

Enhancing Graduate Employability through the Introduction of Artificial Intelligence in Building Technology Education in Nigerian Universities

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ABSTRACT

The study was carried out to ascertain how to enhance graduate employability through the introduction of Artificial Intelligence in building technology education in Nigerian Universities. The study adopted a case study survey design. The study was carried out in three public Universities in South-East Nigeria: University of Nigeria Nsukka, Nnamdi Azikiwe University Awka, and Michael Okpara University of Agriculture Umudike. The population for this study is 62 subjects, consisting of 24 building technology lecturers and 38 building technology technical instructors in the three public institutions. No sampling was used for this study since the total population of 62 subjects is of manageable size. The instrument for data collection was a structured 34 item questionnaire titled: Questionnaire on Enhancing Graduate Employability through the Introduction of Artificial Intelligence (QEGEIAI). The questionnaire was designed on the 5 point likert scale as follows: Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD). Three experts validated the research instrument. The reliability of the instrument was established using Cronbach alpha and a reliability coefficient (α) of 0.862 was obtained. Data collected were analyzed using Mean and t-tests of Statistical Package for Social Sciences (SPSS) version 23. The mean was used to answer the research questions. Any item of the questionnaire with mean of 3.50 and above was considered to be agreed while any item of the questionnaire with mean value below 3.50 was considered to be disagreed. The null hypothesis was accepted when the p-value (t-calculated) is greater than 0.05 level (t-critical) but the null hypotheses was rejected when the p-value (t-calculated) is less than 0.05 level value of the t-critic. Based on the findings of the study, graduate employability can be enhanced by exposing students to AI-platforms that aids in project planning & project management. The major challenges hindering the introduction of artificial intelligence in building technology education of Nigerian Universities is that there is still no policy that empowers the incorporation of AI in the curriculum of building technology in Nigerian Universities. The study recommended that there should be a robust collaboration among AI startups, researchers, educational policy makers, building technology education stakeholders, so as to come up with a policy which empowers Nigerian Universities to train students in AI technologies in building technology education.

Keywords: Buildings, Building Technology Education, Graduate Employability, and Artificial Intelligence.

Introduction

Buildings which provide Shelter are amongst the three basic needs of life after food and water. Buildings are also universally accepted and recognized as essential for life sustenance and survival. Building according to Dokubo (2017) is a permanent or temporary structure enclosed within exterior walls with a roof which is primarily utilized for working, storage and shelter. Oviawe, Ezeji and Uwameiye (2016) defined building technology as the technical processes and methods of assembling permanent or temporary structures to provide shelter, comfort, security and privacy to man for his needs. Aigbavboa and Aliu (2017) also defined building technology as a form of educational training aimed at preparing and equipping individuals with knowledge, attitude and skills in drafting-architectural design, building drawing, block-laying and concreting, costing and estimation, building structures detailing, plumbing, repairs and installation, and supervision of the building construction. Building technology in this study is the training of individuals in tertiary institutions on how to plan for the creation and execution of residential or commercial buildings or properties. Building technology therefore, provide individuals with the skills needed to be successful building contractors or as managers in the construction of walls, roofs, floors, and foundations, estimating, piping and electrical systems as well as other woodworking interior and exterior products. Building construction experience can be acquired through building technology education in tertiary institutions such as colleges of education, polytechnics and Universities.

Building technology is concerned with the extensive technological skills which involve the capacity to manage people, tools, machines and products to carry out building

construction tasks professionally and successfully. In most universities in Nigeria Building technology is studied as a course of study as Building technology education. The objectives of building technology education in the Universities according to Nigerian Universities Commission (NUC) (2015) is to train and produce individuals that will become professional builders in the areas of (i) production of simple buildings; (ii) maintenance of simple buildings; (iii) management of small projects; (iv) costing of simple construction work; (v) cost control techniques in minor construction and engineering works; and (vi) selection of materials for new building systems. It is aimed at producing technicians and builders who will be able to perform basic functions in Building Technology practice, both in the private and public sector (National Board for Technical Education (NBTE) 2013). Building technology education as a course comprises of different components or operations which require skills to perform them. These components according to Ariba (2011) include designing of building plans, setting out of the building, lock work on the concrete foundation, leveling of the building, roofing pattern, plastering and rendering of walls. These areas of operation require that students of building technology education should possess the necessary skills to carry them out. Building technology education students should possess skills in designing building plans and be able to read and interpret them. Also, graduates of building technology education should possess the skills in setting out of buildings, form block walls on the concrete foundation, be able to level the building and also possess skills in designing good roofing pattern.

Building technology education graduates are expected set up an enterprise in the production of sandcrete blocks, production of well rings, fancy blocks,

concrete kerbs, renting of building equipment and tools like concrete mixers, wheel barrows, shovels, diggers, theodo-lite, ranging poles, leveling staff among others. Graduates of building technology can also train individuals on how to carry out operations in building construction (Alashwal & Abdul-Rahman, 2014). The building technology education graduate according to the Federal Government of Nigeria (FGN, 2014) has the option to further his/her education, secure employment or set up his/her own business and become self-employed. It has been observed that the objectives have not been achieved over the years. Building technology education students still find it difficult to acquire building skills and requisite training that can make them functional in the society after graduation. Most students of building technology graduate with little or no building skills and training that should enable them work in building industries or firms or to be self-employed. Oviawe and Anetekhai (2020) stated that the result of the training offered to most building technology students while in school fails to match up with the expectations of the world of work thereby leaving the graduates short of the employability skills perceived to be essential in the dynamic workplace.

Unemployment among youths appears to be on the increase every year. This is because the graduates of tertiary institutions, especially in building technology education, still roam the street without jobs (Adenle, Oyeyemi, Shobowale, Olukayode & Ariba, 2019). The consequences of joblessness among youths according to Ekwue, Udemba and Ojuro (2019) include burglaries, robbery, psychological and financial stresses, fear, anxiety, aggression, frustration, prostitution, drug addiction, vagrancy, poverty, hunger and diseases. Others include social vices such as armed robbery, kidnapping, vandalization of pipe

lines and cultism, in order to make quick money. The reason may be because they do not possess necessary skills in the area that they were trained, and as a result they have no confidence in themselves to set up business. Good possession of relevant building skills that will enable building technology students set up businesses or become self-employed may reduce joblessness and social vices among them after graduation. Therefore, there is need for improving skill acquisition and exposure to requisite training of building technology students in tertiary institutions especially in Universities so as to produce graduates who have employable skills that will enable them function effectively in the society.

Graduate employability skills are the core, transferrable skills that are needed for a graduate to gain employment in nearly every job or firm. According to Toland as cited in Okolocha and Odimmega (2019), graduate employability skills are non-discipline specific, economically valuable skills required to get initial employment, progress in a job, as well as secure another job when desired. Okeke and Nweke (2021) defined graduate employability skills as attributes, skills and knowledge that individuals possess to ensure capability of being effective in the workplace. Graduate employability skills in this study are the basic skills, personal traits, qualities and values that helps a graduate to be gainfully employed and thrive in any workplace. Some of these core employability skills include conflict resolution, accepting criticisms, working with a team, workplace etiquette, proper use of workplace electronics, interviewing skills, resume writing and workplace communication (Emeasoba, & Igwe, 2016). Employability skills also include creativity, ability to do self managing and being effective. Dave, (2017) stated that to be able to work in teams, being energetic and motivated is also a key part of the main skills needed for employability.

Ajuluchukwu (2012) in Oviawe, and Anetekhai (2020) reported that about 60% of graduates (including building technology graduates) being produced from the Nigerian tertiary institutions were not qualified for employment at the global level. Similarly, the National Bureau of Statistics (2018) asserted that unemployment and underemployment are on the increase in Nigeria, with 25.50% of her youths unemployed as at the third quarter of 2017; 52.5% in the third quarter of 2017; which increased to 30.50% in the second quarter of 2018; and 55.4% in the third quarter of 2018. These statistics are very worrisome as it indicates that many graduates including building technology graduates are not employable because they do not possess employable skills. Chen, Chen, and Em (2020) however noted that in recent years, the development of artificial intelligence technology has been encouraging and could be used to enhance graduate employability skill if introduced in building technology education.

Corresponding activities such as academic conferences, scientific research, and technical competitions in the field of artificial intelligence is spreading all over the world. Artificial Intelligence (AI) refers to the study of intelligent machines and software that can reason, learn, gather knowledge, communicate, manipulate and perceive objects (Verma, 2018). Artificial Intelligence is a part of computer science that deals with the design of intelligent systems that exhibit characteristics associated with intelligence of human behaviours (Ocana et al., 2019). In this study AI is a combined large volume of data with computing power which simulate human intellectual abilities such as reasoning, language processing, perception, vision recognition and spatial processing. AI has penetrated education spheres, in the form of intelligent books, web browsers, education apps, and learning platforms (Karsenti, 2019). AI has also

enabled new ways of learning, teaching, assessment and research thus, increasing the efficiency of educational activities and give access to a wide range of information. The technology and applications is rapidly being updated and expanded.

In the area of building construction, AI can help automate processes, improve project management, enhance safety measures, and optimize resource allocation. By leveraging machine learning algorithms, construction companies can analyze large datasets to gain valuable insights for informed decision-making and predictive maintenance (Akpomi, Kayii, & Nwile, 2022). AI can also aid in quality control and monitoring on construction sites, ensuring adherence to design specifications and identifying potential safety risks. AI-driven optimization algorithms can streamline construction schedules, minimize delays, and improve overall project efficiency (Dalia, Rania., Marwa, & Salem, 2021). However, several challenges must be addressed to effectively implement AI in the building construction industry. These challenges include data availability and quality, integration with existing systems, ensuring ethical use of AI, and overcoming the resistance to change within the industry (Nayebare, 2019). Additionally, there is a need for up-skilling the workforce and building technology graduates to embrace and utilize AI technologies effectively. There is also the need to introduce AI concepts and technologies to existing and future building technology students in order to get them ready and equip them with requisite skills so as to be employable after graduation.

Statement of the Problem

Building technology education in Nigeria is one of the courses offered in college of Education, polytechnics and Universities. It is designed to produce

professional builders for construction/building industry. In building technology education, students are expected to work with materials, tools, equipment and machines to mould blocks, carry out preliminary site operations, concreting, block wall construction and finishing in the building industry. Students also learn building construction, brick/block laying, technical drawing, building drawing, construction management, surveying and quantity surveying. Graduates of the programme can also teach in secondary schools and higher institutions of learning. The aim of the programme is to increase the technological growth of the country and to allow students acquire more technical skills.

In spite of this, building technology education students still find it difficult to acquire building skills that can make them functional in the society after graduation. This is because the graduates of tertiary institutions, especially in building technology, still roam the street without jobs. Most students of building technology graduate with little or no building skills that should enable them work in building industries or firms or to be self-employed. This may be due to little or no skill acquired by the students during training in the school. Studies indicate that the result of the training offered to most building technology students while in school fails to match up with the expectations of the world of work thereby leaving the graduates short of the employability skills perceived to be essential in the ever dynamic workplace.

The consequences of joblessness among include burglaries, robbery, psychological and financial stresses, fear, anxiety, aggression, frustration, prostitution, drug addiction, vagrancy, poverty, hunger and diseases. Others include social vices such as armed robbery, kidnapping, vandalization of pipe lines and cultism, in order to make quick money. The reason may be because

they do not possess necessary skills in the area that they were trained, and as a result they have no confidence in themselves to set up business. Good possession of relevant building skills and exposure to requisite training that will enable building technology students set up businesses or become self-employed may reduce joblessness and social vices among them after graduation. Therefore, there is need for improving skill acquisition and training of building technology students in tertiary institutions especially in Universities so as to produce graduates who have employable skills that will enable them function effectively in the society. The introduction of artificial intelligence could help to enhance the employability skills of building technology graduates. Therefore, there is need for carrying out a study to determine how to enhance graduate employability through the introduction of artificial intelligence in building technology in Nigerian Universities.

Purpose of the Study

The purpose of the study was to find out how to enhance graduate employability through the introduction of artificial intelligence in building technology education in Nigerian Universities. Specifically, the study sought to ascertain the following:

1. Identify AI tools relevant to building technology education in Nigerian Universities.
2. Ascertain how introduction of artificial intelligence in building technology education could enhance graduate employability skills in Nigerian Universities.
3. Find out the challenges hindering the introduction of artificial intelligence in building technology education of Nigerian Universities.

Research Questions

This research therefore seeks to provide answers to the following questions:

1. What are the AI tools relevant to building technology education in Nigerian Universities?
2. How can the introduction of artificial intelligence in building technology education of Nigerian Universities enhance graduate employability skills?
3. What are the challenges hindering the introduction of artificial intelligence in building technology education of Nigerian Universities?

Hypotheses

The following null hypothesis was tested at 0.05 level of significance:

1. There is no significant difference in the mean responses of building technology education lecturers and instructors on the how the introduction of artificial intelligence in building technology education of Nigerian Universities will enhance graduate employability skills.
2. There is no significant difference in the mean responses of building technology education lecturers and instructors on the challenges hindering the introduction of artificial intelligence in building technology education of Nigerian Universities.

Methodology

The study adopted a case study survey design. The study was carried out in three public Universities in South-East Nigeria. These Universities include University of Nigeria Nsukka, Nnamdi Azikiwe University Awka, and Michael Okpara University of Agriculture Umudike. The population for this study is 62 subjects, consisting of 24 building technology lecturers and 38 building technology technical instructors in the three public universities. No sampling was used for this

study since the total population of 62 subjects is of manageable size.

The instrument for data collection was a structured 34 item questionnaire titled: Questionnaire on Enhancing Graduate Employability through the Introduction of Artificial Intelligence (QEGEIAI). The questionnaire was designed on the 5 point likert scale as follows: Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD). Three experts were requested to validate the research instrument. The reliability of the instrument was established using 12 building technology lecturers and 18 building technology technical instructors of the Department of Vocational and Technical Education, Benue State University, Makurdi, North Central region of Nigeria. The responses to the questionnaire were collated and analyzed using Cronbach alpha and a reliability coefficient (α) of 0.862 was obtained. Data collected were analyzed using Mean and t-tests of Statistical Package for Social Sciences (SPSS) version 23. The mean was used to answer the research questions. Any item of the questionnaire with mean of 3.50 and above was considered to be agreed while any item of the questionnaire with mean value below 3.50 was considered to be disagreed. The null hypothesis was accepted when the p-value (t-calculated) is greater than 0.05 level (t-critical) but the null hypotheses was rejected when the p-value (t-calculated) is less than 0.05 level value of the t-critic.

Results

The data for answering research question 1 to 3 are presented in Table 1 to 3

Research Question 1: What are the AI tools relevant to building technology education in Nigerian Universities?

Table 1: Mean and Standard Deviation of lecturers and instructors on the AI tools relevant to building technology education in Nigerian Universities. *N = 62*

S/ N	Items	Lecturers		Instructor s		Grand		Rema rk
		Mea n	SD	Mea n	SD	Mea n	SD	
1	Use of Gradescope which provides automated grading for various types of assignments.	3.57	.87	3.52	.69	3.56	.74	A
2	Teachers can use ChatGPT to generate ideas, lesson plans and quizzes for students.	3.52	.78	3.57	.71	3.57	.73	A
3	Teachers can use Kira Learning AI tool to deliver learning content to students.	3.54	.90	3.50	.62	3.58	.73	A
4	Teachers can use Diffit AI tools to create differentiated learning materials tailored to various proficiency levels.	3.53	.97	3.56	.80	3.88	.84	A
5	Teachers can use AudioPen AI tool to convert voice to texts and enhance it for lesson plans.	3.54	.73	3.57	.73	3.65	.74	A
6	Teachers can use Curipod AI tool to create interactive customized lesson for students in minutes.	3.59	.73	3.54	.76	3.74	.70	A
7	Teachers can use Eduaide AI tool to generate syllabus, create discussion prompts to create individualized learning for students.	3.55	.83	3.55	.62	3.71	.68	A
8	Teachers can use Quizizz AI tool to create personalized learning path based on each students' responses.	3.52	.78	3.57	.71	3.57	.73	A
9	Teachers can use Internet of Things (IOT) to teach how projects are managed with real-time data and insights, improving efficiency, safety and decision making.	3.54	.90	3.50	.62	3.58	.73	A
10	Teachers can use Machine Learning to teach students how construction teams stay focused on high priority tasks.	3.53	.97	3.56	.80	3.88	.84	A
11	Teachers can use AI Robotics to teach students how robotics can perform bricklaying, painting, welding, and enhancing project timely completion.	3.54	.73	3.57	.73	3.65	.74	A
12	Teachers can use Predictive AI tool to teach students how to anticipate equipment failures or safety incidents,	3.59	.73	3.54	.76	3.74	.70	A

allowing for preventive measures and reducing downtime.

Table 1 shows the mean of responses and standard deviations of building technology education lecturers and instructors on the AI tools relevant to building technology education in Nigerian Universities. The values of the grand mean ranged from 3.88 to 3.56, indicating that the responses of the respondents for all the items were under agree category. The grand value for the standard deviation ranged from 0.84 to .52. The values of the SD were low, and this shows that the responses are clustered around

the mean. It can be deduced from the grand mean values that all the identified items of Table 1 were the AI tools relevant to building technology education in Nigerian Universities.

Research Question 2: How can the introduction of artificial intelligence in building technology education of Nigerian Universities enhance graduate employability skills?

Table 2: Mean and Standard Deviation of lecturers and instructors on how the introduction of artificial intelligence in building technology education of Nigerian Universities enhances graduate employability skills. *N = 62*

S/N	Item Statements	X	SD	P-values	Remarks	SIG
1	Graduate employability can be enhanced by exposing Students on how to use AI tools to predict cost overruns based on factors such as project size & contract type.	3.6 1	0.7 1	0.14	Agree	NS
2	Graduate employability can be enhanced by exposing Students to AI-platforms that aids in project planning & project management.	3.5 7	0.7 0	0.18	Agree	NS
3	Graduate employability can be enhanced by exposing Students to 3D building information modeling which gives builders insights to efficiently plan, design, construct & manage buildings.	3.6 3	0.7 5	0.10	Agree	NS
4	Graduate employability can be enhanced by exposing Students to AI tools which helps to prioritize worker safety & mitigate risk on job sites.	3.7 2	0.6 0	0.15	Agree	NS
5	Graduate employability can be enhanced by exposing Students to AI-tools which can carry out off-site construction of building projects.	3.5 8	0.6 6	0.09	Agree	NS
6	Graduate employability can be enhanced by exposing Students to AI tools that can monitor developing problems or gain valuable insights in the operation/performance of a building.	3.5 3	0.7 2	0.12	Agree	NS

7	Graduate employability can be enhanced by exposing Students to AI tools that can optimize building design for energy efficiency such as natural ventilation & solar orientation.	3.7	0.6	0.15	Agree	NS
		3	0			
8	AI platforms can be used to connect graduates with potential employers, mentors & other professionals, helping them to build valuable networks & new opportunities.	3.5	0.6	0.20	Agree	NS
		5	5			
9	AI-powered tools can provide graduates with personalized career advice, training, mentorship, helping them to build skills & knowledge needed to succeed in the workforce.	3.6	0.7	0.26	Agree	NS
		4	4			
10	AI job matching platforms can analyze skills, qualifications & experience of graduates, match them with relevant job opportunities based on their preference & career goals.	3.7	0.6	0.09	Agree	NS
		8	6			

Keys: X = Mean SD =Standard Deviation, NS-Not significant.

The data in table 2 revealed that the 10 have their mean values all above the cut-off point of 3.50. This indicates that all the items were accepted by the respondents as how the introduction of artificial intelligence in building technology education of Nigerian Universities enhances graduate employability skills. The standard deviation of the 10 items in table 1 ranges from 0.71-0.60 which shows that the respondents were not far from each other in their responses. On the other hand, the hypothesis showed that all the 10 items in table 2 have their p-values greater than 0.05 level of significance. The null hypothesis that there is no significant difference in the mean responses of building technology education lecturers and instructors on the how the introduction of artificial intelligence in building technology education of Nigerian Universities will enhance graduate employability skills was therefore accepted.

Research Question 3: What are the challenges hindering the introduction of artificial intelligence in building technology education of Nigerian Universities?

Table 3: Mean and Standard Deviation of lecturers and instructors on the challenges hindering the introduction of artificial intelligence in building technology education of Nigerian Universities. *N* = 62

S/N	Item Statements	X	SD	P-Value	Remarks	SIG
1	There is still no policy yet that empowers the incorporation of AI in teaching and learning building technology in Nigerian Universities.	3.82	0.73	0.13	Agree	NS
2	Relevant policies which will create clear directions on the application of AI for building technology education in line with the peculiarities of Nigerian society are not yet available.	3.69	0.71	0.08	Agree	NS
3	The optimization of AI for building technology requires an environment with adequate infrastructure, state of-the-art data facilities and requisite AI expertise, which are largely inadequate in Nigerian Universities.	3.95	0.75	0.18	Agree	NS
4	AI requires robust networks, immense computing power, and stable connections but most Nigerian Universities are riddled with extremely inconsistent IT infrastructure.	3.77	0.77	0.26	Agree	NS
5	There is shortage of skilled experts that can train building technology educators on how to use AI for teaching and learning.	3.80	0.76	0.08	Agree	NS
6	The funds required to set up and implement AI for building technology in Universities are very high, thus not every school can afford to invest in it.	3.59	0.74	0.22	Agree	NS
7	The skill gap and poor technical expertise among building technology educators poses a serious challenge in effective applications and use of AI technologies in Nigeria universities.	3.56	0.75	0.18	Agree	NS
8	There is lack of proactive training and retraining of building technology educators which should enable them adapt to the changing technological landscape for smooth AI implementation in Nigeria universities.	3.68	0.82	0.28	Agree	NS

9	Most academic departments in Nigeria operate with poor budget and the cost of implementing AI can be very high which could make it practically difficult to effectively deploy AI technologies in teaching and learning building technology.	3.58	0.83	0.17	Agree	NS
10	Poor and irregular electric power supply in most Nigeria Universities may render AI facilities unusable and put them in a state of moribund.	3.82	0.73	0.13	Agree	NS
11	Poor bandwidth in most Universities results to very low internet connectivity which makes it difficult to access and download the require datasets. Thus leading to poor AI implementation in building technology education.	3.77	0.77	0.26	Agree	NS
12	Introducing AI in building technology education may face resistance from staff who are not familiar or comfortable with new technologies, they may prefer traditional services or may find it difficult to adapt to new technologies.	3.54	0.72	0.16	Agree	NS

Keys: X = Mean SD =Standard Deviation, NS-Not significant.

The data presented in Table 3 revealed that the 12 items listed as the challenges hindering the introduction of artificial intelligence in building technology education of Nigerian Universities have their mean values all above the cut-off point of 3.50. This indicates that the respondents accepted the items suggested as challenges hindering the introduction of artificial intelligence in building technology education of Nigerian Universities. The standard deviation of the 12 items in table 2 ranges from 0.72-0.83 which shows that the respondents were not far from each other in their responses. On the other hand, the hypothesis showed that all the 12 items in table 3 have their p-values greater than 0.05 level of significance. The null hypothesis that there is no significant difference in the mean responses of building technology education

lecturers and instructors on the challenges hindering the introduction of artificial intelligence in building technology education of Nigerian Universities was not rejected.

Discussion of Findings

The findings of the study in Table 1 revealed the AI tools relevant to building technology education in Nigerian Universities. Some of them include; Gradescope, ChatGPT and Kira Learning AI tool etc. Educators can provide tailored learning experiences based on AI-driven analytics that provide valuable insights into student performance and learning trends. Using this data, AI can instantly adapt student learning materials. Teachers can then use this information to provide personalized

learning experiences, adapting to each student's strengths, weaknesses, and learning pace. Ocana et al. (2019) supported the findings of the study by stating that teachers can adopt the use of Deep Learning for teaching students of building technology education. This is because in construction, deep learning can enhance design processes by analyzing intricate data to optimize building layouts and structural integrity. Chen et al. (2020) also stated that teachers can expose building technology education students to Internet of Things (IoT). In construction, IoT devices can monitor site conditions, track equipment usage, and ensure optimal performance. For example, AI systems are helping ensure construction sites have the materials when needed by predicting supply chain demand and shipping requirements, thereby avoiding supply shortages or overages.

The findings from Table 2 indicate how the introduction of artificial intelligence in building technology education of Nigerian Universities enhances graduate employability skills. Some of the items include: graduate employability can be enhanced by exposing students on how to use AI tools to predict cost overruns based on factors such as project size & contract type and graduate employability can be enhanced by exposing students to AI tools which helps to prioritize worker safety & mitigate risk on job sites. The findings are in line with the opinion of Goralski, and Tan, (2020), who stated that exposing building technology education students to AI construction automation will definitely increase employability skill of those students when they eventually graduate. They will be able to utilize AI technologies in project design, management and construction projects. Nayebare, (2019), also supported the findings of the study by stating that adoption and teaching of AI techniques in building

technology education offers students automated solutions and provides them with competitive advantages in the labour market. Such students can graduate with requisite knowledge and skill in AI techniques: they have immense potential to apply AI techniques in the construction industry.

The findings from Table 3, shows the challenges hindering the introduction of artificial intelligence in building technology education of Nigerian Universities. Some of them include: there is lack of proactive training and retraining of building technology educators which should enable them adapt to the changing technological landscape for smooth AI implementation in Nigeria universities. Also, poor and irregular electric power supply in most Nigeria Universities may render AI facilities unusable and put them in a state of moribund. These findings are in line with study of Nayebare (2019) who stated that the optimization of AI for education requires an environment with adequate infrastructure, state-of-the-art data facilities and requisite AI expertise, which are largely inadequate in Africa. Extremely inconsistent IT infrastructure represents a major challenge that needs to be addressed by various African governments and the private sector, mostly because AI requires robust networks, immense computing power, and stable connections. The findings are also in consonance with the findings of Akpomi, Kayii, and Nwile (2022), who states the funds, required to set up and implement Artificial Intelligence is very high, thus not every tertiary institution in Nigeria can invest in it. Also there is shortage of data science skills within the universities to get maximum output from artificial intelligence in Nigeria. There is a clear shortage of advanced skills that will interface between the tertiary institutions in Nigeria and AI technology.

Conclusions

The study was carried out to ascertain how to enhance graduate employability through the introduction of Artificial Intelligence in building technology education in Nigerian Universities. Based on the findings of the study, students can be equipped for employment after graduation by exposing them to AI-platforms that aids in project planning & project management. Students can be equipped for employment after graduation by exposing them to 3D, building information modeling which gives builders insights to efficiently plan, design, construct & manage buildings. The major challenges hindering the introduction of artificial intelligence in building technology education of Nigerian Universities is that poor bandwidth in most Universities results to very low internet connectivity which makes it difficult to access and download the require datasets, thus leading to poor AI implementation in building technology education. Similarly, the introduction of AI in building technology education may face resistance from staff who are not familiar or comfortable with new technologies, as they may prefer traditional services or may find it difficult to adapt to new technologies.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. There should be a robust collaboration among AI startups, researchers, educational policy makers, building technology education stakeholders, so as to come up with a policy which empowers Nigerian Universities to adopt the use of AI technologies in teaching and learning of building technology education in tertiary institutions especially in Nigeria. There should be a policy which empowers educators to incorporate the technologies in building technology education curriculum.
2. The government through the state and federal ministry of education in collaboration with

the school management should organize proactive up-skilling of staff through regular training and retraining of building technology educators which should enable them adapt easily to the adoption of teaching and learning of building technology using AI technologies. This will also enable for smooth AI implementation in Nigeria universities.

3. Funding of tertiary institutions especially Nigerian Universities should be improved on a regular basis so they can be able to acquire, set up and maintain state of art AI facilities for teaching and learning of building technology education.
4. Epileptic power supply across the country hinders the full implementation of AI technologies in tertiary institutions. Therefore, there is need for Universities to have alternative power supply systems which they can rely upon to power the AI facilities in their institutions.

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