ROLE OF ARTIFICIAL INTELLIGENCE IN THE MANAGEMENT OF UNIVERSITY EDUCATION IN ENUGU STATE, NIGERIA

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Abstract

This study investigated the role of artificial intelligence in the management of university education in Enugu State, Nigeria. Two research questions and two hypotheses guided the study. The study adopted a descriptive survey design. The population comprised the 8,056 lecturers in the Faculty of Education in University of Nigeria, Nsukka and Enugu State University of Technology. A sample of 230 lecturers was drawn using simple random sampling technique. The instrument used for data collection was questionnaire titled 'role of artificial intelligence in the management of university education questionnaire (RAIMUEQ). The instrument was validated by experts and the reliability was established using Chrombac Alpha Statistics, which yielded an index of 0.91. The findings revealed among others that, the role of artificial intelligence in the management of university education include: streamlining administrative efficiency in the management of education resources, enabling institutions to allocate resources effectively, making decisions on academic matters, analyzing data, creating personalized learning paths, adapting learning contents and materials based on students' progress, and optimizing resource allocations by predicting future student enrollment. Based on the findings, recommendations were made.

Keywords: *artificial intelligence, management, university education, Enugu State*

Introduction

University education is the third level of education system where students are equipped with knowledge, skills and ideas to live as responsible citizens of the society after graduation. University education is the life wire of human capital development of the nation through which knowledge and skills are transferred to the students for immediate and future progress. Nwabueze and Onyenandu (2015) defined university education as one of the most significant human needs for social progress, which produces the manpower needed for socio-economic, cultural and political development of any given society. Nwabueze and Nwokedi (2016) stated that university education is the system where teaching, learning, administration, research processes and community service are carried out through proper management of educational resources for individual growth and societal development.

University education is responsible for social progress, economic growth and scientific development of every individual and the society at large. It is an education system that transforms the students for individual growth, societal development and nation building in the fast developing world.

University education as system where knowledge and skills are transferred to the students for individual growth and societal development needs proper management. Proper management of university education increases staff and students' productivity for institutional growth and national development. Management therefore, is the systematic coordination of educational resources (human, material, finance, time and energy) for the achievement of institutional set goals and objectives (Nwabueze, 2017). It is a distinct process consisting of activities such as planning, organizing, actuating and controlling aimed at actualising organizational goals. It is a process demanding the performance of specific functions for the actualization of university education goals and objectives.

University education management is a systematic process of making use of human resources (academic and administrative staff) as well as the non-human resources (school buildings, instructional resources, finance and time) to achieve the goals and objectives of the institution. It involves proper planning of school activities, controlling, organizing, staffing, leading, coordinating and directing the human and non-human activities for productivity and nation building (Kpokpo, 2018). However, it is concerned with the performance of executive duties, proper application policies in school programmes and decisions to maintain and fulfil a purpose, in line with the control of day-to-day programmes of the school. University education management includes all the activities that leadership in the universities carry out in an effort to implement their quality policy such as quality planning, quality control, quality assurance and quality improvement (Oluwuo, Obaro & Nwabueze, 2013). According to Oluwuo, Obaro and Nwabueze, quality university management helps to build up strategic mechanisms to assess the quality of student's admission, quality of academic staff, quality of physical infrastructural facilities, quality teaching and learning experience, quality student assessment, quality teaching methods, and quality of curriculum content. The realization of quality university services depends on the management of university resources of which artificial intelligence is one of the resources needed for institutional growth.

Artificial intelligence could be seen as a branch of technology concerned with the process of designing intelligent devices that displays features or characteristics related with human intelligence. Artificial Intelligence as a branch of technology encompasses the various techniques and approaches such as: machine learning, deep learning, natural language processing, computer vision and robotics for the management of university education (Abinbola & Idakwoji, 2023). These technologies enable computer users to analyze vast amounts of data, recognize patterns, make predictions and automate complex processes for the growth of students and institutional development. According to Alagbe, Awodele and Ayorinde (2023), AI is the ability of a computer or machine to mimic the capabilities of the human mind, learning from examples and experiences, recognizing objects, understanding and responding to language, making decisions, solving problems and combining these and other capabilities to perform functions a human might perform, such as greeting a hotel guest or driving a car. Ogunode and Gregory (2023) defined artificial Intelligence as the development of computer systems and machines capable of performing tasks that typically require human intelligence. These tasks include: learning, reasoning, problem-solving, perception and natural language understanding. Artificial Intelligence has applications across numerous fields, including health care, finance, transportation, customer service and education (Manafa & Onyekaba, 2025). Artificial intelligence has the potential to transform educational programmes, enhance innovative ideas, improve efficiency and create new opportunities (AFSA, 2022).

Artificial intelligence has the potentials for spatial processing, language processing and even image processing. AI could be a program developed to perform specific tasks that are being utilized for a wide range of activities including medical diagnosis, electronic trading platforms, robot control, and remote sensing. According to Nwakunor (2021), artificial intelligence (AI) is the computer controlled robots that think intelligently like human, and these robots are controlled electronically with the aid of the computer by mimicking the competencies of the human mind. Artificial intelligence keeps records and analysis of every action being made by the user, especially in the school system (Abinbola & Idakwoji, 2023). As a result of creativity and innovation in science, education and technology, artificial

intelligence is used in all facets of life for human development and comfort. It is used to teach students in the education sector using robots as teaching aids in the classrooms to impact knowledge, skills and ideas to them.

The academic world is becoming more convenient in the management of knowledge, as there exist numerous ways of applying artificial intelligence technology in educational practices for institutional development. This has changed the way people learn since educational materials are becoming accessible to all through smart devices and computers (Manafa & Onyekaba, 2025). As it is today, students do not necessarily need to attend physical classes to study, as long as they have computers and internet connection that will aid them to learn. Artificial intelligence is also allowing the automation of administrative tasks, allowing institutions to minimize the time required to complete difficult tasks so that the educators can spend more time with students (Abimbola & Idakwoji, 2023). However, Nigeria as a developing nation will need to improve her educational system by embracing the expertise of artificial intelligence in the management of university education. This means that artificial intelligence can impact on education, as a teaching and learning process for knowledge and skills acquisition by individuals and groups, with varying degrees of outcomes supports the growth and development of the institution. To ensure inclusive and equitable quality education while promoting lifelong learning opportunities in line with the Sustainable Development Goal 2 & 4 (ensuring that every child completes a full course of primary schooling, and reduction of child mortality), artificial intelligence must be promoted for educational activities in developing countries.

Artificial intelligence can automate the administrative duties of teachers and academic institutions as educators spend a lot of time grading exams, assessing homework, and providing valuable responses to their students. University education however, is no exception to how artificial intelligence (AI) is transforming businesses worldwide as it helps to improve the educational processes, expedite administrative duties, and spur innovation as educational institutions work to adjust to the rapidly changing technological landscape. Analytics driven by artificial intelligence can also provide insightful information about students' behaviour and performance following their individualized competition. University institutions may detect at-risk students early on and provide tailored assistance initiatives by examining data like grades, attendance, and online behaviour (Helm, Swiergosz, Heather, Karnuta, Jonatha & Viktor, 2020).

Artificial intelligence (AI) has revolutionized technology in many domains, and its implications for university education are gaining increasing attention as it has the potential to completely transform administrative, instructional, and learning processes, offering several opportunities to improve the quality and accessibility of education. Artificial intelligence play important roles in the management of university education, and such role include serving as customized learning by analyzing vast data and providing students with individualized learning experiences; intelligent tutoring by mimicking one-on-one interactions with human tutors to provide students with quick feedback, guidance, and assistance; data analytics by analyzing massive datasets to generate useful information and direct university education institutions' decision-making; simplified administrative procedures by saving staff and professors significant time (Hassain, Silva, Unger, Tajmazinani & MacFeely, 2020). Artificial intelligence powered data analytics can help administrators create effective academic strategies, maximize resource allocation, and boost retention rates (Offor, Nwaru & Offiah, 2024). It can accomplish this by identifying patterns in course offerings and forecasting student performance. Chatbots driven by artificial intelligence (AI) can provide prompt support and answers to often requested questions, improving the educational process and operational efficiency.

Therefore, when developing and deploying artificial intelligence systems, fairness, transparency, and accountability must be guaranteed. This implies that artificial intelligence is an instrument to enhance human capabilities, and academic staff of universities are to play a crucial role in helping students acquire critical thinking, creativity, and social skills that AI cannot replicate. University institutions must equally consider accessibility issues while implementing AI technologies. The impartiality of AI systems is determined by the data they are trained on, and university institutions

have to identify and remove bias in AI systems to guarantee justice and equal opportunity for all students (Dam, 2024). AI can improve administrative procedures in university education institutions and revolutionize the educational processes. AI technologies can automate tedious processes, cut down on paperwork, and boost departmental efficiency in various areas, including financial assistance, alumni relations, admissions, and enrolment management (Seo, Tang & Yoon, 2021). By utilizing AI technology, universities may improve students' experiences and more efficiently, manage educational resources appropriately.

Artificial intelligence (AI) has the potential to revolutionize university education by fostering innovation in research and scholarship, streamlining administrative procedures, and personalizing learning experiences. Hence, there is need for all parties involved, including educators, administrators, legislators, and technology companies to work together and realize AI's full promise in education. University education institutions may use AI to make learning more accessible, inclusive, and productive for students by adopting it sensibly and morally.

Statement of the Problem

University education as the life-wire of human capital development of every nation need to be well-structured in terms of providing educational resources for the improvement of academic staff and students' productivity. Artificial intelligence could be seen as an educational resource that must be provided to support the management of university education. But, overdependence of staff and students on the use of AI tools in the management of university education seems to affect their productivity. This is because excessive AI use can lead to decreased critical thinking and problem-solving skills due to lack of human interaction. Over-reliance on AI can reduce face-to-face interaction, potentially negatively impacting social skills. AI systems can perpetuate existing biases if trained on biased data, potentially disadvantaging certain student groups, and raises concerns about student data privacy, security, and potential misuse. It may automate certain teaching tasks, potentially displacing human facilitators. Hence, over-reliance on AI can lead to decreased resilience and adaptability in students.

Purpose of the Study

The aim of this study is to investigate the role of artificial intelligence in the management of university education in Enugu State, Nigeria. The specific objectives include to:

1. find out the ways university education can be managed using artificial intelligence in Enugu State; and
2. ascertain the roles artificial intelligence play in the management of university education in Enugu State.

Research Question

The following research questions guided the study.

1. In what ways can university education be managed using artificial intelligence in Enugu State?
2. What are the roles artificial intelligence play in the management of university education in Enugu State?

Hypotheses

The following hypotheses were tested at a 0.05 level of significance.

1. There is no significant difference between the mean scores of male and female lecturers on the ways university education can be managed using artificial intelligence in Enugu State
2. There is no significant difference between the mean scores of male and female lecturers on the roles artificial intelligence play in the management of university education in Enugu State?

Methodology

The study adopted a descriptive survey design. The study area is Enugu State. The population comprised the 956 male and female lecturers in the Faculty of Education in University of Nigeria, Nsukka and Enugu State University of Technology. There are 561 lecturers in University of Nigeria, Nsukka having 242 male and 319 female lecturers, and 395 lecturers are from Enugu State University of Technology having 155 male and 240 female lecturers. A sample of 230 lecturers was drawn using simple random sampling technique representing 24% of the population. This included 130 lecturers from UNN (50 male and 80 female lecturers), and 100 lecturers from ESUT (40 male and 60 female lecturers). The sample included 90 male and 140 female lecturers. The instrument used for data collection was questionnaire titled 'role of artificial intelligence in the management of university education questionnaire (RAIMUEQ) designed by the researchers. The questionnaire comprised two sections (A and B). Section 'A' contained background information about the respondents, such as sex and status. Section 'B' contained questionnaire items designed to generate relevant information needed in the study based on the variables of the Study. The four-point Likert scale of strongly agree, agree, disagree and strongly disagree was adopted to gather the information needed for data analysis. The instrument was validated by three experts and the reliability was established using Chrombac Alpha Statistics, which yielded an index of 0.91. Mean scores and standard deviation were used to answer the research questions, while t-test was used to test the hypotheses at a 0.05 level of significance.

Results

Answers to Research Questions

Research Question One: In what ways can university education be managed using artificial intelligence in Enugu State?

Table 1: Mean scores and standard deviation of male and female lecturers on the ways university education can be managed using artificial intelligence

S/N	Ways university education can be managed using artificial intelligence include:	Male Lecturers (90)		Female lecturers (140)		Decision
		Mean	**St.D**	**Mean**	**St.D**	
1	AI-powered tools can assist instructors in creating engaging activities	3.41	0.69	3.00	0.59	**Agreed**
2	provide grading and feedback assistance	3.21	0.72	3.12	0.58	**Agreed**
3	AI might assist in the analysis of student data to personalize learning experience	3.27	0.71	3.10	0.58	**Agreed**
4	assisting instructors in creating assignments	3.37	0.70	3.16	0.57	**Agreed**
5	Establish learning pathways based on individual needs and strengths	3.37	0.70	3.34	0.56	**Agreed**
6	AI could be used to develop curriculum by identifying academic trends	3.39	0.69	3.16	0.57	**Agreed**
7	Analyze learning outcomes	3.26	0.71	3.06	0.59	**Agreed**
8	Encouraging the teachers in applying new technology devices in teaching for effective learning	3.23	0.72	3.20	0.57	**Agreed**
9	Recommend best practices for instructional design	3.20	0.72	3.32	0.56	**Agreed**
10	Help educators identify gaps in school curriculum and note areas for improvement	2.95	0.75	2.98	0.60	**Agreed**
	Aggregate Mean Score	3.27	0.71	3.14	0.58	**Agreed**

Data presented in Table 1 showed the mean scores and standard deviation of male and female lecturers on the ways university education can be managed using artificial intelligence. The respondents agreed on all the items with high mean scores above the mean criterion of 2.50. Based on the analysis, it can be seen that the higher the mean score, the lower the standard deviation and vise-versa. The aggregate mean scores of 3.27 (St.D. = 0.71) and 3.07 (St.D. = 0.58) for male and female lecturers respectively

indicated that the items in the table are agreed upon. Therefore, the ways university education can be managed using artificial intelligence include: AI-powered tools assisting instructors in creating engaging activities, providing grading and feedback assistance, assisting in the analysis of student data to personalize learning experience, assisting instructors in creating assignments, establishing learning pathways based on individual needs and strengths, developing curriculum by identifying academic trends, analyzing learning outcomes, encouraging the teachers in applying new technology devices in teaching for effective learning, recommending best practices for instructional design, and helping educators identify gaps in school curriculum and note areas for improvement.

Research Question Two: What are the roles artificial intelligence play in the management of university education in Enugu State?

Table 2: Mean scores and standard deviation of male and female lecturers on the roles artificial intelligence play in the management of university education

S/N	Roles artificial intelligence play in the management of university education include:	Male lecturers (90)		Female lecturers (140)		Decision
		Mean	**St.D**	**Mean**	**St.D**	
1	Enabling the creation of adaptive learning systems that automatically adjust to each student's skill level	3.34	0.70	3.31	0.55	**Agreed**
2	Using AI-based virtual assistants as learning companions for students	3.13	0.73	3.34	0.55	**Agreed**
3	Fostering effective collaboration and knowledge exchange among students	3.28	0.71	3.32	0.55	**Agreed**
4	AI provides natural language tools such as google Cloud Natural Language API, Gensim, SpaCy, IBM Watson, Natural language Toolkit, chatbots, search engines among others to help resolve ambiguities in language	3.35	0.70	3.43	0.54	**Agreed**
5	AI provides enabling environment for communication among people with diverse languages to understand each other	3.18	0.72	3.42	0.54	**Agreed**
6	AI can be used to eliminate repetitive tasks by freeing human capital to work on higher impact problems	3.25	0.71	3.37	0.54	**Agreed**
7	AI can eliminate manual errors in data processing	3.32	0.70	3.35	0.54	**Agreed**
8	AI can improve administrative procedures in university education and revolutionize the educational process	3.38	0.70	3.36	0.54	**Agreed**
9	AI technologies can automate tedious processes and boost departmental efficiency in various areas	3.40	0.69	3.31	0.55	**Agreed**
10	AI can save lecturers' significant time by automating time-consuming administrative tasks like scheduling, admissions, and enrolment	3.34	0.70	3.35	0.54	**Agreed**
11	AI systems can analyse massive datasets to generate useful information and direct universities' decision-making	3.42	0.69	3.41	0.54	**Agreed**
	Aggregate Mean Score	3.31	0.70	3.36	0.54	**Agreed**

Data presented in Table 2 showed the mean scores and standard deviation of male and female lecturers on the roles artificial intelligence play in the management of university education. The respondents agreed on all the items with high mean scores above the mean criterion of 2.50. Based on the analysis, it can be seen that the higher the mean score, the lower the standard deviation and vise-versa. The aggregate mean scores of 3.31 and 3.36 for male and female lecturers respectively indicated that the

items in the table are agreed upon. Therefore, the roles artificial intelligence play in the management of university education include: enabling the creation of adaptive learning systems that automatically adjust to each student's skill level; using AI-based virtual assistants as learning companions for students; fostering effective collaboration and knowledge exchange among students; providing natural language tools such as google Cloud Natural Language API, Gensim, SpaCy, IBM Watson, Natural language Toolkit, chatbots, search engines among others to help resolve ambiguities in language; providing enabling environment for communication among people with diverse languages to understand each other; and eliminating repetitive tasks by freeing human capital to work on higher impact problems. The roles also include: improving administrative procedures in university education and revolutionize the educational process, automating tedious processes and boost departmental efficiency in various areas, saving lecturers' significant time by automating time-consuming administrative tasks like scheduling, admissions, and enrolment; and analysing massive datasets to generate useful information and direct universities' decision-making.

Test of Hypotheses

$H_0$1: There is no significant difference between the mean scores of male and female lecturers on the ways of managing university education using artificial intelligence in Enugu State

Table 3: Summary of t-test analysis on the difference between the mean scores of male and female lecturers on the ways of managing university education using artificial intelligence

Staff Gender	N	Mean	St.D	df	t-calculated value	t-critical value	Decision
Male	90	3.27	0.71	228	0.64	±2.00	**Accept Ho1**
Male	**140**	**3.14**	**0.58**				

Data presented on Table 3 showed the summary of t-test analysis on the difference between the mean scores of male and female lecturers on the ways of managing university education using artificial intelligence in Enugu State. The null hypothesis was accepted because the t-calculated value of 0.64 is less than the t-critical value of ±2.00. This implies that, there is no significant difference between the mean scores of male and female lecturers on the ways of managing university education using artificial intelligence in Enugu State.

$H_0$2: There is no significant difference between the mean scores of male and female lecturers on the roles artificial intelligence play in the management of university education in Enugu State.

Table 4: Summary of t-test analysis on the difference between the mean scores of male and female lecturers on the roles artificial intelligence play in the management of university education in Enugu State

Lecturers' Gender	N	Mean	St.D	df	t-calculated value	t-critical value	Decision
Male	90	3.31	0.70	228	- 0.96	±2.00	**Accept**
Female	**140**	**3.36**	**0.54**				**Ho2**

Data presented on Table 4 showed the summary of t-test analysis on the difference between the mean scores of male and female lecturers on the roles artificial intelligence play in the management of university education in Enugu State. The null hypothesis was accepted because the t-calculated value of - 0.96 is less than the t-critical value of ±2.00. This implies that, there is no significant difference between the mean scores of male and female lecturers on the roles artificial intelligence play in the management of university education in Enugu State.

Discussion of Findings

The findings of the study revealed that, the ways university education can be managed using artificial intelligence include: AI-powered tools assisting instructors in creating engaging activities, providing grading and feedback assistance, assisting in the analysis of student data to personalize learning experience, assisting instructors in creating assignments, establishing learning pathways based on individual needs and strengths, developing curriculum by identifying academic trends, analyzing learning outcomes, encouraging the teachers in applying new technology devices in teaching for effective learning, recommending best practices for instructional design, and helping educators identify gaps in school curriculum and note areas for improvement. The test of hypothesis one had shown that, there is no significant difference between the mean scores of male and female lecturers on the ways of managing university education using artificial intelligence in Enugu State. Proper management of university education increases staff and students' productivity for institutional growth and national development. University education management is a systematic process of making use of human resources (academic and administrative staff) as well as the non-human resources (school buildings, instructional resources, finance and time) to achieve the goals and objectives of the institution. In line with the findings, Oluwuo, Obaro and Nwabueze (2013) revealed that, university education management includes all the activities that leadership in the universities carry out in an effort to implement their quality policy such as quality planning, quality control, quality assurance and quality improvement. Hence, quality university management helps to build up strategic mechanisms to assess the quality of student's admission, quality of academic staff, quality of physical infrastructural facilities, quality teaching and learning experience, quality student assessment, quality teaching methods, and quality of curriculum content. Nwabueze (2017) stated that the realization of quality university services depends on the management of university resources of which artificial intelligence is one of the resources needed for institutional growth.

The findings of the study had finally revealed that, the roles artificial intelligence play in the management of university education include: enabling the creation of adaptive learning systems that automatically adjust to each student's skill level; using AI-based virtual assistants as learning companions for students; fostering effective collaboration and knowledge exchange among students; providing natural language tools such as google Cloud Natural Language API, Gensim, SpaCy, IBM Watson, Natural language Toolkit, chatbots, search engines among others to help resolve ambiguities in language; providing enabling environment for communication among people with diverse languages to understand each other; and eliminating repetitive tasks by freeing human capital to work on higher impact problems. The roles also include: improving administrative procedures in university education and revolutionize the educational process, automating tedious processes and boost departmental efficiency in various areas, saving lecturers' significant time by automating time-consuming administrative tasks like scheduling, admissions, and enrolment; and analysing massive datasets to generate useful information and direct universities' decision-making. Artificial intelligence has the potentials for spatial processing, language processing and even image processing. In line with the findings, Abinbola and Idakwoji (2023) stated that, artificial intelligence keeps records and analysis of every action being made by the user, especially in the school system. As a result of creativity and innovation in science, education and technology, artificial intelligence is used in all facets of life for human development and comfort. It is used to teach students in the education sector using robots as teaching aids in the classrooms to impact knowledge, skills and ideas to them. Hassain, Silva, Unger, Tajmazinani and MacFeely (2020) revealed that, artificial intelligence play important roles in the management of university education, and such role include serving as customized learning by analyzing vast data and providing students with individualized learning experiences; intelligent tutoring by mimicking one-on-one interactions with human tutors to provide students with quick feedback, guidance, and assistance; data analytics by analyzing massive datasets to generate useful information and direct university education institutions' decision-making; simplified administrative procedures by saving staff and professors significant time. Artificial intelligence-powered data analytics can help administrators create effective academic strategies, maximize resource allocation, and boost retention

rates. Chatbots driven by artificial intelligence (AI) can also provide prompt support and answers to often requested questions, improving the educational process and operational efficiency.

Conclusion

The study had shown that AI can automate the administrative duties of teachers and academic institutions as they spend a lot of time grading exams, assessing homework, and providing valuable responses to their students. University education is no exception to how artificial intelligence (AI) is transforming academic and administrative activities worldwide. Hence, AI offers previously unheard-of possibilities to improve the educational process, expedite administrative duties, and spur innovation as educational institutions work to adjust to the rapidly changing technological practices. Artificial intelligence offers exciting opportunities to enhance teaching, learning, and administrative procedures in higher education. Some possible benefits include personalized learning, intelligent tutoring, data analytics, and streamlined administrative processes.

Recommendations

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

1. University administrators should adopt the implementation of artificial intelligence in managing university education to improve students' academic pursuits.
2. The management of universities should create an enabling environment to adopt artificial intelligence in their institutions to help students adjust automatically to their skill level.

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