex tasks like discovering proofs for mathematical theorems and playing chess with great proficiency. Kurzweil in

Adiguzel, and et al (2023) saw AI as the machine that can perform tasks that typically necessitate human intelligence. Russell and Norvig (2021) defined AI as the ability of a machine to mimic human cognitive functions like learning, problem-solving, reasoning, and decision-making. This definition emphasizes the ability of AI systems to perform tasks that traditionally required human intelligence. Chui and et al (2016) opined AI as the use of algorithms and data to achieve intelligent behaviour. This focuses on the technical aspects of AI, highlighting the role of algorithms and data in enabling intelligent behaviour in machines.

In the views of Bostrom (2014), AI is an intelligent machine that can perform tasks typically requiring human intelligence. It emphasizes the ultimate goal of AI research, which is to develop machines that exhibit intelligence comparable to or exceeding human capabilities. Also, AI is a subfield of machine learning that is utilizing artificial neural networks inspired by the human brain to process complex data like images, text, and speech (Goodfellow, Bengio, & Courville, 2016). In line with the above, Russell and Norvig (2021) affirmed that machine learning is a core subfield of AI where algorithms learn from data to improve performance on a specific task without explicit programming

Roshanaei (2023) asserts that the advent of AI is characterized by its capabilities of data analysis, pattern recognition, and predictive analytics, which brings forth nuanced opportunities to foster a more equitable educational landscape. These technologies can potentially facilitate personalized learning experiences, bridge language barriers, and augment resources in underserved communities. AI in education is not merely confined to algorithmic teaching assistants or intelligent tutoring systems, but expands to encompass data-driven decision-making processes, analytics that can help in identifying and addressing learning gaps, tools that enhance accessibility for differently abled students, and platforms that foster global connectivity and collaboration. These advancements have the potential to revolutionize education by shifting the paradigm from a one-size-fits-all approach to a more nuanced, inclusive, and adaptive learning environment. Kaplan and Haenlein in Sollosy and McInerey (2023) saw AI as systems to interpret external data and to learn and use those learnings to achieve a specific goal or task via adaption. Also, AI could be described as a subfield of computer science that centers on investigating the essential nature of intelligence



by using a set of algorithmic procedures to create intelligent artefacts that resemble human intelligence (Szeliski, 2010). Artificial intelligence is the intelligence of machines or software, as opposed to the intelligence of living beings, primarily of humans. It is also a field of study in computer science that develops and studies intelligent machines. Such machines may be called AIs [Wikipedia](#).

### **Branches of Artificial Intelligence (AI)**

Artificial Intelligence (AI) has evolved into a vast field with various branches, each focusing on specific tasks or techniques. It includes the following:

#### **Machine Learning**

Machine Learning (ML) is a subset of artificial intelligence (AI) that enables systems to learn from data and improve their performance over time without being explicitly programmed. Mitchell (1997) defines ML as the study of algorithms that allow computers to learn from data. A subset of AI that allows systems to learn from data without being explicitly programmed. It is a field that is seen significant growth and innovation in recent years, with applications ranging from self-driving cars to personalized recommendations. Russell and Norvig (2021) present machine learning as a core component of AI, focusing on algorithms that learn from experience. Machine Learning (ML) include the supervised learning, unsupervised learning and reinforcement learning.

#### **Natural Language Processing (NLP)**

Natural Language Processing (NLP) is a subfield of artificial intelligence (AI) that focuses on the interaction between computers and human (natural) languages (Russell & Norvig, 2021). It involves the development of algorithms and techniques that enable computers to understand, interpret, and generate human language. According to Jurafsky and Martin (2022) Natural Language Processing (NLP) enables computers to understand, interpret, and generate human language. The core components of NLP include text analysis, syntax analysis and pragmatics.

#### **Computer Vision**

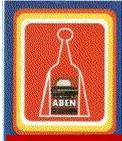
Computer Vision is a field of artificial intelligence (AI) that deals with the interpretation and understanding of visual information from the real world (Szeliski, 2010). It involves teaching computers to "see" and understand images and videos in a way that is similar to human vision. According to Forsyth and Ponce (2012), Computer Vision offers a detailed introduction to computer vision theory and algorithms. It provides a comprehensive overview of computer vision techniques and applications.

#### **Neural Network**

Neural Networks are a subset of artificial intelligence (AI) inspired by the structure and function of the human brain (LeCun & et al, 2015). They are composed of interconnected nodes (neurons) that process information and learn from data. Goodfellow and et al (2016) assert that Neural Networks provides a comprehensive introduction to neural networks, covering various architectures and techniques. It is a type of machine learning algorithm inspired by the structure and function of the human brain.

#### **Expert Systems**

Expert systems are a subset of artificial intelligence (AI) that emulate the decision-making ability of human experts in a specific domain. They can be applied in various educational contexts to enhance learning and teaching. Sayed (2021) opined that Expert Systems offer a valuable tool for enhancing education by providing personalized instruction, automating tasks, and supporting decision-making. However, careful consideration must be given to the challenges and ethical implications associated with their use.



## **Robotics**

According to Russell and Norvig (2021), Robotics is the design, construction, operation, and use of robots. It is application in industrial automation, healthcare, exploration, entertainment. These are just a few of the many branches of AI. As the field continues to evolve, new branches and applications are emerging. Robotics is an interdisciplinary field of science and engineering with mechanical engineering, computer science and many others. Robots are deployed to conduct tasks that might be laborious for humans to perform steadily (Alabi, 2022).

## **Artificial Intelligence in Business Education**

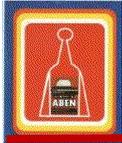
Artificial Intelligence in business education is about equipping future business leaders with the knowledge, skills, and mindset to harness the power of Artificial Intelligence (AI) for educational success. It is the understanding of how AI works, its potential applications in business, and the ethical implications of its use. AI in education is the process of integrating and applying artificial intelligence technologies within the classroom to enhance teaching and learning experiences (Ramadan, 2023). AI in education initially involved the use of computers and computer-related systems. It has advanced further with the emergence of web-based and online education platforms. The embedded systems enable the use of robots as colleagues or independent instructors and chatbots to perform teacher-like functions. Alabi (2022) asserts that AI in education involves the integration of social, cultural, economic and pedagogical dimensions. It involves the utilization of AI technologies, including intelligent tutoring systems, chatbots, robots, learning analytics dashboards, adaptive learning systems and automated assessment, so as to support and enhance the educational process (Chen et al in Alabi, 2022).

Chassagne as cited in Ramadan (2023) claimed that there is evidence of a better and enhanced learning experience for students as a result of the usage of AI in education. Through the help of Artificial intelligence, academics can also concentrate on more difficult subjects by using AI to automate complex activities (Ramadan, 2023). Recent reviews suggest that research regarding AI in education is mainly concentrated in developed countries and is limited in the developing world. There are multiple limitations or challenges that contemporary education faces in leveraging AI technology. In many developed countries, AI tools are increasingly being integrated into educational systems to enhance learning outcomes and improve the overall quality of education. Although, Artificial Intelligence refers to the ability of machines or computer systems to mimic human intelligence and perform tasks that typically require human intelligence, such as learning, reasoning, problem-solving, and decision-making. In the field of education, AI is being used to develop innovative tools and technologies that have the potential to transform the traditional methods of teaching and learning (Olufemi, 2023).

In the view of Surugiu and et al (2024) AI in education comes not only with opportunities but mostly with challenges for both educators and learners. Babu (2023) stated that the swift progress of artificial intelligence (AI) has triggered a transformative influence on the business landscape, necessitating business education to adapt and confront the arising challenges and prospects. AI continues to lead the way in education with its ability to provide personalized tutoring. Traditional classrooms are often challenged with catering to individual student needs due to time and other constraints. Whereas, AI-powered virtual assistants simply fit in with each student's peculiar learning style and pace, offering custom guidance that improves better understanding and information retention.

## **Benefits of AI in Business Education**

Artificial Intelligence (AI) is revolutionizing the educational landscape by offering innovative solutions to traditional challenges. The benefits of incorporating AI into education include:



### **Personalized Learning**

Hopcan (2022) asserts that personalized learning, powered by AI, offers several significant benefits for students and educators. In the first place, Artificial Intelligence can analyze student data to identify individual learning styles, strengths, and weaknesses. This allows for the creation of customized learning paths, ensuring that students receive content and instruction that aligns with their needs. Secondly, AI-powered assessments can adjust the difficulty level of questions in real-time based on student's performance, providing a more accurate evaluation of their understanding. This helps to prevent frustration and disengagement. In the words of Hopcan (2022), AI-driven tutoring systems can offer immediate assistance and feedback, helping students overcome challenges and stay on track. This personalized support can be particularly beneficial for students who may struggle in traditional classroom settings. Also, personalized learning experiences can make learning more engaging and motivating for students. When content is relevant and challenging, students are more likely to be interested and invested in their education. By leveraging AI to personalize the learning experience, educators can create more effective and engaging classrooms that cater to the individual needs of each student.

### **Enhanced Efficiency and Productivity**

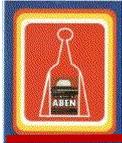
Baker and Siemens (2014) noted that AI offers significant benefits in improving efficiency and productivity within educational settings through the automation of administrative tasks, such as grading and scheduling, freeing up teachers' time to focus on instruction. Also, AI can generate personalized learning materials, such as quizzes, summaries, and practice problems. According to Baker and Siemens (2014), AI can analyze student performance data to identify areas for improvement and inform instructional decisions.

### **Data-Driven Decision Making**

According to Davenport and Patil (2012), Data-Driven Decision Making (DDDM) is a critical component of effective education. AI can significantly enhance this process by analyzing large data sets. AI algorithms can process vast amounts of data, including student performance, attendance records, and demographic information, to identify patterns and trends that may not be apparent to human analysis. AI can use historical data to predict future trends, such as student performance, dropout rates, and resource needs (Baker & Siemens, 2014). This allows educators to proactively address potential issues and allocate resources more effectively. In the word of Wang and Liu (2020) AI can help identify inefficiencies in educational systems, such as underutilized resources or ineffective teaching methods. This information can be used to make data-driven decisions about resource allocation and program improvement. O'Neil (2016) stated that AI can help to identify and address disparities in student outcomes, ensuring that all students have equal opportunities to succeed. By leveraging data-driven decision making, educational institutions can make more informed choices, improve student outcomes, and optimize resource allocation.

### **Improved Access to Education**

According to UNESCO (2019), AI can significantly enhance access to education, particularly for marginalized populations and those in remote areas. AI-powered platforms can facilitate remote learning, allowing students to access education from anywhere with an internet connection. AI-powered tutoring systems can provide personalized support to students, helping them overcome learning challenges and stay on track (Baker & Siemens, 2014). In the word of Hopcan and et al. (2022) AI can be used to develop assistive technologies for students with disabilities, making education more inclusive. Jurafsky and Martin (2022) asserts that AI-powered language translation tools can help students access educational materials in their native language, expanding their learning opportunities. By breaking down geographical barriers, providing personalized support, and improving accessibility, AI can significantly enhance access to education for marginalized populations and individuals in remote areas.



### **Fostering Innovation and Creativity**

Pea (2004) noted that AI can play a significant role in fostering innovation and creativity among students. In the word of Baker and Siemens (2014), AI-powered tools can create personalized learning experiences that cater to individual student needs and interests, encouraging exploration and creativity. Hopcan and et al. (2022) assert that the use of AI can create engaging problem-based learning scenarios that challenge students to think critically and creatively. Also, AI-powered simulations can provide students with opportunities to experiment with different ideas and approaches, fostering a creative mindset. Wang and Liu (2020) stated that AI-powered tools can facilitate collaboration and teamwork among students, encouraging them to share ideas and develop innovative solutions. By fostering personalized learning, problem-based learning, and exposure to emerging technologies, AI can help students develop the skills and mindset needed to become creative and innovative thinkers.

### **Ethical Considerations**

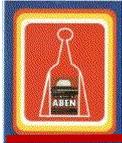
O'Neil (2016) emphasized that while AI offers numerous benefits, that it is crucial to address ethical considerations to ensure its responsible and beneficial use in education. O'Neil noted that AI algorithms can perpetuate existing biases if not carefully designed and trained. By addressing bias, AI can ensure that all students have equal opportunities to learn and succeed. Also, implementing robust data privacy measures is essential to safeguard student information. And clearly communicating how student data is collected, used, and stored can build trust. By carefully considering and addressing these ethical considerations, educational institutions can harness the potential of AI while minimizing risks and ensuring that it benefits all students.

### **Challenges of Implementing AI in Education Technological and Infrastructural Challenges**

Technological and infrastructural challenges are significant hurdles to overcome when integrating AI into various fields, including education. According to Cuban (2001) AI algorithms can be computationally intensive, requiring powerful hardware like GPUs (Graphics Processing Units) or TPUs (Tensor Processing Units). Training and deploying AI models often require large amounts of data storage. In the word of Davenport & Patil. (2012), to ensure that AI systems can handle increasing workloads and data volumes can be challenging. Also obtaining sufficient and high-quality data for AI training can be difficult, especially in niche domains (O'Neil, 2016). Biased data can lead to biased AI models, perpetuating existing inequalities.

### **Pedagogical Challenges in Using AI in Education**

Integrating AI into education presents several pedagogical challenges. Mishra and Koehler (2006) assert that many educators may lack the necessary skills to effectively use AI tools and understand their pedagogical implications. Also, teachers may be resistant to adopting new technologies, especially if they feel it threatens their autonomy or expertise. Incorporating AI into existing curriculum requires careful planning to ensure it aligns with learning objectives and overall educational goals. In the word of Mishra and Koehler (2006) creating assessments that effectively evaluate students' understanding of AI concepts and their ability to use AI tools can be complex. AI-based assessments may inadvertently perpetuate biases if not carefully designed and calibrated. Also, overreliance on AI can hinder students' development of critical thinking and problem-solving skills. AI should not replace human interaction and guidance, especially in areas like emotional support and mentorship. According to O'Neil (2016) AI algorithms can perpetuate existing biases if not carefully designed and trained. Collecting and using student data for AI applications raises concerns about privacy and data protection. Also, there are concerns about AI replacing certain roles in education, such as administrative tasks. Addressing these challenges requires a multifaceted approach, including teacher training, infrastructure investment, and ethical considerations.



## Conclusion

The ability to reason logically is an important aspect of intelligence and has always been a major focus of Artificial intelligence (AI) research. This focus has revolutionized Artificial intelligence in virtually every field it has touched. The revolutionizing ability of AI can be of immense benefits to business education programme if AI is deliberately given a priority to strive in the nations educational system. AI unarguably holds the potential to revolutionize teaching and learning in Africa by eradicating challenges associated with conventional educational methods. Artificial intelligence (AI) makes it possible for machines to learn from experience, adjust to new inputs and perform human-like tasks. Some of the branches of AI discussed in this paper like Machine Learning, Natural Language Processing, Computer Vision, Neural Network, Expert systems and Robotics will help to support and enhance the educational process. Finally, by carefully considering and addressing ethical considerations, educational institutions can harness the potential of AI while minimizing risks and ensuring that it benefits all students.

## Suggestions

The paper suggests:

1. The need for collaborative effort involving educators, researchers, and policy-makers to ensure the ethical and responsible use of AI in education.
2. The need for training and retraining of business educators in the use of AI in delivering of their services in order to achieve improved operational efficiency in business education programme where the technology is to be adopted.
3. The need for proper funding of educational institutions prior to adoption of AI in the school system.

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