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Article

Artificial Intelligence Tools and Teaching and Learning in Adult Education Programme in Federal Capital Territory, Abuja

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Abstract: The study assessed the deployment of artificial intelligence tools on teaching and learning of adult education in Abuja mass education schools. A descriptive survey design was used for this study. The population of the study consists of all facilitators and learners in Federal Capital Territory, Abuja. The sample size of the study consists of 356 respondents made of 72 teachers and 284 SS2 learners. Stratified random sampling procedure was use for the selection of the Area Councils and sample size. The instrument used for the collection of data was a questionnaire, titled "AI Deployment Questionnaire" (AIDQ). To ensure the validity of the instruments, the instruments were submitted to the lectures in department of art education University of Abuja who edited the draft copies and recommended necessary amendments to be effected by the researcher. To ascertain the reliability of the instrument, pilot test was carried out in some adult schools that are not part of the sample. The data were correlated using the Pearson Product Moment Correlation Coefficient (PPMCC). The analysis yielded an index value of 0.83 index value. The decision rule was based on real limit of numbers. In rating the mean, each response option had the following numerical values: VGE = 3.50-4.00; GE= 2.50-3.49; LE = 1.50-2.49; VLE = 0.00-1.49. If above the cut-off point 2.50, then it will be accepted as valid and if less than 2.50, the result will be rejected as invalid. The study showed that Intelligent Tutoring Systems (ITS), Data Analytics and Learning Management Systems, Speech Recognition and Language Learning, Intelligent Content Creation Tools, Natural Language Processing (NLP), Chatbots and Virtual Assistants, Adaptive Learning Platforms (ALP), Virtual Reality (VR), AI algorithms and AI-integrated classrooms are AI tools deployed in a very low extent in the implementation of teaching and learning in the adult schools in Federal Capital Territory, Abuja, Nigeria. It was also revealed that poor funding, unstable electricity, inadequate ICT facilities, poor digital literacy, high cost of maintenance and unstable internet services are the challenges militating against the deployment of artificial intelligence for teaching and learning in adult education in Abuja mass education schools.

Keywords: Adult education, artificial intelligence, Mass education schools

1. Introduction

Adult education is a special education designed for the masses who are not literate. Adult education is one of the educational system of Nigeria that is very important in aiding social, economic and technological development. Adult education is grouped among the mass education or literacy programme in Nigeria. Funmilola & Peter submitted that providing literacy programmes for these youths and adults will also help in improving the economic condition of the country as well as serving as an impetus to sustainable development in the long run [1]. This is because the empowered youths and adults will be able to contribute positively to the growth of the economy instead of reverting to different sorts of crimes or begging.

To build a society that is self-sufficient requires the mobilization of the uneducated, the poor and underdeveloped, many of whom have untapped potentials; and if they are fully developed will be of immense benefit not only to themselves but to the nation as a whole. This is evident when one considers the objectives of setting up literacy programmes and how they are relevant to sustainable development of any nation [2]. The objectives of organising literacy programmes include the eradication of illiteracy among youth and adults by providing them with basic communication and numeracy skills. It also aims at sustaining and promoting multiple literacies through post-literacy and continuing education programmes. Literacy programmes also target at providing education to out-of-school youths and adults through non-formal education approaches. Literacy programmes also set out to promote the acquisition of relevant knowledge, attitude and skills among adults in order to facilitate adoption of new technologies and production skills [3].

The realization of the objectives of adult education depends on some resources like the artificial intelligence. Artificial intelligence according to Ogunode & Ukozor is the ability of a machine to carry out tasks usually carry out by human intelligent [4]. Artificial intelligence is a branch of science that deals of programming machines with a simulation of human intelligence to performance similar tasks normally carry out by human beings. Frankenfield defined Artificial intelligence (AI) as simulation of human intelligence by software-coded heuristics [5]. Artificial Intelligence is a branch of science producing and studying the machines aimed at the stimulation of human intelligence processes. Artificial intelligence (AI), according to Copeland is the ability of a digital computer or computer controlled robot to perform tasks commonly associated with intelligent beings [6].

Artificial intelligence is one of the educational resources that has assisted in the delivery of teaching and learning in the schools system. Integrating AI into education offers many benefits, it also poses important considerations and potential challenges. Ethical concerns about privacy, data security, and algorithmic bias must be considered to ensure responsible and fair use of AI in the classroom. In addition, training and professional development programs are needed to equip educators with the skills and knowledge to effectively leverage AI tools and platforms. It is important to find a balance between the use of AI technology and the essential role teachers play in fostering creativity, critical thinking, and social-emotional skills. Bringing AI into the classroom has the potential to revolutionize education globally. Educators can use the power of AI to personalize learning, automate administrative tasks, create rich learning experiences, and deliver intelligent learning systems. However, careful attention should be paid to ethical considerations and teacher training to ensure responsible and fair behavior [7].

AI operate with different technological tools. These AI tools are designed to handle specific educational programme such as teaching, learning, researching, management, finance, security etc. Additionally, AI can aid in the development of intelligent tutoring systems that provide immediate feedback and guidance to students, even outside the classroom. Intelligent tutoring systems leverage AI algorithms to assess student progress, identify misconceptions, and offer targeted interventions or resources to address gaps specific learning. These systems can tailor their instruction in real time, providing

personalized pathways for each student's academic growth [8]. The AI tools are crucial to the implementation of teaching and learning in the classroom, school plant management, school finance management and school security management [9]. It is important to assess the use of these AI facilities in the implementation of teaching and learning in the various adult schools in Federal Capital Territory, Abuja, Nigeria.

1.2 Purpose of the study

The study assess the deployment of artificial intelligence tools on teaching and learning of adult education in Abuja mass education schools. The specific objectives includes;

1. To find out artificial intelligence based tools utilized for teaching and learning in adult education in Abuja mass education schools in FCT;
2. To find out the challenges militating against deployment of artificial intelligence on teaching and learning of adult education in Abuja mass education schools.

1.3 Research Questions

Based on the purpose of the study, the following research questions were generated for the study:

1. To what extent are artificial intelligence based tools utilized for teaching and learning in adult education in Abuja mass education schools in FCT?
2. What is the challenges militating against deployment of artificial intelligence on teaching and learning of adult education in Abuja mass education schools?

2. Materials and Methods

A descriptive survey design was used for this study. The population of the study consists of all facilitators and learners in Federal Capital Territory, Abuja. The sample size of the study consists of 356 respondents made of 72 teachers and 284 SS2 learners. Glenn, recommended 10-20% of the population as sample [10]. Based on Glenn recommendation, the researcher used 10% as the sample of the study. The researcher used stratified random sampling procedure for the selection of the Area Councils, while the simple random sampling procedure was used to select the sample size. The instrument used for the collection of data was a questionnaire, titled "AI Deployment Questionnaire" (AIDQ). The questionnaire was designed by the researcher in line with the modified four points scale. Response pattern are as follows: Very G Extent = 3.50-4.00; Great Extent= 2.50-3.49; Less Extent = 1.50-2.49; Very Low Extent. To ensure the validity of the instruments, the instruments were submitted to the lectures in department of art education University of Abuja who edited the draft copies and recommended necessary amendments to be effected by the researcher. To ascertain the reliability of the instrument, pilot test was carried out in some adult schools that are not part of the sample. The data were correlated using the Pearson Product Moment Correlation Coefficient (PPMCC). The analysis yielded an index value of 0.83 index value. The researcher selected twelve (12) research assistants, two from each of the selected area councils. The decision rule was based on real limit of numbers. In rating the mean, each response option had the following numerical values: VGE = 3.50-4.00; GE= 2.50-3.49; LE = 1.50-2.49; VLE = 0.00-1.49. If above the cut-off point 2.50, then it will be accepted as valid and if less than 2.50, the result will be rejected as invalid.

3. Results

Impact of artificial intelligence on teaching and learning of adult education in Abuja mass education schools

Table 1. Impact of artificial intelligence on teaching and learning of adult education in Abuja mass education schools

S/N	AI supported the following;	X	SD	Decision
1	Intelligent Tutoring Systems (ITS).	2.20	99.6	Disagree
2	Data Analytics and Learning Management Systems.	2.25	99.18	Disagree
3	Speech Recognition and Language Learning.	2.21		Disagree
4	Intelligent Content Creation Tools.	2.18	99.3	Disagree
5	Natural Language Processing (NLP).	2.11	99.1	Disagree
6	Chatbots and Virtual Assistants.	2.32	99.22	Disagree
7	Adaptive Learning Platforms (ALP).	2.08	98.80	Disagree
8	Virtual Reality (VR).	2.27	99.20	Disagree
9	AI algorithms	2.15	99.4	Disagree
10	AI-integrated classrooms	2.05	98.88	Disagree
	Average mean	**2.43**		Disagree

The result collected on table one showed that Artificial intelligence tools such Intelligent Tutoring Systems (ITS), Data Analytics and Learning Management Systems, Speech Recognition and Language Learning, Intelligent Content Creation Tools, Natural Language Processing (NLP), Chatbots and Virtual Assistants, Adaptive Learning Platforms (ALP), Virtual Reality (VR), AI algorithms and AI-integrated classrooms have the following mean (item 1, X = 2.20), (item 2, X = 2.25), (item 3, X = 2.21), (item 4, X = 2.18), (item 5, X = 2.14), (item 6, X = 2.32), (item 7, X = 2.08), (item 8, X = 2.27), (item 9, X = 2.15) and (item 10, X = 2.05) with an average mean of 2.43 which is lower than the cut-off point of 2.50. This implies that that majorities of respondents held the view that Intelligent Tutoring Systems (ITS), Data Analytics and Learning Management Systems, Speech Recognition and Language Learning, Intelligent Content Creation Tools, Natural Language Processing (NLP), Chatbots and Virtual Assistants, Adaptive Learning Platforms (ALP), Virtual Reality (VR), AI algorithms and AI-integrated classrooms are deployed very low extent in the implementation of teaching and learning in the adult schools in Abuja

Table 2. Challenges militating against deployment of artificial intelligence on teaching and learning of adult education in Abuja mass education schools.

S/N	The challenges militating against deployment of artificial intelligence on the teaching and learning in adult education in Abuja mass education schools includes;	X	SD	Decision
1	Poor funding	3.05	99.0	Agree
2	Unstable electricity	3.20	99.04	Agree
3	Inadequate ICT facilities	3.41	98.97	Agree
4	Poor digital literacy	3.10	99.09	Agree
5	High cost of maintenance	2.85	98.90	Agree
6	Unstable internet services	2.92	99.15	Agree
	Average Mean	2.89		Agree

The result obtained disclosed that that the respondents agreed that that challenges militating against deployment of artificial intelligence on the teaching and learning in adult education in Abuja mass education schools include; poor funding, unstable electricity, inadequate ICT facilities, poor digital literacy, high cost of maintenance and unstable internet services with mean (item 1, X = 3.05), (item 2, X = 3.20), (item 3, X = 3.41), (item 4, X = 3.10), (item 5, X = 2.85), (item 6, X = 2.91) with an average mean of 2.89 which is greater than the cut-off point of 2.50. Based on this the result indicated that poor funding, unstable electricity, inadequate ICT facilities, poor digital literacy, high cost of maintenance and unstable internet services are the challenges militating against deployment of artificial intelligence on the teaching and learning in adult education in Abuja mass education schools.

4. Discussion

The result obtained from the analysis revealed that Artificial intelligence tools such Intelligent Tutoring Systems (ITS), Data Analytics and Learning Management Systems, Speech Recognition and Language Learning, Intelligent Content Creation Tools, Natural Language Processing (NLP), Chatbots and Virtual Assistants, Adaptive Learning Platforms (ALP), Virtual Reality (VR), AI algorithms and AI-integrated classrooms are deployed very low extent in the implementation of teaching and learning in the adult schools in Federal Capital Territory, Abuja, Nigeria. This result is in line with the findings of Ogunode & Olowonefa that concluded that AI facilities are poorly deployed in the implementation of teaching and learning in both secondary schools and higher institutions [11], [12], [13]. Study by Ukeh, & Anih showed that the extent of utilization of artificial intelligence based tools for teaching among lecturers in Federal University Otuoke, Bayelsa State was very low [14]. This finding provides insights into the current state of technology adoption in the context of teaching at Federal University Otuoke, indicating a need for further exploration and potential strategies to enhance the integration of AI tools in education. The finding of the study agrees with Thomas and Gambari; Uy, Sasan, & Kilag, Tavares, Azevedo, Marques, & Bastos, who reported that the utilization of artificial intelligence tools for teaching is still in a very moderate and low level [15].

The result also showed that poor funding, unstable electricity, inadequate ICT facilities, poor digital literacy, high cost of maintenance and unstable internet services are the challenges militating against the deployment of artificial intelligence for teaching and learning in adult education in Abuja mass education schools. This result collaborates the findings of Zarrouqi, Riyad and Falta, Amira, Westagilelabs, Igbokwe, Ogunode, Agbade & Bassey that discovered in their various studies that poor funding, shortage of AI facilities, poor ICT literacy, internet problem, unstable electricity and poor capacity building programme are some of the problem hindering effective deployment of AI for teaching and learning [16], [17], [18].

5. Conclusion

The study assess the deployment of artificial intelligence tools on teaching and learning of adult education in Federal Capital Territory, Abuja, Nigeria. The study concluded that Intelligent Tutoring Systems (ITS), Data Analytics and Learning Management Systems, Speech Recognition and Language Learning, Intelligent Content Creation Tools, Natural Language Processing (NLP), Chatbots and Virtual Assistants, Adaptive Learning Platforms (ALP), Virtual Reality (VR), AI algorithms and AI-integrated classrooms which are AI tools are deployed very low extent in the implementation of teaching and learning in the adult schools in Federal Capital Territory, Abuja, Nigeria. It was also revealed that poor funding, unstable electricity, inadequate ICT facilities, poor digital literacy, high cost of maintenance and unstable internet services are the challenges militating against the deployment of artificial intelligence for teaching and learning in adult education in Abuja mass education schools.

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