BENEFIT OF ARTIFICIAL INTELLIGENCE AND ETHICAL IMPLICATIONS FOR BUSINESS EDUCATION PROGRAMMES IN TERTIARY INSTITUTIONS IN DELTA STATE NIGERIA

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Abstract

The study explored the benefit of artificial intelligence and ethical implications for Business Education Programmes in tertiary institutions in Delta State, Nigeria. Two research questions guided the study and two null hypotheses were formulated and tested. The study adopted the descriptive survey design. The population of the study consisted of two thousand six hundred and fifty (2,650) business education students registered for 2021/2022 academic session from colleges of education and universities in Delta State. Simple random sampling technique was used to obtain a sample size of 350, comprising 150 college students and 200 university students. A 20 item statement questionnaire that was validated by three research experts was used for data collection. The reliability of the instrument was ensured using test re-test technique and data obtained were analyzed using Cronbach alpha statistics. The analysis yielded a reliability coefficient of 0.79 which was suitable for the study. Data collected from the research questions were analyzed using mean and standard deviation while the independent sample t-test was used to test the hypotheses at a significance level of 0.05.The findings of the study revealed that AI-empowered systems facilitate personalized-learning, enable adaptive learning and real-time feedbacks on learning progression. However, AI ethical concerns in education were identified to include but not limited to: data privacy and security, algorithmic bias, unfairness, among others. Based on the findings, the study recommends that AI- technology developers and regulatory bodies should ensure that viable data privacy policies are established to protect and safeguard personal information and that surveillance mechanism embedded in AI"s predictive systems should be automated for prompt identification of learning patterns and areas of improvement, also that AI-algorithmic systems should be carefully designed for equitable access to data, avoid inequalities that could cause socio-economic disparities and educational gap.

Keywords: *Artificial Intelligence, Personalized learning platforms, Adaptive learning Algorithms, Ethical Implications and Education*

Introduction

Artificial intelligence has become significantly important in transforming various industries, shaping of individual lifestyle and work habit in today's world of work. In recent times the field of education has witnessed a rapid transformation, largely driven by advanced Artificial Intelligence (AI) technology. This technology has the potential to revolutionize every aspect of education ranging from personalized learning experiences to effective administrative system. The rapid update of AI technology and its continuous innovation and application in institutions has come with increased convenience providing innovative solutions and improved access to quality information. AI is remarkably a substantial technology that has recently tried to mop off the traditional pedagogical approach in academic and administrative processes with the introduction of machine learning systems designed to display very high level of human intelligence in an

astonishing velocity. As noted by Cox and Mazumdar (2022), Artificial Intelligence is a collection of technologies with broad applicability in various fields of the human endeavor. AI deals with simulation of intelligence and behaviour in computers with capacity to mimic and virtually improve human conduct. According to Piano (2020), AI technology involves computers performing action or achieving desired result without human intervention. On a general note, especially as regards education sector, the emergence of Artificial Intelligence tools and its integration and application into learning situations has attracted significance with revolutionized teaching and learning, bringing about on the learning outcomes.AI-empowered learning tools involve machine learning system that usesalgorithm to empower personalized and adaptive learning, facial recognitions among others.

Machine learning is concerned with the use of data and algorithms to perform tasks. Adewale and Akintola (2018) noted that Machine learning aims at building systems that make predictions based on data. It also involves drilling algorithms to identify learning styles and improve performance over time. These applications have expanded the digital possibilities in education by introducing new approaches and pedagogies in teaching-learning situations. Algorithms are rules designed to undertake a specific task or solve a particular problem.Algorithmic system provides a clear step-by-step strategy in achieving desired learning experience.According to Dignuim (2018), algorithmic systems are the core element of Artificial Intelligence, they consist of instructions that computers obey in finding solution to a problem. The algorithmic applications have featured prominently on various social media platforms and have contributed immensely to the overall improvement of education by providing timely solution to major challenges in education.The introduction and application of algorithmic systems in learning environment facilitatepersonalized-learning, enable adaptive learning and real-time feedbacks.

Personalized learning platforms are educational technologies that use AI tools to tailor learning experiences to individual learner‘s needs, performance and abilities. The platform influence AI- algorithms to analyze students‘ data and adapt instructional content, feedbacks and resource materials in optimizing learning outcomes. AI-Personalized learning platforms increase motivation and engagement of learners by aligning content with students‘ interest and learning pattern. This learning approach addresses specific gap in knowledge and adapt to varying learning needs. The personalized learning pattern supports diversity in learning patterns which accordingly result in instructional effectiveness. The platform leverages at advance AI technologies to adapt to learning environment of each learner.The adaptive learning platform powers AI to personalize educational experience. It uses algorithms to analyze students‘ learning styles and dynamically adjust content resources and at the same provides instant feedback to guide students in real-time. According to Bulger (2016), the transformative learning experiences through the personalized learning platforms, adapt to each learner‘s personal strengths, weaknesses, and preferences, providing a nurturing way to achieve superior learning outcomes. More importantly, these learning tools support and quicken responses to learners‘ questions, improving performance and other learning experiences. AI learning tools lessen the burden of both teachers and students through the automated learning assessment management systems that facilitate evaluation processes and facial recognition systems‘ insight into learners‘ behavior and other educational activities.

Education is a key to solving all life problems, it does not just prepare the individual for life but it is life itself. Education is dynamic process that emphasizes critical thinking, creativity and development of skills that allow individuals thrive in a complex society. Education involves discovery and talent development for capacity building. Education in its multifaceted nature aims at preparing individuals for active participation in the global world. According to Duckworth (2023),

education is the systematic cultivation of intellectual and emotional resilience through a lifelong learning experience. The integrating of AI into the education system has fostered learning activities with transformative experiences.Adewale, & Akinola (2018) noted that AI-driven educational tools help to identify and nurture individual talents, provides innovative and learning opportunities that suits the learners' interest and strengths. The adaptive learning platforms allow learners to learn at their own pace, providing timely feedback to individual learners. The personalized learning tools are adaptive in nature that help in addressing individual learning styles by providing variety of instructional materials based on individual learning needs and progression. The learning platforms identify gaps in previous knowledge by accommodating learners' strength, weakness and providing adaptive support to students (Chu, Tu, & Yang 2022). Furthermore AI learning tools like the virtual classroom enhances collaborative learning and participation. These platforms are social learning outlets that facilitate interaction and ability to respond naturally with a conversational tone.Social networking learning platform allows for students-teachers connectivity and expands learning opportunities beyond the classroom.AI technological advancements has brought potential benefits to the education sector, although certain ethical issues have be identified to be associated with Artificial Intelligence integration in education

Ethical implication of Artificial intelligence in education extends beyond technical considerations but encompasses issues related to AI algorithmic biases. For instance, when algorithms are created, they collect a large set of data that are always accompanied by systemic biases that automatically transform into algorithms biases. AI applications often require the collection, analysis and storage of large amounts of data. Given the volume of data generated, the greatest ethical concern is related to data privacy and security, fairness, transparency, accountability having greater impact on learning outcomes. The widespread collection and analysis of data by AI system, raises concerns about how that data is used, stored, and protected, particularly in protecting student data. According to Black, Bolsoven, and Daboise (2014), privacy violation occurs when individual information is access online without the owner's consent. AI systems that perpetuate bias and unfairness could result to educational disparities, thus creating gap and learning exclusion, especially among the disadvantaged learners. The amplification of AI systems has resulted in unfairness among learners and has broadened the possibility of less privileged learners having equal access to resources. Consequently, these wide range of ethical concerns in education that are not just limited to data privacy, unequal access, transparency and accountabilitycould be tackled if the systems are carefully designed and monitored by AI technology developers and policy regulatory bodies in their established measures that enhance data privacy and security.Clearly Baker (2023) asserted that there is need for data protection regulations so as to safeguard against unauthorized access or misuse of students' personal information. Furthermore, algorithms and machine-learning model tracking systems need to be largely engaged in monitoring activities of users and determine their actions. Surveillance mechanism should also be embedded into AI's predictive systems to foresee students' outcomes, strengths, weaknesses and learning patterns.Mario and Ayala (2023) clearly noted that, a subtle technique is required to balance the benefits and ethical issues of artificial intelligence integration in education, essentially by applying principles of equity and fairness in AI learning platforms for optimal learning outcomes.

Statement of the Problem

One of the major aims of AI in education is to foster learning activities. With the transformative capacity of AI learning platforms, it presents opportunity for individualized learning experiences. The education sector is expected to fully explore the potentials in AI technologies

through AI-driven learning activities. But observation reveals that the education sector especially some tertiary institutions seem not to have adequate access to AI- empowered learning platforms.Further observations also reveal that most learners especially the disadvantaged are deprived access to learning materials and timely feedback required in determining their learning progression. These setbacks could be attributed to the ethical concerns associated with the integration of AI technology in education. These ethical issues as identified in this study,include: data privacy and security, algorithm bias, unfairness, lack of transparency and accountability among others. The complexity of these hurdles in AI application in education if not contained may result in partial or non-accomplishment of learning objectives and consequently resulting in poor learning experiences, academic gap and unfruitful learning outcomes. In order to checkmate these learning anomalies, there is the need for a balanced approach in AI applications by ensuring an inclusive education system that is free of biases and inequalities if the maximum learning experience expected is to be attained.It is on this premise that the study examined the benefits of Artificial intelligence and ethical implications for business education programme in tertiary institutions especially in Delta State Nigeria.

Research Questions

1 What are the benefits of AI integration in business education programme in tertiary institutions in Delta State?
2 What are the ethical implications of AI integration for business education programme in tertiary institutions in Delta State?

Hypotheses

Two null hypotheses were formulated and tested at alpha level of 0.05.

Ho1: There is no significant difference in the mean responses of business education students in colleges of education and universities on the benefits of AI integration in business education programme in tertiary institutions in Delta State.

H02: There is no significant difference in the mean responses of business education students in colleges of education and universities on the ethical implications of AI integration for business education programme in tertiary institutions in Delta State.

Methodology

The study adopted descriptive survey design. The researcher considered this design suitable for this study since it elicits information from respondents regarding the benefits and ethical implications of AI integration for business education programme in tertiary institutions in Delta State. Two research questions guided the study and two null hypotheses formulated and tested at alpha level of 0.05. The population of the study was made up of two thousand six hundred and fifty (2,650) business education students of the 2021/2022 academic session from colleges of education and universities where business education is offered in Delta State. Simple random sampling technique was employed to obtain a sample size 350, composed of 150 college students and 200 university students. A structured questionnaire with the title ¯Benefits and Ethical Implications of Artificial Intelligence for Business Education Programme Questionnaire‖ (BEIAIBEPQ) was used for the study. The instrument was made up of twenty (20) item statements and was graded on a four point rating scale of Strongly Agreed (4points), Agreed (3points), Disagreed (2points) and Strongly Disagreed (1point) which was validated by three research experts. The reliability of the instrument was determined using test-retest technique.Data obtained from the administrations were analyzed with Cronbach alpha statistics and it yielded a reliability coefficient of 0.79. The value was considered reliable and appropriate

for the study. Data collected from respondents as regards the research questions were analyzed using Mean and Standard Deviation while Independent t-test was used to test the null hypotheses at a significance level of 0.05.
Decision rule for the research questions was based on an average mean score of 2.50 while the null hypotheses were based on t-critical value. If the t-calculated is less than the t-critical, the null hypothesis was accepted and if otherwise, rejected.

Results

Research Question 1: What are the benefits of AI integration in business education programme in tertiary institutions in Delta State?

Table 1:Mean and Standard Deviation of responses on the benefits of AI integration in business education programme in tertiary institutions in Delta State?

S/N	Item Statements	(x)	SD	Remark
1	I always utilize AI personalized learning platform	3.19	0.64	Agreed
2	Relevant resource materials are provided in the learning platforms based on learning needs	2.45	0.45	Disagreed
3	The adaptive learning platform fits into my learning preference	2.32	0.56	Disagreed
4	The learning platforms effectively identifies and address my learning strengths and weaknesses	3.65	0.54	Agreed
5	I am not satisfied with the feedbacks gotten from the AI learning platforms	2.28	0.55	Disagreed
6	I don't always access AI-generated recommendations for additional learning materials	2.23	0.43	Disagreed
7	I am motivated in my career due to the help of AI applications	3.45	0.45	Agreed
8	AI provides individualized performance progress	2.67	0.24	Agreed
9	I gets timely feedback from AI learning platforms	2.73	0.36	Agreed
10	Evaluating my learning progress is made easy through AI assessment platforms	2.65	0.38	Agreed
	Grand Mean	**2.76**	**0.46**	**Agreed**

The analysis in research question one as shown in Table 1 indicates that the mean response of respondents ranged from 2.23 – 3.65. The result reveals that business education students in tertiary institutions in Delta State do access AI-empowered learning platforms. With an aggregate mean score of 2.76 above the criterion mean of 2.50, it implies that personalized and adaptive learning platforms are often utilized and enhances learning outcomes of business education programme in tertiary institutions in Delta State.

Research Question 2: What are the ethical implications of AI integration in business education programme in tertiary institutions in Delta State?

Table 2: Mean and Standard Deviation of responses on the ethical implications of AI integration in business education programme in tertiary institutions in Delta State

S/N	Item Statements	(x)	SD	Remark
11	I have limited access to AI learning resources due to digital divide	3.29	0.54	Agree
12	There is no transparency and accountability in AI learning platforms	2.25	0.56	Disagree

13	AI algorithms perpetuate unfairness in learning outcome	2.42	0.43	Disagree
14	I do have full access to AI- learning tools	3.35	0.55	Agree
15	I have neveraccessed AI learning platforms	2.27	0.64	Disagree
16	AI-algorithms prioritize security of data	2.63	0.47	Agreed
17	personally manage my privacy setting to control the use of data by others	2.17	0.78	Disagree
18	There are potential risks of data privacy and security in AI learning platforms	3.42	0.56	Agree
19	I don't share sensitive information online due to data insecurity	3.56	0.68	Agree
20	My school has some measures put in place to ensure AI-driven data privacy	2.23	0.57	Disagree
	Grand Mean	**2.76**	**0.58**	**Agree**

The analysis in research question two as shown in Table 2 indicates that the mean responses ranged from 2.17 – 3.56. The result reveals that there are ethical challenges in AI integration in business education programme in tertiary institutions. With an aggregate mean score of 2.76 above the criterion mean of 2.50, this signifies that issues such as: data privacy and security, algorithm bias, unfairness among others are associated with AI integration in business education programme in tertiary institutions in Delta State.

Test of Hypotheses

Ho1: There is no significant difference in the mean responses of business education students in colleges of education and universities on the benefits of AI integration in business education programme in tertiary institutions in Delta State.

Table 3: Summary of t-test analysis on the significant difference in the mean responses of business education students in colleges of education and universities on the benefits of AI integration in business education programme in tertiary institutions in Delta State

InstitutionsNXSDdft-calt-criticalDecision
Colleges1503.560.54348 -28.081.96Not Significant
Universities2003.450.49

Data in Table 3 reveals a t-calculated value of -28.06 which is less than the t-critical value of 1.96 at alpha level of 0.05. The analysis depicts a null hypothesis of no significance. Therefore the null hypothesis which states that there is no significance difference in the mean responses of business education students in colleges of education and universities on the benefits of AI integration in business education programme in tertiary institutions in Delta State is retained. It therefore implies that the mean responses of business education students in colleges and universities do not significantly differ on the benefits of AI integration in business education programme in tertiary institutions in Delta State, Nigeria.

H02: There is no significant difference in the mean responses of business education students in colleges of education and universities on the ethical implication of AI integration in business education programme in tertiary institutions in Delta State.

Table4: Summary of t-test analysis on the significant difference in the mean responses of business education students in colleges of education and universities on the ethical implication of AI integration in business education programme in tertiary institutions in Delta State.

Institution	N	X	SD	df	t-cal	t-critical	Decision
Colleges	150	3.68	0.72	273	-26.04	1.96	Not Significant
Universities	200	3.26	0.56				

Table 4 analysis shows a t-calculated value of -26.04 which is less than the t-critical value of 1.96 at alpha level of 0.05. The result depicts a null hypothesis of no significance.Therefore the null hypothesis which states that there is no significant difference in the mean responses of business education students in colleges of education and universities on the ethical implication of AI integration in business education programme in tertiary institutions in Delta State is retained and accepted. The result implies that the mean responses of business education students in colleges of education and universities do not significantly differ on the ethical implications of AI integration in business education programme in tertiary institutions in Delta State, Nigeria.

Discussion of Findings

The findings of the study were discussed in line with the research questions and the tested hypotheses. The result of research question one as shown in Table 1 reveals the mean and standard deviation of respondents on benefits of AI integration in business education study in tertiary institutions in Delta State. With an aggregate mean score of 2.76 above the criterion mean of 2.50, it implies that AI is beneficial in education through the personalized and adaptive learning platforms that enhance individualized learning experiences. This is in agreement with Loeck (2022) who affirm that the transformation of learning experiences through AI- personalized platforms has contributed greatly to the overall improvement in learning processes by identifying areas of improvement and profile timely solution.

The analysis in research question two as shown in Table 2 reveals that there are ethical implications associated with AI integration in learning. With an aggregate mean score of 2.76 above the criterion mean of 2.50, it signifies that the integration of AI technologies in education is associated with issues of data privacy, algorithmic bias and unfairness which are barriers to the learning experiences with AI learning platforms According to Mario and Ayala (2023), the issue of unequal access to AI educational tools could cause socio-economic disparities, thus creating educational gaps especially among the disadvantaged learners.

The data analysis in Table 3 shows a t-calculated value of -28.06 which is less than the t-critical value of 1.96 at alpha level of 0.05. The result depicts a null hypothesis of no significance. Therefore the null hypothesis which states that there is no significance difference in the mean responses of business education students in colleges of education and universities on the benefits of AI integration in business education programme in tertiary institutions is retained. This implies that AI-empowered learning platforms are beneficial to business education students in tertiary institutions in Delta State.

The analysis in Table 4 reveals a t-calculated value of -26.04 which is less than the t-critical value of 1.96 at alpha level of 0.05. The result signifies a null hypothesis of no significance. It therefore depicts that the null hypothesis which states that there is no significant difference in the mean responses of business education students in colleges of education and

universities on the ethical implication of AI integration in business education programme in tertiary institutions in Delta State is accepted. This suggests that ethical issues are associated in AI integration in business education study in tertiary institutions in Delta State.In corroboration with the above analysis, Black, Bolsoven, and Daboise (2014) affirm that AI-algorithms perpetuate bias and inequalities that lead to the exclusion of learners, especially if the systems are not carefully designed and monitored for equitable access.

Conclusion

Based on the findings, the researcher concluded that: AI-personalized and adaptive learning platforms are of utmost importance in education because these platforms adapt to individual learning capability, providing learning materials according to individual learning needs and subject areas.More importantly the AI-interactive learning tools, promote critical thinking and collaborative learning thus facilitating lifelong learning experiences. Algorithm bias and unequal access to data were revealed to be associated with AI integration in education. The most worrisome concerns were the issue of data privacy and security, lack of transparency among others

Recommendations

The following recommendations were made by the researcher based on the findings of the study:;

1 AI technology developers and regulatory bodies should ensure that viable data privacy policy regulations are maintained to regularly protect and safeguard personal information.

2 Surveillance mechanism embedded in AI's predictive systems and AI- personalized platforms should be actively automated for prompt identification of learning patterns and areas of improvement and profile timely solution for the overall contribution and improvement in learning processes

3 AI-algorithmic systems should be carefully designed and monitored for equitable access to avoid inequalities that could cause socio-economic disparities, thus creating educational gaps that may lead to the exclusion of learners

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