

THE IMPACT OF ARTIFICIAL INTELLIGENCE ON ADULT LITERACY EDUCATION AND SKILL LEARNING ACQUISITION IN ONDO STATE

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Abstract: The paper provided a comprehensive overview of the status of Artificial Intelligence (AI) integration and its effects on adult literacy education and skills acquisition in Ondo State. The study focused on generative artificial intelligence technologies and its potential applications in adult literacy and skills acquisition with the consideration of the opportunities, moral and ethical challenges associated with integrating AI and equally provided insights into current trends. It also, looked at the evolving artificial technologies such as Large Models (LLM) for personalized adult learning machine learning Algorithms for adaptive adult learning systems, Virtual Reality (VR) and Augmented Reality (AR) for immersive adult learning and skills acquisition experiences. The use of Chatbots and virtual assistants for adult learners' support and guidance, with Data learning Analytics (DLA) for tracking adult learners' progress and performance in the acquisition of skills and literacy education. Conclusively, it explored the moral and ethical implications of AI in adult literacy education and skill acquisition. It also looked at the emerging trends and future directions with the consideration of policy implications and recommendations made for adult educators working to develop artificial intelligent (AI) driven adult literacy education and skills acquisition programmes.

Keywords: Adult Literacy Education, Artificial Intelligence, and Adaptive Learning Systems

Skills Acquisition

I. Introduction

Education has been defined by many scholars, institutions and organizations from various perspectives. While the International Convention in Economic, Social and Cultural Rights (ICESCR) (2002) Article 13, page 7 of the Convention defined education as an indispensable means of realizing other human rights. It is an empowerment right and a vehicle by which economically and socially marginalized adults and youths can lift themselves out of poverty level and obtain the means of participating fully in their community affairs (Okemakinde and Ogunyinka, 2016 p. 5) To Aderinoye, (2015) it is the transmission of values and accumulated knowledge of a society and a societal instrument for the expansion of human culture, which may be through formal, non-formal and informal education. Fafunwa (1991) opined that education is the sum total of all the processes by which a child or young adult develops the abilities, attitudes and other forms of behaviours which are of positive values to the society in which he lives.

Akinpelu (2002) on the other hand quoted by Amaele (2003) argued that four processes to qualify education must involve the following;

- a) A conscious effort to bring about desirable changes.
- b) A change that is intentional, deliberate and purposeful.
- c) Knowledge and understanding.
- d) A method of transmission that is morally acceptable.

Thus, the term "education" is used in three (3) main senses, namely, to indicate a process, a system and a goal. Broadly, education can be seen as a planned process of purposeful learning which is the bedrock for individuals and national development.

II. Adult Literacy and Skills Education

Adult literacy education is generally defined as the ability to read, write and carry out simple arithmetic for daily activities by an individual and this has many faces such as basic, functional, cultural and some others. Quebec, (2004) defined literacy education as a complex set of abilities to understand and use the dominant

symbol systems of culture for personal and community development. The need and demand for these abilities vary from one society to the other and this depend on the needs of a particular society. While vocational skills education aimed at imparting and improving marketable vocational skills on individuals or adults in the society. The purpose of this skill acquisition is to enable these sets of adults become young entrepreneurs and facilitate the establishment of small scale industries by them within the scope of vocation. This is the acquisition of special skills that are related to their immediate environments for the overall development of their communities.

However, the International Standard on Classification of Education defines adult learning as specifically targeting individuals who are regarded as adults by the society they belong to improve their technical or professional qualifications, further develop their abilities, enrich their knowledge to complete a level of formal education or acquire knowledge, skills and competences in a new field or to refresh or upgrade their knowledge in a particular field. This may also be referred to as continuing education, “recurrent education” or second chance education (United Nations Educational, Scientific and Cultural Organization; Institute for Statistics, 2012, p. 78)

III. Artificial Intelligence

According to the Organization for Economic Cooperation and Development (Verhagen, 2021), Artificial Intelligence can improve and replace current technologies in delivering training, spreading information on skill requirements and relevant training courses, and personalizing the matching of job seekers to available learning opportunities. Adult learners, as digital natives, are comfortable using generative Artificial Intelligence tools to access information and with education institutions diving deep into the analyses of large databases to track their progress and performance (Impact Research, 2023).

Artificial intelligence has emerged as one of the most trans-formative technologies of the 21st century, impacting various sectors including education. Although, much focus on artificial intelligence have been on it’s role in mainstream and higher education, artificial intelligence’s application in adult and literacy and skills acquisition is equally deep. Adult education, particularly literacy and vocational training skills acquisition plays a vital role in empowering individuals and fostering socioeconomic development in the society (UNESCO, 2020)

In order to prepare the global workforce to transition from an information society to an intelligent society, the United Nations Educational, Scientific and Cultural Organization (UNESCO) developed a global framework to help define and measure digital literacy (2018). The framework has seven competency areas: devices and software operations, information and data literacy, communication and cooperation, digital content creation, safety, problem-solving, and career-related competencies, which suggest that Artificial Intelligence’s application in adult education is strategically significant to training an innovative, scientific, and technologically talented workforce. Such a move requires educators to develop an open, flexible, active, and innovative adult education ecosystem to promote quality education and ensure education equity (Kang, 2023). Also, in 2019, UNESCO published a report entitled “Artificial Intelligence in Education: Challenges and Opportunities for Sustainable Development,” which highlighted the increasing role of Artificial Intelligence in influencing students’ access to education, learning performance, teaching andragogy, educational data analysis and management.

Artificial intelligence is positively affecting people’s lives which include the way of learning and preparing for labour market. It has been estimated that AI will substantially contribute to the automation of 14% of jobs while another 32% of occupation will face major transformation (News Article, 2023) Artificial Intelligence is any machine system that perform tasks which ordinarily requires human intelligence. These tasks are in various forms ranging from problem solving, decision making, pattern recognition and language processing among many others. Artificial Intelligence aids in transforming how learning activity is delivered and as well enhances educational experiences, administrative tasks through automation and data analysis.

Therefore, the application of AI in education provides innovative ways to personalize learning activities and tailors learning experience to students, particularly adult learners individual needs unlike the standardized education learning system; this makes learning more interesting and equally allows effective and inclusive educational experience. However, AI is not a single technology but an umbrella term that describes a range of technologies and methods, such as machine learning, natural language processing, data mining, neural networks, or algorithms Baker & Smith, (2019) cited in Amiee and Wagner, (2024)

IV. Integrating Artificial Intelligence into Adult Education

The emergence of computer assisted learning in adult education and the rising role of and capabilities of generative artificial intelligence machine learning technologies such as Large Language Models (LLM), Machine learning Algorithms for adaptive learning Systems (ALS), Virtual Reality (VR) and Augmented Reality (AR) for immersive learning experiences, Chathbots and virtual assistants for learners’ support and guidance. There is also Data Analytics (DA) machine for tracking learning and learning progress as well as learners performance in adult literacy education programmes. Hence, integrating generative artificial intelligence

technologies into adult and literacy learning education curricula can change the traditional adult education practices as this requires transitioning from teaching-oriented to learning oriented control.

It is however, argued that the transition is imperative for adult education planners and educators generally to use already available artificial intelligence assisted tools that can provide adult learners with differentiated instruction, a personalized learning plan consisting suitable content, learning activities that matches various individuals learning characteristics and assessment that can evaluate adult learners academic performance. AI makes learning more accessible for adults most especially in the remote areas or those with tight schedule because of work situation. Through, AI chatbots, virtual tutors and mobile learning applications, adults can engage in learning anytime and anywhere (Holmes et al., 2016) this flexibility is important for adults who may want to balance education with work, family and other responsibilities, also, AI based translation and speech recognition tool help break language barriers by enabling non - native gain literacy skills in a new language (OECD, 2021)

The evolution of Computer-Assisted- Instruction (CAI) courseware used in the teaching and learning of adult learners is an example of early artificial intelligence application in adult education programmes. Facilitators instructions and learning materials were recorded on CDs (audio) or DVD (video) and transmitted or sent to adult learners to facilitate learning activities. Thus, making adult learners access quality education by interacting with facilitators presentations at their own pace and time (Kang, 2023) cited in Wagner, (2023). Introduction of computers began to support teachers by automatically grading examinations (limited to objective questions such as multiple choice, right or wrong questions) presently, virtual teaching assistants can take over tasks such as assigning individual and group learning activities, distributing and collection of home work, answering repetitive questions as well as grading assignments with customized feedback (kang, 2023)

Also, AI powered learning platform can personalized education to actually meet the unique needs of adult learners both in literacy and vocational skills acquisition. Contrary to traditional education, AI tools adapt to an individual learning pace, skill level and preferred learning style (Luckin et al., 2016) It is equally note worthy that for adults struggling literacy or skill acquisition, receiving tailored lessons addressing specific weakness in reading comprehension, skill acquisition, writing or basic numeracy. AI - driven applications like “Duolingo and Grammarly” address how adults can improve language skills independently and effectively (Zawacki-Richter et at., 2019)

V. Skills Acquisition and Vocational Development

The transformative role of generative artificial intelligence in education, most especially in skills acquisition and vocational training programmes in adult education can help reshape adult education by changing how learning and teaching are perceived. Through, artificial intelligence, adult facilitators and instructors can generate courses and lecture materials, real-world simulations, virtually striking graphics, tasks and personal assessment that can enhance valuable skills acquisition and vocational training programmes in adult education activity.

Artificial intelligence technologies enable interactive and practical learning experiences and this may be achieved through gamification, simulation and virtual environment. Adult learners can therefore acquire both literacy and vocational skills in ways that are engaging and relevant to the real life situation (UNESCO, 2022) AI simulators can train adult learners in technical skills such as customer service or trade offering hand-on practice in a safe, and virtual environment (Luckin, 2016)

Akbar, et al (2024) validates IVETA’s assessment regarding the significant impact of generative AI on adult education. As does a longitudinal study by zhang et al., (2022) that monitored the professional progress of adult learners who participated in AI-driven up-skilling programmes and the study found that AI - driven upskilling programmes sustainably imparted the learner’s employability and career development. The immersive nature of AI technologies facilitate greater learners involvement, motivation and absorption through more advanced features of the interactive functions of the VR and AR technologies.

VI. Challenges of Artificial Intelligence in Adult Literacy and Skills Acquisition

The emerging new technologies in the world is posing numerous challenges in the use and the applications of the these new devices most especially in the area of adult literacy and skills acquisition. Effective adult teaching and learning extends beyond the typical educational path. It is a voluntary choice of learning throughout life for personal and professional development. One of the major challenges in implementing artificial intelligence tools for adult education activity is the digital literacy gap. This is because of the fact that many adults who require literacy and skills acquisition training may lack the basic technology skills needed to operate AI based platforms (OECD, 2019)

Also, artificial intelligence offers innovative solutions to emerging issues but the cost and infrastructural limitation of AI based educational platforms poses impediments to the use if the devices and more so unstable access to internet facilities most especially for low income adults earners (Holmes et al., 2019)

Artificial intelligence technology based learning platform however efficient it may be may as a matter of fact lack the human element needed in adult education programmes and this may affect the effectiveness on adult learning situations. Personal interactions, mentorship and emotional encouragement attributed to adult learning activities may be lacking in AI driven learning situation.(UNESCO, 2022) while it is equally believed that absence of peer learning and group dynamics in AI platforms could be an impediment and as well limit adult learners' motivation and persistence in skills acquisition and literacy learning activities.

Scholars have equally raised ethical and privacy concern in the use of artificial intelligence in education generally and in particular adult education. The issue raised are in the areas of data collection and data protection. It is assumed that adult learners may be reluctant to use AI tools feeling that their personal information may not be secured (OECD, 2021)

VII. Conclusion

Artificial intelligence brings greater promise for transforming adult literacy and skills acquisition by offering personalized, accessible and engaging learning opportunities. Effective adult teaching and learning extends beyond the typical educational path. It is a voluntary choice of learning throughout life for personal and professional development. Traditional computer systems are being replaced by AI and integrated into adult education and adult education research (Milana et al., 2024; Kang, 2023). As the OECD noted in 2021, "Realizing AI's full potential and ensuring that using AI for training has beneficial outcomes for all requires more research and policies that address the need for digital skills, the costs of adoption, and the development" (p.9).

Adult educators must use research-based curriculum design and development in AI literacy and capabilities to further curriculum engagement and relevance. Further, AI in adult education forces adults to reflect and redefine their role in teaching, challenging them to improve their andragogical and analytic skills, develop digital literacy, and be prepared to work with AI colleagues.

VIII. Recommendations

To maximize the benefits and minimize the challenges of artificial intelligence in adult literacy and skills acquisition development in adult education. Several steps should be taken by adult educators, facilitators and other education stake holders which may include:

Blended Learning Approach: Artificial intelligence tools should complement and not replace human teachers. The combination of AI with traditional teaching can provide a balanced and effective learning experience in adult literacy and skills acquisition activities;

Digital Literacy Training: It must be noted that before introducing artificial intelligence tools, adult learners' facilitators should be trained in basic digital skills to ensure proper navigation on artificial intelligence platforms confidently;

Government agencies, Non Governmental Organizations and private sectors must collaborate effectively to make AI tools affordable and freely available to low income and marginalized groups;

Also, artificial intelligence platforms must be designed with cultural sensitivity to address diverse cultural backgrounds and needs of adult learners; and

Lastly, clear guidelines and protections must be in place to ensure adult learners' data is confidential and secured.

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