



## APPLICATION OF ARTIFICIAL INTELLIGENCE IN BUSINESS EDUCATION FOR ENHANCED STUDENT OUTCOMES

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### Abstract

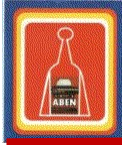
*The evolution of Artificial Intelligence (AI) has positively impacted the socio-economic and political space of our dynamic society as its pronounced presence is seen in education, skills acquisition and technology which are primal to the socio-economic expensiveness of our society. The thrust of this paper thus, is to x-ray the application of AI in Business Education. The paper highlighted the impactful roles of Artificial Intelligence in Business Education to include personalized learning, intelligence tutoring system, enhanced accessibility, career guidance, and automated grading. The paper further uncovered the challenges of Artificial Intelligence in Business Education to include lack of artificial intelligence literacy, curriculum development, access to artificial intelligence resources, ethical consideration, faculty training, industry partnership, data quality and availability, scalability, regulatory and legal consideration, etc. Consequently, the paper recommended some possible solutions to the challenges of AI in Business Education to include, development of literacy, update of curricular, students' data management, regulatory awareness, amongst others.*

**Keywords:** *Application, Artificial Intelligence (AI), Business Education, Challenges, Solutions*

### Introduction

The world's constant innovative changes have shown that the future is unpredictable especially as it concerns education, knowledge, skills, competencies and technology, which are considered the bedrock of economic, social and political growth. According to Alam (2021), technological development in the world poses many challenges and opportunities, and perhaps the most increased competition among institutions and enterprises. Around markets in changing competitive environments, knowledge, technology, research and development activities have become increasingly important as the dominant advantage of contemporary economies and strength of nations, and the institutions are measured by their progress in technology, research and development (Chen, Jane & Wenting, 2023).

Artificial intelligence (AI) (an aspect of machine learning) is poised to revolutionize the educational landscape by providing personalized learning experiences for teachers and students. For teachers in business education, this means access to tools that can adapt to the learning pace and style of individual students that offer real-time feedback and generate an insight into students' performance. Adamopoulou and Moussiades (2020) state that artificial intelligence (AI) is a broad field that encompasses various techniques and approaches used to build intelligent machines capable of performing tasks that typically require human intelligence. It is transforming business education practices in various ways including personalized learning systems and tailors these to individual student's needs, skills and learning styles. It also has driven virtual mentors, offering guidance support and feedback to teachers, students and simulating real-world entrepreneurial experiences (Surugiu, Gradinaru & Surugiu, 2024)



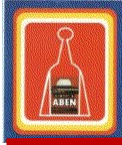
Business education is the type of education that assists individual to acquire skills, which they can apply to solve problems in business and office occupation. According to Nwaigburu and Eneogwe (2019), business education has a definite role in preparing and equipping students with skills that increase their chances of finding jobs across territorial boundaries after schooling. Nwaigburu and Eneogwe further observe that business education equips students with knowledge and skills they need to create their own employment. Business education involves teaching students the fundamental theories and processes of business. Anyaeneh and Nzegwu (2017) affirm that it typically prepares students for an occupation in business or a business-related field or a teaching career in academics. Business education is offered in both secondary and tertiary educational institutions as its courses are taught in Management, Office Technology, Marketing and Accounting. Students are expected to have relevant skills; knowledge and attitude to enable them perform effectively in their private business and public offices.

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

Intelligence is a natural endowment in humans which enables them to discern and apply knowledge. It is the ability to apply knowledge to manipulate one's environment or to think abstractly as measured by objective criteria. According to Gottfredson (1977) cited in Oygarden (2019), intelligence is a very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. The term Artificial Intelligent (AI) refers to the development of a computer system that can perform tasks that typically require human intelligence; and the system can learn from data experiences and interactions, enabling them to improve their performance and adapt to new situations. It can also draw conclusions, make decisions and solve problems using logic, rules and patterns. Artificial Intelligence system can identify and resolve problems often using creative and innovative approaches. The system can interpret and understand data from sensors, images, speech and text, enabling them to understand the world around them. According to Berglund, Bousfiha and Mansoori (2020), artificial intelligence system can also comprehend and generate human language, enabling them to communicate with humans. Artificial Intelligence system uses algorithms to process data, learn from experiences, and the system relies on high-quality data to learn, improve and make accurate decisions. Berglund, Bousfiha and Mansoori further state that the system requires significant computing power to process large amounts of data and perform complex tasks. Artificial intelligence systems use sensors to perceive the environment and actuators to interact with the physical world. The types of Artificial Intelligence include narrow or weak, general or strong and super intelligence.

### **Concept of Business Education**

The term Business Education refers to the process of teaching and learning about business principles, practice and techniques. It aims to equip students with the knowledge, skills and attitudes necessary to succeed in the business world. According to Elujekwute, Nwaokwa, Aja & Oigoche, (2021), by understanding the concept of business education, students can be better prepared to succeed in the dynamic and complex business world. Anyaeneh and Nzegwu (2017) define business education as a program of study which offers students who wish to pursue a career in business an opportunity to develop those skills and understanding that will enable them to enter, perform and progress in business occupation after graduating from high school or university. Thus, the primary goal of business education is to produce competent, skillful and to dynamic business teachers, office administrators and businessmen and women that will effectively compete in the job market. Business education is the type of education that assists individual to acquire skills, which they can apply to solve problems in business and office occupations. Students are expected to



have relevant skills and knowledge, attitude to enable them performs effectively in their private business and public offices.

### **Application of Artificial Intelligence in Business Education**

Artificial Intelligence can be applied in business education through the following ways:

**Intelligence Tutoring System;** an Intelligent Tutoring System (ITS) is a computer-based system that provides personalized guidance and feedback to students, mimicking the role of human tutor. It aims to adapt to individual learning needs, offering tailored support and instruction. Assessing students' knowledge, skills and learning style. Also, organizing and storing content expertise. It adapts to individual pace and needs of the students. According to Tuomi (2018), intelligent tutoring offers effective and efficient learning experiences, making education more accessible and engaging, and it supplements traditional teaching method by preparing students for standardized tests as well as providing tailored support for diverse learners.

**Personalized Learning:** Personalized learning is an educational approach that tailors learning experiences to individual students' needs abilities, and learning styles. It aims to provide each student with a unique learning pathway, allowing them to learn at their own pace and focus on their strengths and weaknesses. It is student centered thereby focuses on individual students' needs and materials and also allows students to learn at their own speed, adjust difficulty and content to match student progress, offers various routes to achieve learning goals. Regularly evaluates students' progress and adjusts instruction. Teachers guide and support students rather than lecturing. More so, artificial intelligence in business education helps to leverage digital tools and resources to enhance learning through technology integration. Chen, Jane and Wenting (2023) state that the application of artificial intelligence in business education increases student's motivation and interest and enhances comprehension and retention among students, it also reduces time spent on reviewing materials; it provides a clearer picture of students' knowledge, foster strong bonds and trust that enhances teacher-student relationship. By tailoring education to each students' unique needs, personalized learning aims to maximize academic potential and foster a lifelong interest of learning.

**Enhanced Accessibility:** By leveraging artificial intelligence to enhance accessibility, business education can become more inclusive, providing equal opportunities for all students to succeed and reach their full potential. Enhance accessibility in the application of Artificial Intelligence (AI) in business education is the use of AI technologies to make learning more inclusive and accessible for all students, particularly those with disabilities or limitations.

**Career Guidance:** Career guidance in the application of Artificial Intelligence (AI) in business education is to the use of Artificial intelligence technologies to support students in exploring and navigating their career paths; it can assess students' interest, skills and values to suggest relevance career options. Also, it offers tailored career guidance based on individual student strengths, weaknesses and aspirations. Artificial intelligence driven analytics can forecast career trajectory, helping students make informed decisions. It can pinpoint areas where students need skill development, enabling targeted learning. AI can assist students in setting and achieving career goals and creating personalized plans. Artificial intelligence powered career guidance can revolutionize the way students approach their professional futures, making business education more effective and impactful (Banfield, Lombard & Wax, 2015).

**Automated Grading;** Automated grading in the application of Artificial Intelligence in business education is the use of AI algorithms to evaluate and grade students' assignments, exams and other assessments. Artificial intelligence-powered automated grading can accurately score objective questions and instantly grade multiple-choice, true/false and numerical answers



questions. It can also access subjective answers and evaluate essay-type questions, using natural language processing (NLP) to analyze content, structure and language use. According to Berglund, Bousfiha and Mansoor (2020), artificial intelligence can generate feedback reports, highlighting strength, weaknesses and areas for improvement. The provided feedback can help students identify knowledge gaps and improve their understanding. Supporting adaptive learning through adjust assessment difficulty and content based on student performance. Facilitating data analysis by providing insights into student performance, helping instructors refines their teaching methods. It can automate much faster than human teachers, freeing up time for teaching and mentoring and increasing grading consistency, apply grading criteria consistently reducing bias and errors. It enhances student learning, providing feedback that can help students identify knowledge gaps and improve their understanding.

### **Challenges of Artificial Intelligence in Business Education**

The challenges of artificial intelligence in business education are briefly discussed below:

**Lack of Artificial Intelligence Literacy:** Teachers and students may not have the necessary knowledge and skills to effectively integrate artificial intelligence into business education. The limited understanding and knowledge of artificial intelligence concepts, technologies and applications among business education students and professionals is a challenge. This literacy gap hinders the effective integration of Artificial Intelligence in business education leading to limited AI adoption, inadequate AI education, misconceptions and fear, ineffective AI integration and widening skills gap, among others.

**Curriculum Development:** Developing curricula that incorporate Artificial Intelligence (AI) and its application in business education is a significant challenge, because artificial intelligence is a rapidly changing field, making it challenging to develop curricula that keep pace with the latest advancement. Again, many business teachers may not have the necessary AI knowledge or experience to develop effective AI related curricula due to lack of AI expertise, integration with existing courses: AI concepts must be integrated into existing business education courses, requiring significant curriculum redesign. The curricula must balance technical AI skills with business education acumen and soft skills. Addressing ethical and social implication; AI curricula must include ethical and social implications such as data privacy, bias and job displacement. The curricula must provide hands-on-experience with AI tools and technologies to prepare students for real world application thereby developing practical skills. Curricula development may require partnership with industry experts and AI professionals to ensure relevance and practicality. More so, developing AI-related curricula may require significant resources, including funding, infrastructure, and personnel.

**Access to Artificial Intelligence (AI) Resources:** Access to artificial intelligence resources is a challenge in integrating artificial intelligence in business education because the cost of purchasing artificial software, hardware, and tools can be expensive, making it difficult for educational institutions to afford. As the result, the institutions may lack the necessary infrastructure, such as high-performance computing, data storage and internet bandwidth. Access to relevant high-quality data for artificial intelligence projects and research may be limited. Institutions may thus rely on cloud services, which can be vulnerable to outage and data privacy concerns (Nwosu, 2019).

**Ethical Consideration:** Artificial intelligence system can perpetuate existing biases and discrimination, if not designed with fairness and equity in mind. Artificial intelligence system often relies on vast amount of personal data which raises concern about privacy and data protection. It has the potential to automate jobs, potentially displacing workers and exacerbating income



inequality. It can be complex and difficult to understand, making it challenging to explain their decisions and actions.

**Faculty Training:** Many business faculty members may not have the necessary artificial intelligence knowledge or experience to teach artificial intelligence related courses. Faculty may not fully understand how artificial intelligence applies to business disciplines, making it difficult to integrate it into the curricula. Oguejiodor and Ezeabasili (2017) affirm that faculty members may have limited time and resources to devote to artificial intelligence training and curriculum development. They require need for up skilling is required training to develop skills in artificial intelligence tools, technologies and pedagogies. Artificial intelligence is a rapidly evolving field, making it challenging for faculty to stay current with the latest development and advancement. They may need training on how to effectively integrate artificial intelligence concepts into existing business courses.

**Students Preparation:** Students' preparation is a challenge in integrating Artificial Intelligence (AI) in business education. This is because many students may not have strong understanding of artificial intelligence concepts and technologies. Many students may not possess the necessary technical skills, such as programming and data analysis, to fully understand and work with artificial intelligence. Nwanewezi (2018) states that students may require development of critical thinking and problem – solving skills to effectively apply artificial intelligence in business contexts. Students need to be aware of the ethical implications of artificial intelligence in business such as bias and privacy concerns. Also, students must stay current with the rapidly evolving artificial intelligence landscape.

**Industry Partnership:** Industry partnership is a challenge in integrating artificial intelligence in business because identifying industry partners with relevant artificial intelligence expertise and interest can be challenging, ensuring industry partners needs align with academic goals and curricular requirement can be difficult. Balancing academic priorities with industry needs and timeliness can be challenging.

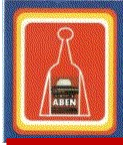
**Data Quality and Availability:** Data quality and availability are challenges in integrating artificial intelligence in business education, this is because artificial intelligence algorithms require high-quality, accurate and reliable data to learn and make decisions. The data must be relevant to the specific business problem and representative of the population or market. Accessing and sharing data across organization and industries can be challenging due to legal and ethical agreement (Nwaigburu & Eneogwe, 2019).

**Balancing Artificial Intelligence:** Balancing artificial intelligence with human skills is a challenge in integrating artificial intelligence in business education; this is because artificial intelligence may lead to over-automation, diminishing human skills and judgment. It may neglect essential human skills like communication, empathy and creativity.

**Assessment and Evaluation:** Assessment and evaluation are challenges in integrating artificial intelligence in business education. This is because creating assessment that accurately measure artificial intelligence related skills and knowledge is difficult. Assessing skills like creativity, critical thinking, and problem-solving which are enhanced by artificial intelligence is challenging. Ensuring that assessments are valid, reliable and free from bias is crucial.

**Scalability:** Scalability and accessibility are challenges in integrating artificial intelligence in business education; this is because artificial intelligence powered tools may struggle to handle large student's numbers, leading to performance issues. Thus, managing and storing large amounts of data for artificial intelligence application can be difficult.

**Regulatory and Legal Considerations:** Regulatory and legal considerations are challenges in integrating artificial intelligence in business education, this is because ensuring compliance with



data privacy laws, such as GDPR and CCPA when collecting and processing student data for artificial intelligence applications. In ensuring artificial intelligence meets accreditation standards and regulatory requirement as well ensuring artificial intelligence system complies with cyber security regulations is a challenge.

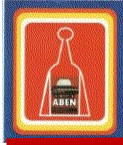
### **Conclusions**

Artificial Intelligence (AI) is an elaborate field that harbors various techniques and approaches used in developing intelligent machines capable of performing tasks that typically demand the application of human intelligence. It is fascinating to note that within the shortest span of AI's emergence, it has drastically impacted on virtually every facet of the society ranging from economic, political and social spheres. This paper therefore succinctly highlighted the positive influence that AI has on Business Education in terms of its applicability. And agreeably, the discoveries unveil the fact that AI could be applied in Business Education through intelligence tutoring system, personalized learning, career guidance, and automated grading, amongst others. Thus, despite the challenges identified to impede on the application of AI in Business Education, its positive impact has been enormous and hence a strong need for its sustenance and advancement.

### **Recommended Solutions to the Challenges of Artificial Intelligence in Business Education**

Addressing the challenges of integrating artificial intelligence in Business education requires a multifaceted approach. By addressing these challenges, business education can effectively integrate artificial intelligence, preparing students for the future of work and fostering responsible artificial intelligence adoption in business. According to Nwagwu (2020), these approaches are briefly discussed below:

1. **Develop AI literacy:** Incorporate artificial intelligence basics into curricula, enabling students to understand AI concepts and applications.
2. **Update curricula:** Regularly review and update curricula to reflect AI's rapid evolution and industry needs.
3. **Invest in V resources:** Provide access to Virtual-related hardware, software, and data, ensuring hands-on experience.
4. **Ethical considerations:** Integrate ethical discussions into AI courses, addressing bias, privacy, and responsibility.
5. **Faculty development:** Offer training and support for faculty to develop AI expertise and teaching skills.
6. **Students support:** Provide additional resources and support for students to develop AI-related skills.
7. **Industry partnerships:** Collaborate with industry partners to provide practical experience, case studies, and mentorship.
8. **Data management:** Ensure access to high-quality data and develop data management skills.
9. **Balance AI with human skills:** Emphasize the complementarity of AI and human skills, like creativity and critical thinking.
10. **Assessment innovation:** Develop innovative assessment methods to evaluate student learning in AI-related topics.
11. **Scalability and accessibility:** Implement AI-powered education that is scalable, accessible, and inclusive.
12. **Regulatory awareness:** Stay updated on regulatory and legal developments related to AI in business.



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