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FOSTERING CRITICAL THINKING AND CREATIVITY THROUGH ARTIFICIAL INTELLIGENCE (AI) IN NIGERIA PUBLIC TERTIARY INSTITUTIONS OF SOUTH EAST STATES

Rev. Fr. Dr. Aloysius Ezeanolue
Department of Educational Foundation,
Nnamdi Azikiwe University Awka.

Dr. Ezewuzie Jideofor J.
Department of Educational Foundations
Federal College of Education (T) Umunze

and

Anazodo Ogochukwu G.
Department of Early Childhood Education
Federal College of Education (T) Umunze
Anamnbra State - Nigeria

Abstract
The study examined fostering of critical thinking and creativity through artificial intelligence (AI) in Nigeria public tertiary institutions of South East States. Philosophy guides education in the development of critical thinking and creativity in learners. These higher order of thinking make learners to think creatively, approach problems from different angles and develop innovative solutions. Thus, this study becomes imperative in order to make learners better prepared to fit into this ever-changing world of technological advancement. Three research questions guided the study. A 15 – item structured questionnaire constructed by the researchers was used for data collection. The instrument was validated by three experts each from the Department of Educational Foundations (measurement and evaluation), Department of Philosophy and Department of Computer Science of Nnamdi Azikiwe University Awka. Cronbach Alpha was used to determine the internal consistency reliability of the instrument which was seen as reliable with an index of 0.83. Mean (x) was used to analyze the data collected with the instrument. The results revealed among other things factors necessary for fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States as adequate digital infrastructure, adequate computer literate academic staff, better staff welfare package, adequate funding of curriculum, organizing regular workshop and conference on Artificial Intelligence (AI). The study also found out the reasons that call for the necessity and benefits of fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States. It was recommended among other things that government at all levels should provide adequate digital infrastructure, recruit adequate computer literate academic staff and place their priority on staff welfare.

Keywords: Critical thinking, creativity, artificial intelligence (AI).

Introduction

Education is a powerful tool for social change through acquiring knowledge, skills, values, beliefs and habit that enables one make sound decisions for personal progress and advancement of the society. According to Bisong (2025) education restructures one's cognitive perception and revolutionizes a people's thinking pattern and way of doing things. It is fundamental to societal progress and it is intricately interwoven with society. The progress of every society reflects the level to which its educational system can solve societal needs. Education equips individuals with skills and values needed for advancement of the society. Moreover, society is dynamic, evolving fast as demands, needs and competitions arise. Education in its present state in Nigeria, is a far cry to the speed at which new technologies such as Artificial intelligence (AI) emerge.

Tertiary education embodies advanced learning, cultivating specialized knowledge with critical thinking and creativity as vital tools. Philosophy instills critical thinking in students. Critical thinking helps them to decide how to behave. They are meant to know how to distinguish right and wrong, good and bad, morality and immorality, and between what they ought to do and ought not to do. Critical thinking enables students discover insight to understand how their minds work in quest of knowledge. Critical thinking enables students to navigate complex challenges and adapt to an ever-changing world (Ezeanolue, Ekeh, Ezewuzie & Okpara, 2025). Creativity is the ability to develop new ideas and discover new ways of looking at problems and opportunities. Creativity is to put elements together to form a coherent or functional whole, reorganize elements into a new pattern or structure. In the words of Assimonye & Ibe (2019) creativity involves thinking or behaving imaginatively directed at achieving an objective that is original and valuable. Ideas are to be combined in a unique way or unusual associations in creativity. Creativity enables students to approach problems from different angles and develop innovative solutions. It also offers students a unique opportunity for personal growth and development.

Artificial Intelligence (AI) has revolutionized all aspects of human life. It is shaping the future of the workforce and society at large. AI is a set of technology that enables machines to mimic human intelligence. It is a process of simulating human intelligence by machine which enables them to perform human-like functions. AI is the ability for a computer to think and learn. According to Russell and Norvig (2016) AI is the designing and building of intelligent agents that receive percepts from the environment and take actions that affect the environment. The Oxford Dictionary (Lexico, 2019) defines AI as the theory and development of computer systems that can perform tasks normally requiring human intelligence such as visual perception, speech recognition, decision-making, translation and interpretation. The roots of AI can be traced back to ancient civilizations where philosophers like Aristotle laid the ground work for logical reasoning, a fundamental aspect of AI (Roy, 2023). Education has adopted AI which is versatily used. It assists computers to perform lots of advanced functions efficiently like analyzing, editing, writing language and typing (Google cloud, 2024).

Artificial Intelligence (AI) helps to promote access to critical thinking and creativity, strengthen the relevance of critical thinking and creativity to the digital world. It also raises educational quality by helping to make teaching and learning in Nigeria public tertiary institutions an engaging active process that is connected to real life. According to Greengard (2020) artificial intelligence is characterized by exponential growth and disruptive impact that offer unprecedented opportunities for innovation, disruption and transformation. AI profoundly transforms critical thinking and creativity in tertiary education, fostering innovative, interactive and inclusive environments. Digital learning platforms facilitate seamless information dissemination, collaborative discussions and personalized learning experiences. In the words of Obanya (2019), artificial intelligence - powered tools provide tailored guidance, enhancing analytical reasoning, critical thinking and creativity. AI – driven adaptive assessments optimize evaluation processes. Thus, artificial intelligence fosters critical thinking and creativity with ethical awareness, contextualized learning and accessibility.

The integration of Artificial Intelligence (AI) in teaching and learning in Nigerian public tertiary institutions profoundly impacts academic experiences. AI transforms traditional teaching methods, fostering immersive, interactive and inclusive environments. According to Ezeanolue, Ekeh, Ezewuzie & Okpara (2025) artificial intelligence enhances personalized learning through adaptive assessments and intelligent tutoring systems. It also enhances critical thinking and creativity with analytical reasoning and problem-solving skills. Morestill, facilitates moral dilemma, discussions, illustrating philosophical concepts. Its platform fosters peer-to-peer discourse, promoting inclusive learning environment. Despite benefits, challenges persist. Nigeria's public tertiary institutions face inadequate digital infrastructure, inadequate computer literate academic staff, poor staff welfare package, inadequate funding of curriculum and lack of AI awareness. Addressing these challenges demands contextualized solutions. Consequently, it becomes needful to study the research work fostering critical thinking and creativity through artificial intelligent (AI) in Nigeria public tertiary institutions of South East States.

Statement of the Problem

Nigeria's current educational system is grappling with numerous intricate challenges of considerate magnitude. Our education system in its present state cannot produce skilled individuals who can function in this digital age. The use of Artificial Intelligence (AI) in educational institutions, especially in tertiary institutions is gaining rapid attention globally in this era of digital breakthroughs and advancements. Of particular concern are public tertiary institutions, where the government is a key stakeholder. The people of the South East, Nigeria, though traditionally business-oriented, are also educationally inclined (Ezeanolue, Ekeh, Ezewuzie & Okpara, 2025). Fostering critical thinking and creativity through Artificial Intelligence (AI) has become an indispensable factor in the process of education. In public tertiary institutions in South East Nigeria, there are digital literacy gaps which some research works have addressed from several perspectives. However, to the best knowledge of the present researchers, no research work has addressed the issue from the perspective of fostering critical thinking and creativity through artificial intelligence in the public tertiary institutions, especially with regard to what artificial intelligence is and how it can foster critical thinking and creativity. This study is an attempt to fill this perceived knowledge lacuna.

Purpose of the Study

The main purpose of the study was to examine fostering of critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States. Specifically, it sought to determine;

i. The factor necessary for fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States.
ii. The reasons that call for necessity of fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States.
iii. The benefits of fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States.

Research Questions

The following research questions guided the study;

i. What are the factors necessary for fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States?
ii. What are the reasons that call for the necessity of fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States?
iii. What are the benefits of fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States?

Method

Descriptive survey research design was used for this study. The area of study was all public tertiary institutions in South East States, Nigeria. The target population was therefore all lecturers in the thirty – one (31) public tertiary institutions in South East States, Nigeria. The sample size of this study was 120 lecturers of 5 public tertiary institutions in South East States of Nigeria selected through simple random sampling techniques by using balloting method. The instrument for data collection was a 15 – item structured questionnaire constructed by the researchers. The instrument was validated by three experts each from Department of Educational Foundations (Measurement and Evaluation), Department of Philosophy and the Department of Computer Science of Nnamdi Azikiwe University Awka. They all vouched for the content, construct and face validities of the instrument. The internal consistency reliability was determined using Cronbach Alpha procedure. It has a reliability coefficient index of 0.83 adjudged to be very reliable. The instrument was structured on a four-point scale ranging from Strongly Agree (4 points), Agree (3 points), Disagree (2 points) and Strongly Agree (1 point). The instrument was administered to the lecturers in Department of Educational Foundations in the 5 institutions using direct delivery approach through the help of five (5) research assistants. All the copies of the questionnaires were returned. Mean was used to analyze the research questions. A mean of 2.50 and above was accepted as agree while below 2.50 was taken as disagree.

Results

Table 1: Mean Rating of Respondents on the Factors Necessary for Fostering Critical Thinking and Creativity through Artificial Intelligence (AI) in Nigeria Public Tertiary Institutions of South East States.

S/N	Item Statement	X	Decision
1	Adequate digital infrastructure is one of the factors necessary for fostering critical thinking and creativity through Artificial Intelligence (AI)	2.90	Agreed
2	Adequate computer literate academic staff is a factor necessary for fostering critical thinking and creativity through Artificial Intelligence (AI).	2.88	Agreed
3	Better staff welfare package is another factor necessary for fostering critical thinking and creativity through Artificial Intelligence (AI).	2.86	Agreed
4	Adequate funding of curriculum is also a factor necessary for fostering critical thinking and creativity through Artificial Intelligence (AI).	2.74	Agreed
5	Organizing regular workshop and conference on AI is among the factors necessary for fostering critical thinking and creativity through Artificial Intelligence (AI).	2.60	Agreed
	Cluster Mean	**2.80**	**Agreed**

In Table 1, all the item statements including the cluster mean obtained mean rating of 2.50 and above indicating that all the respondents agreed that the item statements in Table 1 are factors necessary for fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States.

Table 2: Mean Rating of Respondents on the Reasons that Call for the Necessity of fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States.

S/N	Item Statement	X	Decision
6	AI – based technologies support the development of critical thinking and creativity in learners.	2.90	Agreed
7	AI – based technologies introduce practical training in teaching and learning.	2.88	Agreed
8	AI – Based technologies enable the perceptual function of learning environments to meet the diverse needs of learners.	2.86	Agreed
9	AI – based technologies create intelligent support to learning process and intelligent – teacher assistance.	2.90	Agreed
10	AI – based technologies enhance learning outcomes by offering personalized learning experiences and increasing students' engagement.	2.88	Agreed
	Cluster Mean	**2.88**	**Agreed**

In Table 2, all the statements including the cluster mean obtained mean rating above the criterion mean of 2.50. It shows that all the respondents agreed on the results that call for the necessity of fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States.

Table 3: Mean Rating of Respondents on the Benefits of Fostering Critical Thinking and Creativity through Artificial Intelligence (AI) in Nigeria Public Tertiary Institutions of South East States

S/N	Item Statement	X	Decision
11	AI – based technologies monitor the developmental processes of learners.	2.86	Agreed
12	AI – based technologies provide a personalized perspective on learning process.	2.90	Agreed
13	AI – based technologies allow learners to create their own learning paths, adapting to the users' personal needs and interests.	2.88	Agreed
14	AI – based technologies provide instant feedback as immediate correction of mistakes in texts and exercises are allowed.	2.90	Agreed
15	AI –based technologies are used not only to support learning but also in many different areas such as teaching, assessment and school management.	2.80	Agreed
	Cluster Mean	**2.87**	**Agreed**

In Table 3, all the item statement including the cluster mean obtained mean rating of 2.50 and above

indicating that all the respondents agreed that the item statements in Table 3 are the benefits of fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States.

Discussions

Based on the results of the study, factors necessary for fostering critical thinking and creativity through Artificial Intelligence (AI) are adequate digital infrastructure, adequate computer literate academic staff, better staff welfare package, adequate funding of curriculum, organizing regular workshop and conference on Artificial Intelligence (AI). To support this result, the findings of Okonkwo and Ibe (2020) posited that by incorporating digital tools such as Artificial Intelligence (AI) at all level ought to provide the demands necessary for fostering critical thinking and creativity through Artificial Intelligence (AI) in educational institutions. Again, the findings by Omosewo (2019) and Bisong (2025) agreed that adequate computer literate academic staff with digital infrastructure in our educational institutions are factors necessary for fostering critical thinking and creativity in Nigeria public tertiary institutions of South East States.

The second findings of the study revealed clearly the reasons that call for the necessity of fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institution of South East States. To support this result, Obanya (2019) posited that artificial intelligence – powered tools provide tailored guidance, enhancing critical thinking and creativity. AI – driven adaptive assessments also optimize evaluation processes. It promotes intellectual curiosity, analytical skills and problem-solving abilities in students. The findings of Zuboff (2019) stressed that traditional teaching methods, devoid of technological innovation such as Artificial Intelligence (AI), hinder critical thinking and creativity. Artificial Intelligence powered technologies enable the perceptual function of learning environments to meet the diverse needs of learners. AI – driven technologies also enhance learning outcomes by offering personalized learning experiences and increasing students' engagement.

The third findings of the study revealed benefits of fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States. To support this result, the findings by Greengard (2020) observed that enhanced critical thinking and creativity skills emerged due to interactive technologies such as Artificial Intelligence (AI) of personalized learning through adaptive assessments and intelligent tutoring systems improved student engagement and motivation. AI – powered technologies facilitated immersive learning experiences, promoting deeper understanding of complex philosophical concepts. Morestill, the findings of Adebayo (2020) discovered that AI – powered technologies allowed learners to create their own learning paths adopting to the users' personal needs and interests. Learners are also provided with instant feedback as immediate correction of mistakes in texts and exercises are allowed. Real – time feedback and assessment enable timely interventions, improving learners' academic performance in educational institutions.

Conclusion

The findings of the study revealed that factors such as adequate digital infrastructure, adequate computer literate academic staff, better staff welfare package, adequate finding of curriculum, organizing regular workshop and conference on AI are necessary for fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States. The shift from the traditional face-to-face mode of teaching to online mode of teaching and learning is most imperative in this 21st century. Tertiary institutions in Nigeria and particularly South East States need to invest more not only in digital infrastructure but should endeavour to ensure computer literacy of their academic staff. It was additionally concluded that personalized learning with real-time feedback and assessment enabled timely interventions, improving learners academic performance in educational institutions are the top most benefit of fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States. The reasons that call for the necessity of fostering critical thinking and creativity through Artificial Intelligence (AI) in Nigeria public tertiary institutions of South East States as identified in

this study are certain and obvious.

Recommendations

Based on the findings of the study, the following recommendations are made;

1. Government at all levels should provide adequate digital infrastructure in the public tertiary institutions.
2. Administrators of public tertiary institutions should recruit adequate computer literate academic staff.
3. Government at all levels should place priority on staff welfare in public tertiary institutions.
4. Government at all levels should adequately fund curriculum in public tertiary institutions.
5. Administrators of public tertiary institutions should organize regular workshops and conference on AI.

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