

Role of Artificial Intelligence in Fostering Inclusive Education Among Undergraduates in Nigeria

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Abstract

The study investigated the role of artificial intelligent (AI) in fostering inclusive education among undergraduates. The study adopted a descriptive survey research design. The study sampled 354 undergraduates from the University of Nigeria, Nsukka. Questionnaire was the instrument of data collection for this study. Mean and standard deviation were used for analysis. The study found that artificial intelligence helps to open up new ways of interacting for students with learning disabilities, helps in learning management system, helps in bringing industry and academia together, among others. Based on the findings, the study among others recommended that university administration should provide opportunities for professional development for educators to enable them learn about effective integration of AI in teaching and learning.

Keywords: Artificial Intelligence, Inclusive Education, Higher Education

Introduction

Artificial intelligence (AI), generally expressed by the general public as the ability of machines or computers to think and act as humans do. Artificial intelligence represents the efforts towards computerized systems to imitate the human mind and actions (Wartman & Combs, 2018). In this respect, the basic definition of artificial intelligence can be expressed as the skillful imitation of human behaviour or mind by tools or programs (Mohammed & Watson, 2019). AI systems are built using algorithms and data sets, and they can learn and adapt over time. They are designed to mimic human cognition and make decisions and predictions based on the information they receive. As a result, AI is now being used in every field, including education, to perform human-oriented work: automation, personalization, prediction, optimization, decision-making, robotics, natural language processing and translation, and visual and voice recognition. Moreover, it comes in several ways, with computer programs, software, and embedded control systems in equipment and robots (Jantakun, Limpahan, Palita, Leelapanu, & Kewpit, 2021).

Artificial intelligence is known for various features, which includes deep learning and adaptation, problem solving, natural language and processing, perception, automation, human machine interaction and many more (Paez-Fernandez &

Pardo-Gomez, 2019). These above-mentioned characteristics are demonstrated in AI powered tools, applications and technology such as: AI- powered virtual tutors like Carnegie learning's MATHia platform which provides individualized instructions and feedback to students (Schaeter, Baker & Crusto, 2020). It can also be AI-powered assessment tools like Knewton, that can adapt assessment to the individual needs of student. There's also AI platforms known as Wolfram alpha, a computational knowledge engine that can answer complex question and generate reports for students in different field. Other examples of AI- powered platform includes Duolingo, chatbots, audio pen and many more. However, these technologies help to create a more personalized and engaging learning environment and are making education more accessible and effective for all students. Hence AI may be used to support Education thus making education more inclusive.

Education is the process of developing the human mind, body, and spirit through the acquisition of knowledge and the development of skills, attitudes, and values. Education is the process by which an individual acquires knowledge, skills, values, and attitudes through learning experiences in formal and informal settings (UNESCO, 2015). Idowu (2011) defined Education as the total process of human learning by which knowledge is impacted, faculties

trained and skills developed. Education is not just about memorizing facts and figures, but about developing a deeper understanding of the world and how to thrive within it. It is also about learning how to think critically, solve problems, and work collaboratively with others. Education helps us to become more self-aware, empathetic, and responsible members of society.

Since Education is the process of developing the mind, body, and spirit. AI is a tool that can assist in this process by providing personalized learning experiences, real-time feedback, and adaptive assessments. While AI cannot replace the human element of education, it can complement and enhance the traditional methods of learning. There is no doubt that AI has played a major role in digital transformation and is felt globally. As an emerging novel technology, the integration of AI into education arose as an interdisciplinary subfield in the early 1980s (Baker, 2021). It has opened up new paths and started modifying educational tools and institutions (Kengam, 2020) with the advancements in the 1980s and 1990s. Further, new potentials for learning technologies in several areas have been identified (Baker, 2021). AI is a continually evolving field, and understanding the potential impact of these changes and advancements on future teaching and learning will bring education a long way forward. AI also has the potential to meet the needs of a wide range of students. This implies that AI may have significant roles to play in enhancing inclusive education.

Applications of artificial intelligence (AI) in education is becoming more common and have drawn a lot of attention in recent years. With a two- to three-year adoption period, artificial intelligence (AI) and adaptive learning technologies are highlighted as significant advancements in educational technology in the 2018 Horizon study (Educause, 2018). The research states that experts forecast a 43% growth in AI in education between 2018 and 2022 (Educause, 2019). In line with this, the present study worries about the role of AI in fostering inclusive education.

Inclusive education refers to a model of education that strives to include all students, regardless of their abilities or backgrounds. Inclusive education is a system whereby the disabled and non-disabled children are educated together in one classroom with modification in physical structures, equipment and methods to suit the conditions of diverse special needs of learners (Ashi, 2010). Inclusivity in education involves removing all barriers to learning for all children and young people, and promoting participation, engagement, and achievement in learning for all (Department for Education, 2014). Thus, inclusive education requires

that schools must not only provide support to individual students with disabilities but also create a welcoming and inclusive environment for all students. Therefore, all students can be full participants in their classrooms, in the local school community and in the societies, they live in. Successful inclusive education happens primarily through accepting, understanding, and attending to student differences and diversity, which can include physical, cognitive, academic, social, and emotional. The importance of inclusive education can be seen in its numerous benefits for students, educators, schools, and society as a whole. According to the United Nations (2016), inclusive education promotes equity and social justice by ensuring all students, regardless of their abilities or background have access to quality education.

AI in inclusive learning assists teachers to identify the right method of teaching and the right channel of communication to interact with a student from a different background. Artificial intelligence has the potential to greatly enhances inclusive education by providing personalized, accessible and engaging learning experiences for all students. Luckin (2018) argued that AI can help address the diverse learning needs of students by adapting the learning content and pace to their individual abilities thus fostering inclusive practices and reducing learning disparities. Hustedt and Ramanathan (2020) recognizes the importance of considering the perspectives and needs of diverse learners in the development and implementation of AI-based educational tools.

While progress is being made, there are still challenges to address in fully realizing the potential of inclusive education for students. These challenges include the need for more widespread adoption of personalized learning tools, greater faculty training on inclusive teaching practices, and continued efforts to foster a culture of diversity and equity within academic settings (Coll & Stockdale, 2017). Thus, AI-powered tools may be able to enhance inclusive education among students. For example, a virtual tutor could be programmed to provide personalized feedback on important aspects of a subject (Baker & Riordan, 2016). Additionally, a virtual discussion board could be used to foster collaboration and discussion among students, giving them the opportunity to share ideas and learn from each other (McGrath & McGreal, 2019).

The justification for this study is that there is evidence of exclusion in learning in Nigeria among some vulnerable group (Center for the Study of the Economics of Africa (CSEA) (2024). There are also factors responsible for this which include among

others socio cultural and economic background of students, school environment, teacher experience unequal learning facilities (Mokaleng, 2019). These factors demand for an effort toward ameliorating the cause of exclusive learning. The challenges of inclusivity demand for an effort to be put in place to ameliorate these ills. Hence, the need for a learning medium that can enhance inclusive education in a way that will make learning continuous even after the classroom which will break the walls of exclusion in learning. Such a medium maybe Artificial Intelligence (AI), which is the focus of this study it is against this background that this study investigated the role of Artificial Intelligence in fostering Inclusive education among university students. Specifically, the study investigated the role of artificial intelligence (AI) in enhancing inclusive education among students and the challenges of using Artificial intelligence (AI) to support inclusive education.

Research Questions

These research questions were posed for the study;

1. What is the role of artificial intelligence in enhancing inclusive education among students?
2. What are the challenges of using Artificial intelligence to support inclusive education?

Methodology

This study adopted descriptive survey research design. The population of the study

comprised of all undergraduate students in University of Nigeria, Nsukka. The sample size of 354 respondents was sampled randomly from Faculty of Education. The study was conducted using a questionnaire which was developed by the researcher. The questionnaire contained two clusters. Cluster A comprised items on the roles of artificial intelligence in fostering inclusive education among students, Cluster B elicited information on the challenges of using artificial intelligence to support inclusive education. The questionnaire was structured on a four-point rating scale of strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD). The research instrument was validated by three experts from the faculty of Education, University of Nigeria, Nsukka. They were requested to examine the instrument for data collection, its appropriateness and language to ensure that it is fit and appropriate for the audience, its ability to measure what it is expected to measure. The reliability coefficient of the questionnaire was ascertained through trial testing of the instrument to determine the internal consistency of the item. The reliability was determined using Cronbach Alpha which yielded an overall reliability index of 0.869 which indicates that the instrument is reliable and therefore considered appropriate for use. Data gotten were analyzed using mean and standard deviation. A mean bench mark of 2.50 guided the decision-making process. Thus, items with a mean score less than 2.50 was rejected while items with a mean score of 2.50 and above were accepted as they fall within the mean criteria of acceptance.

Results

Table 1: Mean rating and standard deviation on the role of artificial intelligence in enhancing inclusive education among undergraduate students

S/N	Item Statements	Mean	SD	Decision
1	It helps to open up new ways of interacting for all students	3.45	0.53	Agree
2	It helps in Learning management system	3.41	0.50	Agree
3	It provides accessibility	3.37	0.53	Agree
4	It helps in bringing industry and academia together	3.34	0.54	Agree
5	It is affordable	3.29	0.66	Agree
6	It helps in Individualized learning	3.38	0.53	Agree
7	It helps in problem solving	3.31	0.58	Agree
8	Helps students develop confidence in their ability to interact with one another	3.29	0.48	Agree
9	Helps in providing instant feedback	3.30	0.53	Agree
Cluster Mean		3.35	0.54	Agree

Table 1 shows the role of artificial intelligence in enhancing inclusive education among undergraduate students. Mean analysis from table 1

shows that the mean scores of items 1-9 are all above the 2.50 acceptance benchmark which implies that they are accepted. This implies that artificial

intelligence helps to open up new ways of interacting for students with learning disabilities, helps in learning management system, provides accessibility, helps in bringing industry and academia together, affordable, helps in Individualized learning, helps in

problem solving, helps students develop confidence in their ability to interact with one another and the world around them and helps in providing instant feedback and improving efficiency in the assessment process.

Table 2: Mean rating and standard deviation on the challenges of using Artificial intelligence to support inclusive education

S/N	Item Statements	Mean	SD	Decision
10	The use of AI can create biasness in learning	3.06	0.46	Agree
11	Most AI has trust deficit	2.98	0.53	Agree
12	There is no data security with using AI	2.93	0.58	Agree
13	The quality of data on most AI is poor	2.87	0.61	Agree
14	There is no creativity with using AI	2.63	0.80	Agree
15	There is skill loss when using AI	2.66	0.77	Agree
16	It leads to job displacement	2.63	0.71	Agree
17	It can lead to overreliance on technology	2.81	0.68	Agree
18	It can lead to lack of teachers training	2.73	0.81	Agree
Cluster Mean		2.81	0.66	Agree

Table 2 shows the challenges of using Artificial intelligence to support inclusive education. Mean analysis from table 2 shows that the mean scores of items 10-18 are all above the 2.50 acceptance benchmark which implies that they are accepted. This implies that the challenges of using Artificial intelligence to support inclusive education includes creation of biasness in learning, trust deficit, no data security with using AI, quality of data on most AI is poor, no creativity with using AI, skill loss when using AI, job displacement, among others.

Discussion of the findings

The study found that artificial intelligence helps to open up new ways of interacting for students with learning disabilities, helps in learning management system, helps in bringing industry and academia together, affordable, helps in Individualized learning, helps in problem solving, helps students develop confidence in their ability to interact with one another and the world around them and helps in providing instant feedback and improving efficiency in the assessment process. In agreement to this finding, Farah (2023) found AI as a tool to achieve equity and accessibility. Also in agreement, Apelehin et al (2025) found that AI helps to create personalized learning experiences, develop smart content, expand the range of education, and facilitate the management & administration of education by integrating information and disseminating data as per the needs of the target group. The finding is also in consonance with the findings of Sadaf et al. (2025) who reported that artificial intelligence can improve student performance, encouraged student interest in

STEM/STEAM, promoted student engagement, and showed other advantages. Also in alignment, Bundit et al. (2023) revealed that artificial intelligence-based systems had a positive impact on student engagement and motivation, as well as providing personalized learning experiences. This study's findings highlight the transformative impact of artificial intelligence (AI) in education, particularly for students with learning disabilities. The results appear this way probably because AI enables tailored learning experiences, accommodating individual needs and learning styles, making education more inclusive for students with disabilities. AI-powered tools also provide alternative interfaces, such as text-to-speech, speech-to-text, and image recognition, breaking down barriers for students with disabilities. AI helps to adjust difficulty levels and content to suit individual students' needs.

The study found that the challenges of using Artificial intelligence to support inclusive education includes creation of biasness in learning, trust deficit, no data security with using AI, quality of data on most AI is poor, no creativity with using AI, skill loss when using AI and job displacement. In alignment with this finding, Bundit et al. (2023) reported challenges such as technical issues and the potential for bias in the AI algorithms used in these systems. However, in contrast to this finding, Mohammed and Watson (2019) revealed that learners have cultural backgrounds and preferences that may not align with most mainstream educational systems. The study's findings highlight the challenges of using Artificial Intelligence (AI) to support inclusive education, which may be due to concerns about AI's decision-

making processes, lack of transparency, and potential for errors can erode trust in AI-supported education. Also, AI's effectiveness relies on high-quality data, but often, the data used to train AI systems is incomplete, inaccurate, or outdated. Also, over-reliance on AI can stifle creative thinking and problem-solving skills in students, as AI takes over tasks that previously required human ingenuity.

Conclusion

Based on the findings, the study concluded by highlighting the transformative potential of artificial intelligence (AI) in promoting inclusive education in higher education. The findings demonstrate that AI can facilitate new interactions for students with learning disabilities, enhance learning management systems, and bridge the gap between industry and academia. Additionally, AI provides interactive support, adapts to individual learning needs, and analyzes student performance. However, the study also reveals challenges associated with AI implementation, including bias, trust deficits, data security concerns, and poor data quality. Furthermore, among others. To harness the benefits of AI while mitigating its challenges, educators, policymakers, and technologists must collaborate to develop and implement AI solutions that prioritize inclusivity, equity, and student-centered learning.

Implications for Education

The educational implication of the findings on role of AI to support inclusive education implies that AI will continue to support students with disabilities, language barriers, or diverse learning needs, promoting equal access to education. The findings also implies that AI will continue to create tailored learning experiences for each student, adapting to their unique needs, pace, and learning style. The findings of the study on the challenges of AI to support inclusive education implies that excessive use of AI may lead to a lack of critical thinking, problem-solving, and social skills in students, making them less prepared for the workforce and society. The findings also implies that AI systems may perpetuate existing achievement gaps, disadvantage certain student groups, and limit opportunities for marginalized students.

Recommendations

Based on the findings and educational implications, the following recommendations were made:

- University administration should provide opportunities for professional development for educators to enable them learn about

effective integration of AI in teaching and learning.

- University administration should provide ethical considerations and guidelines for AI-driven education, addressing concerns like bias, privacy, and accountability.
- Department heads should train students on digital literacy programs to prepare them for effective use of AI-powered tools.
- University community should develop AI-powered tools that complement and support human teaching, rather than replacing it.

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