

CHALLENGES OF ARTIFICIAL INTELLIGENCE ADOPTION TO THE DEVELOPMENT OF BUSINESS EDUCATION STUDENTS IN TERTIARY INSTITUTIONS IN ANAMBRA STATE, NIGERIA

Cyriacus Izuchukwu Mbanugo (Ph.D)
Department of Business Education,
Nwafor Orizu College of Education, Nsugbe.
Anambra State.
07036994433
cyriacandrew1@gmail.com

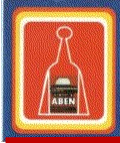
Abstract

The study focused on the challenges of Artificial Intelligence adoption to the development of business education students in tertiary institutions in Anambra State, Nigeria. Two research questions guided the study and two null hypotheses were tested. A descriptive survey research design was adopted. The population of the study comprised of 1,493 business education students in public tertiary institutions that offer business education programme in Anambra State. No sample was taken, as the population size was manageable. A 17-item structured questionnaire titled “Challenges of Artificial Intelligence Adoption to the Development of Business Education Students” was validated by three experts for the study. The reliability of the instrument was ascertained using Cronbach Alpha which showed that the clusters yielded co-efficient values of 0.92 and 0.88 respectively for the clusters B1 and B2, with an overall reliability co-efficient value of 0.90. Data related to the research questions were analyzed using mean and standard deviation, while t-test was used to test the null hypotheses at 0.05 level of significance. The findings of the study revealed that respondents agreed on challenges of Artificial Intelligence adoption on the critical reasoning and academic retention of business education students in public tertiary institutions in Anambra State, Nigeria. The study revealed that degree and NCE students of business education differ significantly on the challenges of Artificial Intelligence adoption on their critical reasoning and academic retention in public tertiary institutions in Anambra State, Nigeria. It was concluded among others that there are significant challenges of artificial intelligence adoption to the critical reasoning ability and academic retention of business education students in government owned tertiary institutions in Anambra State, Nigeria. It was recommended, among others, that students should be encouraged to avoid over-reliance on artificial intelligence as excessive dependence may hinder the development of critical reasoning abilities and academic retention.

Keywords: Challenges, Artificial Intelligence, Academic Development, Business Education Students, Tertiary Institutions.

Introduction

Education is a key and vital element in the broad development of the nation. Education remains the key to empowerment of the people and nations (Udegbonam, Agbili & Igbinoghdua, 2020). The 1990 Longe Commission reviewed Higher Education in Nigeria and noted that education is the most powerful instrument for social reform. The societal expectation therefore, is that tertiary institutions are sources of intellectual power that can be harnessed for the socio-economic priorities of a nation. Tertiary institutions are established to satisfy specific or general educational needs of a country through teaching of students, conduct of research and dissemination of the knowledge together with other community service activities.

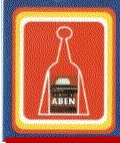


One form of education that equips its recipients to achieve total development is business education. Business Education is a course of study that equips the individual with occupational skills and knowledge that will enable him/her fit into, and finds job satisfaction in the labour market. This field of study also offers every individual an opportunity to develop those abilities, skills and understanding of the vocational opportunity available (Udegbumam et-al., 2020). To Alonta, Onwubuya and Onwuamaeme (2024), business education is a programme of instruction which consists of two parts: (a) office education: a vocational education programme for office careers through initial, refresher and upgrading education leading to employability and advancement in office occupations, and (b) general business education: a programme to provide students with information and competencies which are needed by all in managing personal and business affairs and in using the services of the business world. Business education students are one who is enrolled for their degree programme in the field of business education in the tertiary institutions (college of education and university). Tertiary institutions business education is driven by standards for and about business, therefore teaching and adopting of artificial intelligence (AI) fit perfectly into many areas of business education.

Artificial Intelligence is sometimes called machine Intelligence. It is an Intelligence displayed by machine as opposed to natural Intelligence demonstrated by human and animals (Benhamou and Janin, 2018). This means machines performance task like intelligent beings and animals. Artificial Intelligence 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. Artificial Intelligence is embedded with the ability to reason, make meaning, generalize or learn from past experiences. Artificial Intelligence (AI) is the development of computer systems that can perform tasks that typically require human intelligence, such as learning, problem-solving and decision-making (Voronov, Menshikov & Ruza, 2023). AI mimics cognitive functions to process information, adapt to inputs, and improve over time. Artificial Intelligence is a machine intelligence whose perfection largely depends on its ability and capacity to detect, identify process, and remember increasing number of relevant variables from an environment (Goodfellow, Bengio & Courville, 2016). This is part of the statistical and machine learning that Artificial Intelligence uses to mimic human intelligence.

AI is categorized into two types: Narrow AI (Weak AI) and General AI (Strong AI) (Alonta et-al., 2024). Narrow AI, such as chatbots and virtual assistants, is specialized for specific tasks, while General AI, like Siri and Alexa, exhibits hypothetical intelligence with human-like abilities. Examples of AI's applications include voice recognition, language processing, computer vision, and neural networks (Voronov, Menshikov & Ruza, 2023). Benhamou and Janin (2018) held that adopting the Artificial Intelligence in tertiary institutions business education programmes will enable one to achieve social competence and optimum individual development. Development is a progression from a simpler or lower to a more advanced, mature, or complex stage in life. Udegbumam et-al. (2020) stated that development covers activities that improve awareness and identity, develop talents and potential, build human capital and facilitate employability, enhance the quality of life and contribute to the realization of dreams and aspirations. Total development for tertiary institutions business education programmes covers many areas including academic development and social development to mentions a few.

Academic development involves students increasing their work output, academic standing or work quality. Academic development entails an ongoing accumulation of new knowledge and skills or increasing depth of understanding in one's field of study. In the context of this study, academic development is aimed at helping students develop strategies and behaviours needed to perform as confident, independent and active learners. Academic development helps in



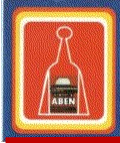
promoting students to become independent developing learners. Udegbumam et-al. stated that it was possible for students to enhance and broaden their academic horizon by browsing for academic materials and equip themselves better toward preparation for examinations during studies. Alonta et-al. (2024) advocated for embracing artificial intelligence in education. Discrepancy may arise from differing views on the potential impact of AI on academic practices. Ade-Ibijola and Okonkwo (2023) emphasize the benefits of AI for teaching and learning. This study highlights concerns about its potential negative effects on academic retention.

The benefits of AI are diverse and span across different sectors, impacting efficiency, accuracy, and innovation in numerous applications (Crawford & Paglen, 2019). However, some challenges and effects of AI on students include job displacement, educational inequality, ethical concerns, dependency on technology, and changing skill requirements (Brynjolfsson & McAfee, 2014). These factors underscore the importance of understanding the implications of AI in education and preparing students to navigate the evolving landscape of technology (Ade-Ibijola & Okonkwo, 2023).

Artificial intelligence (AI) has become increasingly prevalent in various sectors, and the field of education is no exception. AI technologies offer promising opportunities to enhance teaching, learning and administrative processes in educational institutions. However, as AI adoption accelerates, concerns arise regarding the challenges it may cause to academic performance of Business Education undergraduates' students in public tertiary institutions in Anambra State. In recent years, Artificial Intelligence has made significant advancements in the educational domain. According to Bessen (2019), AI-based tools and platforms are being adopted and utilized for personalized learning, adaptive assessments, intelligent tutoring systems, and automated grading systems. These technologies aim to improve learning outcomes, increase efficiency, and provide tailored support to students. Other challenges, according to Kabiru and Mohammed (2024), include infrastructure and connectivity barriers, educational and data ecosystem, policy and ethical considerations, government and industry initiatives.

AI also brings forth challenges that need to be examined. Bower, Christensen and Christensen (2019) asserted that the academic retention of Business Education is a critical factor for educational institutions and policy makers to ensure student success, programme completion and overall educational quality. Nwile and Edo (2023), suggests that AI tools can enhance critical reasoning skills among students. Therefore, it is essential to explore and understand the challenges that Artificial Intelligence may cause on the development of business education undergraduates students in public tertiary institutions in Anambra State. One key concern is the potential reduction in student engagement and interaction with human instructors and peers. Artificial Intelligence-powered tools may provide personalized learning experiences and instant feedback, but they may lack the human element that fosters critical thinking, communication skills, and collaborative learning. Without adequate human interaction, students may experience a decline in motivation, social interaction, and overall academic engagement (Nilsson and Nils, 2019). Another challenge of adoption of AI is that Artificial Intelligence techniques meddle with what students are expected to learn, the standardization, through 'too much' individualization of education. The overreliance on Artificial Intelligence-driven grading systems and feedback mechanisms may limit students' ability to develop essential skills. Automated grading may prioritize surface-level knowledge and neglect the deeper understanding and critical analysis required for Business Education curricula. This overreliance may hinder the development of creativity, problem-solving abilities and independent thinking among students (Crawford & Paglen, 2019).

Business education forms a critical pillar of higher education, equipping students with essential skills and knowledge required for success in the dynamic and competitive corporate



landscape. The introduction of AI has introduced both promise and apprehension, as educators and stakeholders grapple with the delicate balance between harnessing the benefits of Artificial Intelligence-enhanced pedagogical techniques and mitigating any associated risks. It is imperative to comprehensively assess the potential challenges that AI might present, especially when considering its impact on students who are at the forefront of the changing educational landscape (Brynjolfsson & McAfee, 2014).

The influencing factor on challenges of Artificial Intelligence adoption on development of business education students in tertiary institutions could be programme category. The programme category refers to students who undergo business education programme in the universities and colleges of education. In Nigeria, any student who is pursuing a Nigeria Certificate in Education, first degree and higher degrees in business education falls within this category. However, the study is concerned with Nigeria Certificate in Education and first degree students in business education. The two programme category of students in business education were chosen and seen as been in a better position to rate themselves because most of the challenges of Artificial Intelligence might have affected their critical reasoning and academic retention. Consequent upon this, Ade-Ibijola and Okonkwo (2023) affirmed that business students need to be aware of the challenges of Artificial Intelligence adoption on development of their study in tertiary institutions, its benefits to students and the programme.

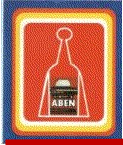
This study delved into the sphere of business education within tertiary institutions in Anambra State, Nigeria, to ascertain the challenges caused by adoption of artificial intelligence on students' educational journeys. To address these challenges, it is necessary to investigate the perceptions, experiences and concerns of Business Education students. By understanding their perspectives, educational institutions can develop strategies to mitigate risks and optimize the adoption of Artificial Intelligence while maintaining high levels of academic retention and performance. Therefore, this research seeks to fill the gap in existing knowledge by ascertaining the challenges of Artificial Intelligence adoption to the development of business education students in public tertiary institutions in Anambra State, Nigeria.

Statement of the Problem

The integration of artificial intelligence (AI) into educational environments, particularly within Business Education programmes in government owned tertiary institutions in Anambra State of Nigeria, presents a complex array of challenges concerning critical reasoning abilities and academic retention among students. At the heart of this issue lies the erosion of traditional modes of engagement and interaction between students and instructors. With the advent of AI-powered tools and platforms, there is a looming risk of diminishing student engagement with human instructors and peers. This shift away from direct human interaction may inadvertently lead to decreased motivation, a decline in collaborative learning opportunities, and ultimately, lower rates of critical reasoning abilities and academic retention among Business Education students.

Moreover, the growing reliance on AI-driven systems for tasks such as grading, feedback provision, and personalized learning interventions poses a significant challenge to students' critical reasoning abilities. As students increasingly rely on AI-generated feedback and assessments, there is a danger of stunting their capacity to think independently, solve complex problems, and engage in rigorous intellectual inquiry. The standardized nature of AI-based assessments may prioritize surface-level knowledge over deep conceptual understanding, thereby hindering students' development of critical reasoning abilities essential for success in the dynamic business landscape.

In essence, the integration of AI in Business Education programmes poses multifaceted challenges to students' critical reasoning abilities and academic retention. By delving into these



complexities, this study seeks to shed light on the nuanced ways in which AI influences student learning experiences.

Purpose of the Study

The main purpose of the study was to ascertain the challenges of Artificial Intelligence adoption to the development of business education students in public tertiary institutions in Anambra State, Nigeria. Specifically, the study ascertained the:

1. Challenges of AI on critical reasoning of business education students in public tertiary institutions in Anambra State, Nigeria.
2. Challenges of AI on academic retention of business education students in public tertiary institutions in Anambra State, Nigeria.

Research Questions

The following research questions guided the study:

1. What are the challenges of Artificial Intelligence adoption on critical reasoning of business education students in tertiary institutions in Anambra State, Nigeria?
2. What are the challenges of Artificial Intelligence adoption on the academic retention of business education students in tertiary institutions in Anambra State, Nigeria?

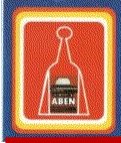
Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant difference between the mean responses of degree and NCE students of business education on the challenges of Artificial Intelligence adoption on their critical reasoning in Anambra State, Nigeria.
2. There is no significant difference between the mean responses of degree and NCE business education students on the challenges of Artificial Intelligence adoption on their academic retention in Anambra State, Nigeria.

Method

Descriptive survey research design was adopted for the study. The population for the study consisted of 1,493 business education students (NCE 649 and degree 844) in government owned tertiary institutions in Anambra State comprised of Federal College Education (Technical)-Umunze; Nnamdi Azikiwe University, Awka; Nwafor Orizu College of Education, Nsugbe, and Chukwuemeka Odumegwu Ojukwu University, Igbariam. Record was gotten from the concerned departments in these institutions as at 2024. The entire population of 1,493 business education students in study area were studied because it is manageable for the researchers to handle. A 17-item structured questionnaire validated by three experts, two experts in business education and one in measurement and evaluation from Nnamdi Azikiwe University, Awka was used in gathering data for the study. To establish the instrument's reliability, split half test was utilized. The internal consistency of the instrument was established using Cronbach Alpha which yielded reliability co-efficient values of 0.92 and 0.88 respectively for the two clusters with an overall co-efficient value of 0.90. Data collected in the study regarding the two research questions were analyzed using descriptive statistics of mean and standard deviation. Mean value was used to answer the two research questions while the standard deviation was used to determine the closeness of the mean ratings. Decision on the questionnaire items were interpreted on means, any mean score of 3.00 and above were considered agreed while the mean scores below 3.00 were considered disagreed. In data collection, out of the 1493 copies of the questionnaire distributed to the respondents, 1,479 copies were actually retrieved from the respondents which represented about 99 percent. Fourteen copies were not properly filled and discarded representing 1 percent. The t-test was used to test



the null hypotheses at 0.05 level of significance. Where the calculated p-value was less than the 0.05, it means that there was significant difference and the hypothesis was rejected. Conversely, where the calculated p-value was equal to or greater than the table value at level of significance (0.05), it means that there was no significant difference and the hypothesis was not rejected.

Results

Research Question 1:

What are the challenges of Artificial Intelligence adoption on critical reasoning of business education students in public tertiary institutions in Anambra State, Nigeria?

Table 1: Mean ratings of respondents on the challenges of Artificial Intelligence adoption to critical reasoning of business education students in public tertiary institutions in Anambra State, Nigeria. N=1,479

S/N	Challenges of Artificial Intelligence adoption on critical reasoning of business education students	\bar{X}	SD	Remarks
1.	Reduced opportunities for problem-solving due to reliance on AI-based tools.	3.60	0.43	Agree
2.	Hindrance to independent thinking due to reliance on AI for feedback.	3.20	0.61	Agree
3.	Students rarely engage in reflective thinking.	3.70	0.42	Agree
4.	Students' inability to make well-reasoned decisions based on information available.	3.69	0.50	Agree
5.	Relying on AI can affect generating innovative ideas to solve academic problems.	3.24	0.59	Agree
6.	AI affects the ability to clearly articulate thoughts in academic settings.	3.20	0.61	Agree
7.	Concerns about overreliance on AI impeding deep understanding of course materials.	3.50	0.54	Agree
8.	Fear of decreased development of analytical skills with increased dependence on AI.	3.36	0.58	Agree
9.	Most students barely conduct thorough research	3.35	0.57	Agree
	Grand Mean	3.44		Agree

Data in Table 1 show that the respondents agree that all the items as challenges of Artificial Intelligence adoption on critical reasoning of business education students in tertiary institutions with mean scores ranging from 3.20 to 3.70. This is because its mean score was above 3.00 which is the cut of point. The standard deviations show that there is homogeneity amongst responses indicating a greater consensus of opinions.

Research Question 2:

What are the challenges of Artificial Intelligence adoption on the academic retention of business education students in public tertiary institutions in Anambra State, Nigeria?

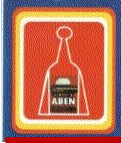


Table 2: Mean ratings of respondents on the challenges of Artificial Intelligence adoption on academic retention of business education students in public tertiary institutions in Anambra State, Nigeria. N=1,479

S/N Challenges of Artificial Intelligence adoption on academic retention of business education students			
Remarks	\bar{X}	SD	
10. Students may not remember information beyond examinations.	3.50	0.47	Agree
11. Reduced student engagement due to over-reliance on AI tools.	3.10	0.64	Agree
12. High probability of not being able to use the information in real-world situations.	3.60	0.42	Agree
13. Overuse of AI for assignments may lead to passive participation in class discussions.	3.57	0.44	Agree
14. Decrease in academic retention rates due to reduced human interaction.	3.43	0.51	Agree
15. AI affects students deep understanding of core concepts	3.13	0.62	Agree
16. AI would alter students' level of comprehensive understanding of subject matter.	3.06	0.67	Agree
17. AI would reduce the ability to recall previously learned information.	3.40	0.54	Agree
Grand Mean	3.44		Agree

Data in Table 2 show that the respondents agree that all the items as challenges of Artificial Intelligence adoption on academic retention of business education students in tertiary institutions with mean scores ranging from 3.10 to 3.60. This is because its mean score was above 3.00 which is the cut off point. The standard deviations show that there is homogeneity amongst responses indicating a greater consensus of opinions.

Testing of Hypotheses

Null Hypothesis 1

There is no significant difference between the mean responses of degree and NCE students of business education on the challenges of Artificial Intelligence adoption on their critical reasoning in Anambra State, Nigeria.

Table 3: Summary of t-test analysis on the mean responses of degree and NCE students of business education on the challenges of Artificial Intelligence adoption on their critical reasoning in public tertiary institutions in Anambra State, Nigeria.

Programme Category	N	\bar{X}	SD	α	df	t-cal	p-value	Decision
Degree	834	3.20	.19	0.05	1477	3.11	.002	Significant
NCE	645	3.17	.15					

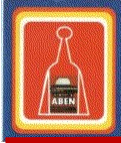


Table 3 indicate that the aggregate mean responses of degree and NCE students of business education differ significantly on the challenges of Artificial Intelligence adoption on their critical reasoning in Anambra State, Nigeria with mean scores of 3.20 and 3.17, while the corresponding standard deviation is .19 and .15. The Table indicated t-value of 3.11, at degree of freedom of 1477 and the p-value of .002. Testing at alpha level of 0.05, the p-value is significant, since the p-value is less than the alpha value (0.05). Therefore, the null hypothesis is rejected.

Null Hypothesis 2

There is no significant difference between the mean responses of degree and NCE business education students on the challenges of Artificial Intelligence adoption on their academic retention in Anambra State, Nigeria.

Table 4: Summary of t-test analysis on the mean responses of degree and NCE students of business education on the challenges of Artificial Intelligence adoption on their academic retention in public tertiary institutions in Anambra State, Nigeria.

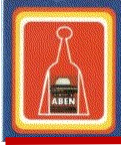
Programme Category	N	\bar{X}	SD	α	df	t-cal	p-value	Decision
Degree	834	3.09	.12	0.05	1477	1.44	.003	Significant
NCE	645	3.02	.10					

Table 4 indicate that the aggregate mean responses of degree and NCE students of business education differ significantly on the challenges of Artificial Intelligence adoption on their academic retention in Anambra State, Nigeria with mean scores of 3.09 and 3.02, while the corresponding standard deviation is .12 and .10. The Table indicated t-value of 1.44, at degree of freedom of 1477 and the p-value of .003. Testing at alpha level of 0.05, the p-value is significant, since the p-value is less than the alpha value (0.05). Therefore, the null hypothesis is rejected.

Discussion of Findings

Findings of first research question agreed that there are challenges of Artificial Intelligence adoption on critical reasoning of business education students in tertiary institutions with mean scores ranging from 3.20 to 3.70. This implies that the respondents agreed that these statements are the challenges of Artificial Intelligence adoption on critical reasoning of business education students in tertiary institutions in Anambra State, Nigeria. The findings of this study agreed with the views of Nwile and Edo (2023), who suggest that AI tools can enhance critical reasoning skills among students. The discrepancy may stem from variations in the context and implementation of AI tools in educational settings. While Crawford and Paglen (2019) focus on the benefits of AI for critical reasoning, this study highlights concerns about the limitations and dependencies associated with AI-driven learning environments.

The result of the first null hypotheses revealed that degree and NCE students of business education differ significantly on the challenges of Artificial Intelligence adoption on their critical reasoning in public tertiary institutions in Anambra State, Nigeria. The findings agreed with Adebijola and Okonkwo (2023) who affirmed that business students need to be aware of the challenges of Artificial Intelligence adoption on the development of their study in tertiary institutions, its benefits to students and the programme. This implies that there are serious challenges and effects of AI on students which include job displacement, educational inequality, ethical concerns, dependency on technology and changing skill requirements. These factors underscore the



importance of understanding the implications of AI in education and preparing students to navigate the evolving landscape of technology.

Findings of the second research question agreed that there are challenges of Artificial Intelligence adoption on academic retention of business education students in tertiary institutions with mean scores ranging from 3.10 to 3.60. This implies that the respondents agreed that all the items are challenges of Artificial Intelligence adoption on academic retention of business education students in tertiary institutions in Anambra State, Nigeria. The finding of this study contradicts the findings of Alonta et-al. (2024) who advocate for embracing artificial intelligence in education. The discrepancy may arise from differing views on the potential impact of AI on academic practices. While Ade-Ibijola and Okonkwo (2023) emphasize the benefits of AI for teaching and learning, this study highlights concerns about its potential negative effects on academic retention.

The result of the second null hypotheses revealed that degree and NCE students of business education differs significantly on the challenges of Artificial Intelligence adoption on their critical reasoning in public tertiary institutions in Anambra State, Nigeria. The findings agreed with Ade-Ibijola and Okonkwo (2023) who affirmed that business students need to be aware of the challenges of Artificial Intelligence adoption on development of their study in tertiary institutions, its benefits to students and the programme. This implies that there are serious challenges and effects of AI on students which include job displacement, educational inequality, ethical concerns, dependency on technology and changing skill requirements.

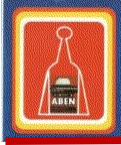
Conclusion

Based on the findings of this study, it is concluded that there are significant challenges of artificial intelligence adoption to the critical reasoning ability and academic retention of business education students in government owned tertiary institutions in Anambra State, Nigeria. The concerns expressed by students reflect apprehensions about job displacement, reduced critical reasoning opportunities, and potential disruptions to traditional educational practices. These findings underscore the importance of addressing students' concerns and needs in the integration of AI into educational settings. However, this study contributes to a deeper understanding on the adoption challenges of AI on critical reasoning abilities and academic retention among business education students in government owned tertiary institutions in Anambra State, Nigeria.

Recommendations

The researchers make the following recommendations based on findings of the study:

1. Students should be encouraged to avoid over-reliance on artificial intelligence as excessive dependence may hinder the development of critical reasoning abilities and academic retention. That is why educational programmes should incorporate activities and assignments that promote critical reasoning, problem-solving skills and academic retention to mitigate the potential negative effects of AI on students' cognitive abilities.
2. Educational institutions should implement policies and guidelines for the controlled use of artificial intelligence to ensure effective development of critical reasoning abilities and academic retention of students. This may include regulating the extent to which AI-driven tools are used in teaching and learning processes to maintain a balance between traditional educational practices and technological advancements.
3. There must be proper policy formulation and implementation prior to, during and after the adoption of artificial intelligence. This is to make sure that lecturers and students understand more of adoption of artificial intelligence to benefit students and staff in the development of their skills in business education.



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