

NEED FOR THE INTEGRATION OF ARTIFICIAL INTELLIGENCE (AI) INTO ADULT LEARNING PROGRAMMES IN NIGERIA.

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Abstract

The thrust of this paper is to promote the motion for the integration of Artificial Intelligence (AI) into adult learning programmes in Nigeria. There is an urgent need to replace the traditional andragogical model of adult learning with a new dynamic structural model. Artificial Intelligence (AI) tools are ideally positioned to fill this role. The importance of Artificial Intelligence (AI) in adult learning programmes and types of adult learning programmes were discussed. All the key concepts were defined. A conclusion was drawn and recommendations such as programmers of adult learning programmes should ensure that adult learners have access to training in Artificial Intelligence (AI) Literacy supported by competencies that enable them to evaluate Artificial Intelligence (AI) technologies critically. Also, that measures should be put in place by the government to checkmate geographical barriers to accessing Artificial Intelligence (AI)-related infrastructure and connectivity.

Keywords: Integration, Artificial Intelligence, Adult Learning Programmes.

Introduction

Artificial Intelligence (AI) technology has become increasingly important in the modern world due to its numerous applications and benefits. The relevance of its application to the field of education generally and adult education specifically cannot be under estimated owing to its versatility in automating administrative tasks and accessing learning environment. To prepare the global workforce to transition from an information society to an intelligent society, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) (2018) developed a global framework to help define and measure digital literacy (Mavroudi, Giannakos and Krogstve, 2018). The framework has seven competency areas: namely; devices creation, safety, problem-solving and career-related competencies which suggests that artificial intelligence application in adult education is strategically significant to training an innovative, scientific and technologically talented individuals. In the same vein, the World Economic Forum (WEF) estimated that almost one-third of all jobs worldwide are likely to be transformed by technology in the next decade and that essential technical and vocational skills are currently underemphasized in educational systems (Zahid, 2020). Consequently, there is an urgent need to replace the traditional andragogical model of adult learning with a new dynamic structural model.

The rapid evolution of Artificial Intelligence (AI) technologies has transformed various sectors, including education. Strategic integration of AI into adult education has the potential to revolutionize adult learning process. This is because, AI has numerous applications across various industries, including healthcare, finance, transportation and education. Its potential to transform industries and improve lives is vast, making it an exciting and rapidly evolving field. It is therefore incumbent on all adult educators to continue their learning to adapt, overcome barriers and effectively integrate AI into programmes for future development (Kaliisa et al, 2022). One

discovery that can promote adult learning in Nigeria today is the utilization of AI technology. This is a welcome development, more so that it has been stated that resources for effective teaching and learning of adult education generally is inadequate (Yakubu, 2018).

Furthermore, emphasizing the unarguable role of AI in adult learning, Storey and Beeman (2023) averred that there is a new dynamic structural model more suited to creating new learning content. Continuing, Storey and Beenman asserted that generative AI tools are ideally positioned to fill this role, given their ability to access and synthesize a wide range of human knowledge into specific outputs. Adult learners, as digital natives are comfortable using generative AI tools to access information for immersive learning experiences (Impact Research, 2023). To Ndom and Nwokike (2024), personalized learning, improved engagement, enhanced assessment, increased access to education and improved learning process are some of the impact of AI in adult learning. Alamri, et al (2020) noted that leveraging AI technologies has plethora of opportunities to enhance adult learning experiences, improve adult learning outcomes, create immersive learning environment and streaming personal or administrative tasks.

In addition, Artificial Intelligence (AI) can improve and replace current technologies in delivering, training, spreading information on skills requirements for relevant courses and personalizing the matching of job seekers to available learning opportunities. It is in this light that Du and Wang (2023) opined that AI-driven educational games and simulations offer engaging and interactive ways for adult learners to apply their knowledge and skills in authentic contexts. Continuing, Du and Wang (2023) stated that by incorporating elements of gamifications and adaptive learning, adult educators can create learning environments that are not only fun and engaging but also highly effective in promoting mastery of complex concepts and skills. Integration means to incorporate into a larger structure, to take in something as part of a whole.

From the above, it can be deduced that AI's integration into adult learning is significant to training an innovative, scientific and technologically talented work force. Such a move requires adult educators to develop an open, flexible, active and innovative adult education ecosystem to promote quality education and ensure education equity (Kang, 2023). Therefore, AI's integration into adult learning programmes in Nigeria is significant to training an innovative, scientific and technologically learned workforce. Hence, the focus of this paper is to promote a motion for the integration of Artificial Intelligence (IA) into adult learning programmes in Nigeria.

Meaning of Artificial Intelligence (AI)

Artificial Intelligence (AI) refers to computer programming that can perform tasks that typically require human intelligence such as reasoning, perception and problem-solving skills. According to Reiss (2021), Artificial Intelligence (AI) is a technology that enables machines to imitate complex human skills. In other words, it is the capability of the computer systems to perform tasks typically associated with human intelligence. Gordon (2025) defined Artificial Intelligence (AI) as a technology which allows computers and machines to simulate human intelligence and problem-solving tasks. Continuing Gordon asserted that Artificial Intelligence (AI) research began in 1950's and was used in the 1960's by the US Department of Defense

when it trained computers to mimic human reasoning. Computer-Assisted-Instruction (CAI) courses were used to teach remote adult learners is an early example of AI application in adult education. Teachers' instructions and learning materials were recorded on CDs (audio) or DVDs (video) and sent to adult learners. Adult learners could access quality education by interacting with teacher presentations at their own pace (Kang, 2023).

Adult Learning Programmes

Adult learning refers to the process of acquiring knowledge, skills and attitudes by adults. Adult learning is a practice in which adults engage in systematic and sustained educating activities. Adult learning (andragogy) is the process by which individuals aged 18 and older, typically after leaving initial education, engage in voluntary, structured, or informal training to acquire new knowledge, skills or competencies. It is self-directed, practical, and experience based, focusing on personal development and professional growth (Brown, 2011). It is also a process of adult gaining knowledge, skills and competence. It is defined as the practice of teaching and educating adults. Adult learning is an integral part of the right to education and lifelong learning, and comprises all forms of education and learning that aim to ensure that all adults participate in their societies and the world of work (Right to Education, Goggle, 2025).

Adult learning programmes refer to any organized activity that aims to facilitate learning for adults, typically individuals beyond the age of traditional schooling. These programmes can encompass formal, non-formal and informal learning experiences, all with the goal of enhancing adults' knowledge, skills, attitudes or values. These programmes can occur in various settings, including educational institutions, workplaces, communities and even through everyday experiences (Europa.eu>adult-learning, 2025). Adult learning is often driven by a desire to address specific needs, such as career advancement, personal development, or addressing social issues.

Types of Adult Learning Programmes

Formal adult learning involves structured programmes with defined curricula, often leading to qualifications or certifications (Ngwu, 2006). Examples include degree programmes, adult literacy education and professional development courses. Non-formal adult learning are organized learning activities outside of formal educational institutions such as vocational training, workshops, seminar and community based programmes (Ngwu, 2006). While informal adult learning encompasses learning that occurs spontaneously through everyday experiences, interactions and self-directed exploration (Ngwu, 2006). Other examples of adult learning programmes are health and wellness programmes, civic engagement programme etc. (Igoche, et al 2018). In addition, Ngwu (2006) outlined a catalog of adult learning programmes which could be; Adult Basic Literacy, Vocational Education, Civic Education, Distance Education and so on.

Adult Basic Literacy Programme: This programme aims at inculcating basic literacy skills in the participants. This may be followed by or form part of other post literacy activities or continuing education programmes in the form of correspondence or distance education activities as well as self-improvement education. It helps adults improve their reading and writing skills. This is equivalent to primary education in the conventional school setting (Ngwu, 2006). Adult basic literacy has been defined

by James (2022) as the skills of reading writing and computing using symbols in at least one language at an appreciable degree. In another development, the National Assessment of Adult Literacy (NAAL, 2023) gave the meaning of Adult Basic Literacy as the ability to use printed and written information to function in society, to achieve one's goals and to develop one's knowledge and potential. A remarkable relationship exist between artificial intelligence and adult basic literacy. Through, artificial intelligence, adult literacy facilitators or instructors can generate courses and lecture materials, real simulations, virtually striking graphics tasks and personal assessment that can enhance valuable skills acquisition and vocational training programmes in adult education activity.

Vocational Education Programmes: Aims at occupational training in which vocational, technical, agricultural and entrepreneurship skills are undertaken. The objectives is preparing participants either for self-employment like in the indigenous apprenticeship system or wage employment as it is done in trade centres and industrial training centres (Ngwu, 2006). Vocational education programmes are adult educational activities that prepare people for a skilled craft. It is given to an individual to prepare him or her to be gainfully employed or self employed with requisite skills (John, 2024). Artificial intelligence in vocational education has the potential to revolutionize skill acquisition and andragogical delivery. Audu (2020) asserted that AI enhances the practical training of students by introducing interactive and intelligent systems that simulate real-world problems.

Civic Education Programmes: These programmes lay emphasis on social participation. Included in these are programmes that aim at improving the personal, interpersonal and social communication skills of the participants such as in citizenship and leadership training programmes. Civic engagement programmes which aim at promoting participation in democratic processes and community development are featured here (Ngwu, 2006). Civic education programmes develop knowledge, skills, disposition and attitudes that prepare people to participate in a democratic society and foster dignity for all (Idakpo, 2018). The development of Artificial Intelligence (AI) technology offers transformative potential in civic education. The intersection of artificial intelligence (AI) and civic education holds tremendous potential for shaping informed and active citizenry. This is achieved through personalized learning and immersive simulations.

Distance Education Programme: Distance education is an educational programme where teachers and students are geographically separated and learn remotely using technology like the internet to deliver content and facilitate interaction (Ngwu, 2006). It is the mode of teaching in which learners are removed in time and space from the teachers. It uses a variety of media technological to provide learning instructions to large number of learners wherever they may be. It involves such components as the electronic and the print media (Loren and Lesley, 2020). The use of Artificial Intelligence (AI) in distance education can be highly effective, this is due to its ability to bridge the gap between students and educators with computer technologies. The integration of Artificial Intelligence (AI) in distance education enhances personalized teaching, adaptive monitoring of students' progress, automate routine tasks and so on. AI can assess individual learning styles, preferences and strengths to create highly personalized learning experiences. This tailored approach ensures learners receive content and resources that are most relevant and effective, making the learning process more engaging and efficient.

Generally, Artificial Intelligence goal is to generate a system that can exhibit intelligent behavior, learning new things, and assist in decision-making for its users. Developers have already developed AI systems that can read and understand human languages and it is known as Natural Learning Processing (NLP). Despite the increasing acknowledgement of the revolutionary potential of Artificial Intelligence (AI) powered educational technology in the field of education, there exists a unique and relatively untapped area pertaining to the application of Artificial Intelligence (AI) on adult learning. Previous studies have extensively investigated the influence of Artificial Intelligence (AI) on pedagogical approaches and educational achievement inside conventional educational environments. Nevertheless, a distinct gap emerges in the form of limited comprehensive biblio-metric assessments that focus on Artificial Intelligence (AI) -driven educational technologies tailored for adult learners. Furthermore, the extent to which Artificial Intelligence (AI) affects the achievements and engagement of adult learners remains unclear (Tuomi, 2019).

The importance of Artificial Intelligence (AI) in Adult Learning Programmes

From the discussions above, one can deduce that Artificial Intelligence (AI) has a lot of importance to adult learning. Below are some:

Individualized Learning Experiences: Artificial Intelligence (AI) powered adaptive learning system cater for individual needs, pace and learning style. Previous researches have consistently shown that individualized learning experiences assisted by Artificial Intelligence (AI)-driven educational systems are successful. An investigation conducted by El-Sabagh (2021), revealed that the utilization of adaptive learning platforms yielded notable enhancements in the engagement levels and information retention of students compared to conventional instructional approaches. This approach is ideal for adult learning since it results into the customization and personalization of curriculum and content to align with the specific needs of students. Consequently, this can facilitate increased adoption and retention rates, leading to enhanced adult learners' experiences and overall improvements in the quality of education.

Enhancing Accessibility: Artificial Intelligence (AI) powered platforms expand access to education. This will enable adult learners to learn remotely and at their own pace. The research conducted by Sanchez-Gordon (2018) centred on the examination of the accessibility elements that are incorporated into Artificial Intelligence (AI)-driven educational platforms demonstrated how these features specifically addressed the requirements of adult learners who have disabilities.

Providing Real-Time Feedback: Artificial Intelligence (AI)-driven systems offer immediate feedback, helping adults to trace progress and identify areas of improvement. AI possesses the ability to automate the process of assessment, enabling the evaluation of individual learner's work and progress, while also offering tailored feedback. The integration of Artificial Intelligence (AI) in the process of assessment and feedback has the potential to boost formative assessment, thereby, empowering adult learners to effectively monitor their progress and make well-informed decisions on their learning strategies. This assertion is supported by the research conducted by Baleni (2015) on Artificial Intelligence and Real-Time Feed Back.

Increased Engagement: Artificial Intelligence (AI) -powered learning experiences can be more engaging and interactive. This can enhance learning efficiency and positively impact learners' self-confidence and motivation (Akbar et al, 2024).

Intelligent Tutoring System: Artificial Intelligence (AI)-powered systems provide one-on-one support which is appropriate for adult learning. For example, e-advisor provides individualized support to students when they select courses and plan their degree programmes. This system offers insights about viable degree pathways students may take to complete the programme's core requirements (Jarrett, 2013). The Adaptive Learning Management System (ALMS) is designed to generate an individualized curriculum for each student, considering their existing knowledge level, preferred learning style and ongoing learning pace. (Alamri, et al 2020).

Generative Artificial Intelligence (AI) training is cost-effective as it does not require additional classrooms, teachers or tailored curricula. This scalability can benefit employers, training providers and policy makers. However, administrators and instructors in adult education need to be conversant with new immersive technologies and seek effective ways of utilizing them to educate adult learners in various education settings (Kang, 2023).

Augmented Reality is a generative AI which is an interactive experience that enhances the real world with computer-generated perceptual information. It is the integration of digital information with the user's environment in real time. It is also an experience where designers enhance parts of user's physical world with computer-generated input (Wikipedia.com). This application is very suitable for primer construction in literacy programme. Another device of AI which can be relevant to enhancing adult education programmes is the Virtual Reality which is a set of images and sounds, produced by a computer that seem to represent a place or a situation that a person can take part in (Wikipedia.com). it is commonly used in entertainment applications such as video games and social virtual worlds. This application is suitable for agricultural and health extension programmes in Adult and Non-formal Education.

Challenges of Artificial Intelligence in Adult Learning Programmes

Although the importance of Artificial Intelligence (AI) integration into adult learning programmes in Nigeria has been x-rayed above, it is important to note that there are some perceived challenges that may confront its successful integration into adult learning programmes in Nigeria: These challenges include:

Inequities in the availability of AI-driven instructional materials for adult learners residing in rural regions: Concerns have been put forth by some authors on the need to resolve issue related to infrastructure and connectivity in order to guarantee universal access to Artificial Intelligence (AI) -enhanced education, regardless of geographical constraints (Graves, et al 2021).

Insufficient technological knowledge and skills by adult educators: There is an urgent need to replace the traditional, andragogical model of adult training with a new dynamic structural model more suited to creating new learning content. However, it is challenging to create this new path as it depends on adult educators having the required knowledge and skills (Storey and Beeman, 2023).

Lack of awareness of the limits of generative AI technologies: This is also known as Algorithmic Bias. An increasing number of adults are using generative AI technologies in their study and work today (including adult teachers and educators) but are often unaware of the limits of generative AI technologies or need to adequately consider the risk such technologies pose from an ethnical point of view. For instance, a digitally competent adult learner should know that chat GPT relies on a limited database and that users should always validate the information by fact-checking and cross-referencing (Kasneci, et al 2023).

Academic dishonesty: Generative AI content submitted by students to teachers/instructors challenges established norms of academic probity (Kumar, 2023). According to Kumar, there is also constant bombardment through social media of innovative generative Artificial Intelligence (AI) tools that assist in writing an essay, editing an essay, literature searches and data analysis (Litero, AI Research mode from you.com.edit GTP). The recent introduction of generative AI tools, such as stealthgpt, promoted as undetectable by Turnitin is particularly worrisome as using this tool indicates a deliberate intent to deceive (Tahir and Tahir, 2023).

Obstruction in data privacy: Issues relating to student's privacy, consent and how data is used, managed, protected and interpreted are of great concern. As consumers of generative Artificial Intelligence (AI) content and also the subject of data mining, adult learners must also be aware of the ethical implications of their actions grounded on digital skills and a solid moral compass (Eciampaetal, 2023).

Conclusion

Artificial Intelligence (AI) improves efficiency by automating tasks, enhancing decision-making through data analysis, and driver innovation by uncovering insights and enabling new products and services across industries like healthcare, finance and education in Nigeria. This is indeed a good development. Artificial Intelligence (AI) integration into adult education can improve learning outcomes, increased accessibility and facilitate lifelong learning. By leveraging Artificial Intelligence (AI) in adult learning programmes, adult education can become more effective, efficient, and accessible, empowering adults to achieve their learning goals.

Recommendations

Based on the findings and discussions in this work, the following recommendations were made:

1. Programmers of adult learning programmes should ensure that adult learners have access to training in Artificial Intelligence (AI) literacy supported by competencies that enable them to evaluate Artificial Intelligence (AI) technologies critically.
2. There is need for researchers or scholars to identify the Augmented Reality (AR) and Virtual Reality (VR) experiences that are most effective in delivering adult learning programmes in order to achieve adult learners' learning competencies.
3. Governmental and non-governmental adult education bodies should embark on instructional design and policy development in the context of adult education enhanced by Artificial Intelligence (AI).
4. Cyber security literacy should be inserted into adult learning programmes anchored by Cyber Security experts. This is to uphold data privacy.
5. Adult learners should be made aware of the limits of generative Artificial Intelligence (AI) technologies in order to avoid the risk such technologies pose from an ethical point of view.

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