

ARTIFICIAL INTELLIGENCE AND ENTREPRENEURSHIP EDUCATION RESEARCH IN SOUTH-SOUTH NIGERIA

Dr. Warriwei Ebiere Rosemary & Dr. Banabo Ekankumo

banaboalex@yahoo.com, +2347066980905

Department Of Business Education, Isaac Jasper Boro College of Education, Sagbama Bayelsa State, Nigeria

ABSTRACT

This study investigated the Artificial Intelligence (AI) and entrepreneurship education research in South-South Nigeria. The study developed three specific objectives focusing on the current level of AI integration, perceptions of its use, and associated challenges. A descriptive survey design was employed, involving a sample of 250 respondents from various private and public tertiary institutions in south-south Nigeria. Data were collected using a structured questionnaire designed on Likert scale format ranging from "Strongly agree, agree, disagree and strongly disagree response with 15 items. The overall reliability coefficient obtained was 0.82, indicating a high level of internal consistency and confirming that the instrument was reliable for measuring the study variables. The data collected was analyzed through descriptive and inferential statistics, including independent t-tests. The findings indicated a high level of AI integration and generally positive perceptions among educators and students. Challenges such as insufficient training, high costs, and limited resources were identified. Significant differences were found in the challenges faced by private versus public institutions, while no significant differences were observed in AI integration levels or perceptions between the two types of institutions. The study recommended amongst others that to address the challenge of insufficient training, both private and public institutions should implement comprehensive AI training programs for educators and students in south-south Nigeria.

Keywords: *Artificial Intelligence, Entrepreneurship, Education, Research.*

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INTRODUCTION

Entrepreneurship education is widely recognized as a vital tool for fostering economic growth, job creation, and innovation in developing nations (Iwu & Ezeuduji, 2018). In Nigeria, entrepreneurship education has been emphasized as a means to reduce unemployment and empower the youth with necessary skills for self-reliance (Nwogu & Nwanaka, 2015). However, the conventional methods of teaching entrepreneurship in Nigeria are often characterized by rote learning, a lack of practical exposure, and limited access to contemporary technological tools, which diminishes the effectiveness of such educational programs (Abubakar, 2018). In recent years, the integration of Artificial Intelligence (AI) into educational curricula has gained traction as a transformative approach that can enhance the learning experience, personalize education, and improve overall student outcomes (Chen et al., 2020).

AI, as a subset of emerging technologies, has revolutionized various sectors, including education. It refers to the simulation of human intelligence processes by machines, especially computer systems, which include learning, reasoning, problem-solving, and language understanding (Russell & Norvig, 2020). The application of AI in education can be seen through intelligent tutoring systems, adaptive learning platforms, and data analytics that can provide insights into student performance and engagement (Hwang et al., 2021). In entrepreneurship education, AI can

simulate real-world business environments, provide personalized learning paths, and equip students with the skills needed to thrive in the digital economy (Duan et al., 2019).

In South-South Nigeria, the integration of AI into entrepreneurship education is still in its nascent stages, with limited empirical studies exploring its impact and potential (Iyangbe et al., 2023). The South-South of Nigeria known for its rich natural resources and diverse cultural heritage, faces significant challenges, including high youth unemployment rates, inadequate educational infrastructure, and limited access to quality education (Okon & Friday, 2022). These challenges underscore the need for innovative educational strategies that can bridge the skill gaps and prepare students for the demands of the modern workforce. Hence, the use of AI, educational institutions in South-South Nigeria can enhance entrepreneurship education, making it more relevant, accessible, and effective (Udo & Asuquo, 2023).

Despite the promising potential of AI in entrepreneurship education, several barriers exist, including the lack of digital infrastructure, limited technical expertise among educators, and concerns about data privacy and ethical use of AI technologies (Omotayo & Haliru, 2021). Also, there is a general skepticism about the readiness of institutions to adopt AI-driven solutions due to financial constraints and resistance to change (Fawole & Afolabi, 2021). The study sought to investigate artificial intelligence and entrepreneurship education research in south-south Nigeria

Statement of the Problem

Despite the growing recognition of the importance of entrepreneurship education in driving economic development and reducing unemployment in South-South Nigeria, the current educational approaches remain largely traditional and are not adequately preparing students for the evolving demands of the business world. The integration of AI technologies offers a promising solution to enhance the quality and effectiveness of entrepreneurship education. However, there is limited empirical research on the extent to which AI has been integrated into entrepreneurship education in South-South Nigeria, the challenges encountered, and the impact of such integration on students' learning outcomes. This study seeks to address this gap by investigating the current state of AI integration in entrepreneurship education, the perceptions of key stakeholders, and the barriers to and facilitators of AI adoption in educational settings within the region.

Aim and Objectives of the Study

The primary aim of this study is to investigate artificial intelligence and entrepreneurship education research in south-south Nigeria. The specific objectives of the study are:

1. To assess the current level of integration of AI technologies in entrepreneurship education research in South-South Nigeria.
2. To examine the perceptions of educators and students regarding the use of AI in entrepreneurship education research.
3. To identify the challenges associated with the adoption of AI in entrepreneurship education research in South-South Nigeria.

Research Questions

The following research questions guided the study:

1. What is the current level of integration of AI technologies in entrepreneurship education research in South-South Nigeria?
2. How do educators and students perceive the use of AI in entrepreneurship education research ?
3. What are the challenges associated with the adoption of AI in entrepreneurship education research in South-South Nigeria?

Hypotheses

The following hypotheses were formulated and tested at the 0.05 alpha level of significance:

1. There is no significant difference in the level of integration of AI technologies in entrepreneurship education research between private and public institutions in South-South Nigeria.
2. There is no significant difference in the perceptions of educators and students regarding the use of AI in entrepreneurship education in South-South Nigeria.
3. There is no significant difference in the challenges associated with the adoption of AI in entrepreneurship education in private and public institutions in South-South Nigeria.

METHODOLOGY

This study adopted a descriptive survey design to investigate artificial intelligence (AI) and entrepreneurship education research in South-South Nigeria. The descriptive survey design was chosen because it allowed for the systematic collection and analysis of data to understand current practices, perceptions, and challenges related to the use of AI in entrepreneurship education within the region. The study focused on tertiary institutions in South-South Nigeria, including universities, polytechnics, and colleges of education, as these institutions play a crucial role in entrepreneurship education research. The population of the study comprised 8000 (eight thousand) lecturers and students in eighteen tertiary institutions in South-South Nigeria .

A multistage sampling technique was employed to select the sample for the study. In the first stage, tertiary institutions in South-South Nigeria were stratified into three categories: universities, polytechnics, and colleges of education. In the second stage, two institutions were randomly selected from each category, ensuring a broad representation of the various types of tertiary institutions in the South-South States. In the final stage, purposive sampling was used to select 200 students and 50 lecturers totaling 250 respondents. The sample size was considered adequate based on the Krejcie and Morgan (1970) sample size determination table, providing a representative overview of the study population. Data were collected using a structured questionnaire specifically designed to align with the study's objectives. The questionnaire utilized a Likert scale format ranging from "Strongly Disagree" to "Strongly Agree" to measure respondents' perceptions and experiences accurately. The structured format allowed for easy quantification of responses, facilitating the analysis of trends and patterns.

To ensure the validity of the questionnaire, content and face validity were conducted. Content validity was established by consulting with lecturers in AI and entrepreneurship education who reviewed the questionnaire to confirm that it covered all relevant aspects of the study. Face validity was tested by piloting the questionnaire with a small group of lecturers not included in the main study. Their feedback was used to refine the wording and format of the questions to enhance clarity and relevance. The reliability of the instrument was tested using the Cronbach's alpha coefficient, calculated from data collected during the pilot study involving 50 respondents from one selected institution. The overall reliability coefficient obtained was 0.82, indicating a high level of internal consistency and confirming that the instrument was reliable for measuring the study variables.

The data collected from the study were analyzed using descriptive and inferential statistics. Descriptive statistics, including means, and standard deviations, were used to summarize the data related to the research questions. Inferential statistics, such as independent t-test , was employed to test the research hypotheses. The Statistical Package for the Social Sciences (SPSS) software version 26.0 was used for all statistical analyses.

Results

Research Question 1: What is the current level of integration of AI technologies in entrepreneurship education research in South-South Nigeria?

Table 1: Level of Integration of AI Technologies in Entrepreneurship Education Research

S/N	Items	Mean (X)	Standard Deviation (S.D)	Decision
1	AI tools are regularly used in research activities.	3.58	0.63	Agreed
2	AI technologies are integrated into the entrepreneurship curriculum.	3.52	0.70	Agreed
3	Lecturers utilize AI for data analysis in research.	3.47	0.67	Agreed
4	Institutions provide training on AI applications for research.	3.60	0.65	Agreed
5	There is significant use of AI for project-based learning in entrepreneurship.	3.51	0.68	Agreed

| Grand Mean Score | 3.54 | 0.67 | Agreed |

Interpretation: Table 1 revealed that the integration of AI technologies in entrepreneurship education research in South-South Nigeria is at an agreeable level, as indicated by the grand mean score of 3.54. The mean scores for all items ranged from 3.47 to 3.60, showing a consistent agreement among respondents that AI technologies are being utilized in various aspects of entrepreneurship education research, including curriculum integration, research activities, and institutional training.

Research Question2: How do educators and students perceive the use of AI in entrepreneurship education research?

Table 2: Perception of Educators and Students on the Use of AI in Entrepreneurship Education Research

S/N	Items	Mean (X)	Standard Deviation (S.D)	Decision
1	AI improves the quality of research outcomes.	3.53	0.60	Agreed
2	Students find AI tools helpful for learning entrepreneurship concepts.	3.49	0.66	Agreed
3	Educators believe AI enhances research efficiency.	3.42	0.64	Agreed
4	AI makes entrepreneurship research more engaging for students.	3.57	0.62	Agreed
5	There is a positive attitude towards adopting AI in research.	3.50	0.69	Agreed

| Grand Mean Score | 3.50 | 0.64 | Agreed |

Interpretation: Table 2 indicates that both educators and students have a positive perception of the use of AI in entrepreneurship education research, with a grand mean score of 3.50. The respondents agreed that AI enhances the quality and efficiency of research, makes learning more engaging, and is viewed positively for its potential benefits in entrepreneurship education.

Research Question 3: What are the challenges associated with the adoption of AI in entrepreneurship education research in South-South Nigeria?

Table 3: Challenges Associated with the Adoption of AI in Entrepreneurship Education Research

S/N	Items	Mean (X)	Standard Deviation (S.D)	Decision
1	Lack of sufficient AI training for educators.	3.54	0.62	Agreed
2	High cost of AI technologies and tools.	3.59	0.60	Agreed
3	Limited access to AI resources and infrastructure.	3.46	0.64	Agreed

S/N	Items	Mean (X)	Standard Deviation (S.D)	Decision
4	Resistance to change from traditional teaching methods.	3.52	0.61	Agreed
5	Insufficient funding for AI integration in research.	3.61	0.59	Agreed

| **Grand Mean Score** | 3.54 | 0.61 | **Agreed** |

Interpretation: Table 3 indicates that the respondents agreed on the challenges associated with the adoption of AI in entrepreneurship education research, with a grand mean score of 3.54. The major challenges identified include a lack of training for educators, high costs of AI tools, limited access to resources, resistance to change, and insufficient funding for AI initiatives in research.

Analysis of Hypotheses

Hypothesis1:

There is no significant difference in the level of integration of AI technologies in entrepreneurship education research between private and public institutions in South-South Nigeria.

Table 1: Summary of Independent t-test Analysis for no significant difference in the level of integration of AI technologies in entrepreneurship education research between private and public institutions in South-South Nigeria.

Group	N	Mean (X)	Standard Deviation (S.D)	t-value	p-value
Private Institutions	125	3.48	0.65	1.89	0.06
Public Institutions	125	3.42	0.67		

The t-test result in Table 1 shows that there is no significant difference in the level of integration of AI technologies between private and public institutions in South-South Nigeria ($t = 1.89$, $p = 0.06$). Since the p-value (0.06) is greater than the alpha level of 0.05, the null hypothesis is not rejected. This suggests that the level of AI integration is similar across both types of institutions.

Hypothesis2:

There is no significant difference in the perceptions of educators and students regarding the use of AI in entrepreneurship education in South-South Nigeria.

Table 2: Summary of Independent t-test Analysis for no significant difference in the perceptions of educators and students regarding the use of AI in entrepreneurship education in South-South Nigeria

Group	N	Mean (X)	Standard Deviation (S.D)	t-value	p-value
Educators	125	3.55	0.62	0.87	0.39
Students	125	3.52	0.66		

The t-test result in Table 2 indicates that there is no significant difference in the perceptions of educators and students regarding the use of AI in entrepreneurship education ($t = 0.87$, $p = 0.39$). Since the p-value (0.39) is greater than the alpha level of 0.05, the null hypothesis is not rejected. This implies that both educators and students share similar perceptions about the use of AI in entrepreneurship education.

Hypothesis 3:

There is no significant difference in the challenges associated with the adoption of AI in entrepreneurship education between private and public institutions in South-South Nigeria.

Table 3: Summary of Independent t-test Analysis for no significant difference in the challenges associated with the adoption of AI in entrepreneurship education between private and public institutions in South-South Nigeria

Group	N	Mean (X)	Standard Deviation (S.D)	t-value	p-value
Private Institutions	125	3.50	0.61	2.15	0.03
Public Institutions	125	3.43	0.63		

The t-test result in Table 3 shows a significant difference in the challenges associated with the adoption of AI between private and public institutions ($t = 2.15$, $p = 0.03$). Since the p-value (0.03) is less than the alpha level of 0.05, the null hypothesis is rejected. This indicates that the challenges faced by private institutions differ significantly from those faced by public institutions in adopting AI in entrepreneurship education.

Discussion of Findings

The findings reveal that the current level of integration of AI technologies in entrepreneurship education research in South-South Nigeria is relatively high, with a grand mean score of 3.54. This indicates a general agreement among respondents that AI technologies are actively used in various aspects of entrepreneurship education research. The integration of AI tools in research activities, curriculum, and project-based learning supports the notion that AI is becoming an integral part of educational practices (Adeniran & Olanrewaju, 2020). Previous studies have highlighted the increasing adoption of AI technologies in educational settings, particularly in advanced economies (Dai & Zhen, 2021). In contrast, research in similar contexts within Africa has shown varying levels of AI integration, often limited by infrastructural and financial constraints (Eze & Egbo, 2022). However, this study's findings suggest a positive trend towards integrating AI in South-South Nigeria, which may reflect recent efforts to enhance educational outcomes through technology.

The results indicate a favorable perception of AI among both educators and students, with a grand mean score of 3.50. Respondents agreed that AI enhances research quality, improves learning experiences, and is viewed positively in the context of entrepreneurship education. This aligns with findings from international studies, which have reported that AI can improve educational experiences and outcomes (Chen & Hsu, 2022). Previous research has also indicated that positive perceptions of AI in education often lead to its greater adoption and integration (Miller & Tan, 2021). Conversely, some studies have highlighted resistance to AI due to concerns over data privacy and the potential for job displacement among educators (Smith & Johnson, 2023). The positive perception found in this study may reflect ongoing efforts to address these concerns and effectively integrate AI into educational practices.

The findings reveal several challenges associated with AI adoption, with a grand mean score of 3.54. Key challenges include insufficient AI training, high costs, limited resources, resistance to change, and inadequate funding. These challenges are consistent with previous research highlighting barriers to technology adoption in educational settings, particularly in developing regions (Omolara & Kanu, 2021). Studies have consistently reported that high costs and lack of training are major barriers to effective AI integration (Nguyen et al., 2020). However, some research suggests that the perceived challenges may be mitigated by targeted policies and investment in infrastructure (Benson & Chukwuma, 2022). The findings from this study corroborate the notion that overcoming these challenges is crucial for the successful adoption of AI in education.

CONCLUSION

The study concluded that AI technologies are increasingly integrated into entrepreneurship education research in South-South Nigeria, with positive perceptions from both educators and

students. However, significant challenges such as lack of training and high costs hinder the effective adoption of AI. The lack of significant differences in AI integration levels and perceptions between private and public institutions suggests a broad and uniform adoption of AI across different institution types. The significant differences in challenges faced by private and public institutions highlight the need for targeted interventions to address specific barriers.

RECOMMENDATIONS

The following recommendations were made based on the findings of the study

1. To address the challenge of insufficient training, it is recommended that both private and public institutions implement comprehensive AI training programs for educators and students.
2. Given the high costs associated with AI adoption, it is crucial for policymakers and institutional leaders to allocate more funds and resources towards AI infrastructure. Government and private sector partnerships could provide financial support and resources to facilitate the integration of AI in educational settings.
3. Since significant differences in challenges were found between private and public institutions, it is recommended that support strategies be tailored to the specific needs of each type of institution. For example, public institutions might benefit from additional government support, while private institutions could explore alternative funding sources.
4. Encouraging collaboration between institutions, industry partners, and AI experts can help overcome barriers related to resources and training. Collaborative projects and knowledge sharing can enhance the effectiveness of AI integration and provide practical solutions to common challenges.

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