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Integration of Artificial Intelligence (AI) Driven Assessment Tools on the Academic Performance of Students in Public Universities in Rivers State

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Abstract

The study examined the integration of Artificial Intelligence (AI) Driven Assessment tools on the academic performance of students in public Universities in Rivers State. Three research questions and hypotheses guided the study. The study employed the descriptive research survey design. The population of the study was 1,754 lecturers of Rivers State University and Ignatius Ajuru University of Education in Rivers State. Taro Yamane formula was used to determine the sample size of 514. Proportionate sampling technique was used to select 329 lecturers from Rivers state university and Ignatius Ajuru university of education. The instrument for data collection was a self-structured questionnaire tagged "Artificial Intelligence (AI) Driven Assessment tools on the Academic Performance of Students in Rives State Universities Questionnaire" (AIDAAPSQ). The instrument was validated by 2 experts in educational management and 1 expert in measurement and evaluation in the faculty of education. Reliability of the instrument was determined using Cronbach Alpha method and reliability indexes of 0.78, 0.81, 0.84. Data collected were analysed using mean and standard deviation to answer research questions while Z-test to analyse the hypotheses at 0.05 level of significance. Based on the findings of the study, the study found that despite the potential benefits of these tools in enhancing students learning outcomes, the respondents' feedback indicated a limited extent of adoption and utilization. Based on the findings of the study, recommended among others that lecturers should undergo training and workshops on AI-driven assessment tools to enhance their technical skills and confidence.

Keywords: Artificial Intelligence, Adaptive Assessment, Automated Grading, Intelligent Tutoring, Personalized Learning

Introduction

Education has played a major role in the growth and development of many nations of the world today. Education is very vital to every society be it formal, non-formal or informal. Organisation for Economic Co-operation and Development (2019) defines Education as a process of facilitating learning, or the acquisition of knowledge, skills, values, beliefs, and habits, through various methods, including teaching, training, research, and engagement with the social and physical environment. University education is a process of higher learning that focuses on the development of advanced knowledge, critical thinking and research skills, preparing students for leadership, innovation and civic engagement in a rapid changing world. (Bok, 2013). University education is a transformative stage from one level of experience to another. In a nut shell, it is a continuous process. Offor-Douglas (2021), perceived university

education as education obtained after the secondary school level with the purpose of training future leaders who will be politicians, educators, lawyers, engineers, doctors, and scientist etc. The purpose of university education includes teaching, learning, research, community, and skill development. UNESCO (2020) described University education as that level of education that follows secondary school (high school). It is an advanced level of education that typically takes place in a university or college setting.

University education aims to:

1. Provide advanced knowledge and skills in a specific field
2. Foster critical thinking, creativity, and problem-solving
3. Develop research and analytical skills
4. Prepare students for careers and leadership roles
5. Promote personal growth, social responsibility, and global citizenship.

In our society today, the quest for science and technology are becoming increasingly oriented towards a massive process of technology in all aspects of the economy be it educational, political, social and what have you. Man has been in constant search for knowledge and a way to make things easier for himself. It is as a result of this search that the invention in the area of artificial intelligence becomes very necessary. There has been a widely accepted believe that technology has made the world go round and easy.

This quest of adapting to new technological world has created a variety of technologies that allow communication with the user, called “virtual assistants”, which use computer algorithms to imitate or replicate human intelligence so that users have the feeling that they are interacting with another person. This concept is known as “artificial intelligence” (AI) (Ocaña, Valenzuela, & Garro, 2019; Yang, Zhuang, & Pan, 2021). In educational environments, AI has taken special interest, in given the high possibilities of communication established between teachers and students when using virtual information assistants, since its excerption there is a simulation of responses that approach a human conversation. As the tool is used, the interaction with the user is learned and recognised intuitively. Artificial intelligence has three major areas of interest in education: learning with AI (using AI tools in the classroom), learning about AI (its technologies and techniques) and preparing for AI (enabling all students to understand the potential impact of AI on human life). AI has the potential to address some of the biggest challenges facing education today.

Studies have shown that AI-driven assessment has a positive impact on academic performance. According to Oyekunle and Adekunle (2022), AI-driven assessment provides immediate feedback, which has been shown to improve student engagement, motivation, and ultimately, academic performance. Similarly, Nwosu and Okoro (2022) in their research on challenges and opportunities of AI-driven assessment in Nigerian Universities found that AI-driven assessment promotes personalized learning, which leads to improved student outcomes, including increased accuracy, reduced bias, and enhanced student engagement.

Furthermore, Igwe and Okeke (2020) noted that AI-driven assessment helps to identify knowledge gaps and provides targeted interventions, leading to improved student academic performance and reduced attrition rates. However, some studies have raised concerns about the limitations of AI-driven assessment. For instance, Zhang (2020) argued that AI-driven assessment may perpetuate existing biases if the data used to train the algorithms is biased. Despite these concerns, the majority of studies suggested that AI-driven assessment has a positive impact on academic performance. As Garcia (2018) noted, AI-driven assessment has the potential to revolutionize the way we evaluate student learning, making it more efficient, accurate, and personalized.

The integration of Artificial Intelligence (AI) in education has transformed the learning landscape, offering innovative opportunities for students to enhance their academic performance. Rivers State Universities, like many other institutions globally, are embracing AI-powered tools and platforms to support student learning. However, the impact of AI on academic performance of students in this context remains largely unexplored. Vegara (2023), stated that Artificial intelligence (AI) has impacted in various sectors of the society, from taking care of the usual practice of doing things manually to the present day of getting things done through the use of machines. The impact of artificial intelligence on education and students cannot be overemphasised has gradually brought a change in the educational system.

AI has brought about a personalized learning that is facilitated by AI algorithms, which is programmed towards educational content for individual needs, enhancing understanding and engagement. Virtual tutors powered by AI offer immediate support, promoting independent learning and critical thinking. AI-driven content creation, including simulations and virtual labs, makes learning and teaching easier. Students gain exposure to advanced technologies, preparing them for a technology- centric future workforce. However, challenges like data privacy concerns and potential over reliance on technology need careful consideration, (Hogan,

2024). According to Schiller (2023) artificial intelligence (AI) has evolved from a mere science fiction fantasy to a tangible reality that is revolutionizing various aspects of our lives. In the field of higher education, AI is playing a fundamental role in transforming the way students learn and prepare for the future. According to Rodrigo (2023), artificial intelligence (AI) is a branch of research systems created to execute skills that are often associated with human beings these functions include recognizing faces or voices, playing chess, or driving a vehicle in Education (AIED) is a term that describes the application of AI in educational set enhancing the teaching, learning, or overall educational experience. It is possible that AIED will have a significant effect on humans. AIED stands for Artificial Intelligence in Education. It refers to the application of artificial intelligence (AI) technologies and methods to improve learning outcomes, teaching effectiveness, and educational experiences. AIED involves using AI to:

1. Personalize learning
2. Automate grading and feedback
3. Develop intelligent tutoring systems
4. Analyze learning data and provide insights
5. Support accessible and inclusive education
6. Enhance teacher professional development

AIED research focuses on developing and evaluating AI-powered educational tools, systems, and environments that can:

1. Adapt to individual learners' needs
2. Provide real-time feedback and guidance
3. Foster collaborative and interactive learning
4. Support lifelong learning and skill development

According to Sharples (2022), evidence of the beneficial effects of the technologies are not only vital for policy but also for the ethical application of AI. AI is required prior to the investment of time and other resources, such as the effort of passing off the work of another person as one's own has been a prevalent practice written essays continue to be an important component of educational assessment. AI-driven assessment refers to the use of Artificial Intelligence (AI) technologies to evaluate student learning, understanding, and performance. AI-driven assessment utilizes machine learning algorithms, natural language processing, and data analytics to:

1. Adaptive Assessment Tools (AAT): This includes AI-driven assessment tools that adjust their level of difficulty and content in real-time based on student performance.
2. Automated Grading System (AGS): This includes AI-driven systems that provide immediate feedback and scores to students, reducing grading time and increasing feedback accuracy.
3. Intelligent Tutoring System (ITS): This includes AI-driven systems that provide personalized learning experiences, real-time feedback, and adaptive scaffolding to support student learning.
4. Enhance rubric-based assessment: AI is used to evaluate student work against specific criteria and rubrics, increasing consistency and accuracy.
5. Support authentic assessments: it is helpful in assessing the students during seminar presentations and projects.
6. Predict students' performance: AI driven tools can be used in predicting the academic ability of a students in future. The use of algorithms machine to predict the learning outcome of a student and also suggests areas of deficiency where such student will be needing support.

AI-driven assessment has the potential to:

1. Increase efficiency and accuracy
2. Enhance student engagement and motivation
3. Provide personalized learning experiences
4. Support data-driven instruction
5. Foster transparency and fairness in evaluation

The impact of AI and AI tools on the future of education is massive, transformative, and also helps in redefining traditional teaching methods. AI has the ability to personalize learning experiences, tailoring content to individual student needs, enhances comprehension and engagement. Adaptive learning platforms, powered by AI, create dynamic and customized educational journeys. Moreover, AI automates administrative tasks, freeing educators to focus on interactive and creative teaching methods. Virtual tutors and AI-driven tools offer real-time support, fostering independent learning.

Statement of the problem

Despite the potential of AI-driven assessment tools to enhance student learning outcomes, public universities in Rivers State continue to face challenges in integrating these tools into

their assessment practices, resulting in: Inefficient assessment methods that fail to accurately measure student learning outcomes, Limited feedback and guidance for students to improve their academic performance, Inadequate use of data and analytics to inform instruction and drive student success, and significant disparities in academic performance among students, with some struggling to meet learning objectives.

The traditional methods of assessment used in these universities may not be effectively capturing students learning outcomes and the potential benefits of AI driven assessment such as personalized feedback and adoptive learning are not being fully leveraged. It has been observed that most at times students do not get their anticipated feedback instantly while AI-driven assessment has the potential to enhance the accuracy and efficiency of assessment processes, its effectiveness in improving student learning outcomes in public universities in Rivers State remains unknown. Furthermore, there are concerns about the potential biases and limitations of AI-driven assessment tools, which may disproportionately affect certain student groups. Therefore, this study aims to investigate the impact of integrating AI-driven assessment tools on the academic performance of students in public universities in Rivers State, with a focus on identifying potential benefits and areas for improvement.

Purpose of the study

The purpose of the study is to examine the integration of AI- driven assessment tools on the academic performance of students in public universities in Rivers state. Specifically, the research sought to achieve the following:

1. investigate the effect of Adaptive Assessment Tool (AAT) on students' academic performance in public universities in Rivers state.
2. to identify the impact of Automated Grading Systems (AGS) on students' academic performance in public universities in Rivers state.
3. to determine the effectiveness of Intelligent Tutoring Systems (ITS) in improving students' academic performance in public universities in Rivers state.

Research questions

The following research questions were posed to guide the study:

1. To what extent does Adaptive Assessments Tool (AAT) affect the students' academic performance in public universities in Rivers state?
2. To what extent does Automated Grading Systems (AGS) influence the students' academic performance in public universities in Rivers state?

3. To what extent does Intelligent Tutoring Systems (ITS) improve students' academic performance in public universities in Rivers State?

Hypotheses

The following research questions were tested at 0.05 level of significance.

1. There is no significant difference in the mean response of students of RSU and IAUE on the effect of adaptive assessments on the students' academic performance in public universities in Rivers state.
2. There is no significant difference on the mean response of RSU and IAUE students on the influence of automated grading systems on the students' academic performance in public universities in Rivers state.
3. There is no significant difference on the mean response of RSU and IAUE students on the improvement of intelligent tutoring systems on the academic performance of students in public universities in Rivers State.

Methodology

The study adopted descriptive survey design. The study was conducted in two state universities in Rivers state. The universities were Rivers State University and Ignatius Ajuru University of education, Port Harcourt. The population of the study was 1,754 consisting of 1,330 lecturers from Rivers state university and 424 lecturers from Ignatius Ajuru university of education. The sampling size of the study was determined using Taro Yamane formula which gave the sample size as 514. Proportionate sampling technique was used to select 329 lecturers from RSU and IAUE which is 64% of the sample size. The instrument for data collection was a self-structured questionnaire, titled "Artificial Intelligence (AI) Driven Assessment tools and the Academic Performance of Students in Rives State Universities Questionnaire" (AIDAAPSQ). the instrument was sub-divided into 2 sections. Section A had to do with the demography of the respondents while section B was about items that illicit the responses from the respondents on the research questions presented. Responses from the respondents were graded using a 4likert scale of Very High Extent (VHE), High Extent (HE), Low Extent (LE), and Very Low Extent (VLE) with rating values as 4,3,2 and 1. The instrument was validated by two experts from department of Educational Management and Measurement and Evaluation in Rivers State University for face and content validity. The instrument was vetted in terms of appropriateness, relevance and level of language and corrections made were effected in the final copy of the instrument before administering. The instrument was administered on 20 lecturers from university of Port Harcourt. The reliability of the instrument was obtained using Cronbach

Alpha method and reliability indexes of 0.78, 0.81, 0.84 were obtained for the various clusters of the instrument. The instrument was administered directly by the researcher to the respondents with the help of two research assistants. Out of the 329 copies of the questionnaire administered, 320 copies were properly filled and retrieved: 200 from RSU lecturers and 120 from IAUE lecturers. Research questions were analyzed using mean and standard deviation statistics while the hypotheses were tested using z-test. Decision rule for the research questions were based on the classification of level of extent.

Classification Value Range

Very High Extent (VHE)= 4	3.50 – 4.00
High Extent (HE) =3	2.50 – 3.49
Low Extent (LE) =2	1.50 – 2.49
Very Low Extent (VLE) = 1	1.00 – 1.49

The null hypothesis was rejected and the alternate hypotheses accepted when the computed value was greater than the critical value of 1.96 at the significance level of 0.05. On the contrary, the null hypothesis was also accepted and the alternate hypotheses rejected when the computed value is less than the critical table value of 1.96.

Results

Research Question 1: To what extent does adaptive assessments affect the students' academic performance in public universities in Rivers state?

Table 1: Mean and Standard Deviation of Respondents on the Extent of the effect of Adaptive Assessment Tools (AAT) on the students' academic performance in public universities Rivers State.

S/NO: To what extent do you:		RSU (N=200)			IAUE (N=120)		
		X1	SD1	RMK	X2	SD2	RMK
1	believe AAT enhances student engagement in your courses?	3.5	0.87	High Extent	3.7	0.90	High Extent
2	use AAT to adjust the difficulty level of assessments for students?	2.0	0.58	Low Extent	2.1	0.58	Low Extent
3	think AAT helps students identify knowledge gaps in your course?	3.1	0.80	High Extent	3.0	0.81	High Extent

4	utilize AAT to provide real-time feedback to students?	2.1	0.59	Low Extent	2.3	0.81	Low Extent
5	believe AAT improves student motivation and participation?	3.0	0.80	High Extent	3.1	0.80	High Extent
6	use AAT to track student progress and understanding?	2.3	0.60	Low Extent	2.2	0.52	Low Extent
7	believe AAT reduces student anxiety and stress during assessments?	2.8	0.76	High Extent	3.0	0.79	High Extent
GRAND MEAN & SD		2.7	0.71		2.8	0.74	

Researcher's field Result 2024

The result in table 1 shows the responses of lecturers in both RSU and IAUE on the extent adaptive assessments tools affect students' academic performance in public universities in Rivers state. The result in table 1 revealed that lecturers in RSU had mean and standard deviation scores of 2.7 and 0.71 whereas lecturers in IAUE had a mean and standard deviation scores of 2.8 and 0.74. The closeness in the average mean and standard deviation of lecturers from both schools shows that there is an effect of Adaptive assessment tools on academic performance of students in public universities in Rivers state to a high extent.

Research Question 2: To what extent does Automated Grading Systems (AGS) influence the students' academic performance in public universities in Rivers state?

Table 2: Mean and Standard Deviation of Respondents on the Extent Automated Grading Systems (AGS) influence the students' academic performance in public universities in Rivers state.

S/NO	To what extent do you:	RSU (N=200)			IAUE (N=120)		
		X1	SD1	RMK	X2	SD2	RMK
8	believe AGS reduces grading time and increases accuracy?	3.9	0.88	High Extent	3.8	0.80	High Extent
9	use AGS to provide immediate feedback to students?	2.4	0.59	Low Extent	2.3	0.57	Low Extent
10	think AGS helps students track their progress and performance?	3.1	0.78	High Extent	3.5	0.89	High Extent
11	utilize AGS to identify areas where students need improvement ?	2.3	0.54	Low Extent	2.2	0.59	Low Extent

12	believe AGS improves student satisfaction with feedback?	3.5	0.84	High Extent	3.7	0.90	High Extent
13	use AGS to generate detailed reports on student performance?	3.4	0.80	High Extent	3.6	0.86	High Extent
14	believe AGS enhances the overall grading process?	3.4	0.80	High Extent	3.5	0.84	High Extent
GRAND MEAN & SD		3.1	0.75		3.2	0.78	

Researcher's field Result 2024

The result in table 2 shows the responses of the lecturers in RSU and IAUE on the extent automated grading systems influence students' academic performance in public universities in Rivers state. The result indicated in table 2 revealed that lecturers in RSU had an average mean and standard deviation of 3.1 and 0.75 whereas students in IAUE had an average mean and standard deviation of 3.2 and 0.78. The closeness in the mean of both schools shows that there is an influence of automated grading systems on the students' academic performance in Rivers state universities to a high extent.

Research Question 3 To what extent does Intelligent Tutoring Systems (ITS) improve students' academic performance in public universities in Rivers State?

Table 3: Mean and Standard Deviation of Respondents on the Extent Intelligent Tutoring Systems (ITS) improve students' academic performance in public universities in Rivers State.

S/NO: To what extent do you:		RSU (N=200)			IAUE (N= 130)		
		X1	SD1	RMK	X2	SD2	RMK
15	believe ITS provides personalized learning experiences for students?	3.3	0.78	High Extent	3.6	0.79	High Extent
16	use ITS to provide real-time guidance and support to students?	2.3	0.57	Low Extent	2.4	0.53	Low Extent
17	think ITS helps students develop critical thinking and problem-solving skills?	3.8	0.79	High Extent	3.5	0.84	High Extent
18	utilize ITS to adapt to individual student learning styles?	2.2	0.57	High Extent	2.3	0.44	High Extent
19	believe ITS improves student engagement and motivation?	3.1	0.89	High Extent	3.4	0.84	High Extent

20	use ITS to identify knowledge gaps and provide targeted interventions?	2.4	0.58	Low Extent	2.3	0.59	Low Extent
21	believe ITS enhances student learning outcomes and academic performance?	3.4	0.80	High Extent	3.4	0.83	High Extent
GRAND MEAN & SD		2.9	0.71		2.9	0.69	

Researcher's field Result 2024

The result in table 3 shows the responses of the lecturers in RSU and IAUE on the extent intelligent tutoring systems improve the academic performance of students in Rivers state universities. The result indicated in table 3 revealed that lecturers in RSU had an average mean and standard deviation of 2.9 and 0.71 whereas students in IAUE had an average mean and standard deviation of 2.9 and 0.69. The closeness in the mean of both schools shows that intelligent tutoring systems improves the students' academic performance in Rivers state universities to a high extent.

Test of hypotheses

1. Ho1: There is no significant difference in the mean response of lecturers of RSU and IAUE on the effect of adaptive assessments tools on the students' academic performance in public universities in Rivers state.

Table 4: Z-test Analysis the Extent of the effect of Adaptive assessment tools on the students' academic performance in public universities in Rivers State.

Respondents	N	X	SD	DF	z-cal	Z-crit	A	Decision
RSU	200	2.7	0.71	318	0.641	±1.96	0.05	Accept
IAUE	120	2.8	0.74					

The analyzed data in table 4 revealed that the z- calculated value is 0.641 and the z-critical table value is ±1.96 with a degree of freedom of 318 at 0.05 level of significance. Since the z-cal (0.641) is less than the z-critical value (±1.96), the null hypothesis was not rejected indicating that there is no significant difference in the mean responses of RSU lecturers and IAUE lecturers on the extent adaptive assessment tools affects the students' academic performance in public universities in Rivers state.

- 2 HO₂: There is no significant difference on the mean response of RSU and IAUE lecturers on the influence of automated grading systems on the students' academic performance in public universities in Rivers state.

Table 5: Z-test Analysis on the extent automated grading systems influence the students' academic performance in public universities in Rivers state

Respondents	N	X	SD	DF	z-cal	Z-crit	A	Decision
RSU	200	3.1	0.75	318	0.621	±1.96	0.05	Accept
IAUE	120	3.2	0.78					

The analyzed data in table 5 revealed that the z- calculated value is 0.621 and the z-critical table value is ±1.96 with a degree of freedom of 328 at 0.05 level of significance. Since the z-cal (0.621) is less than the z-critical value (±1.96), the null hypothesis was not rejected indicating that there is no significant difference in the mean responses of lecturers in RSU and IAUE on the extent automated grading systems influence students' academic performance in Rivers state universities.

- 3 HO₃: There is no significant difference on the mean response of RSU and IAUE lecturers on the improvement of intelligent tutoring systems on the academic performance of students in public universities in Rivers State.

Table 6: Z-test Analysis on the Extent the improvement of intelligent tutoring systems affects the students' academic performance in public universities in Rivers state.

Respondents	N	X	SD	DF	z-cal	Z-crit	A	Decision
RSU	200	2.9	0.71	318	0.541	±1.96	0.05	Accept
IAUE	120	2.9	0.69					

The analyzed data in table 6 revealed that the z- calculated value is 0.541 and the z-critical table value is ±1.96 with a degree of freedom of 328 at 0.05 level of significance. Since the z-cal (0.541) is less than the z-critical value (±1.96), the null hypothesis was not rejected indicating that there is no significance difference in the mean responses of RSU and IAUE lecturers on the extent the improvement of intelligent tutoring systems affects academic performance of students in public universities in Rivers State.

Discussion of findings

Result from table 1 revealed that lecturers in the public universities in the state agreed to a high extent that adaptive assessment tools have an effect in the academic performance of students in the public universities in Rivers state. These Adaptive assessment tools can help the lecturers through: enhances student engagement in their courses, adjusting the difficulty level of assessments for students, helping students identify knowledge gaps in their course areas, providing real-time feedback to students, improving students' motivation and participation, track students' progress and understanding, help in reducing students' anxiety and stress during assessments. However, lecturers in these two public universities do not adequately utilize or integrate this adaptive assessment tools in their academic assessment programmes. Afolabi, (2020), opined that despite the potential of adaptive assessment tools to enhance student learning, many lecturers in Nigerian universities have been slow to adopt and integrate these tools into their teaching practices. Supporting this assertion, Ogunsola (2019), stated that the integration of adaptive assessment tools in Nigerian universities is hindered by lecturers' lack of technical skills, inadequate training, and limited access to resources Vergara (2023) stated that Artificial intelligence (AI) has impacted various sectors of society, from replacing rudimentary tasks in factories to tailoring advertisements based on user information. Despite its proven utility, the full-fledged adoption of AI in the educational realm remains nascent. Numerous studies have delved into the application of different forms of AI, such as machine learning and natural language processing, to enhance students' performance and engagement. The corresponding hypothesis 1 revealed that there is no significant difference in the mean response of the lecturers from RSU and IAUE in the effects of Adaptive assessment tools on the students' academic performance. Oyekule and Adekule (2022), opined that Adaptive assessment has a positive impact on students' academic performance as it provides immediate feedback, identifies knowledge gaps, and facilitates personalized learning.

Result from table 2 revealed that the integration of automated grading systems influenced the students' academic performance in public universities in Rivers state in many ways. The result had showed that it: reduces grading time and increases accuracy, provides immediate feedback to students, helps the lecturers in tracking students' progress and performance, helps in identifying areas where students have need for improvement, improves students' satisfaction with feedback, helps in generating detailed reports on students' performance and enhances the

overall grading process of students. Lajoie, (2015) stated that Automated grading systems can reduce grading time by up to 90%, freeing instructors to focus on teaching and mentoring students. The corresponding hypothesis 2 revealed that there is no significance difference in the mean responses of lecturers from RSU and IAUE on automated grading systems on the academic performance of the students to a high extent. In support of this assertion, Bennett, (2018) opined that Automated grading systems can provide immediate feedback to students, which can lead to improved students' outcome, increased students' satisfaction, and reduced teacher workload.

The result in table 3 revealed the improvement of intelligent tutoring systems on academic performance of the students through: provision of personalized learning experiences for students, provision of real-time guidance and support to students, helping students develop critical thinking and problem-solving skills, adapting to individual student learning styles, improving students' engagement and motivation, identifying students' knowledge gaps and provide targeted interventions and enhancing students' learning outcomes and academic performance.

VanLehn and Nwaigwe, (2017) opined that Intelligent tutoring systems have been shown to be effective in improving students' learning outcomes, with average gains of 0.5 to 1.0 standard deviations compared to traditional instruction. The corresponding hypothesis 3 revealed that there is no significant difference in the mean responses of students in RSU and IAUE on the improvement of intelligent tutoring systems on the students' academic performance. Heffernan and Heffernan, (2018), on their study on the impact of intelligent tutoring systems on student academic achievement: A meta-analysis, stated that the results of this meta-analysis suggest that intelligent tutoring systems have a positive and significant impact on students' academic achievement, with an average effect size of 0.35 standard deviations.

Supporting this, Ritter & Tanner, (2016) were of the view that intelligent tutoring systems can be an effective way to improve student outcomes, particularly for students who are struggling or at risk of falling behind their peers.

Conclusion

Based on the findings of the study, it was concluded that lecturers in public universities in Rivers state have not fully embraced the integration of AI-driven assessment tools in their teaching practices. Despite the potential benefits of these tools in enhancing student learning outcomes, the respondents' feedback indicated a limited extent of adoption and utilization. This could be attributed to various factors such as lack of technical expertise, inadequate training,

and limited access to resources. The results of this study highlight the need for universities to provide lecturers with the necessary support and resources to effectively integrate AI-driven assessment tools, ensuring that students receive the best possible learning experience. By doing so, universities can harness the potential of AI-driven assessment tools to improve students' outcomes, academic performance, and overall quality of education.

Recommendations

Based on the findings of the study, it was recommended that:

1. lecturers should undergo training and workshops on AI-driven assessment tools to enhance their technical skills and confidence.
2. Government should provide adequate resources, including hardware, software, and internet connectivity, to support the integration of AI-driven assessment tools.
3. There should be review and revise of curricula to incorporate AI-driven assessment tools and ensure alignment with learning objectives.

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Revitalizing Educational Management in Nigeria: Pathways to Sustainable Development through Effective Leadership and Policy Reform

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Abstract

This paper explores the revitalization of educational management in Nigeria, highlighting effective leadership and policy reform in attaining sustainable development. The educational system of Nigeria is confronted with various challenges such as low literacy rates, inadequate infrastructure, insufficient funding, policy implementation and governance. These hurdles obstruct the delivery of quality education and restrict the nation's capacity for advancement. Efficient leadership is acknowledged as a crucial component in transforming educational management. By cultivating accountability and inclusiveness, educational leaders may significantly improve institutional performance. Leadership strategies that promote collaborations are effective in addressing the increasing demands of the educational sector. The paper advocates for comprehensive, evidence-based policy overhauls that are open and responsive to changing circumstances. Regular policy evaluations are essential to ensure the continued relevance and effectiveness of policies. By implementing these measures, Nigeria can overcome its educational challenges and establish the foundation for sustainable development.

Keywords: Revitalization, Educational Management, Sustainable Development, Effective Leadership, Policy Reform.

Introduction

Nigeria, holds immense potential in its diverse human capital. The nation boasts a rich cultural heritage, abundant natural resources, and a dynamic youthful population that, if properly harnessed, can drive the country towards sustainable development. However, despite this vast potential, Nigeria's educational sector faces significant challenges that have hindered its progress and, by extension, the overall development of the country. The current state of educational management in Nigeria is critical, not only for the personal growth and advancement of its citizens but also for the sustainable development of the nation (Musah, 2021). The educational system in Nigeria is marked by stark disparities and systemic

deficiencies. These include low literacy rates, inadequate infrastructure, insufficient funding, ineffective policy implementation etc. These challenges are exacerbated by socio-economic factors such as poverty, cultural practices that devalue education, and a burgeoning population that the current educational infrastructure cannot adequately support (Olujuwon, 2019). The compounded effect of these issues is a system that struggles to provide quality education to all its citizens, thereby impeding national growth and development.

Educational Management refers to the process of planning, organizing, directing, and controlling the activities within an educational institution to achieve its objectives. It involves the efficient and effective use of resources, both human and material, to foster a conducive learning environment. Educational management encompasses various functions, including curriculum development, staff management, financial planning, and infrastructure maintenance. It aims to ensure that educational institutions operate smoothly and deliver high-quality education to students (Weli, 2017). Effective leadership and policy reform are vital in revitalizing Nigeria's education sector. Leadership in education encompasses setting a clear vision, direction, and tone for educational institutions, ensuring that they are managed efficiently and sustainably. Policy reform provides the necessary framework within which these institutions operate, addressing systemic issues and relating it to educational objectives with national development goals. Together, effective leadership and sound policy reforms create an environment conducive to learning, innovation, and growth.

The global system offers numerous examples of successful educational management and policy reform from which Nigeria can learn. Countries like Finland, Singapore, and Rwanda have implemented strategies that have transformed their educational systems, resulting in improved educational outcomes and national development. These countries have demonstrated that with the right mix of leadership, policy, and investment, significant improvements in educational quality and access is achieved. By incorporating these best practices to the Nigerian context, the country can address its unique challenges and set itself on a path toward sustainable development (OECD, 2021; Musah, 2021;). The educational system in Nigeria is a key component in the nation's development framework, playing major role in shaping the socio-economic future of the country. Historically, Nigeria's educational system has undergone several transformations influenced by colonial legacies, post-independence aspirations, and contemporary global trends. The current state of education in Nigeria presents a mixed picture of progress and persistent challenges, necessitating revitalization of educational management.

Nigeria's education system dates to pre-colonial times, where informal education was the norm, focusing on vocational skills, cultural transmission, and moral instruction. With the advent of colonial rule, formal education was introduced, primarily serving the colonial administration's needs. Post-independence Nigeria saw an expansion of the education system, aiming to democratize access and reduce illiteracy rates. However, rapid population growth, economic challenges, and political instability have often hampered these efforts. In recent years, the Nigerian government has implemented various reforms to address these challenges. These include policies aimed at increasing funding for education, improving teacher quality, and expanding access to education in rural areas/ regions. Despite these efforts, significant gaps remain. Many schools, particularly in rural areas, lack basic infrastructure, learning materials, and qualified teachers. The education sector also faces systemic issues such as corruption, policy inconsistencies, and inadequate stakeholder engagement.

Policy reforms are another critical component in revitalizing education in Nigeria. Nigerian government has introduced several policy initiatives aimed at improving the quality of education. For instance, the Universal Basic Education (UBE) program was launched to provide free and compulsory education for children up to junior secondary school. Additionally, policies promoting Science, Technology, Engineering, and Mathematics (STEM) were introduced to relate the curriculum with the demands of the modern economy. However, the implementation of these policies often falls short due to lack of funding, poor coordination, and insufficient supervision and assessment (Adebayo, 2019). effective educational leadership and policy reforms is central to achieving sustainable development in Nigeria. Effective educational leaders can drive the successful implementation of policies by creating a culture of accountability and continuous improvement.

The historical context of Nigeria's educational system highlights policy and leadership dynamics. During the colonial era, educational policies were primarily designed for colonial administration's needs. Post-independence, the Nigerian government sought to indigenize the curriculum and expand access to education. However, these efforts were often hampered by political instability and economic challenges. The focus shifted towards relating educational policies with global standards and encouraging innovation through technology and STEM education. These dynamics are particularly pronounced in Nigeria's universities, universities play a crucial role in national development by producing the skilled workforce needed for various sectors of the economy. However, Nigerian universities face numerous challenges,

including inadequate funding, poor infrastructure, and brain drain (Josiah et al., 2023). Policy reforms for university governance, autonomy and research capacity are instruments for revitalizing the higher education sector. Driving these reforms in universities are administrators, must exhibit strong leadership skills for institutional management and effective policy implementation. This involves not only managing resources efficiently but also encouraging academic excellence.

Theoretical Perspectives

Revitalization of educational management in Nigeria stapled on policy reform and effective leadership grounded in several theoretical perspectives that illustrate education, leadership, and sustainable development. Understanding these theories and contextualizing management in Nigeria education, where systemic challenges have long delayed progress.

Transformational Leadership Theory by James MacGregor Burns. The theory focuses on leaders and followers' relationships, how leaders can galvanize and motivate stakeholders towards shared objectives (Ololube, 2019). This theory asserts that transformational leaders are important in facilitating substantial change by cultivating a collective vision, promoting innovation and dedication. The need for administrators of higher institutions in Nigeria to adopt transformational leadership theory is imperative for tackling insufficient infrastructure, inadequate funding, and systemic inefficiencies. By embracing this leadership concept, educational leaders can mobilize efforts to enact sustainable policies that resonate with the broader aspirations.

Transformational leadership presents a viable avenue for educational leaders to galvanize and inspire both faculty and students towards a collective vision of enhancement. By prioritizing innovation, dedication, and collaborative effort can facilitate the mitigation of resistance to change, cultivate ongoing improvement, and harmonize educational practices with the overarching objectives. Ololube (2019) posits that effective leaders inspire and motivate followers to transcend their self-interest for the collective good, encouraging organizational change and growth. This implies that transformational leadership is indispensable for invigorating the educational sector and mobilizing resources to enact effective reforms (Adiele, 2020). Efficacious policy reform necessitates the engagement of diverse stakeholders, including governmental bodies, educators and international collaborators. This cooperative approach guarantees that educational policies are not only meticulously designed but also effectively

implemented and scrutinized. The relevance of this theory resides in its focus on policy transformation, which is essential for the revitalization of Nigeria education.

Conceptual Discussion

Revitalization

The constructs of revitalization, educational management, sustainable development, effective leadership, and policy reform are intricately interconnected and collectively constitute the foundational elements of endeavors Nigeria's educational framework. Each construct offers a distinct perspective through which one can scrutinize the multifaceted challenges and prospects confronting education in Nigeria, and collectively, they provide an exhaustive schema for comprehending the mechanisms necessary for instigating substantial transformation.

Revitalization transcends mere enhancement; it entails a fundamental transformation of the educational system to become increasingly responsive, dynamic, and congruent with contemporary exigencies (Green et al., 2021; El Khoury, 2023). Revitalization is imperative in Nigeria education based on obstacles that have beleaguered the educational domain for numerous decades, including insufficient funding, antiquated curricula, and deficient infrastructural support. The notion of revitalization embodies the concept of reinvigoration, infusing novel energy and innovative methodologies into education that can surmount these entrenched challenges. Revitalization typically is a multifaceted strategy that encompasses curricular reform with educational content aligning with the exigencies of a modern economy, infrastructural enhancement to furnish students with favorable learning environments, and investment in professional teaching development to elevate instructional quality. Revitalization connotes a dedication to continuous assessment and adaptation, thereby guaranteeing that the educational system remains attuned to the evolving demands of society.

Educational Management

Educational Management refers to the systematic organization and coordination of educational institutions to accomplish specific objectives. It encompasses a range of activities, including strategic planning, decision-making and evaluation. It is the administration of the education system in which a group combines human and material resources to supervise, plan and implement structures to execute an education system (Ehule & Dike, 2024). Educational management ensures that academic institutions function seamlessly and that learners receive an education of high quality.

The challenges of educational management in Nigeria are enormous. Issues such as inadequate financial resources, poor governance and accountability, inefficiencies, etc. Educational management emphasizes the efficient utilization of resources to mitigate these challenges. This includes the implementation of policies in institutional administration, accountability and the promotion of the professional advancement of educators. By strengthening educational management, Nigeria can enhance the capacity of its institutions and fulfill their commitment to learners.

Sustainable Development

Sustainable development is a concept that correlates education with wider societal aspirations. It posits that education should not solely prepare individuals for employment but also instill in them competencies essential for contributing to advancement of society. The variations in intellectual society have always tailored towards educational revitalization. Education for Sustainable Development (ESD) is commonly understood as education that encourages changes in knowledge, skills, values and attitudes to enable a more sustainable and just society for all. Sustainable development goals, specified by UNESCO, 2017 in Aberu and Lawal (2022) as necessary conditions for nations to ensure economic sustainability for human beings are: No poverty, decent work and economic growth, zero hunger, good health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy, industry, innovation and infrastructure, reduced inequalities, sustainable cities and communities, responsible consumption and production, climate action, justice and strong institutions, partnership for the goals are not negotiable, then it becomes abundantly clear that most countries in Africa are still lagged in attaining the sustainable development agenda when compared to Malaysia, Singapore and the other Asian Tigers that uses industrialization and education to escape the trap of poverty and build world-class economies.

Therefore, education becomes a fundamental objective of sustainable development and a prominent source of sustainable development indeed. At the same time, education plays a key role in the ability of a developing country to absorb modern technology and to develop the capacity for self-sustaining growth and development. There is an extensive disparity between educational standards and learning achievements in Nigeria. The system emphasizes theoretical knowledge at the expense of technical, vocational, and entrepreneurial education. School curricula remain unstandardized without review to make them relevant and practice oriented. Education in Nigeria has faced several tailbacks, one of which is the poor funding. The government has not been providing adequate funds to stir up educational activities in the

country. Annual budgetary estimates carry little proportions of allocation for education sector which ought to have been given more priority. However, Nigeria is far away from attaining the benchmark specified by UNESCO, which specified that developing nations should allocate at least 26 percent of their yearly budget to education. thereby impeding human development strength of the country which is supposed to activate growth and sustainable development. Thus, it is of great concerned to see countries like Kenya, Ghana, Cameroon and Equatorial Guinea overtake Nigeria in terms of educational standard, living Nigeria (Aberu & Lawal, 2022).

Nigeria is continually plagued with the upheaval advancement in the educational sector which is not unconnected to the sharp decline in government funding in the sector and the low esteem placed on education in Nigeria. However, these has adverse effects of dilapidation of education facilities at all levels, teachers' salaries not paid and in its more pronounced forms are the various strikes actions engaged in by the universities teaching and non-teaching staff due to the worsening living and poor working conditions in the university system. Furthermore, these upheaval and unpleasant conditions resulting from government poor funding of the educational sector would no doubt produce and harvest increase rate of crime most especially cybercrime, promiscuity and declining literacy rates in the country. These outcomes therefore reveal low or poor investment in the education sector not only having effects on the quality of education in terms of infrastructure but also on general human capital development at large in Nigeria. However, the problems raised above do not seem to be a very strong concern for successive governments in Nigeria. Education for sustainable development necessitates a reevaluation of the objectives and content of education in Nigeria. It entails educating students about environmental stewardship, social equity, and ethical decision-making, in conjunction with conventional academic disciplines. Educational sustainable development brings about accessibility of educational opportunities, thereby mitigating disparities and promoting social cohesion. By coordinating educational objectives with the principles of sustainable development, Nigeria can nurture a generation of leaders and citizens who are adequately prepared to confront the challenges of the 21st century (UNESCO. 2020).

Effective Leadership and Policy Reform

Effective leadership in educational management is essential for setting a clear vision and direction. Leaders who are committed to educational excellence can inspire and mobilize

stakeholders towards common goals. They play a key role in developing and implementing strategic plans that translate objectives. Strong leadership ensures that educational institutions are not only places of learning but also hubs of innovation and progress (Leithwood et al., 2020). Leadership and policy reform are critical for creating a conducive learning environment. This includes ensuring that schools have the necessary infrastructure, resources, and support systems to facilitate effective teaching and learning. Policies that prioritize investment in educational infrastructure, teacher training, and student support services are vital. A conducive learning environment enhances student engagement, motivation, and overall academic performance (Day et al., 2021).

Transparency and accountability are fundamental principles of effective educational management. Leaders must ensure that educational policies are implemented transparently and that resources are used efficiently. This involves regular monitoring and evaluation of educational programs and initiatives to assess their impact and identify areas for improvement. Policy reforms that promote accountability and transparency help to build trust and confidence in the education system (Hargreaves & Fullan, 2020).

Effective leadership and policy reform are crucial for promoting equity and inclusivity in education. This means addressing disparities in access to education and ensuring that all students, regardless of their socio-economic background, can succeed. Policies that support inclusive education, gender equality, and the needs of marginalized groups are essential for building a more equitable education system (UNESCO, 2020).

The Challenges of Educational Management in Nigeria

The educational sector in Nigeria faces multifaceted challenges that impede its progress and development. Addressing these challenges is crucial for revitalizing the education system and relating it to it with national development goals. This challenge includes low literacy rates, inadequate infrastructure, insufficient funding, poor quality of teaching and teacher training, policy implementation and governance.

Low Literacy Rates: Nigeria's low literacy rates are indicative of deeper systemic issues within its education sector. As of recent reports, the adult literacy rate in Nigeria stands at approximately 62%, with significant disparities between urban and rural populations, and between genders (UNESCO, 2020). This low literacy rate is a barrier to socio-economic development and contributes to the cycle of poverty. Mangywat and Meshak (2022) described the Nigeria's literacy rate as piteous; the shroud of illiteracy in Nigeria tends to make efforts by the government in combating the menace unfruitful. The commitment towards literacy

development is not encouraging. Nigeria's literacy rate from 1991 – 2020, based on the World Bank Data released by Microtrends, shows the literacy rate of Nigeria is 62.0%, showing a 10.94 % annual change from 2008 to 2020. THISDAY Newspaper (2019) in Mangywat and Meshak (2022) cited the National Commission for Mass Literacy, Adult and Non-formal Education (NMEC), states that 35% of the nation's adult population was illiterate. Hence, it is worrisome that more than a third of the national population flourishes in illiteracy. It goes further to assert that literacy is pivotal to national development and should be accorded with great prominence because it is linked to the quality of life of people. In summary, literacy is a key link to opportunities. Poverty is a major impediment, as many families cannot afford to send their children to school, children often must work to support their families. Cultural practices and gender biases, with girls often receiving less encouragement to pursue education compared to boys, and issues of unqualified teachers further worsens the problem, making it difficult for students to receive a quality education even when they do attend school.

Inadequate Infrastructure: Inadequate infrastructure is a pervasive issue across many Nigerian schools. A significant number of institutions, particularly in rural areas, lack basic amenities such as clean water, electricity, and sanitary facilities. This not only affects the health of the students but also creates an unconducive environment for learning. Classroom overcrowding is another critical issue. Many schools have classrooms that are filled beyond capacity, with a single teacher often managing 50 to 100 students at a time. Josiah et al. (2023) observed that you see a class that meant accommodating 30 students being used to house over 100 students. This overcrowding makes it difficult for teachers to provide individual attention to students and for students to engage actively in the learning process. The shortage of essential teaching materials, such as textbooks, desks, and laboratory equipment, further compounds the problem as a result of inadequate funding and mismanagement of available resources. Without significant investment in building and maintaining educational facilities, it is challenging to create a conducive learning environment that can support student achievement and development.

Insufficient Funding: Funding for education has continually been inadequate, despite various government promises and international commitments. The inability of the Nigerian government to objectively accept and implement the 26% funding formula for education recommended by UNESCO impact negatively on the performance and sustainability of educational institutions (Aberu & Lawal, 2022; Josiah et al., 2023). Education often receives less than the recommended 26% of the national budget, leaving it under-resourced and unable to meet the growing demands

of the population. This financial shortfall affects every aspect of the education system, from infrastructure and learning materials to teacher salaries and professional development. The lack of funding has led to a decline in the quality of education offered in public schools, pushing many parents to seek private schooling options for their children, further exacerbating educational inequality. Inadequate funding also means that many schools cannot afford to implement necessary improvements or introduce innovative teaching methods and technologies that could enhance learning outcomes. Efforts to increase funding are often hindered by issues of corruption and mismanagement. Even when funds are allocated, they are not always used efficiently or transparently, leading to waste and misappropriation. Addressing these issues requires robust financial oversight and accountability mechanisms to ensure that educational funds are used effectively and reach the intended beneficiaries.

Quality of Teaching and Teacher Training: The quality of teaching in Nigeria is a significant concern, with many teachers lacking the necessary qualifications and training to deliver effective education. This issue is compounded by the shortage of continuous professional development opportunities for teachers, which limits their ability to improve their skills and stay updated with new teaching methodologies. Teachers are implementers of the school curriculum. The teachers are critical members of the education stakeholders ensuring quality attainment. Josiah et al. (2023) defined a teacher as someone who causes learning to take place; someone who imparts knowledge, skills, values and attitudes to a group of learners. From the definition, a teacher helps the learners often in a school, as well as in a family, religious and community setting. Learning cannot take place without the teacher, even though he is not physically present; he is indirectly represented by the medium through which learning takes place. Josiah et al. (2023) asserted that Basic Schools in Nigeria do not have adequate professional teachers in the teaching field, based on the report of independent Newspapers (2019) that stated the deficit of 135,319 teachers at the Early Childhood Care Development Education, 139,772 deficit in primary schools and 2,446 shortages in Junior Secondary Schools across the nation. Many teachers in Nigeria work under challenging conditions, with low salaries, large class sizes, and inadequate resources. These factors contribute to low morale and high attrition rates among educators. Without sufficient support and motivation, it is difficult for teachers to perform at their best and provide high-quality education to their students. Improving the quality of teaching requires a comprehensive approach that includes better teacher training programs, competitive remuneration, and a supportive working environment. This involves not only pre-service training but also ongoing professional development and

mentoring to help teachers continuously improve their skills and adapt to changing educational needs.

Policy Implementation and Governance: While Nigeria has numerous educational policies and plans, the implementation of these policies is often fraught with challenges. Issues such as corruption, lack of accountability, and political interference hinder effective policy execution. There is also a disconnect between policy formulation and the realities on the ground, resulting in policies that are not fully related to the needs and conditions of the education sector. It is one thing to succeed in getting research finding translated into national policies; it is another ballgame altogether getting them implemented (Odukoya et al., 2018). One of the key issues in policy implementation is the lack of effective monitoring and evaluation mechanisms. Without regular assessments and feedback loops, it is difficult to track the progress of policy initiatives and make necessary adjustments. This gap between policy and practice undermines efforts to improve the education system and achieve sustainable development goals.

Effective governance is crucial for the successful implementation of educational policies. This includes transparent decision-making processes, stakeholder engagement, and accountability mechanisms to ensure that policies are implemented as intended and that resources are used efficiently. Strengthening governance structures can help to build trust and confidence in the education system and support the achievement of educational objectives.

Countries with Successful Educational Management and Policy Reform

Finland is renowned for its high-performing education system, which is characterized by effective leadership, innovative teaching practices, and a strong policy framework. The Finnish education system emphasizes equity, with policies designed to ensure that every student has access to high-quality education (Al-Thani, 2024). Key features of Finland's educational management include decentralized decision-making, continuous professional development for teachers, and a focus on student well-being. These elements contribute to a learning environment where students thrive and achieve excellent outcomes.

Singapore's education system is another example of successful educational management and policy reform. The country has achieved remarkable educational outcomes through strategic planning, rigorous standards, and a strong emphasis on teacher quality. Singapore's Ministry of Education sets clear goals and standards, and schools are given the autonomy to innovate and adapt to local needs. Continuous assessment and feedback mechanisms ensure that educational policies are effectively implemented, and that student performance is closely monitored (Darling-Hammond et al., 2017; Al-Thani, 2024).

Rwanda has made significant strides in revitalizing its education sector through effective leadership and innovative policies. Despite facing numerous challenges, including a history of conflict and limited resources, Rwanda has prioritized education as a key driver of national development. The government has implemented policies to improve access to education, enhance the quality of teaching, and promote the use of technology in education. Strong leadership at all levels has been instrumental in driving these reforms and achieving positive outcomes (UNICEF. 2024).

Implementation Strategies for Policy Reform in Nigeria

To revitalize educational management in Nigeria, it is essential to strengthen leadership at all levels of the education system. This involves developing leadership training programs that will bring together principal actors involved in translating policies into action which includes school administrators, policymakers, and education officials. These programs should focus on strategic planning, decision-making, and the implementation of best practices.

Policy formulation in Nigeria should be based on evidence and best practices from successful education systems around the world. Engaging stakeholders, including teachers, parents, and students, in the policy-making process can ensure that policies are relevant and effective. Improving the mechanisms for policy implementation and monitoring is vital. This includes establishing clear guidelines, regular evaluations, and feedback systems to track progress and make necessary adjustments. Additionally, creating a culture of accountability and transparency is crucial for effective leadership through appropriate delegation of authority among the main actors for effective translation of policy into action. (Obafemi & Eke, 2020).

Significant investment in educational infrastructure and resources is necessary to create a conducive learning environment. This includes building and renovating schools, providing essential facilities, and ensuring the availability of teaching materials and technology. Public-private partnerships can play a crucial role in mobilizing resources and expertise for infrastructure development.

Summary

Addressing the current challenges in educational management in Nigeria is essential for revitalizing the education sector and relating it to it with national development goals. By tackling issues such as low literacy rates, inadequate infrastructure, insufficient funding, poor quality of teaching, and ineffective policy implementation, Nigeria can create an education system that provides quality education to all its citizens and supports sustainable development.

Through effective leadership, robust policy reform, and significant investment in the education sector, Nigeria can overcome these challenges and unlock the full potential of its human capital. Revitalizing educational management in Nigeria is a critical step towards achieving sustainable development. By addressing the current challenges through effective leadership and policy reform, Nigeria can create an education system that meets the needs of its population and supports national development goals. Drawing on successful examples from other countries, Nigeria can adopt best practices and implement strategies that are tailored to its unique context. With a strong commitment to education and a focus on continuous improvement, Nigeria can transform its educational sector and unlock the full potential of its human capital.

Suggestions

1. To revitalizing educational management government and Policymakers should Increase budgetary allocations to education, implement transparent resource management systems, and engage in continuous policy review and reform.
2. Educational leaders and administrators should encourage inclusive and participatory leadership models, invest in professional development, and build strong school community relationships.
3. Teachers should engage in continuous professional development, participate in decision-making processes, and advocate for better working conditions and resources.

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Effective Strategies for Managing Teachers Attitude to Work in Public Secondary Schools in Obio /Akpor Local Government Area of Rivers State

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Abstract

The study investigated. Effective Strategies' for Managing Teachers' Attitude to Work in Public Secondary Schools in Obio /Akpor Local Government Area of Rivers State. Three objectives, three research questions and three hypotheses guided the study. Descriptive Survey Design was adopted for the study. The population of the study comprises of 91 Principals and Vice Principals from 21 secondary schools. A Purposive sampling technique was adopted in selecting the sample for the study. A 20-item structured questionnaire title Effective Strategies for Managing Teachers' Attitude to Work in Public Secondary Schools (ESMTAWPSS) questionnaire was used to elicit response for the study and used for data collection. The instrument was on four-point rating scale of VHE, HE, ME and LE. The instrument was validated by two Business Educators and one expert in Measurement and Evaluation, all in the Faculty of Education, Rivers State University. Cronbach Alpha statistics was used to establish a reliability coefficient index of 0.83. The instrument was administered to the respondents in their respective schools by the researchers with the help of two research assistants. Data collected was analyzed using Mean and Standard Deviation to answer the research questions, while the t-test statistics was used to test the hypotheses at 0.05 level of significant. The findings revealed that effective management strategies enhances teachers attitude to work to high extent, ensures regular attendance to work, ensure teachers' good conduct, effective instructional delivery, development of teachers' personality, makes teachers' be conscientiousness, diligent and effective to school duty for achievement of educational goals in public secondary schools. However, it was recommended amongst others that, school Principals and administrators should adopt the use of effective monitory of teachers' pedagogical instructions, good record keeping, good reward system, promotion, suspensions and adequate punishment embedded in Effective supervision, compensation and disciplinary strategies to managing teachers' attitude to work in public secondary school.

Keywords: Effective Strategic, Management, Teachers Attitude, Public Secondary Schools

Introduction

Education is a major factor that brings about rapid economic and socio-political development in any country. It facilitates learning and acquisition of valuable knowledge that mobilizes human resources for personal orientation and national development (Kelven, 2014). Supposedly, every nation needs good educational system to achieve her developmental goals. Good education however, is a frame work that has multiplier effects and depends on many factors, including effective strategy for managing teachers' attitude to work in schools.

Attitude to work is the individuals' prevailing tendency to respond favorably or unfavorably to an object person or group of people, institutions or events. It is a mindset that affects how a person thinks and acts. In addition, Anastasi (2021), explained attitude to mean a tendency to react in a certain way towards a designed class of stimuli. The explanation portrayed, attitude as a mental and neutral state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related (Vipene, 2023). Attitude is a complex mental state of individual which involves beliefs, feelings and concept to understanding human behaviour in work environment as well as factors influences duty performance in educational enterprises. Similarly, attitude affects how well a teacher plans and prepares for instructional duties which consciously or unconsciously affect students' academic performance. Omebe (2018) rightly observed that teachers' attitude influence students' interest in learning and affect their academic performances especially in practical and skill related subjects in vocational field of study. This is because; Teachers' attitude is the psycho-social quality which motivates job performance and enhances students' academic achievement. Therefore, teachers' needs a strategic management principle that will propagate quality behaviors and conduct in school and job performance.

Managing teachers' attitude is part of human resource management that concerns development and sustenance of teachers' behaviour and relationship within and outside educational enterprise. The intention is to ensure effectiveness and develop quality teaching workforce that will put-in their best for the success of the school (Onu, 2017). Management of teaching workforce involves a number of approaches including operational and strategic management which begins and maintains activeness in the achievement of personal and organizational goals. Operational management principle may be lopsided but, Strategic management is encompassing involving setting standard, formulation of policies and implementation of goals based on consideration of resources and assessment of the internal and external environments of the school operations in order to make teachers' dutiful and effective (Ezekwe, 2023).

Strategic management is compensational driven with good expectations. It provides overall direction to educational enterprises and workforce to specify school objectives, develop policy plans and allocating resources for achievement of stated objectives. Hence, any teacher that experiences strategic management is bound to develop a positive attitude to work and put-in the best in duty performance (Ezekwe, 2023). In strategic management, school managers could adopt Supervisory strategy, Compensation, Disciplinary strategies amongst others to manage teachers' attitude to work (Nwachukwu, 2016).

Supervisory Strategy for Managing Teachers Attitude to work

Supervisory strategy has been explained in different perspective to mean a managerial approach for attaining efficiency in work environment. Amaewhule (2015) conceptualized Supervisory Strategy as a tactical management styles of human resource that emphasizes' constant check on teaching staff and quality of work done on the job process daily. The intention is to ensure active services delivery for the efficiency and attainment of quality productivity of teaching workforce in educational enterprises. Oleforo (2014) explained that Supervisory strategy focuses primarily on the achievement of appropriate goals in an organization. Thus, Supervision is an indispensable function and a hall-mark of a school manager to ensure effectiveness in duty performance without prejudice or abnormal behaviors. Supervisory strategy ensures teachers' punctuality, regular attendance and efficiency in the instructional delivery. Furthermore, Akpomi (2020) affirmed that supervisory role in school is the effort of all designated school officials toward providing leadership to the teaching workforce and other for instructional improvement. Akpomi obliged Oleforo adding that supervisory strategy involves having a comprehensive view of the activities and problems of the institutions and the assessment of the extent to which school is fulfilling basic objectives. For this reason, supervisory strategy therefore is the activity or exercise in which a superior or group of professional help in facilitating learning by improving conducive teaching and learning environments in school's system through constant check, guiding, advising and interest stimulation of both the students and teachers for educational goal attainment. The aim of supervisory strategy is to enhance quality pedagogical instructions that stimulate students' interest in learning, professional growth and development of good attitude to work. The manager does the supervision through; selection and revision of educational objectives, materials for instructions, methods and the evaluation of instructional outcome (Kashyap, 2019). Supervisory role could also be informed of weekly perusal of teachers' Note of lesson, ensuring accurate record keeping of vital documents, moderation of examination questions, checking the pattern of classroom management and instructional delivery, punctuality to classes, participation in co-curricular activities, daily attendance to school, effectiveness in the discharge of assigned duties amongst others. The nature of quality instructional supervision within a school is presumed to have affected teachers' expertise job performance and by extension on students' academic achievement (Aseka, 2016). Teachers' supervision acts as an appraisal tool where teachers reflect on highlighted issues. In addition, Ochuko (2019) posited that teachers' poor or good attitude may reflects on job performances. Thus, the essence of supervision is to motivate the

teachers and check irregularities in school activities in order to reduce truancy and other attitudinal problems that could mar teaching, learning and students' academic achievement.

Compensatory Strategy for Managing Teachers Attitude to Work

Compensatory management strategic is an approach that encompasses application of extrinsic motivational principles. It involves giving of entitlements, financial benefits, bonuses, enhanced remunerations and special commendations to improve teachers' attitude to work (Liu (2017). Extrinsic motivations could also be informed of salary upgrade, fringe benefits, promotion and other monetary rewards that encourages teachers for duty performance. Extrinsic motivation of Monthly salaries and other financial benefits are tools and strategies for enhancing Teachers' attitudinal change for work but, fringe benefits sustain effectiveness and competitiveness in teachers' performances (Malik, 2019). It is through the compensation for the work down that teachers derives satisfaction and support for family welfare. The condition of satisfaction and dissatisfaction of teachers depends on the methods through which these compensations are carried out. Thus, the school administrators' have the responsibilities of providing suitable financial rewards system for hardworking teachers' to strongly influence their wills for good teaching attitude. George (2021) posited that all factors included in teacher's compensation influences attitudinal change for positive instructional delivery and encourage teachers for more designated effort in work environment. Thus, compensatory management strategy is an effective approach for managing teachers' attitude to work. Additionally, teachers are wanting bees, their expectation on payment and promotion increase the quest for more work and job satisfaction. School managers using this approach enjoy the services of dedicated teachers and may be satisfying their curiosity for Job performance. Job satisfaction is actually an enjoyable and exciting emotional condition that changes workers mentality and attitude. Therefore, the reduction and increase in teachers' performance is directly linked to Job satisfaction which educational managers tend to be more meticulous but, a strategic administrator ensures that her teachers gets satisfying in work arena (Koko, 2015).

Disciplinary Strategy for Managing Teachers' attitude to work

Discipline is a managerial strategy of enforcing obedience and training the mind for self-control in order to accept challenges in work environment (Okah & Uzoeshi, 2015). Every school institution has rules and regulation that guilds her modus-operandi for actualization of goals. Therefore, the responsibility placed on school managers is supposedly to manage human and

material resources through enforcement of stated rules and regulation for achievement of educational goals (Koko, 2015). Thus, educational managers cannot function in isolation of coercive powers of discipline and reprimands as a managerial strategy for managing teachers' abnormalities and mischievous behaviors in school environment (Malik, 2019). Teachers' Attitude affects school productivity and need to be properly checked through disciplinary measures (Malik, 2019). The use of disciplinary strategy such as suspension, dismissal, no promotion, and reprimand in managing teaching work force is a function of strategic management approach which produces positive results on teachers' attitude to work. It enhances teachers' behaviors, builds confidence, refined work organization and improved teachers' personality for job performance (Vepine, 2023). In addition Amaewhule (2015) posited that discipline improves teachers' mentality, improves working relationship and provides a conducive environment. Discipline also ensures respect, brings sanity, moderates teachers' actions and conducts for effective implementation of pedagogical instructions and quality productivity in education enterprises (Koko, 2015).

However, teachers' may intentionally neglect their duties or malicious insubordination due to economic pressures and need to be corrected via discipline to forestall or avoid future occurrence. Disciplined teachers are assets and intellectual property to school institution. Therefore, the use of disciplinary measures in managing teachers' attitude is an effective strategy to maintain social decorum, tolerance, diligences, building integrity, patriotism and effective instructional delivery which are positive traits of a teacher for students' academic achievement, educational growth and national development (Malik, 2019).

Alig-Mielccarek and Hoy (2018), Investigated Transformational leadership and Job Satisfaction of Mathematics Teachers' in secondary schools in Calabar, Cross Rivers State Capital, Nigeria. The study was guided by three research question and hypotheses. A correlational research design was adopted with total population of 2000 respondents comprises of Senior and Junior secondary mathematics teachers. A sample size of 400 senior secondary school teachers was used and determined through Taro-Yamane sample size determination. Instrument was raised and validated by three experts and reliability coefficient of 0.82 was obtained through Pearson Product Moment Correlation indicating that the instrument was reliable. Data collected was analyzed using correlation and multiple regressions. The results showed that there is a significant relationship between democratic leadership in decision making, motivation, discipline, productivity and teachers' job satisfaction. The study suggested

and urged Principals' and educational administrators to adopt democratic leadership style in organizing and managing teachers for effective job performance. Despite suggestions and disciplinary measures adopted in different managerial styles, teachers are still exhibiting lackadaisical attitude to work. Therefore, the researchers' deemed it necessary to investigate effective strategies for managing teachers' attitude to work for in Public secondary for productive society in Rivers State

Statement of the Problem

Teachers are trained educational personnel for impartation of knowledge and skills that enhance development. Teachers' have been doing perfectly well in the past without misconduct and negligence of duty. In recent time however, economic and social dynamism have lured teachers to develop poor attitude to work on the detriment of the learners. Therefore, most teachers are seen hawking wears, snacks and food items during school hours, some absent themselves from classes and school, while others refuse to write their notes of lesson as well as abandoning their assigned responsibilities on the detriment of the students. These are some of the testimonies of the alarming rate of poor teachers' attitude to work which can leads to poor job performance and poor students' academic performance in public secondary schools in Obio/Akpor Local Government Area of Rivers State. In lieu of this, Parent, students and other stakeholders became worrisome about the devastating effects of teachers' attitude and began to question educational authorities on better strategies of managing teachers' attitude to work. Based on this notion, the researcher's attention was drawn to examine the effective strategies for managing teachers' attitude to work in Public secondary schools in Obio/Akpor Local Government Area in Rivers State.

Purpose of the Study

The purpose of the study was to determine effective strategies for managing teachers' attitude to work in Public secondary schools in Obio/Akpor Local Government Area of Rivers State. Specifically, the study sought to:

1. Determine the extent of supervisory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State.
2. Determine the extent of compensatory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State

3. Determine the extent of disciplinary strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State

Research Questions

1. What is the extent of supervisory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State?
2. What is the extent of compensatory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State?
3. What is the extent of disciplinary strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State?

Hypotheses

Ho₁: There is no significant difference in the mean responses of Principals and Vice Principals on the extent of supervisory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State.

Ho₂: There is no significant difference in the mean responses of Principals and Vice Principals on the extent of Compensatory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State.

Ho₃: There is no significant difference in the mean responses of Principals and Vice Principals on the extent of disciplinary strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State.

Methodology

The study adopted a descriptive survey design. The population of the study comprises 91 respondents made up of 49 Principals and 42 Vice Principals in twenty one (21) Public Secondary schools in Obio/Akpor Local Government Areas of Rivers State. The study adopted purposive Sampling technique which the population was used as sample due to its manageable size. Instrument for data collection was questionnaire tagged "Effective Strategies for Managing Teachers' Attitude to work in public secondary school (ESMTAWPSS) questionnaire. The questionnaires contained 20 item questions developed on 4-point rating

scale of: Very high extent (VHE-4points), High Extent (HE- 3points), Moderate Extent (ME-2points) and Low Extent (LE-1point) and was validated by two business educators and one expert in measurement and evaluation all in faculty of education Rivers State University Port-Harcourt. A reliability Coefficient of 0.83 was established using Cronbach Alpha statistical tool. It was determined through a pilot test carried out on 20 independent persons outside the study area to establish the internal consistency. The administration of the instrument was done by the researcher with the help of two assistant who were guided on how to fill and retrieve the instrument within two weeks. Data collected was analyzed using Mean and Standard Deviation to answer the research questions while t-test was used to test the hypotheses at 0.05 levels of significance. The decision rule for acceptance was any mean higher than 2.50 is considered to be high extent while mean below 2.50 is considered low extent.

Result

Research Question 1: What is the extent of supervisory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State?

Table 1: Mean rating of Principals and Vice Principals on the extent of supervisory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State

Extent of supervisory strategy in managing teachers' attitude to work in public secondary schools Items		Principals (Number 49)			Vice Principals (Number 42)		
		X	SD	Rmk	X	SD	Rmk
1	Regular check on teachers' attendance is effective strategy moderates teachers' absenteeism and poor attitude to work.	2.89	0.86	HE	3.09	0.12	HE
2	Monitoring classroom pedagogy is effective approach to ensure teachers effectiveness and right attitude to work	3.78	0.93	HE	3.66	0.84	HE
3	Non monitoring of teachers' activities is effective strategy in managing poor attitude to work	1.97	0.42	LE	2.26	1.02	LE
4	Regular check on record keeping, lesson note and taking action for non-compliance is effective strategy to enhancing teachers' right attitude to work.	3.86	0.98	HE	3.71	0.87	HE
5	Regular meeting to discuss problem and solutions is effective method of managing teachers' attitude to work	3.34	0.91	HE	3.49	0.18	HE
Grand Mean/SD		3.17	0.82		3.24	0.61	

Source: Research Work 2024.

Table 1 above revealed the extent of supervisory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State. Item 1, 2, 4 and 5 has mean scores of 2.89, 3.78, 3.86 and 3.34 for Principals while 3.09, 3.66, 3.71 and 3.49 for Vice Principals which is above 2.50 criterions graded as high extent. While item 2 has mean score of 1.97 and 2.26 for Principals and Vice Principals which is below 2.50 criterions graded under low extent? However, the grand mean of 3.17 and 3.24 for Principals and Vice Principals respectively indicates that supervisory strategy is effective to a high extent in managing teachers' attitude to work in public secondary schools in Rivers State.

Research Question 2: What is the extent of Compensatory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State?

Table 2: Mean rating of Principals and Vice Principals on the extent of Compensation strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State.

Extent of Compensation strategy in managing teachers' attitude to work in public secondary schools		SSS Principals (Number 49)			JSS Principals (Number 42)		
Items		X	SD	Rmk	X	SD	Rmk
11	Rewards for hard working teachers is effective strategy to managing teachers attitude to work	3.86	0.84	HE	3.87	0.81	HE
12	Non-Utilization fringe benefits is effective strategy to enhance teachers attitude to work	2.13	0.19	LE	2.33	0.10	LE
13	Regular promotion is effective strategy to manage teachers' attitude to work	3.91	0.93	HE	3.95	0.86	HE
14	<i>Principals nonchalant behaviour to praises</i> is effective strategy to manage teachers' attitude to work	1.64	0.17	HE	1.78	0.11	LE
15	Regular salary payment and monetary rewards is effective strategy to managing teachers attitude to work	3.98	0.98	LE	3.89	0.91	HE
Grand Mean/SD		3.11	0.62		3.16	0.56	

Source: Researcher Work 2024.

Table 2 above revealed the extent of Compensation Strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State. Item

11, 13 and 15 has mean scores of 3.86, 3.91 and 3.98 for Principals. While 3.87, 3.95 and 3.89 for Vice Principals which is above 2.50 criterions graded as high extent. While item 12 and 14 had 2.13 and 1.64 mean scores for Principals, and 2.33 and 1.78 for Vice Principals graded below 2.50 criterions as low extent. Indeed the grand mean of 3.11 and 3.61 for Principals and Vice Principals indicates that compensation strategy is effective to high extent in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State.

Research Question 3: What is the extent of disciplinary strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State?

Table 3: Mean rating of Principals and Vice Principals on the extent of disciplinary strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State

Extent of Disciplinary strategy in managing teachers' attitude to work in public secondary schools Items		Principals (Number 49)			Vice Principals (Number 42)		
		X	SD	Rmk	X	SD	Rmk
16	Suspension of earing teachers is effective strategy for managing teachers attitude to work	3.66	0.84	HE	3.87	0.83	HE
17	Seizing of salary for truancy is effective strategy for managing teachers' attitude to work	3.73	0.99	HE	3.68	0.75	HE
18	Non-promotion for negligence of duty is effective strategy to managing teachers' attitude to work	3.50	0.78	HE	3.95	0.86	HE
19	Dismissals for capital offences is effective strategy for managing teachers attitude to work	3.64	0.81	HE	3.78	0.91	HE
20	Punishment for non-record keeping is effective strategy for managing teachers attitude to work	3.75	0.93	LE	3.91	0.83	LE
Grand Mean/SD		3.66	0.87		3.84	0.84	

Source: Researcher Work 2024.

Table 3 above revealed the extent of disciplinary strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State. All items

from 16 to 20 for Principals and Vice Principals had mean scores of 3.50 to 3.91 which are above 2.50 criterions graded as high extent. Indeed the grand mean of 3.66 and 3.84 for Principals and Vice Principals respectfully indicates that discipline strategy is effective to high extent in the managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State.

Research Hypotheses 1: There is no significant difference in the mean responses of Principals and Vice Principals on the extent of supervisory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State.

Table 4: A Summary of t-test analysis of Principals and Vice Principals responses on the extent of supervisory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State

Response	N	X	SD	Df	Alp	T.cal	t-crit	Decision
Principals	49	3.17	0.82	89	0.05	0.47	1.96	Retained
Vice Principals	42	3.24	0.61					

Source: Field Work 2024

The table 4 above revealed the t-test result on extent of supervisory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State. Data in the table shows that the t-cal. of 0.47 with degree of freedom of 89 and 0.05 levels of significant which is low than the t-crit. of 1.96. Therefore the hypothesis is retained. This means that the mean responses of Principals and Vice Principals do not significantly differs on the extent of effectiveness which supervisory strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State.

Hypotheses 2: There is no significant difference in the mean rating Principals and Vice Principals on the extent of compensation strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State.

Table 5: Summary of t-test Result of Principals and Vice Principals on the extent of compensation strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State

Response	N	X	SD	Df	Alp	T.cal	t-crit	Decision
Principals	49	3.11	0.62	89	0.05	0.42	1.96	Retained
Vice Principals	42	3.16	0.56					

Source: Field work 2024.

The table 5 revealed that t-test calculated value of 0.42 is less than the t-critical value of 1.96 at 89 degree of freedom and at 0.05 levels of significance. The null hypotheses is therefore retained meaning that the responses of Principals and Vice Principals do not differs significantly on the extent of compensation strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State

Research Hypotheses 3: There is no significant difference in the mean rating of Principals and Vice Principals on the extent of disciplinary strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State.

Table 6: Summary of t-test Result of Principals and Vice Principals on the extent of disciplinary strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State

Response	N	X	SD	Df	Alp	T.cal	t-crit	Decision
Principals	49	3.66	0.87	89	0.05	1.00	1.96	Retained
Vice Principals	42	3.84	0.84					

Source: Field Work 2024.

Table 6 revealed the mean responses of Principals and Vice Principals on the extent of disciplinary strategy in managing teachers' attitude to work. Data in the table showed that t-cal. of 1.00 with degree of freedom of 89 at 0.05 levels of significant is less than the t-crit. of 1.96. Therefore, the hypothesis is retained. This means that the responses of Principals do not differs significantly with Vice Principals on the extent of effectiveness of disciplinary strategy in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in River State

Discussion of Major Findings

1. The findings presented from the study, revealed that supervisory strategy is effective to high extent in managing teachers attitude to work in public secondary schools. The

application of supervisory strategy makes teachers to be regular in school, Moderates teachers' absenteeism, monitors classroom pedagogy which enhance teacher's effectiveness, regulates teachers for record keeping and makes teachers meet regularly to brainstorm on matters of interest, discuss problem and proffer solutions that enhance teachers' mentality and right attitude to work for the benefit of students, staff growth and development of schools.

2. The research findings presented from the study showed that compensatory strategy is effective to high extent in managing teachers' attitude to work in public secondary schools. Thus, Principal rewards to hard work, regular promotion, regular salary payment and other monetary rewards are some of the compensation strategy school principals and vice principals could adopt to manage teachers poor attitude work. Findings in the study also indicate that compensating teachers' positively make them happy be regular to school and brings their enthusiasm to bear in work. Promotion, regular payment and praises adequately encourage teachers' to effectively deliver on their pedagogical duties and related instruction without prejudice and social rancor.
3. The result and findings presented in research question three in the study indicated that disciplinary strategy is effective to very high extent in managing teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State. disciplinary strategies such as suspension of erring teachers, seizing of salary, non-teachers' promotion for truancy, punishment and out-right dismissal for capital offences reduces teachers absenteeism, lateness to duty, negligence, insubordination and gross misconduct that portrays teachers bad attitude to work. Findings also emerged that adoption of managerial strategy of discipline enhance teacher's personality traits development, realize the importance of their job and change their characters for effective service delivery in public secondary schools. Teachers who faced the wrought of discipline in school system always be conscientious to school duty, obey rules and regulations and work diligently in accordance with the school norms and ethical standard. Therefore, disciplinary measures serve as a deterrent to teachers with nonchalant attitude to work.

Conclusion

Despite challenges, the study strengthened the enthusiasm of the researchers to investigate effective strategies for managing teachers' attitude to work in public secondary schools. Result obtained in this study indicated that effective management strategies are a vital managerial approach that enhances teachers' attitude to work in public secondary schools. Hence, it was

concluded that effective management strategy has evolved with new emerging pattern and advancement in the management of human resources in work environment particularly school enterprises. Thus, Principals adoptions of effective supervision, compensation and disciplinary strategies enhance teachers' attitude to work to high extent. It ensures teachers' good conduct, effective instructional delivery, development of good personality trait, teachers' conscientiousness, effectiveness to school and diligence to duty for achievement of educational goals in public secondary schools in Obio/Akpor Local Government Area in Rivers State.

Recommendations

Based on the findings, the following recommendations were made:

1. School Managers should adopt regular check on teachers' activities, note of lesson, attendance book, good record keeping as effective supervision strategies to ensure teachers' effectiveness in classroom instructional delivery in public secondary schools in Obio/Akpor Local Government Area of Rivers State.
2. School administrators should regularly reward hard working teachers' in form of promotion, financial bonuses, praises and recognitions as effective compensation strategy to enhance and manages teachers' attitude to work in public secondary schools in Obio/Akpor Local Government Area in Rivers State.
3. Principals and school administrators should diligently adopt the use of suspension and non-promotion of teachers for negligence of duty, insubordination, absenteeism, lateness to duty and gross misconduct as effective disciplinary strategies to managing teachers' attitude to work in public secondary schools.

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Awareness of Education Law for Effective Administration of Secondary Schools in Rivers State, Nigeria.

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Abstract

The study examined awareness of education law for effective administration of secondary school in Rivers State, Nigeria. The study was carried out in Rivers State. Two research questions guided the study. The study employed the descriptive research survey design. The population of the study is 311 Principals in public senior secondary schools in Rivers State. A sample of 208 respondents (112 urban principals and 96 rural principals) were selected for the study using proportionate and simple random sampling techniques. The instrument for data collection was a self-structured questionnaire tagged "Awareness of Education Law for Effective Administration of Secondary School Questionnaire" (AELEASSQ) which was designed in a four-point rating scale arrangement of 1 – 4. The instrument was validated by experts in Educational Management and Educational Foundations respectively. A reliability coefficient of 0.82 was established using Cronbach Alpha. Data collected were analyzed using mean (X) and standard deviation (SD) for research question 1 while Frequency count (F) and Percentage (%) were used to analyzed research question 2. For research question 1, mean value less than 2.50 was considered as "Disagree (D)" while item with mean value equal 2.50 and above are considered as "Agree (A)". The study found that available strategies enhances the awareness of education law in secondary school. The study also found that, available items are the challenges facing the awareness of education law in secondary school. Based on the findings of the study, it was recommended amongst others that, full provision of the constitution of the land and adequate financial encouragement should be provided for by the government. Good planning and proper supervision of manpower should always be carried out within and outside the school.

Keywords: Education Law, Effectiveness, Administration, School plants, Secondary school.

Introduction

Policy makers and school administrators are the major focus in the achievement of secondary school objective both in private and public educational institutions. However, the extent to which achievements are conceived also calls for general attention since it deals with remodeling and the production of secondary school products that will be beneficial to the society.

The establishment of secondary schools and every other educational institution are usually anchored on the laws and policies of the host country and state. In the same vein, Oyaka (2016) stated that, schools whether public or private, formal and informal are all educational institutions established to render public services and can sue or be sued either by private or corporate bodies. Educational institutions are organizations established in a given society in order to help integrate positive values amongst members of the society. Therefore, for a smooth running of school activities and achievement of education objectives, there is need for full awareness of the laws guiding the operations of school. This is because, many parents are more informed and enlightened about the law and therefore eager to know what happens to their child in school.

Igwe (2014) stated that, every school administrator needs to be aware of the law for proper direction and to be on track. Nwadike and Godwins (2018) stated that ignorance of a fact or law is never an excuse within the context of the law. More so, nowadays most school administrators, school managers and policy makers lack the knowledge of education law and its practicability in their various schools. The doctrine of *in-loco parentis* empowers both the teacher and the school managers to act as parents and be parents to the students while in school. As a parent therefore, there is need to be aware of do's and don'ts within the educational circle for the enablement and achievement of effective secondary school administration. Again, government being the head, owner and controller of educational institution has a vital role to play in making the school administrators and school managers be fully aware of education law and the implications that follows. The National policy on education NPE (2004) has stated objectives that relates the awareness and guidelines on education law that would help boost educational activities in Nigeria. Elemchi (2017) opined that, that effectiveness of secondary education is solely dependent on the versatile knowledge of the school administrators. In knowing, know it all and in doing, do it all. This means that, teachers as pioneers of secondary education in Nigeria are expected to know more in order to give out more for the effectiveness of the educational goal.

Finally, many teachers and administrators of secondary school are purely not aware of the mechanism of the functionality of the laws guiding secondary school's system in Rivers State Nigeria, hence commencement of this study is to ascertain the level of awareness and practicability of education law for effective administration of secondary school in Rivers State Nigeria.

Conceptual Review

The review will be captured under the following sub headings: Education law, Nigerian judicial system, Characteristics of education law, Importance of education law, Sources education law, Effective administration of secondary school.

Education Law

Every county, every state, every organization and every living thing has a law that is guiding them so as to enable the players stick to the modus-operandi and also achieve expected goals of the said organization. However, educational institution has their Own structured laws which in outwards are referred to as education law. Igwe (2015), defined Education Law as range of rules and regulations guiding the operation, workability and administration of schools. In the same vein Saha (2018) defined Education Law as laws that are been passed by the legislative organ of a country which are specifically for the operation, organization, administration and planning of educational system in a given country. Nwadike and Godwins (2018) defined education law as the legal disciplinary action covering all issues pertaining to school from primary school through tertiary institution. Furthermore, Dike (2020) opined that education laws are those laws, decrees and regulations which empowers educational administrators and school managers to act and carryout actions that are within the law on both teachers and students respectively as a disciplinary measure in curtailing some negative vibes around the school.

Laws of educational institution are synonymous to compass device which also act as a guide in ensuring that good directions are gotten in piloting the affairs of certain institutions within their jurisdiction. Education laws are the jurisprudence which is mainly being practiced only at the educational institution whether private or public for onward achievement of goals and objectives. In the contemporary world mainly in this part of the country, the awareness of education law amongst school's administrators is quite very discouraging and unacceptable. Ojoh (2019) argued that, the unawareness of teachers and administrators of education laws pose a great danger on the students in knowing the rudiments of the law while in school. Therefore, the need for education law to be made grown course for the betterment of the students is very necessary. The essence of education law in secondary schools is to help state clarifies the duties, responsibilities, rights, obligations, boundaries and penalties to the teachers and administrators as well as same to the students.

Nigerian Judicial System

Laws are being practiced, displayed and argued in the law court and the Nigerian judicial system are being structured mainly in two wings that is, the federal and the state judiciary. The arrangement of the judiciary is usually done in an ascending order, whereby the lower court is stationed at the foundation, the middle court at the middle and the Supreme Court at the top.

The lower court takes evidence(s), witness(es) and delivers judgement, the appeal court sits to review the judgement of the lower court and correct judicial errors where necessary while the Supreme Court sit also to review the decision of the appellate court which usually, their decisions are based on votes among their lordships. Ojoh (2019) agreed that both the appeal court and the supreme court are appellate courts.

The supreme court of Nigeria can also be seen as a policy court because every of their rulings are automatically laws of the land. The types of courts as stated in the Nigerian 1999 constitution as amended are as follows:

- 1) The Supreme Court
- 2) The Appeal Court
- 3) The Federal High Court
- 4) The High Court of FCT Abuja
- 5) The National Industrial Court
- 6) The High Court of a State
- 7) The Sharia Court of Appeal of FCT Abuja
- 8) The Sharia court of Appeal of a State
- 9) The Customary Court of Appeal of FCT Abuja
- 10) The Customary Court of Appeal of a State.
- 11) The Magistrate Court

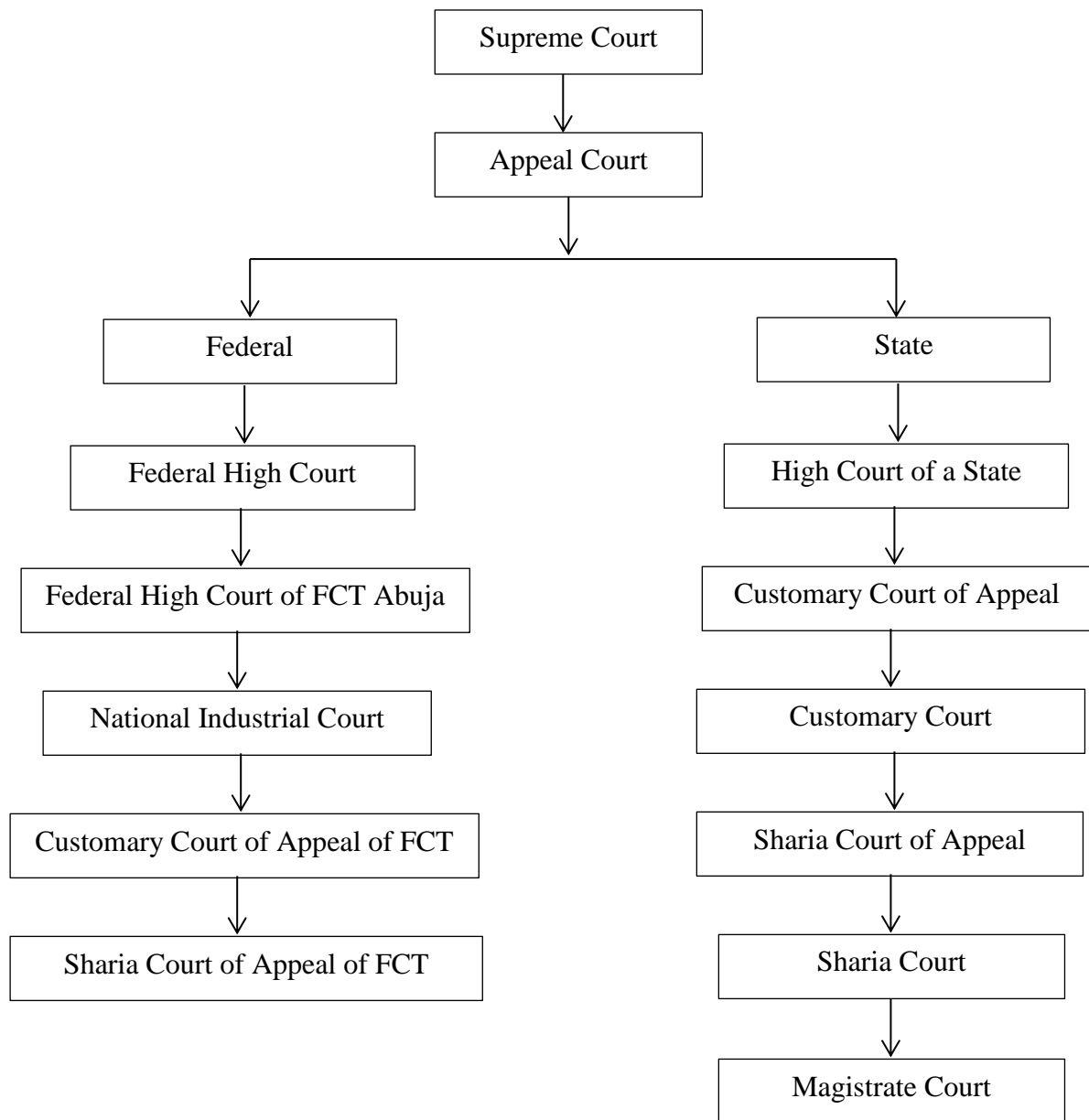


Fig 1: Diagram of the Nigerian Judiciary System
Source: Researchers construct, 2024

Characteristics of Education Law

Dike (2020), identified the following as the key components of education law at the educational institutions and they include, clarity of purpose, simple and short, acceptability and visibility.

- Clarity of purpose: educational laws must be clear and direct to the end users for proper and prompt adherence and compliance.
- Simple and short: educational laws are to be made simple and short without any form of ambiguity, confusion or contradiction.
- Acceptability: the laws of educational institutions must be acceptable by the public or should be an affordable law for targeted people.
- Visibility: Education law is meant to be visible either written or unwritten, but must be visible in the heart of the end users.

Importance of Education Law

Education Law enables both the teachers and administrators to understand their rights, do's and don'ts, limitation and the corresponding implications of the law. Elemchi (2017) pointed out this few points as importance of education law and they include: self-education, good knowledge of the law, eradication of illiteracy and dispute settlement.

- Self-education: it helps school administrators to take good, positive and orderly decisions without the help of a legal luminary.
- Good knowledge of legal side of education, that is knowing when to sue and be sued.
- Inculcate in the end users the spirit of law and the mind of being a full legal representative.
- Helps to give the thought of settling issues or dispute legally between teachers – students and school – community.
- Helps to eradicate the illiteracy of unawareness of education laws amongst administrators and make them legally literate in order to discharge their duties accordingly.

Sources of Education Law

Nwadike and Godwins (2018) outlined some sources of education laws which include, customary law, constitution, decree and statutory laws.

- Customary law: basically, the laws and cultures of the people constitutes education law because, the more one is obeying the laws of the land, the more knowledge he acquires.
- Constitution of the country: constitution is laid down rules and regulation of a country on how her citizens should behave which could be written or unwritten as the case maybe.

- Decree: the military in their regime make laws for educational institutions to obey and work with.
- Statutory laws, Common sense, United Nations Educational, Scientific and Cultural Organization (UNESCO), International Criminal Court, United Nation.

As a means of controlling unacceptable conduct in the educational system, discipline plays a prominent role in that area hence, Saha (2018) identified suspension of salary, change of classroom, half payment of salary and deduction of salary as some disciplinary actions that can be taken against teachers and students. However, below are some other ways of disciplining some people within the educational sector.

(i) Waring, (ii) Quarry, (iii) Suspension, (iv) Rustication, (v) Termination, (vi) Dismissal, (vii) Compulsory retirement, (viii) Demotion.

Who can sue and be sued:

- a. Students
- b. Teachers
- c. Parents
- d. School
- e. Cooperate body
- f. Government.

Effective Administration of Secondary School

The administration of secondary school for effective result requires the cooperation of all stakeholders within the educational institution. Effectiveness entails proper management of educational resources both human and physical facilities. The quality of manpower displayed also determines the level of efficiency and output to be recorded. Ododo (2021), stated that, stakeholders in educational industry are the major contributory factors towards effective administration of secondary school. The smooth running of secondary school is highly dependent on the level of manpower, physical facilities and policy makers available for maximum discharge of duties. Dike (2020) opined that, proper administration of secondary school can only be achieved maximally with the help of the government. Therefore, the influence of government on the administration of secondary school helps in achieving the goals and objectives of secondary education smoothly.

Statement of the Problem

Administrators of secondary school in Nigeria is so sensitive that it requires the highest level of professionalism amongst the administrators. However, the unawareness of education law and its challenges is a major problem within the educational sector which Nwadike and Godwins (2018) affirmed that ignorance of laws that governs schools slows down the speed for efficiency and effectiveness of school objectives. The question is “will the awareness of education law among school administrators enhance effective secondary school administration”? In trying to answer this question, this study seeks to examine the awareness of education law for an effective administration of secondary school in Rivers State, in Nigeria.

Purpose of the Study

The purpose of the study is to examine awareness of education law for effective administration of secondary schools in Rivers State, Nigeria. Objectively, the study sought to achieve the following:

1. Identify the strategies for promoting awareness of education law for effective administration of secondary schools in Rivers State, Nigeria.
2. Find out the challenges facing awareness of education law for effective administration of secondary schools in Rivers State, Nigeria.

Research Question

The following research questions guided the study

1. What are the strategies for promoting awareness of education law for effective administration of secondary schools in Rivers State, Nigeria?
2. What are the challenges facing awareness of education law for effective administration of secondary schools in Rivers State, Nigeria?

Methodology

The study employed the descriptive research survey design. The study was conducted in Rivers State. The population of the study is 311 principals in public senior secondary school in Rivers State. A sample of 208 principals (112 urban and 96 rural) were selected for this study using proportionate and simple random sampling techniques. The instrument for data collection was a self-structured questionnaire tagged “Awareness of Education Law for Effective Administration of Secondary School Questionnaire” (AELEASSQ) which was designed in a patterned modified four-point rating scale agreement of 1-4. The instrument was validated by expert in educational management and education foundation respectively. A reliability

coefficient of 0.82 for both was established using Cronbach Alpha. The instrument that was administered to the respondents was retrieved completely and used for the study. Data collected were analyzed using Mean (X) and Standard Deviation (SD) for research question 1 while Frequency count (F) and Percentage (%) were used to analyze research question 2. For research question 1 mean value less than 2.50 was considered as “Disagree (D)” while items with mean value equal to 2.50 and above are considered as “Agree (A)”.

Results

The results of the study were presented in Table 1 – 2 below.

Research Question 1: What are the strategies for improving awareness of education law for effective administration of secondary schools in Rivers State, Nigeria?

Table 1: Respondents’ Mean (X) and Standard Deviation (SD) scores on the strategies for improving awareness of education law for effective administration of secondary schools in Rivers State, Nigeria

S/N	Strategies for Improving Awareness of Education Law	Urban Principals (112)			Rural Principals (96)			X+X/2
		\bar{X}	SD	Rmk	\bar{X}	SD	Rmk	
1	Provision of constitution of the country to school administrators	3.60	0.77	A	3.43	0.68	A	3.51
2	Regular conduct of school administration law seminars and workshops for administrators	3.16	0.75	A	3.0	0.71	A	3.30
3	Financial encouragement	3.50	0.77	A	3.0	0.80	A	3.25
4	Industrial training and attachment in a law firm for more knowledge of the law	3.0	0.81	A	2.61	1.01	A	2.80
5	Regular implementation of education law to the defaulters	3.0	0.81	A	2.70	0.80	A	2.90
6	Provision of relevant instructional materials and educational resources	2.90	1.01	A	2.60	0.89	A	2.80
7	Recruitment of competent hand with law background	3.30	0.76	A	2.70	0.88	A	3.0
8	Enactment of good, simple and accessible laws and policies by the government	3.60	0.84	A	2.70	0.71	A	3.15
Aggregate Mean		0.71			0.81			3.10

Source: Researchers’ field work 2024

Table 1 shows respondents' responses on the strategies for awareness of education laws for effective administration of secondary schools in Rivers State, Nigeria. Result from Table 1 indicates that all the items listed from 1-8 are strategies for awareness of education law in secondary school in Rivers State, Nigeria. The result also shows an aggregate average Mean of 3.10 with standard deviation of 0.71 and 0.81 respectively for urban and rural principal. The mean values were higher than the criterion mean of 2.50 as a bench mark for the decision taking. Standard deviation values less than 1.0 (< 1.0) indicates that the respondents were divers in their response while standard deviation value greater than 1.0 (> 1.0) show that respondents responded in uniformity.

Research Question 2: What are the challenges facing awareness of education law for effective administration of secondary school in Rivers State, Nigeria?

Table 2: Respondents' Frequency count (F) and Percentage (%) scores on the challenges facing awareness of education law for effective administration of secondary school in River State, Nigeria

S/N	Challenges facing awareness of education law	Urban Principals (n=112) Freq	%	Rural Principals (n=96) Freq	%
9	Lack of fund	112	100.00	96	100.00
10	Lack of manpower	112	100.00	96	100.00
11	Government negligence	112	100.00	96	100.00
12	Abuse of power by school administrators	112	100.00	96	100.00
13	Cultural Differences	112	100.00	96	100.00
14	Lack of interest to master education law by school administrators	112	100.00	96	100.00
15	Poor planning	112	100.00	96	100.00
16	Poor supervision	112	100.00	96	100.00

Source: Researchers' field result 2024.

Table 2 shows the frequency and percentage responses of urban and rural secondary schools principals on the challenges facing awareness of education law in Rivers State. The result indicates that the respondents all agreed that the listed items are the real challenges facing awareness of education law in secondary schools in Rivers State, Nigeria.

Discussion of Findings

Result from Table 1 revealed that items 1-8 are the strategies for awareness of education law in secondary schools in Rivers State. Strategies such as provision of constitution, workshops and seminars, financial encouragement amongst others are some of the strategies for awareness of education laws in Rivers State. This finding is in line with the findings of Ogbugi (2020) who found that strategies such as grass root campaign and enlightenment of education law, financial assistance, subsidizing law courses amongst others are some of the strategies for improving awareness of education law.

Result from Table 2 showed the challenges facing awareness of education law for effective administration of secondary schools in Rivers State, Nigeria. Result from Table 2 shows that, the challenges facing awareness of education law in Rivers State include lack of fund, lack of manpower, poor planning, poor supervision amongst others. The funding is in agreement with Uzor (2018) who found that poor funding and financing of education hinders the progress of secondary school administration.

Conclusion

The study concluded that awareness of education law for effective administration of secondary schools in Rivers State, Nigeria is of great paramount for both school administrators and students. The study found that the identified strategies for the awareness of education law in secondary school enhances proper administration of secondary education. Also, the study found that the challenges facing awareness of education law in secondary school is a major setback in the administration of secondary school in Rivers State, Nigeria.

Recommendations

Based on the findings of the study, it was recommended among others that:

1. The strategies listed should be encouraged and adhered to so as to boost the morale's of secondary school principals and administrators both in awareness and in practice of education laws in school.
2. Proper supervision, good and comprehensive planning and more funding and financing by the government should be provided for so as to ameliorate the challenges facing awareness of education laws and the administration of secondary schools in Rivers State, Nigeria.

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Cultivating a Culture of Lifelong Learning for Tertiary Institution Staff in Rivers State Through Artificial Intelligence

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Abstract

This paper explores cultivating a culture of lifelong learning for tertiary institution staff in Rivers State through artificial intelligence. In light of the dynamic nature of the educational environment, it is imperative to adopt innovative strategies that enable educators to acquire the necessary skills and expertise to thrive in their professional capacities. Artificial intelligence (AI) provides a transformative avenue through which personalised learning routes, adaptive learning environments, data-driven insights, and virtual learning communities can be facilitated. Nevertheless, the process of integration also gives rise to significant ethical concerns that must be carefully examined. These concerns encompass issues such as the protection of data privacy, the potential for bias, the need for transparency, the promotion of equity, and the establishment of effective governance mechanisms. In order to optimise the advantages of AI-driven professional development while simultaneously tackling the aforementioned obstacles, the research proposed a holistic strategy encompassing personalised learning, stringent data privacy protocols, strategies to mitigate bias, transparent AI algorithms, principles of inclusive design, ethical governance frameworks, and ongoing monitoring and evaluation. By implementing these tactics, higher education institutions in Rivers State can effectively include artificial intelligence (AI) as a potent instrument for fostering a culture of ongoing professional development among educators, thereby augmenting the overall educational standards in the area.

Keywords: Artificial Intelligence (AI), Professional Development, Continuous Learning and Ethical Considerations

Introduction

As the world progresses into the digital age, educational institutions are under increasing pressure to adapt to the changing needs of stakeholders, which include not only students but also staff in the usage of Artificial Intelligence (AI) as a driven factor in promoting a culture of continuous learning of staffs. One of the defining features of AI is its capacity to process vast amounts of data, learn from it, and make informed decisions or recommendations base on the needs of the users given a directive prompt. Again, artificial intelligence is characterized by its ability to perform tasks that typically require human intelligence such as learning, reasoning, problem-solving, and decision-making which makes significant inroads into various sectors which education is not excluded. (Marr, 2020). The advent of AI in education

brings forth innovative solutions that can personalize learning, automate administrative tasks, and provide real-time data analytics to improve educational outcomes. In line with teacher professional development, AI presents opportunities for creating more effective, personalized, and continuous learning experiences for classroom teachers, which are important for maintaining a high standard of teaching and adapting to the increasing changes in the educational system.

AI analyze the unique needs and preferences of staff enabling the customization of learning experiences (Panigrahi, 2020). Today, artificial intelligence is one of the emerging technologies which are capable of altering every aspect of our social interactions. In education, AI has begun producing new teaching and learning solutions that are now undergoing testing in different areas. AI-driven systems can assess an educator's proficiency in specific teaching methodologies or identify gaps in their subject matter. AI has a rich history dating back to the mid-20th century. It began with rule-based systems and symbolic AI, where experts manually encoded knowledge into computers. The field progressed with the development of machine learning algorithms and neural networks. Recent advancements, such as deep learning and reinforcement learning, have propelled AI to new heights, enabling it to excel in tasks like autonomous learning strategies. As AI systems become more prevalent in everyday life, ensuring responsible development, transparency, and ethical use of AI has become a pressing concern for researchers, policymakers, and society at large in fostering a culture of continuous learning in tertiary institutions in Rivers State (Bryson et al., 2017).

Continuous learning is no longer an option; it's a necessity. To meet this need, the integration of Artificial Intelligence (AI) into teacher professional development emerges as a transformative solution. AI offers promising avenues for individualized learning experiences. Nwosu (2020) suggested that AI algorithms can analyze the unique needs and preferences of teachers, creating tailored professional development plans. This personalization ensures that educators receive the precise training required to enhance their skills and knowledge during classroom interactions. AI-driven platforms that offer adaptive learning materials and assessments are also gaining prominence. According to Okon (2019), these platforms adjust content difficulty based on individual teacher progress, ensuring that educators are challenged at the right level and facilitating continuous improvement. Moreover, data-driven decision-making in education has been emphasized by educational expert Adesina (2021). He further pointed that AI can analyze data on teacher performance and the effectiveness of professional

development programs, enabling institutions to make informed decisions for improvement by identifying challenges during classroom instructions. Additionally, the use of AI chatbots to assist teachers has been investigated. According to Okafor (2022), AI-driven chatbots can offer users information, answer queries, and provide an outline for a specific assignment, all of which can improve the learning experience for teachers. AI systems that track teachers' progress and provide prompt assistance when problems arise have also been suggested. Adebayo (2020) asserted that these solutions can guarantee that instructors get the assistance they require in practical circumstances. Ethical considerations surrounding AI integration in education have been highlighted by Adeyemi (2019) who emphasized the importance of ensuring data privacy and ethical use of AI to maintain trust in the education system. The integration of Artificial Intelligence (AI) into education necessitates a thoughtful examination of the ethical implications to ensure that educators' rights and privacy are protected. One critical ethical consideration is data privacy. As Okeke (2018) aptly noted, AI systems often require access to vast amounts of data, including teachers' personal information and learning patterns. While this data is essential for personalization and improvement, it must be handled with utmost care to prevent unauthorized access or breaches.

Furthermore, the issue of bias in AI systems raises ethical concerns. AI algorithms may inadvertently perpetuate biases present in the data they are trained on, as emphasized by Nwosu (2021). In the context of teacher professional development, biases in AI systems could lead to unfair assessment or unequal access to learning opportunities. Vigilant oversight and regular audits are essential to mitigate algorithmic bias and ensure fairness in AI-driven learning experiences. A related ethical concern is transparency and accountability in AI decision-making. According to the research by Adewale (2019), when AI systems make recommendations or decisions related to teacher development, it may be challenging for educators to understand the rationale behind these suggestions. This lack of transparency can erode trust in AI systems and hinder their adoption. Educators should be provided with clear explanations of how AI-driven decisions are reached, ensuring accountability and ethical use.

The need for continuous learning among educators and staff in Rivers State's tertiary institutions is underscored by global trends in education. The 21st century has witnessed an unprecedented transformation in the way knowledge is created, disseminated, and accessed. The traditional models of professional development that were once sufficient are now being outpaced by the demands of a knowledge-driven economy and an information-savvy generation of students

(UNESCO, 2020). In a world where information is constantly evolving and new knowledge is being generated at an unprecedented pace, the concept of continuous learning has gained paramount importance. Continuous learning is more than a buzzword; it is a strategic approach to personal and professional growth that acknowledges the ever-changing nature of knowledge and skills required for success (Schleicher, 2019). The imperative for continuous learning extends to educators and staff within tertiary institutions. Traditional methods of professional development, such as periodic workshops or seminars, have limitations. They often lack personalization, and the knowledge acquired may become outdated before it can be effectively applied in practice. This inadequacy necessitates a paradigm shift in professional development, aligning it with the principles of continuous learning that AI can facilitate.

The idea behind AI-driven professional development in Rivers State's tertiary institutions stems from the understanding that the state's academic staff and non-teaching staff are its most valuable assets. The state wants to establish an environment where lifelong learning is valued and permeates all of its higher institutions. This vision is consistent with current global educational trends that emphasize the value of adjusting to the changing requirements of the information economy (World Bank, 2021). The inadequacy of conventional professional development methods is exacerbated by the growing expectations of students who have grown up in the digital age, as well as the evolving needs of the job market. To address these challenges, educational institutions must embrace innovative approaches to professional development that align with the principles of continuous learning. Artificial Intelligence (AI) has emerged as a disruptive technology with the potential to revolutionize professional development by offering personalized and data-driven learning experiences for educators. However, despite the promise that AI holds, the integration of AI-driven professional development in Rivers State's tertiary institutions faces several pressing issues and challenges that warrant in-depth investigation:

In Rivers State, Nigeria, there is an urgent need to foster a culture of lifelong learning among staff in tertiary institutions to adapt to the rapid advancements in education and technology. The integration of Artificial Intelligence (AI) into professional development programmes offers a promising solution to this challenge. AI has the potential to transform how staff and administrative staff acquire new skills and knowledge by providing personalized, data-driven learning experiences. However, the effective implementation of AI-driven professional development faces several significant issues that must be addressed. A major challenge is the

widespread lack of awareness and understanding of AI among staff. This knowledge gap hinders the adoption and effective use of AI-driven tools and resources, limiting their potential benefits. Furthermore, AI systems require access to sensitive personal information, raising concerns about data privacy and the ethical use of AI. Ensuring that this data is handled responsibly is crucial to maintaining trust and protecting the privacy of academics.

Another critical issue is the potential for AI systems to perpetuate biases present in their training data. Such biases can lead to unfair assessments and unequal access to learning opportunities for staff. Addressing these biases requires careful oversight and regular audits to ensure fairness and equity in AI-driven professional development. Additionally, traditional methods of professional development, such as periodic workshops or seminars, often lack the personalization and adaptability that AI can offer. This highlights the need for innovative approaches that align with continuous learning principles and are tailored to the unique needs of academics. The practical challenges of implementing AI-driven professional development also include limited infrastructure and resources in some institutions, which may impede the adoption of new technologies. There may also be resistance to change from staff who are unfamiliar with or skeptical of AI. Overcoming these barriers is essential for successfully integrating AI into professional development programmes.

Given these challenges, research is needed to explore effective strategies for incorporating AI into the professional development of staff in Rivers State's tertiary institutions. Such research will provide valuable insights into creating a framework that leverages AI to enhance learning opportunities, ensuring that academics are equipped to meet the evolving demands of the educational system and cultivate a culture of lifelong learning which prompted the investigation of this research.

Theoretical Framework

Diffusion of Innovation Theory

Rogers' theory of the diffusion of innovations was postulated by Rogers in (1962) as pointed out in the work of Nwuke (2022). The theory posited that the process of individuals, organisations, or communities embracing a novel innovation unfolds gradually. The theory provides a comprehensive explanation of the mechanisms through which new concepts or ideas are communicated and adopted within a specific population. The process consists of five

fundamental phases, specifically knowledge acquisition, persuasion, decision-making, implementation, and confirmation.

1. Knowledge: The individual acquires knowledge of the innovation through focused and concise practise. During this first stage, individuals are exposed to the innovation for the first time, gaining awareness of its presence and cultivating a basic understanding of its purpose and potential benefits that will accrue from the innovation

2. Persuasion: The individual develops an inclination towards the innovation and actively pursues additional information. During this stage, individuals develop a favourable attitude towards the innovation. The individuals evaluate the advantages of the subject being assessed and compare it with existing alternatives, considering multiple factors such as cost, suitability for their needs, and potential risks.

3. Decision Making: The process of decision making involves the careful evaluation of the strength and weaknesses associated with the adoption of the innovation, leading to a conclusive determination to adopt it. Individuals partake in a purposeful procedure to ascertain the feasibility of embracing or dismissing the innovation. The decision-making process is susceptible to various internal and external factors, encompassing personal perceptions, societal norms, and the perspectives of influential individuals.

4. Implementation: The individual starts using the novel concept (Innovation). Once individuals have made the decision to accept, they proceed with the implementation of the innovation in their respective daily lives or work environments. This may involve the acquisition of knowledge related to the product, the adjustment of established routines, or the alteration of processes to accommodate the innovation.

5. Confirmation: Confirmation is the stage in which the individual assesses the outcomes of adopting the innovation and makes a determination regarding its ongoing utilisation. The concept involves the continuous adoption and application of the innovation by individuals, leading to either the validation or dismissal of their initial choice. If the innovation successfully meets the users' expectations and effectively delivers the desired benefits, there is a strong likelihood that it will be embraced and spread through informal channels of communication. Nwuke (2022) considered the usage of a virtual reality learning platform as an example, using the various stages. In respect to the first stage, knowledge acquisition, educators and learners become aware of the availability and potential benefits of utilising artificial intelligence. It has

been found that this technology has the capability to provide captivating and interactive educational experiences, thereby enhancing students' interest and comprehension across various academic fields. During the second stage of persuasion, teachers evaluate the advantages of incorporating artificial intelligence into their instructional methodologies. Factors such as enhanced student motivation, the potential for experiential learning, and alignment with instructional goals are considered in their evaluation. In order to enhance their understanding and gain additional insights, individuals may consider engaging in discussions with colleagues or attending professional development events such as workshops and conferences.

Rogers in Nwuke (2022) posited that the rate of adoption of an innovation is influenced by five key factors, namely relative advantage, compatibility, complexity, trialability, and observability. Various factors have the potential to influence an individual's inclination towards either embracing or dismissing an innovation. The application of the Diffusion of Innovation theory holds significant relevance in the context of artificial intelligence on teacher professional development for sustainable education in public schools in Rivers State. The theory elucidates the manner in which individuals, encompassing university administrators, are subject to the influence of specific factors when making decisions regarding the adoption of a novel innovation. The theory emphasizes the significance of effective communication and the involvement of early adopters in facilitating the diffusion of innovation within the organisation. The successful implementation of artificial intelligence necessitates the establishment of efficient communication channels that facilitate the dissemination of information, fostering awareness, comprehension, and expertise regarding emerging technologies among relevant stakeholders. Therefore, the relevance of this theory to the study is that it facilitates comprehension of the adoption process and enables the formulation of strategies to enhance its effectiveness on teacher professional development for sustainable education in public schools in Rivers State.

Conceptual Clarifications

Fostering a Culture of Continuous Learning Using Artificial Intelligence

Continuous learning is not just a buzzword, it's a necessity in today's fast-changing and competitive world. But how do you create a culture of continuous learning in your organization, where employees are motivated and empowered to learn new skills, share knowledge, and grow professionally? Here are some tips to help you foster a learning mindset and environment in your organization. one of the first steps to foster a culture of continuous learning is to align

learning with your organization's vision, mission, and goals. This means that you need to communicate clearly and regularly what your organization is trying to achieve, why learning is important, and how learning contributes to the success of the organization and the individual. You also need to identify the skills and competencies that are relevant and in demand for your organization, and provide learning opportunities and resources that match them fostering a culture of continuous learning using Artificial Intelligence (AI) is a forward-looking approach that can revolutionize how organizations embrace ongoing development and adaptation. In this discussion, we will explore key aspects of this concepts:

Personalized Learning Journeys

One of the significant benefits of AI in continuous learning is the ability to tailor learning experiences to individual needs. As Siemens and Gasevic (2017) emphasize, AI algorithms can analyze learners' preferences and past performance to create personalized learning journeys. This personalization ensures that each individual's learning path is optimized for their unique strengths and weaknesses.

Adaptive Learning Environments

AI-driven systems are particularly adept at providing adaptive learning environments. Koedinger et al. (2012) highlight that these systems can dynamically adjust the difficulty of assignments and content based on real-time performance data. Learners are consistently challenged at the right level, maximizing engagement and knowledge retention.

Data-Driven Insights

AI's data analytics capabilities are instrumental in fostering continuous learning. Hill and Barber (2019) argue that AI can provide educators and learners with real-time insights into their progress. This data-driven approach allows for immediate course correction and targeted interventions when needed.

Accessibility and Inclusivity

AI-powered learning tools can enhance accessibility and inclusivity. Li et al. (2019) suggest that AI can assist learners with diverse needs, such as language barriers or disabilities, by offering customized support and adapting content delivery methods.

Ongoing Feedback and Assessment

In the realm of continuous learning, frequent feedback and assessment are essential. Almadhi et al. (2020) demonstrate that AI-enhanced assessment tools can provide continuous feedback on learners' performance, helping them track their progress and make necessary improvements.

Lifelong Learning Mindset

Fostering a culture of continuous learning requires instilling a lifelong learning mindset. Dweck (2006) highlights the importance of a growth mindset, where individuals view challenges as opportunities for growth. AI-driven learning experiences can reinforce this mindset by promoting resilience and a positive attitude towards learning.

Accessibility and Inclusivity of AI tools in fostering a Culture of Continuous Learning

Accessibility and inclusivity are critical considerations when integrating AI tools to foster a culture of continuous learning. Ensuring that AI-driven learning environments are accessible to all individuals, regardless of their abilities or backgrounds, is essential for promoting equitable and effective continuous learning experiences. Universal design principles are fundamental in creating AI tools for continuous learning that are accessible to a wide range of users. As Burgstahler (2015) points out, these principles emphasize designing products and environments that can be used by everyone, regardless of their abilities. AI tools should be designed with flexibility and adaptability in mind, accommodating various learning styles and needs.

AI tools can provide significant benefits to learners with disabilities. For example, screen reader compatibility and voice commands can enhance access for individuals with visual impairments (Bogdanov et al., 2016). Moreover, AI-driven language processing can support learners with dyslexia or other reading difficulties by providing text-to-speech and speech-to-text functionalities (Blikstein et al., 2017).

AI tools should be language and culturally inclusive to cater to diverse user groups. Raza et al. (2017) emphasize the importance of multilingual AI systems that can adapt to different languages and dialects. Additionally, cultural sensitivity is vital to ensure that AI tools respect and accommodate various cultural perspectives and norms. Personalization and adaptability are key features of AI tools for continuous learning. Hsiao et al. (2018) highlight the role of AI in providing personalized learning pathways based on individual preferences and progress. This adaptability ensures that each learner's unique needs and strengths are considered, promoting inclusivity.

AI interfaces should be intuitive and user-friendly to ensure accessibility for all. Czerkawski and Lyman (2016) stress the importance of designing AI-driven platforms with clear navigation and user interfaces that are easy to understand and operate. This approach benefits all users, including those with varying levels of technological proficiency.

Addressing the potential challenges and ethical considerations associated with integrating AI into professional development

Addressing the potential challenges and ethical considerations associated with integrating AI into professional development is essential to ensure responsible and effective implementation. Below, we explore these challenges and ethical concerns:

Data Privacy Concerns

Integrating AI into professional development often involves collecting and analyzing data about educators' performance and learning behaviors. This raises significant data privacy concerns. As Adeyemi (2019) points out, educators have a right to privacy regarding their personal and professional data. Organizations must establish robust data privacy policies and practices to protect sensitive information.

Bias in AI Algorithms

AI systems can inadvertently perpetuate biases present in their training data, leading to unfair advantages or disadvantages for certain groups of educators. Nwosu (2021) highlights this challenge, emphasizing that bias in AI algorithms can result in unfair assessments or recommendations. Addressing bias in AI algorithms requires ongoing monitoring, auditing, and efforts to mitigate bias in training data and algorithms.

Transparency and Explainability

The opacity of AI algorithms poses challenges related to transparency and explainability. As Adewale (2019) argues, educators and stakeholders should understand how AI-driven decisions are made. Ensuring transparency in AI systems is essential to build trust and allow users to scrutinize and question the recommendations and assessments provided by AI.

Equity and Inclusivity

AI-driven professional development tools should be designed to promote equity and inclusivity. Adeniyi (2020) underscores the importance of ensuring that AI-enhanced learning opportunities are accessible to all educators, regardless of their background or circumstances. Neglecting inclusivity can exacerbate educational inequalities.

Ethical AI Governance

Ethical AI governance is vital in addressing these challenges. Adeoye (2017) emphasizes the need for clear ethical guidelines, codes of conduct, and regulatory frameworks governing the use of AI in professional development. Ethical AI governance ensures responsible AI use and protects educators' rights and well-being.

Continuous Monitoring and Evaluation

To mitigate these challenges and ethical concerns, continuous monitoring and evaluation of AI systems are essential. Organizations should regularly assess the impact of AI-driven professional development on educators and the learning outcomes. Ongoing evaluations help identify and rectify potential biases, privacy breaches, or transparency issues (Hao et al., 2019). Integrating AI into professional development offers numerous benefits, but it also presents challenges and ethical considerations related to data privacy, bias, transparency, equity, and governance. These challenges can be addressed through stringent data privacy measures, bias mitigation strategies, transparent AI algorithms, equitable access, ethical governance frameworks, and continuous monitoring and evaluation. By proactively addressing these concerns, educational institutions can harness the potential of AI for responsible and effective professional development while upholding ethical standards and ensuring equitable opportunities for all educators.

Mitigating the Challenges and Ethical Considerations Associated with Integrating AI into Professional Development

1. **Data Privacy Solutions:** Implement strong encryption protocols to protect sensitive data during storage and transmission
2. **Data Anonymization:** Anonymize data whenever possible to ensure that individual educators cannot be identified
3. **User Consent:** Obtain informed consent from educators before collecting and using their data for AI-driven professional development
4. **Diverse Data Sources:** Use diverse and representative data sources for training AI algorithms to minimize bias
5. **Bias Audits:** Regularly audit AI algorithms to detect and address bias in recommendations and assessments
6. **Ethics Review Boards:** Establish ethics review boards or committees to assess the ethical implications of AI applications in professional development

7. Ethical Guidelines: Establish clear ethical guidelines and codes of conduct for the use of AI in professional development
8. Ethics Committees: Form ethics committees or boards responsible for reviewing and guiding the ethical use of AI
9. Regular Audits: Conduct regular ethical audits to assess the compliance of AI systems with established guidelines

Conclusion

A critical step towards promoting a culture of continuous learning is the use of Artificial Intelligence (AI) into professional development in tertiary institutions in Rivers State. This method offers individualised instruction, adaptability, and data-driven insights that can be very useful to teachers. To be implemented successfully, AI-driven professional development must take into account a number of possible issues and ethical issues, such as data privacy, bias, transparency, equity, and governance. Realising the full potential of AI in encouraging continuous learning requires addressing these problems through solid techniques and frameworks. Overall, AI-driven professional development has the potential to transform education in Rivers State by giving teachers the tools and materials they need to succeed in a constantly changing environment. It is a journey towards a time when education is individualised, open to all students, and morally upstanding, ultimately raising the standard of instruction and fostering professional development in tertiary institutions throughout the state.

Suggestions

1. State government should identify the needs of educators by conducting a detailed needs assessment among the tertiary institutions in Rivers State and determine the areas where AI can have its impact.
2. University Management should encourage cooperation between academic institutions, AI specialists, and pertinent parties to ensure a comprehensive and educated approach to AI integration.
3. Academics should create and follow a set of moral standards that give all AI-driven projects top priority when it comes to data privacy, justice, and openness. Make sure that all local, national, and international data protection rules are followed.
4. University Management should offer academics training and programmes to help them develop their skills so they can use AI-driven products efficiently.

5. University Management should create a long-term strategy for the incorporation of AI in professional development, keeping in mind that both educational requirements and AI technology will advance over time.

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Literacy Level and Attitude of Academics towards the Adoption of Artificial Intelligence (AI) in Public Universities in Rivers State

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Abstract

The study focused on literacy level and attitude of academics towards the adoption of AI in public Universities in Rivers State. Three research questions were answered and three hypotheses tested in the study. The study adopted descriptive survey design. Population of the study was 3,766 lecturers in the three public Universities in Rivers State out of which 362 lecturers were sampled using stratified random sampling technique. Instrument used for gathering data was a 15-item questionnaire named "Lecturers Literacy and Attitude on the Adoption of Artificial Intelligence Questionnaire" (LLAAAIQ) which face and content validated by three Educational Management expert at Rivers State University. Cronbach alpha was used to estimate the reliability of the questionnaire and it produced an index of 0.81. There were 362 copies of questionnaire administered while 357 copies (238 males and 119 females) representing 98.6% were retrieved. Research questions raised were answered using mean and standard deviation while the hypotheses were tested using z-test at 0.05 level of significance. The findings showed that the lecturers had low level of AI literacy but had a good attitude towards its adoption. It was also shown that shortage of AI tools was not a challenge to them but the lack of regulatory framework and security of digital information. It was recommended among others that the lecturers should be trained on the adoption of AI for the discharge of their academic and administrative responsibilities in the University.

Keywords: Artificial Intelligence, Lecturers, Universities, Literacy, Attitude

Introduction

Artificial Intelligence (AI) is one of the modern technologies which was developed to help solve problems that would ordinarily require the human brain to execute in the past. This technology has continued to gain relevance across all sectors of the economy and the education sector is not left out. Seldon and Abidoye (2018) alluded to this when they stated that AI has strategically increased the value of education and this implies that a lot of transformation has been made possible in the education sector since the emergence of AI.

The relevance of AI cuts across all levels of education and lecturers in Universities have continued to explore how this technology can be relevant to their educational service delivery. Yusuf et al., (2022) mentioned that there are several features that makes AI beneficial to users including lecturers in Universities and this is premised on the fact that it is user-friendly, has infinite functions and can simplify complex tasks. However, the extent to which these lecturers can benefit from this technology depends on their level of awareness on its usage as well as the believe they hold about the usefulness of this technology.

So far, Kuleto et al., (2021) pointed out that AI represents the future of work and its adoption in solving educational problems cannot be undermined. Lecturers have several educational roles that they are expected to discharge for the achievement of educational goals and objectives. However, the extent to which they maximize the benefits of this technology will depend on their level of literacy in its adoption and perceived usefulness of the technology to them. This is important to maximize this technology in the lecturer's functions.

Statement of the Problem

Artificial Intelligence (AI) has been in existence for several decades and have been helpful in solving societal problems particularly in the area of finance and health. However, its adoption in the education sector particularly among lecturers in Universities has been very slow. Despite the fact that University administrators encourage lecturers to embrace this new technology, the rate of adoption among lecturers in the discharge of their duties has been epileptic. This experience raises questions as to whether or not these lecturers are literate on the adoption of this technology and if they perceive that the technology will be useful to them in the discharge of their academic and administrative roles and this forms the problem that this study intends to investigate.

Literature Review

Artificial Intelligence (AI) is one of the most talked about technological tool for production of goods and rendering of services all over the world as a result of the several advantages that it possesses. Garcia-Martinez et al., (2023) defined AI as any resource or machine that has the capacity to execute human activities. In a clearer term, it remains to any form of technology that can emulate human reasoning in the execution of simple or complex task. This means that rather than man thinking for himself about how to carry out his or her day-to-day activities, the worries and responsibility is transferred to the machine.

The importance of AI in a knowledge community such as the University cannot be overemphasized as academics who are at the forefront of knowledge production and management require essential tools such as the AI for the execution of their academic and administrative responsibilities. However, the extent to which these academics will familiarize with this technology depends on how knowledgeable they are about this emerging technology. This means that academics must show AI literacy for them to be able to put this technology into meaningful use. Long and Magerko (2020) as well as Miao et al., (2021) both alluded to the fact that AI literacy refers to the set of skills that enable an individual to understand how AI is being used by learning about AI, how it works and how it can be used sustainably.

Furthermore, Ng et al., (2021) pointed out that for an individual to be said to be AI literate, he or she must know and understand AI, use and apply it, evaluate and create things with it and understand the ethics that guides its usage. It is only when this is achieved that a user can be said to be AI literate. This means that University lecturers must understand the basis behind the development of this technology, understand how it can be useful in their own line of duty and also ensure that they are able to adhere to the principles guiding the use of this technology.

The knowledge vis-à-vis literacy of lecturers about AI cannot be of great benefit if they do not develop the right perception about this technology. There is no doubt that while some lecturers have heard about the emergence of AI and how it can be used in their line of duty, they are still skeptical about whether or not they should adopt it. This means that their perception about this technology is not strong enough to compel them to adopt the technology. West and Allen (2018) pointed out that it was not until recently when the scientific community began to engage with AI has some have previously expressed fear about this technology which has affected their willingness to deploy it even in the education sector. The wrong notion that people hold about AI has therefore limited the pace at which it is being deployed by lecturers even in the Universities.

Additionally, there are several other factors that hinder lecturers from deploying AI at work and the issue of policy surrounding its use, security and data issues about AI were dominant (Onaolapo & Onifade, 2020). Furthermore, Alam et al., (2024) stated that there are other challenges that hinder lecturers' adoption of AI at work and this includes issues about the low level of expertise, privacy and security issues, the capital intensive nature of AI integration, resistance to change, problem of data quality and availability, lack of training and so on. Therefore, except these challenges are systematically addressed, the issue of AI among lecturers

in the ivory towers will continue to wobble as its adoption will be undermined by those who are supposed to promote its usage.

Empirical Review

Studies have continued to be conducted by scholars on the adoption of AI across different levels of education. Woodruff et al., (2023) looked into how educators in the fifty US states felt about AI adoption and what obstacles they faced. According to the study, people's perceptions of AI were generally positive and they were open to integrating it. Nonetheless, there were differences in the comfort level and accessibility of technology amongst the various age, gender, and regional groups. Alam et al., (2024) conducted a study on artificial intelligence (AI) literacy in university libraries in Zambia. The study concentrated on the perspectives and utilization of AI by librarians. 82 different participants provided the data, which was collected by convenience and purposive sampling techniques. The results show that Zambian librarians have a strong grasp of AI principles and a favorable outlook on the technology's potential to improve library services. Nonetheless, obstacles like the requirement for more advanced AI knowledge, opposition to change, and financial limitations are noted.

Alnasib (2023), on the other hand, concentrated on the elements influencing faculty members' preparedness to include artificial intelligence into their instruction within the framework of Saudi Higher Education. The study included 465 faculty members from King Faisal University in Saudi Arabia as a sample. To gather information, a 46-item online survey was employed. According to the findings, the respondents were generally prepared to include artificial intelligence (AI) into their lessons ($M = 3.40$, $SD = 0.841$). At the 0.01 significance level, statistically significant correlations were discovered between the perceived benefits of artificial intelligence (AI) in teaching and higher education, faculty members' readiness to incorporate AI into their lessons, their attitudes toward AI, their behavioral intentions to use AI, and the supportive environments for AI use. Regarding faculty members' preparedness to incorporate AI into their instruction, significant variations were observed based on gender, age, and prior teaching experience at the 0.05 significance level. However, when it came to faculty members' preparedness to incorporate AI into their instruction, there were no statistically significant variations discovered at the 0.05 significance level based on the type of college or academic rank.

Another study on the potential and difficulties of artificial intelligence in Tehran's higher education was carried out by Jafari and Keykha in 2023. The study used a qualitative methodology and underwent thematic analysis. The study involved 15 purposively sampled AI

PhD students from Tehran University in 2022–2023 who were interviewed as part of the study. The results of the study demonstrated that participants thought about eight secondary subthemes which were faculty members, students, the teaching and learning process, assessment, the development of educational structures, the development of research structures, the development of management structures, and the development of academic culture—when examining the opportunities that AI creates for higher education. Additionally, it was demonstrated that AI presents certain difficulties for higher education.

O'Shaughnessy et al. (2023) carried out a study that was relevant to the topic of creating inclusive and efficient governance structures as well as public outreach plans for the adoption of AI. For the study, a sample of 3,524 and 425 technology specialists was taken. The study's conclusions indicated that cultural values, risk aversion, and techno-skepticism are the main influences on AI attitudes. The data gathered from them was examined using structural equation modeling. In the study, experts expressed a more positive opinion about AI than did the general public, but they did not agree to demand regulation, which they both view as essential. Therefore, these results indicate that in order for academics to fully embrace AI as a tool for efficient service delivery in their universities, rules and procedures need to be strengthened.

Aim and Objectives of the Study

The aim of the study was to investigate literacy level and attitude of academics towards the adoption of AI in public Universities in Rivers State. Specifically, the study sought to:

1. determine the level of AI literacy among academics in public Universities in Rivers State.
2. ascertain the attitude of academics towards the adoption of AI in public universities in Rivers State.
3. examine the challenges to academics' adoption of AI in public Universities in Rivers State.

Research Questions

The following research questions guided the study:

1. What is the level of AI literacy among academics in public Universities in Rivers State?
2. What is the attitude of academics towards the adoption of AI in public universities in Rivers State?
3. What are the challenges to academics' adoption of AI in public Universities in Rivers State?

Hypotheses

The following hypotheses were tested at 5% significance level:

1. There is no significant difference between the mean opinion score of male and female lecturers on the level of AI literacy among academics in public Universities in Rivers State.
2. There is no significant difference between the mean opinion score of male and female lecturers on the attitude of academics towards the adoption of AI in public universities in Rivers State.
3. There is no significant difference between the mean opinion score of male and female lecturers on the challenges to academics' adoption of AI in public Universities in Rivers State.

Methodology

This study employed descriptive survey design as it sought to interrogate an ongoing phenomenon. The population of the study consisted of all the 3,766 lecturers in the three public Universities in Rivers State. There were 362 lecturers (241 males and 121 females) who were sampled for the study using stratified random sampling technique. The sample size was estimated using the Taro Yamane minimum sample size determination formula. The instrument used for the collection of data was a 15-item questionnaire tagged "Lecturers Literacy and Attitude on the Adoption of Artificial Intelligence Questionnaire" (LLAAAIQ). The instrument was responded to on a four-point Likert rating scale of Very High Level (VHL=4), High Level (HL=3), Low Level (LL=2) and Very Low Level (VLL=1) for research question one and Strongly Agree (SA=4), Agree (A=3), Disagree (D=2) and Strongly Disagree (SD=1) for research questions two and three. These weights were summed and divided by 4 to arrive at 2.50 which is the decision mean. The instrument was face and content validated by three Educational Management expert at Rivers State University. The reliability was estimated using Cronbach alpha and the index was 0.81 which showed that the questionnaire was reliable. There were 362 copies of questionnaire administered by the researcher and three trained research assistance but 357 copies (238 males and 119 females) which represented 98.6% were retrieved. The research questions raised were answered using mean and standard deviation while the hypotheses were tested using z-test at 0.05 level of significance.

Results

Answer to Research Questions

Research Question One: What is the level of AI literacy among academics in public Universities in Rivers State?

Table 1: Mean and Standard Deviation Scores on the Level of AI Literacy Among Academics in Public Universities in Rivers State

S/No	Items	Male Lecturers n=238		Female Lecturers n=119		Mean Set	
		Mean \bar{X}_1	SD	Mean \bar{X}_2	SD	\bar{X}	Decision
1	Lecturers understand how AI can be applied in their line of duty	2.42	0.68	2.42	0.68	2.42	Low Level
2	Understanding of the ethics guiding the use of AI	2.39	0.69	2.35	0.72	2.37	Low Level
3	AI has been used to solve educational problems	2.37	0.70	2.38	0.70	2.38	Low Level
4	Lecturers know how to create educational contents using AI	2.44	0.67	2.33	0.73	2.39	Low Level
5	Lecturers exhibit emotional balance in the use of AI	2.46	0.66	2.40	0.69	2.43	Low Level
Grand Mean and Standard Deviation		2.42	0.68	2.38	0.70	2.40	Low Level

Table 1 showed that with an average mean set score of 2.40, there was a low level of AI literacy among academics in public Universities in Rivers State and this applied to both the male and female lecturers given the grand mean scores of 2.42 and 2.38 which were also below the criterion mean score of 2.50 used for decision making. It was revealed in the study that lecturer application of AI, its ethics, its adoption for problem solving, creation of educational content and exhibition of emotional balance were all at a low level.

Research Question Two: What is the attitude of academics towards the adoption of AI in public universities in Rivers State?

Table 2: Mean and Standard Deviation Scores on the Attitude of Academics Towards the Adoption of AI in Public Universities in Rivers State

S/No	Items	Male Lecturers n=238		Female Lecturers n=119		Mean Set	
		Mean \bar{X}_1	SD	Mean \bar{X}_2	SD	\bar{X}	Decision

6	Lecturers have intention to use AI when necessary	2.62	0.62	2.66	0.64	2.64	Agree
7	AI is a threat to the duties of lecturers and should be avoided	2.60	0.63	2.69	0.61	2.65	Agree
8	Acquiring AI skills is a complex experience for lecturers	2.43	0.67	2.42	0.68	2.43	Disagree
9	The use of AI can affect the quality of a lecturers work negatively	2.65	0.60	2.67	0.62	2.66	Agree
10	The use of AI can expose the lecturer to cyber threats	2.70	0.59	2.71	0.61	2.71	Agree
Grand Mean and Standard Deviation		2.60	0.62	2.63	0.63	2.62	Agree

Table 2 indicated from the mean set score of 2.60 which was above the criterion mean score of 2.50 used for decision making that the respondents agreed on the attitude of the lecturers towards the adoption of AI. The lecturers agreed that they have intention to use AI, see it as an academic threat, see that it can affect academic originality and that it can expose them to cyber threats but they disagreed that acquiring AI skills is a complex task for them. The male and female lecturers agreed to these given their grand mean scores of 2.60 and 2.63 which were above the criterion mean score used for decision making.

Research Question Three: What are the challenges to academics' adoption of AI in public Universities in Rivers State?

Table 3: Mean and Standard Deviation Scores on the Challenges to Academics' Adoption of AI in Public Universities in Rivers State

S/No	Items	Male Lecturers n=238		Female Lecturers n=119		Mean Set	
		Mean \bar{X}_1	SD	Mean \bar{X}_2	SD	\bar{X}	Decision
11	There are no sufficient training for lecturers to adopt AI	2.73	0.58	2.72	0.61	2.73	Agree
12	Shortage of AI tools that can be used by lecturers	2.35	0.71	2.33	0.73	2.34	Disagree
13	Lack of regulatory framework to guide the adoption of AI	2.77	0.56	2.70	0.62	2.74	Agree

14	The use of AI overrides originality	2.79	0.55	2.81	0.57	2.80	Agree
15	Digital information theft is a bane to AI adoption	2.71	0.59	2.63	0.64	2.67	Agree
Grand Mean and Standard Deviation		2.67	0.60	2.64	0.63	2.65	Agree

Table 3 indicated that with the mean set average of 2.65, the respondents agreed on the challenges to academics' adoption of AI in public Universities in Rivers State. This means that the male and female lecturers agreed that insufficient training, lack of regulatory framework, theft of digital information and the fact that AI overrides originality were challenges faced in its adoption. The however disagreed that the shortage of AI tools was a challenge to its adoption. Summarily, the grand mean scores of 2.67 and 2.64 from the male and female lecturers indicated that they agreed on the challenges to academics' adoption of AI in public Universities in Rivers State.

Test of Hypotheses

HO₁: There is no significant difference between the mean opinion score of male and female lecturers on the level of AI literacy among academics in public Universities in Rivers State.

Table 4: Summary of z-test Analysis on the Difference between the Mean Opinion Score of Male and Female Lecturers on the Level of AI Literacy Among Academics in Public Universities in Rivers State

Variable	n	Mean	SD	df	z-cal.	z-crit.	Level of Significance	Decision
Male Lecturers	238	2.42	0.68	355	0.51	1.96	0.05	Null hypothesis not rejected
Female Lecturers	119	2.38	0.70					

The value of z-cal. of 0.51 in Table 4 was less than the value of z-crit. of 1.96 and as such, the null hypothesis was not rejected and this indicated that there was no significant difference between the mean opinion score of male and female lecturers on the level of AI literacy among academics in public Universities in Rivers State.

HO₂: There is no significant difference between the mean opinion score of male and female lecturers on the attitude of academics towards the adoption of AI in public universities in Rivers State.

Table 5: Summary of z-test Analysis on the Difference between the Mean Opinion Score of Male and Female Lecturers on the Attitude of Academics Towards the Adoption of AI in Public Universities in Rivers State

Variable	n	Mean	SD	df	z-cal.	z-crit.	Level of Significance	Decision
Male Lecturers	238	2.60	0.62	355	0.43	1.96	0.05	Null hypothesis not rejected
Female Lecturers	119	2.63	0.63					

The value of z-cal. of 0.43 in Table 5 was less than the value of z-crit. of 1.96 and as such, the null hypothesis was not rejected and this indicated that there was no significant difference between the mean opinion score of male and female lecturers on the attitude of academics towards the adoption of AI in public universities in Rivers State.

HO₃: There is no significant difference between the mean opinion score of male and female lecturers on the challenges to academics' adoption of AI in public Universities in Rivers State.

Table 6: Summary of z-test Analysis on the Difference between the Mean Opinion Score of Male and Female Lecturers on the Challenges to Academics' Adoption of AI in Public Universities in Rivers State

Variable	n	Mean	SD	df	z-cal.	z-crit.	Level of Significance	Decision
Male Lecturers	238	2.67	0.60	355	0.43	1.96	0.05	Null hypothesis not rejected
Female Lecturers	119	2.64	0.63					

The value of z-cal. of 0.43 in Table 6 was less than the value of z-crit. of 1.96 and as such, the null hypothesis was not rejected and this indicated that there was no significant difference between the mean opinion score of male and female lecturers on the challenges to academics' adoption of AI in public Universities in Rivers State.

Discussion of Findings

The data collected and analyzed from the lecturers showed that there was a low level of AI literacy among the lecturers and there was no significant difference between the opinion of the male and female lecturers on the AI literacy of academics in public Universities in Rivers State. This finding differs from the outcome of the study by Woodruff et al., (2023) which showed

that Zambian librarians have a strong grasp of AI in their institutions. This may however be because AI is a tool that they must use in their line of duty as librarians as there are slimmer alternatives to their job. It was shown in the study that lecturers do not have full grasp of how AI can be applied in their various lines of duty. Similarly, they showed from their responses that they do not fully understand the ethics that guide the adoption of AI which is very important to avoid bridging extant guidelines. Similarly, the respondents indicated that there was a low level to which they had adopted AI in solving educational problems. This means that the lecturers do not fully understand how they can deploy AI in solving some of their educational needs. The ability to create educational content and showcase emotional balance in the use of AI was also very low and this calls for more training for these lecturers on how they can adopt this technology in their various areas of responsibilities.

Furthermore, the lecturers showed a mix of attitude towards the adoption of AI and the male and female lecturers did not differ in this regard. The study by O'Shaughnessy et al. (2023) supported this finding as it shows that technology experts showed more connection and interest to AI more than the public and this is simply because it is a terrain that they are familiar with. Although, the male and female lecturers showed that they had intention to use AI, they also perceived AI to be a threat which supports the finding of the study by O'Shaughnessy et al. (2023). This finding suggests that the low literacy of the academics in terms of AI does not imply that they are unwilling to use the technology and this was further alluded to by the fact that they are afraid of the threats that may come with the use of this technology. These lecturers must therefore be enlightened for them to develop the right attitude towards this technology. Their response also showed that they disagreed that acquiring AI skills was a complex experience and this again shows their willingness to learn how this technology can be used. This means that these lecturers believe that they can acquire AI skills if they are provided the opportunity to do so. This agrees with the findings of the study by Alnasib (2023) which indicated that lecturers have a positive interest in the use of AI in their schools. They however agree that AI can affect the quality of their work and this is premised on the fact that if this technology is not properly used, it can erode originality and affect lecturers' creativity. The current wave of cyber insecurity also showed in their responses as they indicated that this technology can expose them to cyber threat which intuitively is one of the challenges with this kind of technology.

According to the lecturers, they agree that there are challenges to their adoption of AI and this applies to both the male and female academics. The lecturers agreed that there is no adequate

training on how the lecturers can adopt AI and this reflected in most of their responses implying that there is still a knowledge gap among the lecturers on how they can deploy AI at work. The lecturers also agree that the lack of regulatory framework in AI adoption is also a challenge. This is not only restricted to the Universities alone as AI policy and framework is still scanty at the national and international level. The lecturers alluded to the fact that AI can override academic originality and that it can expose them to digital information theft but they disagree that there is shortage of AI tools for its adoption. This study shows that a lot needs to be done in the Universities for lecturers to embrace AI as an integral part of their functions as custodians of knowledge in the nation's ivory towers. Jafari and Keykha (2023) discovered and pointed this out in their study as it was revealed that the adoption of AI requires management support and no institution of learning should shy away from this.

Conclusion

The Study concludes based on the findings that there is a low level of AI literacy among the academics, but the academics showed the right attitude towards its adoption. The low literacy may be as a result of several challenges faced by the lecturers in the adoption of AI and the male and female lecturers did not differ in their opinion about the adoption of AI in the Universities.

Recommendations

The recommendations that emanated from the findings of this study are as follows:

1. There is need for capacity building programmes to be organized for these lecturers on how AI can be adopted in their various activities as this will promote the acceptance and adoption of AI by these academics as a professional tool for the discharge of their duties.
2. University administrators need to provide incentives for these academics for the adoption of AI through the provision of essential AI resources as well as suitable policies that will encourage the lecturers to deploy this tool in their various personal and professional activities.
3. Lecturers in these Universities must collaborate with colleagues in order institutions of higher learning on the adoption of AI as this will help to strengthen their awareness, skills and benefits from the use of AI. Similarly, belonging to associations that promote the use of AI will assist these academics to be more informed on the adoption of AI in their various areas of service delivery.

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Artificial Intelligence as a Tool in Enhancing Teaching Effectiveness in Public Senior Secondary Schools in Awgu L.G.A. Enugu

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Abstract

The study examined artificial intelligence as a tool in enhancing teaching effectiveness in public senior secondary schools in Awgu LGA, Enugu state Nigeria. The study utilized a descriptive survey research design, which is appropriate for gathering data on the current practices of teachers regarding the use of artificial intelligence as a tool in enhancing teaching effectiveness in public senior secondary schools in Awgu LGA, Enugu state. The sample was obtained using a random selection method. The sample size consisted of 355 teachers comprising 189 females and 166 male teachers from 22 public secondary schools. A self-structured questionnaire titled "AI in Teaching Effectiveness Questionnaire" (AITEQ) was used to collect data. The findings of the study revealed that teachers in public senior secondary schools in Awgu LGA of Enugu State moderately use AI tools in enhancing teaching effectiveness.

Keywords: Artificial intelligence, Intelligence tutoring systems, Machine learning algorithm, Natural language processing.

Introduction

Artificial Intelligence (AI) has emerged as a transformative force in the evolving educational sector, offering innovative solutions to longstanding challenges. As educational systems worldwide confront issues such as overcrowded classrooms, diverse student needs, and limited resources, AI presents a compelling opportunity to address these challenges through advanced technological approaches. Artificial Intelligence encompasses a broad spectrum of technologies, including machine learning, natural language processing, and intelligent tutoring systems, which have the potential to revolutionize traditional teaching methods. These technologies can offer personalized learning experiences, facilitate real-time assessment, and assist teachers in managing diverse classroom environments. In Awgu, where educational resources are often constrained, and teaching conditions can be particularly challenging, the integration of AI tools represents a promising strategy for improving educational outcomes.

The application of AI in education can significantly enhance teaching effectiveness by addressing specific needs such as tailored lesson plans, adaptive learning environments, and efficient administrative support. For instance, AI-driven platforms can analyze student performance data to deliver customized instructional strategies, thereby improving student engagement and achievement. Additionally, AI tools can help teachers identify learning gaps and provide targeted interventions, fostering a more supportive and effective learning environment. By evaluating current practices and identifying areas where AI can be integrated, this study seeks to demonstrate how these tools can be utilized to overcome local educational challenges.

The integration of AI into educational settings is a rapidly growing field that holds promise for addressing some of the persistent challenges faced by educators. AI technologies, such as machine learning algorithms, natural language processing, and intelligent tutoring systems, are designed to support personalized learning, streamline administrative tasks, and facilitate data-driven decision-making (Zawacki-Richter et al., 2019). AI-powered platforms can adapt to individual students' learning needs, providing customized resources and feedback aligned with their unique abilities and progress (Woolf, 2010). This level of customization is particularly pertinent in public secondary schools, where diverse student populations present varied educational needs. Awgu Local Government Area, located in Enugu State, Nigeria, serves as a relevant case study due to its unique educational context and challenges. Public secondary schools in this region frequently encounter issues such as overcrowded classrooms, limited resources, and a shortage of qualified teaching staff (Nwachukwu & Nwankwo, 2018). Implementing AI tools could offer innovative solutions to these problems, potentially enhancing teaching effectiveness by automating routine tasks, providing additional support to teachers, and offering more engaging and interactive learning experiences for students.

Research in this area is still emerging, but a growing body of literature suggests that AI can significantly impact educational outcomes. For example, studies have demonstrated that AI applications can improve student engagement and achievement by providing targeted interventions and real-time feedback (Luckin et al., 2016). However, the adoption of AI in education also raises important questions about equity, accessibility, and the role of educators in a technologically advanced classroom environment. As educational institutions seek to adapt to the demands of the 21st century, AI offers a promising solution for enhancing teaching effectiveness in senior secondary schools.

Machine learning algorithms have shown considerable promise in personalizing and adapting instruction to individual student needs. A study by Nwosu and Okafor (2021) in secondary schools in southeastern Nigeria found that the use of adaptive learning systems powered by machine learning led to significant improvements in student performance across multiple subject areas. The researchers noted that these AI-driven systems were able to analyze student data in real-time and adjust the difficulty and pacing of content delivery, allowing for a more tailored learning experience. This personalization helped address the challenge of diverse student abilities within large classroom settings.

Eze and Nnamani (2022) investigated the application of predictive analytics in identifying at-risk students in public secondary schools in Enugu State. Their findings revealed that machine learning models could accurately forecast student performance and engagement levels, enabling early interventions. The researchers emphasized that such proactive measures were crucial in a context where teacher-student ratios were high, making it challenging for educators to closely monitor individual student progress. By leveraging AI, teachers could allocate their time and resources more efficiently to support struggling learners.

Natural language processing (NLP) is another AI technology that has shown potential in enhancing language instruction and communication in Nigerian classrooms. Okorie and Onyeka (2020) conducted a study on the use of NLP-based chatbots to support English language learning in secondary schools in Anambra State. Their research demonstrated that AI-powered language tools could provide students with immediate feedback on grammar, vocabulary, and pronunciation, supplementing teacher instruction. The 24/7 availability of these AI assistants allowed students to practice and receive guidance outside of regular class hours, addressing the limited instructional time in crowded classrooms.

Nwoye and Ezeani (2023) explored the application of NLP in automating essay grading and providing detailed feedback to students in Imo State secondary schools. Their study found that AI-assisted grading not only reduced the workload on teachers but also provided more consistent and comprehensive feedback to students. This was particularly beneficial in large classes where manual grading of numerous essays could be time-consuming and prone to inconsistencies. The researchers noted that the AI system's ability to analyze text structure, coherence, and argumentation helped students improve their writing skills more rapidly.

Intelligent tutoring systems (ITS) have also garnered attention for their potential to provide individualized instruction and support. Adebayo and Oluwole (2022) conducted a comparative study of traditional teaching methods and ITS in mathematics education across secondary schools in Oyo State. Their findings indicated that students who used AI-powered tutoring systems alongside regular classroom instruction showed greater improvements in problem-solving skills and conceptual understanding compared to those relying solely on traditional methods. The researchers attributed this success to the ITS's ability to provide step-by-step guidance, immediate feedback, and adaptive problem sets tailored to each student's proficiency level.

In a similar vein, Ugwu and Eze (2021) investigated the impact of an ITS on science education in Enugu State secondary schools. Their study revealed that the AI-driven system effectively simulated laboratory experiments, providing students with virtual hands-on experiences in settings where physical laboratory resources were limited. This not only enhanced student engagement but also improved their understanding of complex scientific concepts. The researchers emphasized that such AI tools could help bridge the resource gap in underfunded schools, providing equitable access to quality science education.

However, the implementation of AI in Nigerian secondary schools is not without challenges. Okonkwo and Nwankwo (2022) conducted a comprehensive survey of AI readiness in public secondary schools across southeastern Nigeria. Their findings highlighted significant barriers to AI adoption, including inadequate infrastructure, limited teacher training in AI technologies, and concerns about data privacy and ethical use of AI in education. The researchers stressed the need for targeted investments in digital infrastructure and comprehensive professional development programs to prepare educators for the integration of AI tools in their teaching practices.

Despite these challenges, the potential benefits of AI in enhancing teaching effectiveness are substantial. Chukwu and Onwu (2023) proposed a framework for integrating AI tools in Nigerian secondary education, emphasizing a phased approach that considers local contexts and resource constraints. Their model suggests starting with basic AI applications like automated administrative tasks and gradually progressing to more advanced tools like adaptive learning systems and intelligent tutors. The researchers argue that such a measured approach could help overcome resistance and build capacity over time.

In conclusion, the literature reveals a growing body of evidence supporting the potential of AI tools to enhance teaching effectiveness in Nigerian secondary schools, including those in Awgu LGA. Machine learning algorithms, natural language processing, and intelligent tutoring systems offer promising solutions to longstanding challenges such as personalized instruction, timely feedback, and resource limitations. However, successful implementation will require addressing infrastructure gaps, providing adequate teacher training, and developing contextually appropriate AI solutions. As research in this field continues to evolve, it is crucial to critically examine both the opportunities and challenges presented by AI integration in education, ensuring that technological advancements serve to enhance rather than replace the crucial role of teachers in the learning process.

Statement of the Problem

Teachers should be well equipped with sufficient resources and support to effectively manage their classrooms, ensuring that no student is left behind. Educational institutions should be well-staffed with qualified educators who can dedicate time and attention to each student, fostering an environment where all learners can thrive. Furthermore, administrative tasks can be streamlined, allowing educators to focus on teaching and engaging with students rather than being burdened by routine paperwork. Technology plays a complementary role, enhancing teaching and learning processes without overwhelming the human elements of education.

However, the reality in many senior secondary schools, particularly in regions such as Awgu Local Government Area of Enugu State, Nigeria, diverges significantly from this ideal. According to Ukazu (2017), Schools in Awgu LGA are often characterized by overcrowded classrooms, limited educational resources, and a shortage of qualified teaching staff. Teachers face significant challenges in managing diverse classroom environments, meeting the varied needs of students, and ensuring that all learners are adequately supported. The lack of sufficient resources further exacerbates these challenges, as teachers are unable to access the tools and materials necessary for effective instruction. As a result, educational outcomes are often suboptimal, with students not receiving the personalized attention they need to succeed. Administrative inefficiencies add to the burden on educators, leaving them with less time to focus on improving teaching practices and student engagement.

This research seeks to explore the potential of Artificial Intelligence (AI) tools in enhancing teaching effectiveness in public senior secondary schools in Awgu Local government area, Enugu State. The research will examine how AI can be utilized to provide personalized learning

experiences, support teachers in managing classroom dynamics, and streamline administrative tasks. The question this study seeks to answer is: Can the integration of AI truly transform the educational sector in Awgu Local Government Area, creating a more equitable and effective system for all students?

Purpose of the Study

The purpose of this study was to investigate Artificial Intelligence as a Tool for enhancing Teaching Effectiveness in Public Secondary Schools in Awgu Local Government Area of Enugu State. Specifically, the study sought to:

1. determine the extent teachers use machine learning algorithms as a tool in enhancing teaching effectiveness in public senior secondary schools in Awgu L.G.A of Enugu state.
2. examine the extent teachers use natural language processing as a tool in enhancing teaching effectiveness in public senior secondary schools in Awgu local government area of Enugu state.
2. ascertain the extent teachers use intelligent tutoring systems in enhancing teaching effectiveness in public senior secondary schools in Awgu local government area of Enugu state.

Research Questions

The following research questions guided this study;

1. To what extent do teachers use machine learning algorithms in enhancing teaching effectiveness in public senior secondary schools in Awgu L.G.A of Enugu state?
2. To what extent do teachers use natural language processing as a tool in enhancing teaching effectiveness in public senior secondary schools in Awgu local government area of Enugu state?
3. To what extent do teachers use intelligent tutoring systems in enhancing teaching effectiveness in public senior secondary schools in Awgu local government area of Enugu state?

Methodology

This study adopted a descriptive survey design, which is appropriate for gathering data on the current practices of teachers regarding the use of Artificial Intelligence (AI) tools in enhancing teaching effectiveness in public senior secondary schools within Awgu Local Government Area (LGA) of Enugu State. The population for this study consisted of 3084 teachers comprising of

1956 females and 1119 males from 43 public senior secondary schools in Awgu LGA (Source: ESSSSBR, Jan 2024), which were randomly selected to ensure representation across gender, age, and experience. The sample size was determined using the Taro Yamane formula, which yielded a sample of 355 teachers comprising of 189 female teachers and 166 male teachers from 22 public senior secondary schools in Agwu local government. This sample was stratified to include both male and female teachers, ensuring the diversity necessary for examining differences in their responses.

A self-structured questionnaire titled "AI in Teaching Effectiveness Questionnaire" (AITEQ) was used to collect data. The questionnaire comprised 30 items divided into three sections corresponding to the study's objectives: the use of machine learning algorithms, natural language processing, and intelligent tutoring systems in teaching. Each item was rated on a 4-point Likert scale ranging from Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE) with values 4,3,2 and 1 respectively. Cronbach Alpha was used to establish the reliability of the instrument which yielded reliability indexes of 0.83, 0.71 and 0.80. Mean and standard deviation were used to answer the research questions with a criterion mean of 2.50. Questionnaire items with ratings below 2.50 denoted 'Low Extent' while 2.50 and above signified 'High Extent'.

Results

Research Question 1: To what extent do teachers use machine learning algorithms in enhancing teaching effectiveness in public senior secondary schools in Awgu L.G.A of Enugu state?

Table 1: Mean Ratings of Male and Female Teachers on the Extent of the Use of Machine Learning Algorithms in Enhancing Teaching Effectiveness in Public Senior Secondary Schools in Awgu L.G.A of Enugu State?

S/N	Item	Male Teachers N=166		Decision	Female Teachers N=189		Decision	Mean set ($\bar{X}_1 + \bar{X}_2$ / 2)
		\bar{X}	SD		\bar{X}	SD		
1	teachers' ability to use machine learning tools to assist in teaching.	3.31	0.78	HE	2.90	0.72	HE	3.11
2	ability to identify and analyze students' performance through the use of machine learning tool	3.08	0.61	HE	2.65	0.51	HE	2.87
3	ability for teachers to receive training on using machine learning in teaching practice	3.13	0.77	HE	3.09	0.73	HE	3.11

4	ability to create lesson plan using machine learning tools	2.73	0.63	HE	2.96	0.69	HE	2.85
5	ability to identify the barriers faced in using machine learning algorithms in teaching	3.20	0.79	HE	3.05	0.76	HE	3.13
Grand Mean/SD		3.09	0.72	HE	2.93	0.68	HE	3.01

The result in Table 1 above revealed that all the questionnaire items 1, 2, 3, 4 and 5 had grand mean scores of 3.09 and 2.93 with corresponding standard deviations of 0.72 and 0.68 for both male and female teachers. This infers that to a high extent teachers' utilization machine learning algorithms enhances teaching effectiveness in public senior secondary schools in Awgu L.G.A of Enugu State.

Research Question 2: To what extent do teachers use natural language processing as a tool in enhancing teaching effectiveness in public senior secondary schools in Awgu local government area of Enugu state?

Table 1: Mean Ratings of Male and Female Teachers on the Extent of the Use of Natural language processing as a tool in Enhancing Teaching Effectiveness in Public Senior Secondary Schools in Awgu L.G.A of Enugu State?

S/N	Item	Male Teachers N=166			Female Teachers N=189			Mean set ($\bar{X}_1 + \bar{X}_2/2$)
		\bar{X}	SD	Decision	\bar{X}	SD	Decision	
1	teachers' ability to use natural learning processing tools in teaching	3.17	0.59	HE	2.96	0.70	HE	3.07
2	ability to incorporate natural learning processing tools in teaching practices	3.38	0.74	HE	3.15	0.66	HE	3.27
3	ability to identify subjects or areas natural learning processing tools are needed	3.24	0.79	HE	2.93	0.71	HE	3.09
4	ability to use natural learning processing tools to impact students' engagement in the classroom.	3.20	0.68	HE	2.66	0.88	HE	2.93
5	ability to identify students' improvement when using natural learning processing tools.	2.87	0.77	HE	2.43	0.80	HE	2.65
Grand Mean/SD		3.17	0.71	HE	2.83	0.75	HE	3

The result in Table 2 above revealed that all the questionnaire items 1, 2, 3, 4 and 5 had grand mean scores of 3.17 and 2.83 with corresponding standard deviations of 0.71 and 0.75 for both male and female teachers. This infers that to a high extent teachers' utilization of natural language processing as a tool enhances teaching effectiveness in public senior secondary schools in Awgu L.G.A of Enugu state

Research Question 3: To what extent do teachers use intelligent tutoring systems in enhancing teaching effectiveness in public senior secondary schools in Awgu local government area of Enugu state?

Table 1: Mean Ratings of Male and Female Teachers on the Extent of the Use of intelligent tutoring systems in Enhancing Teaching Effectiveness in Public Senior Secondary Schools in Awgu L.G.A of Enugu State?

S/N	Item	Male Teachers N=166		Decision	Female Teachers N=189		Decision	Mean set ($\bar{X}_1 + \bar{X}_2$ / 2)
		\bar{X}	SD		\bar{X}	SD		
1	Teachers' ability to use intelligent tutoring systems	3.72	0.81	HE	2.70	0.76	HE	3.21
2	Ability to evaluate the influence of intelligent tutoring systems in students' engagement.	3.02	0.87	HE	2.90	0.91	HE	2.96
3	Ability to identify improvements in students' performance related to the use of intelligent tutoring systems.	3.15	0.94	HE	3.07	0.78	HE	3.11
4	Ability to identify diverse learning needs among students with the use of intelligent tutoring systems.	2.60	0.93	HE	2.80	0.60	HE	2.7
5	Ability to identify challenges faced in utilizing intelligent tutoring systems	3.50	0.71	HE	3.09	0.79	HE	3.29
Grand Mean/SD		3.19	0.85	HE	2.91	0.77	HE	3.05

The result in Table 3 above revealed that all the questionnaire items 1, 2, 3, 4 and 5 had grand mean scores of 3.19 and 2.91 with corresponding standard deviations of 0.85 and 0.77 for both male and female teachers. This infers that to a high extent teachers' utilization of intelligent tutoring systems enhances teaching effectiveness in public senior secondary schools in Awgu L.G.A of Enugu State.

Summary of Findings

The findings of the study revealed that teachers in public senior secondary schools in Awgu LGA of Enugu State moderately use AI tools in enhancing teaching effectiveness. Specifically, the use of machine learning algorithms was found to be at a moderate level, with a mean score of 3.09 and 2.93 and a standard deviation of 0.72 and 0.68 respectively. The use of natural language processing tools was also moderate, with a mean score of 3.17 and 2.83 and a standard deviation of 0.71 and 0.75 respectively. On the other hand, the utilization of intelligent tutoring systems was slightly higher, with a mean score of 3.19 and 2.91 and a standard deviation of 0.85 and 0.77 respectively, indicating that these systems are more integrated into the teaching practices compared to the other AI tools.

Discussion of Findings

The findings of this study align with existing literature on the adoption of AI in education, particularly in developing regions like Nigeria. According to Okeke (2021), the moderate adoption of AI tools such as machine learning algorithms and natural language processing in Nigerian schools can be attributed to factors such as limited access to technology, inadequate training, and a lack of awareness of the potential benefits of these tools in teaching and learning processes. The slightly higher utilization of intelligent tutoring systems, as observed in this study, may be due to their user-friendly nature and their ability to provide immediate feedback to students, which enhances personalized learning experiences (Eze & Chukwu, 2020).

Moreover, the absence of significant gender differences in the adoption of AI tools suggests that both male and female teachers are equally equipped and motivated to integrate these technologies into their teaching practices. This finding is consistent with the work of Nwafor (2019), who found no gender disparity in the use of educational technology among secondary school teachers in Enugu State.

These findings underscore the need for increased professional development and support for teachers in the area of AI in education. By providing teachers with the necessary skills and resources, they can more effectively integrate AI tools into their teaching practices, ultimately enhancing educational outcomes in public senior secondary schools in Awgu LGA, Enugu State.

Recommendations

Based on the findings, the following recommendations are advanced

1. Government and philanthropist should provide adequate artificial intelligent tools to be used by teachers in Awgu Local Government Area of Enugu state.

2. Government should provide trainings for teachers in Awgu LGA Enugu State on the use of AI tools such as machine learning algorithms, intelligent tutoring system, natural language processing.
3. Teachers in Awgu LGA Enugu state, should be sensitized of the potential benefits of the use of AI tools in teaching process.

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Stakeholders Participation in Funding of Public Secondary Schools in Rivers State, Nigeria

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Abstract

This study examined stakeholders' participation in the funding of public secondary schools in Rivers State, Nigeria. Two research objectives, two research questions and two hypotheses guided the study. The study adopted the descriptive survey design. The area of the study was public secondary schools in Rivers State. The population of the study was 7,693 respondents comprising 7,425 teachers and 268 principals in all the 268 public senior secondary schools in Rivers State. Sample size of 380 respondents drawn from the population. A structured instrument titled "Stakeholders Participation in the Funding of Public Secondary Schools Questionnaire (SPFPSSQ)" was used to elicit data from the respondents. The instrument was validated by experts in educational research. The reliability of the instrument gave a Cronbach Alpha index of 0.78 and 0.88 which was considered reliable. The data collected were analysed using mean and standard deviation in answering the research questions while the null hypotheses formulated were tested using z-test at 0.05 level of significance. The findings of the study revealed that adequate budgeting of school funds and proper utilization of school funds are the factors that will encourage stakeholders' participation in the funding of public senior secondary schools in Rivers State. Based on the findings, the researcher recommended that, school administrators should not rely only on what is coming from the government, but should partner other stakeholders as a way of alternative sourcing of funds to add up with what government is bringing.

Keywords: Funding, Participation, Public, Secondary Schools, Stakeholders

Introduction

Education is a fundamental driver of personal and societal development, and its quality is significantly influenced by the level and effectiveness of funding. In the context of Nigeria's Rivers State, public secondary schools face significant funding challenges that have a direct impact on educational outcomes. Traditionally, the government has been the primary financier of public education; however, the rising cost of education and limited governmental resources necessitate alternative funding strategies. As such, the concept of stakeholder participation in educational funding has emerged as a viable solution to these financial constraints.

Stakeholders in education encompass a wide range of entities, including government bodies, parents, local communities, private sector organizations, non-governmental organizations (NGOs), and international agencies. Each of these groups holds a vested interest in the quality and accessibility of education, and they possess varying capacities to contribute towards its funding. The collaborative involvement of these stakeholders in funding not only alleviates financial burdens but also fosters a sense of shared responsibility and enhances accountability in the educational system.

Stakeholder participation in the context of funding public secondary schools refers to the active involvement and engagement of various individuals, groups, and organizations that have an interest or stake in the educational system. In Rivers State, Nigeria, this participation is essential for enhancing the quality and accessibility of education, given the financial constraints faced by public schools.

In Rivers State, the participation of stakeholders in the funding of public secondary schools has been limited, despite the potential benefits. This lack of participation may be attributed to several factors, including inadequate awareness, a perceived lack of transparency in school management, and insufficient mechanisms for stakeholder engagement. Additionally, socio-economic constraints and competing priorities may hinder the willingness and ability of some stakeholders, particularly parents and communities, to contribute financially.

Addressing these challenges requires a comprehensive understanding of the current state of stakeholder participation in education funding. Recent studies have highlighted the importance of effective communication, transparency, and trust-building in encouraging stakeholder involvement (Johnson & Afolabi, 2023; Eze & Anuforo, 2022). Furthermore, lessons can be drawn from successful models in other regions where multi-stakeholder partnerships have led to substantial improvements in school funding and educational quality (Okoye & Adeyemi, 2023).

Adequate budgeting in the context of school funds refers to the strategic allocation and management of financial resources in a manner that meets the educational institution's needs and objectives. It involves crafting a financial plan that ensures resources are sufficient not only for day-to-day operations but also for achieving long-term educational goals, enhancing the quality of education, and accommodating future growth or unexpected challenges (Smith, & Brown, 2022). Proper utilization of school funds refers to the effective and efficient use of financial resources to achieve the educational objectives and goals of a school. It involves ensuring that funds are spent appropriately, transparently, and in a manner that maximizes

educational benefits for students, staff, and the school community. Proper fund utilization is crucial for enhancing the quality of education, maintaining infrastructure, and supporting innovative educational programs (Harris, & Williams, 2022).

This research seeks to explore the dynamics of stakeholder participation in funding public secondary schools in Rivers State by identifying existing barriers and opportunities. By examining the motivations, expectations, and perceptions of various stakeholders, the study aims to propose strategic interventions to enhance their participation. Ultimately, this research endeavors to contribute to the development of a more sustainable and equitable funding framework, ensuring that all students in Rivers State have access to high-quality education.

Statement of the Problem

In recent years, the challenges confronting public secondary education in Rivers State, Nigeria, have been a source of significant concern for educators, policymakers, and society at large. One of the critical issues identified is the inadequacy of funding, which hampers the ability to deliver quality education and meet the dynamic needs of students. This funding challenge is compounded by the limited and often inconsistent allocation of resources from government sources, which traditionally bear the primary responsibility for financing public education. Such limitations lead to a host of issues, including dilapidated infrastructure, insufficient teaching materials, and inadequate staffing, all of which adversely affect the educational outcomes of students.

The concept of stakeholder participation in the educational sector, particularly in terms of funding, has been propounded as a potential solution to these funding inadequacies. The involvement of Stakeholders in Funding could lead to more sustainable and effective funding models, leveraging community interests and resources to improve the quality of education offered in public secondary schools.

Despite the apparent benefits, the level of stakeholder participation in funding public secondary schools in Rivers State remains suboptimal. Several barriers may account for this lack of engagement, including a possible lack of awareness of the benefits and mechanisms for stakeholder involvement, insufficient communication and collaboration between the government and potential contributors, and perhaps a general lack of trust or interest among private sector stakeholders and communities.

Furthermore, there is limited empirical research detailing the current state of stakeholder participation in this funding context and the specific challenges and opportunities this involvement presents. Understanding these dynamics is crucial for developing strategies to

increase stakeholder participation effectively and sustainably. Addressing these challenges, the researcher investigates, to what extent do Stakeholders Participate in the Funding of Public Secondary Schools in Rivers State? Ultimately, this study seeks to contribute to a more robust and sustainable funding framework that supports the delivery of quality education to all students in Rivers State, thus supporting long-term educational and socio-economic development.

Purpose of the Study

The Purpose of this study was to examine Stakeholders Participation in the Funding of Public Secondary Schools in Rivers State, Nigeria. Specifically, the objectives of the study are to:

1. Determine the extent adequate budgeting of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State.
2. Ascertain the extent proper utilization of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State.

Research Questions

The following research questions guided the study:

1. To what extent does adequate budgeting of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State?
2. To what extent does proper utilization of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State?

Hypotheses

For the purpose of this study, the following null hypotheses guided the study:

1. There is no significant difference between the mean responses of teachers and principals on the extent adequate budgeting of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State.
2. There is no significant difference between the mean responses of teachers and principals on the extent proper utilization of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State.

Review of Related Literatures

Concept of Stakeholder Participation in School Funding

Stakeholder participation in the context of funding public secondary schools refers to the active involvement and engagement of various individuals, groups, and organizations that have an interest or stake in the educational system. In Rivers State, Nigeria, this participation is essential for enhancing the quality and accessibility of education, given the financial constraints faced by public schools. Stakeholders in this context can include government entities, parents, community groups, private sector partners, non-governmental organizations (NGOs), and international agencies (Akpan, & Essien, 2023).

Each stakeholder group plays distinct roles and contributes unique resources towards the goal of providing quality education. Government bodies, for instance, are typically responsible for policy-making, funding allocation, and ensuring educational standards are met. Parents and community members often contribute through financial support, advocacy, or volunteer efforts aimed at improving school facilities and resources (Nweze, & Eze, 2022). The private sector can offer financial contributions, infrastructure support, or expertise in areas like technology and management. NGOs and international agencies often provide funding, training, and resources targeted at specific educational needs or improvements (Akpan, & Essien, 2023).

Effective Stakeholder Participation Involves Several Key Components:

- i. **Inclusivity:** Ensuring that all relevant stakeholders have the opportunity to participate in decision-making processes. This includes marginalized or underrepresented groups who may have unique insights or needs.
- ii. **Collaboration:** Building partnerships between stakeholders that leverage their respective strengths and resources. Collaborative efforts can lead to more sustainable and impactful outcomes.
- iii. **Transparency:** Maintaining open communication and accountability in how funds are managed and utilized. Transparency helps build trust among stakeholders, encouraging further involvement and support.
- iv. **Empowerment:** Providing stakeholders with the knowledge, skills, and authority needed to contribute effectively. Empowerment can enhance the capacity of stakeholders to play active roles in funding and management decisions.
- v. **Sustainability:** Fostering long-term commitments and creating mechanisms that ensure continuous stakeholder engagement and support for educational initiatives.

In Rivers State, fostering stakeholder participation in school funding can help address the limitations of relying solely on governmental resources. It encourages a shared sense of responsibility and can lead to innovative solutions that improve educational outcomes. Studies have shown that when stakeholders are actively involved, there is a positive impact on student achievement, resource availability, and institutional accountability (Akpan & Essien, 2023; Nweze & Eze, 2022).

Concept of Adequate Budgeting of School Funds

Adequate budgeting in the context of school funds refers to the strategic allocation and management of financial resources in a manner that meets the educational institution's needs and objectives. It involves crafting a financial plan that ensures resources are sufficient not only for day-to-day operations but also for achieving long-term educational goals, enhancing the quality of education, and accommodating future growth or unexpected challenges (Smith, & Brown, 2022).

Key components of adequate budgeting include:

- i. **Needs Assessment:** Conducting a thorough analysis to identify the school's needs, including academic programs, infrastructure, teacher salaries, and student services. This assessment forms the basis for setting budget priorities and making informed financial decisions.
- ii. **Strategic Prioritization:** Setting clear priorities that align with the school's educational goals and mission. This involves deciding which programs and services require immediate attention and which can be developed over time, ensuring that critical needs are met first.
- iii. **Resource Allocation:** Efficiently distributing financial resources to various departments and projects to maximize educational outcomes. This requires a deep understanding of the school's financial constraints and the areas that will yield the most significant impact per naira spent.
- iv. **Monitoring and Evaluation:** Establishing mechanisms for regular monitoring and evaluation of budget implementation to ensure that funds are being used effectively and efficiently. This includes tracking expenditures, assessing outcomes, and adjusting allocations as needed.
- v. **Transparency and Accountability:** Ensuring that the budgeting process is transparent and that school administrators are accountable for financial decisions. This builds trust

among stakeholders, including teachers, parents, and the community, and encourages ongoing support.

- vi. **Flexibility and Responsiveness:** Incorporating elements of flexibility into the budget to adapt to changing circumstances, such as fluctuations in enrollment numbers or unexpected expenses, without compromising the quality of education.

Adequate budgeting is crucial because it directly impacts the educational environment, student achievements, teacher satisfaction, and the overall success of the educational institution. By effectively managing funds, schools can provide sufficient learning materials, maintain and improve physical infrastructure, and invest in professional development for teachers, all of which contribute to an improved educational experience (Johnson, & Lee, 2023).

Recent studies emphasize the importance of adequate budgeting in achieving educational equity and quality. For instance, Smith and Brown (2022) highlight that well-managed school finances are linked to higher student performance and reduced dropout rates. Meanwhile, Johnson and Lee (2023) discuss how strategic financial planning in education can help bridge gaps in resource distribution, particularly in underserved communities.

Concept of Proper Utilization of School Funds

Proper utilization of school funds refers to the effective and efficient use of financial resources to achieve the educational objectives and goals of a school. It involves ensuring that funds are spent appropriately, transparently, and in a manner that maximizes educational benefits for students, staff, and the school community. Proper fund utilization is crucial for enhancing the quality of education, maintaining infrastructure, and supporting innovative educational programs (Harris, & Williams, 2022).

Key components of proper utilization of school funds include:

- i. **Strategic Planning:** Establishing a clear plan that aligns financial decisions with the school's mission, vision, and educational goals. This planning process involves setting priorities and ensuring that resources are allocated to areas that will have the most significant impact.
- ii. **Accountability and Transparency:** Maintaining clear records and reporting systems to ensure that all expenditures are well-documented and justified. Transparency helps build trust among stakeholders, such as parents, teachers, and governing bodies ensures accountability in financial decision-making.
- iii. **Efficient Resource Management:** Maximizing the value of every naira spent by minimizing waste and focusing expenditures on key areas such as curriculum

development, teacher salaries, student services, and facility maintenance. This involves regular audits and reviews to assess how funds are being used and to identify areas for improvement.

- iv. **Stakeholder Involvement:** Engaging various stakeholders, including teachers, students, parents, and community members, in financial decision-making processes. Involving stakeholders helps ensure that diverse perspectives are considered and that the financial plan meets the community's educational needs.
- v. **Continuous Monitoring and Evaluation:** Implementing systems for ongoing monitoring and evaluation of financial activities to ensure expenditures align with planned budgets and educational goals. This includes setting measurable objectives and regularly assessing progress toward these objectives.
- vi. **Flexibility and Adaptability:** Building flexibility into the financial management system to allow the school to adapt to changing circumstances, such as new educational mandates or shifts in enrollment, without compromising educational quality.

Proper utilization of school funds is essential for creating an environment where students can thrive academically and personally. When schools efficiently manage their resources, they can provide better educational materials, support innovative teaching methods, and ensure well-maintained facilities, which contribute to a positive learning atmosphere (Adams, & Clark, 2023).

Recent research emphasize the importance of proper fund utilization in improving educational outcomes. For instance, Adams and Clark (2023) found that schools that manage their resources effectively tend to have higher student achievement rates and improved teacher satisfaction. Similarly, Harris and Williams (2022) highlight the role of transparent financial practices in fostering community trust and support for educational initiatives.

Methodology

The study adopted the descriptive survey design. The area of the study was public secondary schools in Rivers State. The population of the study was 7,693 respondents comprising 7,425 teachers and 268 principals in all the 268 public senior secondary schools in Rivers State. Sample size of 380 respondents comprising 240 teachers and 140 principals. The sample size was determined using Taro Yamene's formula. The multi-stage sampling technique was adopted in selecting the sample size. drawn from the population. A structured instrument titled "Stakeholders Participation in the Funding of Public Secondary Schools Questionnaire (SPFPSSQ)" was used to elicit data from the respondents. Responses to the questionnaire items

were structured on a four- point summated rating scale of: Very High Extent (VHE) – 4points, High Extent (HE) – 3points, Low Extent (LE) – 2points and Very Low Extent (VLE) – 1point. The questionnaire was validated by the research experts in Rivers State University. Cronbach Alpha method was used to determine the reliability of the instrument. Reliability coefficients of 0.78 and 0.88 was obtained for the instrument. The research questions were answered using mean and standard deviation statistics while the null hypotheses formulated were tested using z-test statistics at 0.05 level of significance which is a test of difference of mean. The decision rule was to accept the null hypotheses where the calculated z-value is less than critical z-critical value of ± 1.96 , but reject the null hypotheses where the calculated z-value is greater than critical z-critical value of ± 1.96 .

Result Presentation

Research Question 1: To what extent does adequate budgeting of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State?

Table 1: Mean Responses of teachers and principals on the extent adequate budgeting of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State.

S/N	Item	Teachers N=240		Principals N=140		Average mean set	Decision
		\bar{X}	SD	\bar{X}	SD		
1	To what extent does adequate budgeting process increases accountability in financial management, instilling confidence in stakeholders.	3.25	0.72	2.95	0.58	3.10	VHE
2	To what extent does proper budgeting ensures that resources are allocated strategically to areas of greatest need, such as infrastructure improvements or educational materials.	3.00	0.60	3.09	0.53	3.05	VHE
3	To what extent does transparent budgeting processes invite stakeholders to be part of decision-making.	2.77	0.50	3.04	0.62	2.91	HE
4	With adequate budgeting, schools can invest in quality teaching staff, facilities, and learning resources.	3.19	0.69	3.30	0.76	3.25	VHE
5	Schools that consistently adhere to a well-planned budget demonstrate reliability and integrity.	2.69	0.52	3.11	0.65	2.90	HE
Grand Mean/SD		2.98	0.61	3.10	0.63	3.04	VHE

Source: Field Survey, 2024

The analyzed data in Table 1 above for research question 1, revealed that all the items 1, 2, 3, 4 and 5 had mean scores 3.25, 3.00, 2.77, 3.19 and 2.69 with standard deviation 0.72, 0.60, 0.50, 0.69 and 0.52 teachers and 2.95, 3.09, 3.04, 3.30 and 3.11 with standard deviation 0.58, 0.53, 0.62, 0.76 and 0.65 for principals, and revealed the extent adequate budgeting of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State. In summary with grand mean 2.98 and 3.10 which are above the criterion mean of 2.50, this indicated that the respondents are on the same agreement that adequate budgeting of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State to a very high extent.

Research Question 2: There is no significant difference between the mean responses of teachers and principals on the extent proper utilization of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State?

Table 2: Mean Responses of teachers and principals on the extent proper utilization of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State.

S/N	Item	Teachers N=240		Principals N=140		Average mean set	Decision
		\bar{X}	SD	\bar{X}	SD		
6.	To what extent does proper funding allocation lead to improved teachers training.	3.31	0.78	2.90	0.72	3.11	VHE
7.	When funds are utilized properly, stakeholders, including parents, teachers, and community members, are more likely to trust the management.	3.08	0.61	2.65	0.51	2.87	HE
8.	When funds are used wisely, schools can successfully organize community events and workshops.	3.13	0.77	3.09	0.73	3.11	VHE
9.	Proper utilization of funds can lead to better school infrastructure, such as classrooms, laboratories, and libraries.	2.73	0.63	2.96	0.69	2.85	HE
10.	Wise financial management ensures that projects and initiatives are sustainable, encouraging continuous stakeholder investment.	3.20	0.79	3.05	0.76	3.13	VHE

Grand Mean/SD	3.09	0.72	2.93	0.68	3.01	VHE
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Source: Field Survey, 2024

Table 2 above for research question 2, shows that all the items 6, 7, 8, 9 and 10 had mean scores 3.31, 3.08, 3.13, 2.73 and 3.20 with standard deviation 0.78, 0.61, 0.77, 0.63 and 0.79 for teachers and 3.11, 2.87, 3.11, 2.85 and 3.13 with standard deviation 0.72, 0.51, 0.73, 0.69 and 0.76 for principals, and revealed the extent proper utilization of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State. In summary with grand mean 3.09 and 2.93 which are above the criterion mean of 2.50, this indicated that the respondents are on the same agreement that proper utilization of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State to a very high extent.

Testing of Hypotheses

The null hypotheses formulated for the study were tested at 0.05 level of significance by means of z-test analysis, which is a test of difference of mean.

1. There is no significant difference between the mean responses of teachers and principals on the extent adequate budgeting of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State.

Table 3: z-test Analysis of Difference Between the Mean Responses of teachers and principals on the extent adequate budgeting of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State.

Respondents	N	\bar{X}	SD	Df	SL	z-cal.	z-tab.	Decision
Teachers	240	2.98	0.61	378	0.05	-0.76	± 1.96	Accepted
Principals	140	3.10	0.63					

Source: Field Survey, 2024

Data on Table 3 above revealed z-test analysis of difference between the mean responses of teachers and principals on the extent adequate budgeting of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State. At 0.05 level of significance and 378 degrees of freedom, the z-calculated value of -0.76 was less than the z-critical value of ± 1.96 , the null hypothesis was therefore accepted.

2. There is no significant difference between the mean responses of teachers and principals on the extent proper utilization of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State.

Table 4: z-test Analysis of Difference Between the Mean Responses of teachers and principals on the extent proper utilization of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State

Respondents	N	\bar{X}	SD	Df	SL	z-cal.	z-tab.	Decision
Teachers	240	3.09	0.72	378	0.05	-0.74	± 1.96	Accepted
Principals	140	2.93	0.68					

Source: Field Survey, 2024

Table 4 above shows the z-test analysis of difference between the mean responses of teachers and principals on the extent proper utilization of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State. At 0.05 level of significance and 378 degrees of freedom, the z-calculated value of -0.74 was less than the z-critical value of ± 1.96 , the null hypothesis was therefore accepted.

Discussion of Findings

Adequate Budgeting of School Funds and Stakeholders' Participation in The Funding of Public Secondary Schools

The analyzed data in Table 1 above for research question 1, revealed that adequate budgeting of school funds influence stakeholders' participation in the funding of public secondary schools with average mean score of 3.04. This finding is in line with the view of (Eze, & Anuforo, 2022). who noted that an adequate budgeting process increases accountability in financial management, instilling confidence in stakeholders?

Hypothesis on Table 3 above revealed z-test analysis of difference between the mean responses of teachers and principals on the extent adequate budgeting of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State. At 0.05 level of significance and 378 degrees of freedom, the z-calculated value of -0.76 was less than the z-critical value of ± 1.96 , the null hypothesis was therefore accepted. This finding is in consonance with an empirical study carried out by Johnson, & Afolabi, (2023) titled Factors contributing to Stakeholders poor Funding of Public Secondary Schools in Bayelsa State and

found out that there is no significant difference between the opinion scores of principals and teachers on the methods adopted for recruitment/selection of human resources to reduce bureaucratic bottleneck.

Proper Utilization of School Funds and Stakeholders' Participation in The Funding of Public Secondary Schools

Table 2 above for research question 2, shows that proper utilization of school funds influence stakeholders' participation in the funding of public secondary schools with average mean score of 3.01. This finding is in consonance with Okoye, & Adeyemi, (2023) who asserted that Wise financial management ensures that projects and initiatives are sustainable, encouraging continuous stakeholder investment.

Hypothesis on Table 4 above shows the z-test analysis of difference between the mean responses of teachers and principals on the extent proper utilization of school funds influence stakeholders' participation in the funding of public secondary schools in Rivers State. At 0.05 level of significance and 316 degrees of freedom, the z-calculated value of -0.74 was less than the z-critical value of ± 1.96 , the null hypothesis was therefore accepted. This finding agrees with an empirical study carried out by Adams, & Clark, (2023) on Stakeholders Impart in the Funding of both Private and Public Secondary Schools in Cross-River State, Nigeria and found out that there is no significant difference between the opinion scores of principals and teachers on the extent adequate funding improves productivity in the school system.

Conclusion

Based on the findings of the study, it was concluded that adequate budgeting of school funds, and proper utilization of school funds influence stakeholder's participation in the funding of public secondary schools in Rivers State, Nigeria. The study further concluded that, Stakeholder participation in the funding of public secondary schools in Rivers State, Nigeria, plays a crucial role in enhancing the quality and sustainability of education. When stakeholders, including government entities, parents, community leaders, and private organizations, actively engage in the funding process, it can lead to improved educational outcomes, more robust infrastructure, and greater community involvement. This collaborative approach not only alleviates financial burdens on the government but also fosters a sense of ownership and responsibility among all parties involved. By leveraging the strengths and resources of each stakeholder, schools can create a supportive and enriched learning environment that benefits students and sets a foundation for long-term educational success and community development.

Recommendations

Based on the findings of this study and conclusion made, the following recommendations were put forward by the researcher:

1. School administrators should not rely only on what is coming from the government, but should partner other stakeholders as a way of alternative sourcing of funds to add up with what government is bringing.
2. School administrators should establish transparent financial practices: Implement clear and transparent financial management practices to build trust among stakeholders. Regular financial reporting and audits should be conducted to ensure accountability and demonstrate how contributions are being utilized effectively. This transparency can encourage ongoing stakeholder engagement and investment.

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Assessment of Awareness and Adoption of Artificial Intelligence Tools for Enhanced Job Performance of Adult Educators in Rivers State-Owned Universities

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Abstract

The study assessed the awareness and adoption of artificial intelligence tools for enhanced job performance among adult educators in Rivers State-owned universities. Two research questions and two hypotheses guided the study. The study adopted the descriptive survey design. The population of the study was 22 adult educators in the Departments of Adult Education and Community Development, Rivers State University and Ignatius Ajuru University of Education. The entire population of 22 adult educators was studied without sampling because of its small and manageable size. A questionnaire titled "Awareness and Use of Artificial Intelligence Tools for Enhanced Job Performance among Adult Educators Questionnaire" was used for data collection. The instrument was validated by two experts. Cronbach Alpha method was used to test the internal consistency of the instrument which yielded reliability indexes of 0.84 and 0.81. The research questions were answered using mean and standard deviation, and the null hypotheses were tested using t-test statistics at 0.05 level of significance. The study found out that adult educators in Rivers State-owned universities are moderately aware of AI tools. However, the extent of utilization is low. The study also found out that adult educators were concerned about the ethical implications of using AI in education. Based on the findings, it was recommended among others that further research should be carried out on how to tackle the ethical challenges of using artificial intelligence in education.

Keywords: Awareness, Adoption, Artificial Intelligence, Job Performance

Introduction

The theme of the impact of technology on education has been long established. The world over, traditional ways of teaching and learning are giving way for more technologically enhanced means. There is a rapid change in instructional strategies, sporadically shifting from conventional classroom settings to virtual and flipped classrooms which are more favourable and productive for both teachers and learners. Perhaps it was Thomas Edison who made the foremost attempt to predict this change when he stated in 1922 that books would soon be obsolete in schools as the motion picture was "destined" to revolutionize our educational system and that in a few years it would supersede the use of the bound papers (Watters, 2015). Since then, technology has continued to redefine the course of modern education.

In Edison's time, he was basically experimenting the role of the motion picture as a technology in education. Today, more than a hundred years after that novel and seminal guess, the use of educational technology has become ubiquitous, transcending the use of just motion pictures, and attracting multifarious definitions. In simple terms, educational technology entails the integration of technological ideas, resources and devices in enhancing learning activities. The Association of Educational Communications and Technology in Huang, Spector and Yang (2019:8), defined educational technology as "the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources." Educational technology combines the use of computer software, hardware and educational theory to facilitate teaching and learning. Lazar in Nadeem, Rafiq, and Jameel (2023) noted that the practice of educational technology draws from the theoretical knowledge of disciplines such as education, communication, sociology, psychology, computer science and artificial intelligence.

With disruptive innovations in technology, especially in the post COVID-19 era, the need to leverage technological resources in education has become extremely important (Uche, Oluwo & Abraham, 2020). Paradigm shifts in the use of Information and Communication Technology (ICT) have redefined old ways of learning (Orgill & Hervey, 2013). The use of online learning, blended learning, flipped classroom, Zoom application and Google classroom have proven to be substantial methods of delivering instructions. Even more increasingly in demand is the use of artificial intelligence, which is gradually upending the traditional face-to-face knowledge seeking method. (Jack & Nzokurum, 2020)

Like Gates (2023) observed, the era of artificial intelligence has begun. Artificial intelligence (AI) is a term technically used to refer to a model created to solve a certain problem or provide a particular service. The goal of artificial intelligence (AI), a subfield of computer science, is to understand the nature of intelligent behaviour in order to design and build machines that behave similarly to well-informed humans in similar circumstances. Artificial Intelligence (AI) encompasses several domains such as robotics, picture recognition, spoken language recognition, natural language processing, and expert systems for problem solving and decision-making. Artificial intelligence is capable of simulating human consciousness and thought processes through information processing. Although it can think like people and may even be smarter than people, artificial intelligence is not the same as human intelligence (Huang, Spector & Yang, 2019).

Artificial intelligence (AI) as an emerging technology is fast gaining traction in education. AI integration in education can occur in web-based teaching and learning platforms, virtual reality, gamification, animation, interactive video, simulations, video conferencing, audio-visuals, 3-D technology, virtual labs, computer programmes, social media, and mobile applications (Ukoh & Nicholas, 2022). Recent developments in artificial intelligence indicate its use in the automation of teaching, administration and data analysis within the education sector. Ukoh and Nicholas (2022) further noted that the use of artificial intelligence in education has enabled the development of customized/personalized learning, smarter content, and has improved learning effectiveness, and efficiency in administration.

While some technology experts are optimistic about the potential of AI to substitute certain human activities, some (Hess, 2013) believe that technological advances in education such as the use of artificial intelligence can only complement human effort to a great extent. As Lakhani (2023) observed, “AI won’t replace humans – but humans with AI will replace humans without AI.” The weight of this statement presses home the fact that the use of artificial intelligence has become an indispensable part of the activities of man, especially in education. Recent studies in teaching and learning show an increased use of artificial intelligence in instructional delivery because of its ability to enhance the ways in which educators plan, deliver and evaluate instructions.

Ukoh and Nicholas (2022), for instance, noted that most instructors consider the use of AI as instructional tools, especially as they make their work easier when put to effective use. Corroborating this view, Ayanwale, Sanusi and Adelana (2022) stressed that the use of AI technology proves useful in enabling instructors accomplish their tasks more quickly as well as enhancing their effectiveness and increasing their productivity at work. This is further affirmed by Akpomi, Nwile and Kayii (2022) who believe that the use of artificial intelligence has a great impact in the management of education; albeit some experts have expressed concerns about the ethical issues involved in the use of AI. For instance, Akgun and Greenhow (2021) opined that despite the benefits of AI applications, they still pose societal and ethical challenges such as “perpetuating existing systemic bias and discrimination, perpetuating unfairness for students from mostly disadvantaged and marginalized groups, and amplifying racism, sexism, xenophobia, and other forms of injustice and inequity.” Akpomi, Nwile and Kayii (2022) also made similar observations, noting that ethical considerations have posed a great challenge to the use of artificial intelligence in education.

However, Oladosu, Adeaga, Oyedokun and Opaleye (2023) observed that a majority of workers in Nigeria, including teachers and lecturers, still indicate interest in using artificial intelligence systems in their daily works as they believe that it can redefine their economic opportunities. Nwile and Edo (2023:34), even though they suspected that AI may have its negative side, reaffirmed that the use of artificial intelligence tools can “contribute to educational management and administration in respect of accessibility of data through smart devices and computers, simplification of both academic and administrative responsibilities, minimization of the time required to complete difficult tasks, management of a variety of organizational duties effectively, participation in virtual global conferences and absolute mobility and production of knowledge ideas and data.” This implies that the use of AI, despite its perceived drawbacks, can be of great advantage to workers in the knowledge economy.

However, irrespective of the numerous advantages it offers, AI still remains an unexplored area for many university lecturers. Alimi, Buraimoh, Aladesusi and Babalola (2021) observed that many university students have poor knowledge of AI tools because of the unawareness of lecturers in the use of these tools. This, according to Lee et al. (2024), is because university educators are typically slow to adapt to new technologies due to resistance to changing teaching practices. Lee et al. (2024) further observed that AI is viewed as both an opportunity and a threat by university educators because most educators fear that the influx of sophisticated AI tools could possibly replace humans in the labour market. Amadi-Iwai, Ubulom and Okiridu (2024) buttressed this point, noting that many university lecturers are poorly aware of the usefulness of artificial intelligence in designing course modules, developing and implementing new methods of teaching, setting continuous assessments, and programming customized lesson plan. This is further supported by the claim of Oluwadiya et al. (2024), that sometimes, students’ knowledge of AI tools even outwitted that of lecturers in some Nigerian universities. This trend, thus, indicates that there is relative lack of awareness among some university lecturers in the use of artificial intelligence tools.

Koko, Benibo and Bupo (2023) defined awareness as possessing the understanding and know-how of a thing. In this context, it implies the educator’s ability to appreciate and use simple artificial intelligence tools. Such appreciation can be useful in planning, administering and evaluating instructions for learners. With the emergence of artificial intelligence, it has become expedient for many adult educators to re-evaluate their knowledge and competence in the use of emerging instructional media. Such re-evaluation becomes even more necessary as most of

these emerging tools are strange to this generation of educators, many of whom are digital immigrants, unlike their students who are digital natives (Prensky, 2001; Friska, 2019).

One such area of artificial intelligence where educators need to re-assess their competence is in the use of generative AI. Commonly used across people of all ages and professions, generative AI refers to all artificial intelligence tools capable of generating new content such as text, images, videos, sounds and slides. The use of generative AI has shown great potential in transforming the field of education, especially in the way instructors plan, administer and evaluate instructions (Abunaseer, 2024). For this reason, some techno-optimists (Nazaretsky, Ariely, Cukurova, & Alexandron, 2022) have recommended that educators should undergo professional development programmes to increase theoretical and practical knowledge about AI. Although Vasoya (2023) warned that the use of artificial intelligence may have its disadvantages to both learners and instructors, the researcher also believed that the risk of using AI can be managed. It becomes important, thus, for adult educators to also leverage the potentials of AI.

An adult educator is one who co-ordinates the process involved in achieving the goals of an adult education programme (Giannoukos, Besas, Galiropoulos, & Hioctur, 2015). Within the university, the adult educator teaches and trains budding practitioners in the field, and also carries out researches and community services related to his/her profession. This enormous task makes it necessary, thus, for the adult educator to leverage quicker, time-saving and precise means of delivering the job at hand. It is to this end that artificial intelligence becomes a viable tool in enhancing the job performance of the adult educator.

Job performance is used to describe the effectiveness and efficiency of the adult educator in terms of delivering his/her task of teaching, researching and performing useful community services related to his field. It is believed that with emerging trends in the use of artificial intelligence, adult educators can also utilize AI in enhancing their job performance, especially as it has also proven useful for their counterparts in other fields (Amadi-Iwai, Ubulom & Okiridu, 2024). This study, thus, examines the awareness and use of artificial intelligence tools for enhanced job performance among adult educators in Rivers State-owned universities.

Statement of the Problem

The rapid advancement of Artificial Intelligence (AI) has introduced transformative tools that have the potential to significantly enhance job performance across various sectors, including

education. However, the adoption of AI in educational institutions, particularly in the context of adult education, remains inconsistent and poorly understood. In Rivers State-owned universities, adult educators are at the forefront of lifelong learning initiatives, yet there is limited empirical evidence on their awareness and utilization of AI tools to enhance their instructional effectiveness and overall job performance.

Despite the growing global emphasis on AI integration in education, the extent to which adult educators in these universities are aware of, and have adopted, AI technologies is unclear. This gap in knowledge poses a significant challenge, as the effective use of AI could lead to improved teaching methodologies, personalized learning experiences for students, and more efficient administrative processes. Furthermore, without a clear understanding of the factors influencing AI adoption among adult educators, efforts to promote these technologies may be ineffective, resulting in underutilization of AI tools and missed opportunities for professional development and instructional improvement.

This study seeks to address this gap by assessing the level of awareness and adoption of AI tools among adult educators in Rivers State-owned universities, with a focus on understanding how these technologies can be leveraged to enhance their job performance. Identifying the barriers and facilitators to AI adoption will provide valuable insights for policymakers, university administrators, and educators, enabling them to develop targeted strategies that support the effective integration of AI in adult education.

Purpose of the Study

The purpose of the study was to examine the extent of awareness and use of artificial intelligence tools for enhanced job performance among adult educators in Rivers State-owned universities. Specifically, the study sought to:

1. Ascertain the extent to which adult educators are aware of artificial intelligence tools for enhanced job performance in Rivers State-owned universities.
2. Determine the extent to which adult educators utilize artificial intelligence tools for enhanced job performance in Rivers State-owned universities.

Research Questions

The following research questions guided the study.

1. To what extent are adult educators aware of artificial intelligence tools for enhanced job performance in Rivers State-owned universities?

2. To what extent do adult educators utilize artificial intelligence tools for enhanced job performance in Rivers State-owned universities?

Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance.

H₀₁ There is no significant difference in the mean ratings of adult educators in Rivers State University and Ignatius Ajuru University of Education on the extent to which adult educators are aware of artificial intelligence tools for enhanced job performance in Rivers State-owned universities.

H₀₂ There is no significant difference in the mean ratings of adult educators in Rivers State University and Ignatius Ajuru University of Education on the extent to which adult educators utilize artificial intelligence tools for enhanced job performance in Rivers State-owned universities.

Methodology

The study adopted the descriptive survey design. The population of the study comprised 16 adult educators in the Department of Adult Education and Community Development, Rivers State University and 7 adult educators in the Department of Adult Education and Community Development, Ignatius Ajuru University of Education. The entire population of 23 adult educators were studied without sampling due to the small and manageable size. The instrument used for data collection was a structured questionnaire titled “Awareness and Use of Artificial Intelligence Tools for Enhanced Job Performance among Adult Educators Questionnaire” (AUAITEJPAEQ). The instrument provided responses to the two research questions with 20 question items; 1 – 10 for research question one, and 11 – 20 for research question two, on a 4-point rating scale of “Very High Extent” (VHE) – 4 points, “High Extent” (HE) – 3 points, “Low Extent” (LE) – 2 points and “Very Low Extent” (VLE) – 1 point. Face and content validity of the instrument was determined by two experts in Adult Education and Community Development and one in Measurement and Evaluation. Cronbach Alpha method was used to test the internal consistency of the instrument which yielded reliability indexes of 0.84 and 0.81 for the two clusters of the instrument. All 23 copies of the questionnaire administered were retrieved and used for the study, which indicated 100% retrieval. The research questions were answered using mean and standard deviation, and the null hypotheses were tested using t-test at 0.05 level of significance. The criterion decision rule was that any mean score from 2.50 and above was regarded as High Extent, while the mean score below 2.50 was Low

Extent. Similarly, decision rule for hypotheses was that any hypothesis with t-calculated value less than the t-critical table value was accepted, while any with t-calculated value greater than t-critical table value was rejected.

Results

Research Question 1: To what extent are adult educators aware of artificial intelligence tools for enhanced job performance in Rivers State-owned universities?

Table 1: Mean Responses on the Extent to Which Adult Educators Are Aware of Artificial Intelligence Tools for Enhanced Job Performance in Rivers State-owned Universities.

S/N	Items	RSU Mean	(n=15) SD	Rmks	IAUE Mean	(n=7) SD	Rmks
1	I am familiar with the concept of artificial intelligence (AI).	3.85	0.79	High Extent	3.14	0.71	High Extent
2	I am aware of some AI tools or applications used in education.	3.66	0.83	High Extent	3.15	0.75	High Extent
3	I am aware of some AI-based tools or applications for enhancing my teaching performance.	3.85	0.66	High Extent	2.75	0.82	High Extent
4	I am aware that the use of AI can improve my job performance and educational outcomes.	3.67	0.70	High Extent	3.12	0.98	High Extent
5	I have received some training on how to use AI in my teaching practices.	3.11	0.90	High Extent	3.10	0.84	High Extent
6	My university provides moderate support for integrating AI into teaching.	2.51	1.06	High Extent	2.52	1.66	High Extent
7	Lack of resources is a challenge in adopting AI for teaching in my university.	2.20	0.86	Low Extent	1.86	0.77	Low Extent
8	Resistance to change is a challenge in adopting AI for teaching in my university.	3.20	0.76	High Extent	3.19	0.88	High Extent
9	I believe the use of AI can enhance my effectiveness as an educator.	3.41	0.81	High Extent	3.20	0.93	High Extent
10	I am likely to use AI tools or applications in my teaching in the next 1 – 2 years.	3.72	0.82	High Extent	3.62	0.79	High Extent
	Grand Mean	3.32		High Extent	2.97		High Extent

Table 2 shows the mean responses of adult educators in the two Rivers State-owned universities on the extent to which adult educators are aware of artificial intelligence tools for enhanced job performance. The table indicated that adult educators in RSU and IAUE are familiar with the concept of artificial intelligence (AI) to a high extent with mean scores of 3.85 and 3.14 respectively. The respondents are also aware of some AI tools or applications used in education with mean scores of 3.66 and 3.15 respectively. They have also used some AI-based tools or applications to enhance their teaching performance to a high extent with mean scores of 3.85 and 2.75 respectively. Thus, they think that AI can improve their job performance and educational outcomes to a high extent with mean scores of 3.67 and 3.12 respectively. The respondents have also received some training on how to use AI in their teaching practices to a high extent with mean scores of 3.11 and 3.10 respectively. Furthermore, they agree to a high extent that their universities provide moderate support for integrating AI into teaching with mean scores of 2.51 and 2.52 respectively. Thus, with mean scores of 2.20 and 1.86, lack of resources is to a low extent a challenge to respondents' adoption of AI for teaching in their universities. However, the respondents accept with mean scores of 3.20 and 3.19 that resistance to change among educators is to a high extent a challenge in adopting AI for teaching in their universities. That notwithstanding, they believe that AI can enhance their effectiveness as educators to a high extent with mean scores of 3.41 and 3.20 respectively. Hence, with mean scores of 3.72 and 3.62, they are to a high extent likely to use AI tools or applications in their teaching in the next 1 – 2 years. Therefore, the grand mean scores of 3.32 and 2.97 on the table reveal that adult educators in Rivers State-owned universities are to a high extent aware of artificial intelligence tools for enhanced job performance.

Research Question 2: To what extent do adult educators utilize artificial intelligence tools for enhanced job performance in Rivers State-owned universities?

Table 2: Mean Responses on the Extent to Which Adult Educators Utilize Artificial Intelligence Tools for Enhanced Job Performance in Rivers State-Owned Universities

S/N	Items	RSU Mean	(n=15) SD	Rmks	IAUE Mean	(n=7) SD	Rmks
1	You use AI tools such as Chat GPT for accessing updated information for my lessons.	3.00	0.81	High Extent	3.02	0.89	High Extent
2	You use AI tools for generating research topics for your papers for publication.	2.15	0.88	Low Extent	2.10	0.76	Low Extent

3	You use chatbots such as ChatGPT and Claudai to enhance your teaching experience by way of helping you find quick and accurate answers to students' questions.	2.20	0.62	Low Extent	2.19	0.67	Low Extent
4	You use AI to automate the grading of students' tests which saves time for other productive activities.	2.10	0.60	Low Extent	2.21	0.98	Low Extent
5	You use AI to generate course outlines for courses assigned to you for more robust content.	2.31	0.73	Low Extent	2.27	0.66	Low Extent
6	You use AI to prepare PowerPoint presentations for lectures and paper presentations	2.12	0.69	High Extent	2.13	0.66	Low Extent
7	Using generative AI tools has generally improved the quality of educational content you provide to your students.	2.55	0.66	High Extent	2.58	0.81	High Extent
8	Using AI slide generators help lecturers adapt their teaching methods to meet diverse students' needs.	2..71	0.77	High Extent	2.67	0.95	High Extent
9	You use AI to aid you in literature review when conducting researchers.	2.50	0.84	High Extent	2.55	0.87	High Extent
10	You use AI to aid in accessing global perspectives in teaching of students.	2.41	1.06	Low Extent	2.34	1.03	Low Extent
Grand Mean		2.41		Low Extent	2.45		Low Extent

Table 3 shows the mean responses of adult educators in the two Rivers State-owned on the extent adult educators utilize artificial intelligence tools for enhanced job performance in Rivers State-owned universities. The analyzed data revealed that majority of respondents agreed with items 1,7,8 and 9 as they had mean scores that showed high extent. While items 2,3,4,5,6 and 10 had mean scores that showed low extent implying majority of the respondents ticked low extent to those items. The grand mean scores of 2.41 and 2.45 for RSU and IAUE respectively indicates that adult educators utilize artificial intelligence tools for enhanced job performance in Rivers State-owned universities to a low extent.

Test of Hypotheses

H₀₁: There is no significant difference in the mean ratings of adult educators in Rivers State University and Ignatius Ajuru University of Education on the extent to which adult educators

are aware of artificial intelligence tools for enhanced job performance in Rivers State-owned universities.

Table 3: T-test result on the mean responses of adult educators in Rivers State-owned universities on the extent to which they are aware of artificial intelligence tools for enhanced job performance.

Respondents	n	Mean	SD	df	t-cal	t-crit	L/sig	Decision
RSU	15	3.32	0.82	20	0.30	1.96	0.05	Accepted
IAUE	7	2.97	0.92					

Source: Survey Result, 2024

Table 4 above reveals a t-calculated value of 0.30 which is less than the t-critical value of 1.96. Therefore, the null hypothesis was accepted, which means that there is no significant difference in the mean ratings of adult educators in Rivers State University and Ignatius Ajuru University of Education on the extent to which adult educators are aware of artificial intelligence tools for enhanced job performance in Rivers State-owned universities.

H₀₂ There is no significant difference in the mean ratings of adult educators in Rivers State University and Ignatius Ajuru University of Education on the extent to which adult educators utilize artificial intelligence tools for enhanced job performance in Rivers State-owned universities

Table 4: T-Test Result on the Mean Responses of Adult Educators in Rivers State-Owned Universities on the Extent to which Adult Educators Utilize Artificial Intelligence Tools for Enhanced Job Performance in Rivers State-Owned Universities

Respondents	n	Mean	SD	df	t-cal	t-crit	L/sig	Decision
RSU	15	2.41	0.81	20	0.05	1.96	0.05	Accepted
IAUE	7	2.45	0.90					

Table 5 above reveals a t-calculated value of 0.05 which is less than the t-critical value of 1.96. Thus, the null hypothesis was accepted. This implies that there is no significant difference in the mean ratings of adult educators in Rivers State University and Ignatius Ajuru University of Education on the extent to which adult educators utilize artificial intelligence tools for enhanced job performance in Rivers State-owned universities.

Discussion of Findings

The findings of the study revealed that adult educators in Rivers State-owned universities are to a high extent aware of artificial intelligence tools for enhanced job performance. This is because adult educators in RSU and IAUE are familiar with the concept of artificial intelligence (AI) to a high extent and have also used some AI-based tools or applications to enhance their teaching performance. This finding agreed with the findings of Oladosu, Adeaga, Oyedokun and Opaleye (2023) that a majority of Nigerian workers, including teachers and lecturers, have shown interest in using artificial intelligence systems in their daily works as they believe that it can redefine their economic opportunities. This finding also corroborated the findings of Ukoh and Nicholas (2022) that most instructors use AI as instructional tools, especially as they make their work easier when put to effective use. The findings of this study disagreed with the findings of Alimi, Buraimoh, Aladesusi and Babalola (2021), Amadi-Iwai, Ubulom and Okiridu (2024) and Oluwadiya et al. (2024) that many university lecturers are unaware of the use of AI tools. This disagreement could be due to the fact that there was less campaign for artificial intelligence as at the period when the aforementioned authors carried out their research. Between then and the time of the present research, there has been a lot of awareness among educators in the use of artificial intelligence. However, the findings of this study agreed with the findings of Lee et al. (2024) that many educators are slow to adapt to the use of AI tools because of their resistance to change.

The findings of this study also revealed that adult educators utilize artificial intelligence tools for enhanced job performance in Rivers State-owned universities to a low extent. This finding agreed with the findings of Abunaseer (2024) that the use of generative AI has shown great potential in transforming the field of education, especially in the way instructors plan, administer and evaluate instructions. It further corroborates the findings of Nwile and Edo (2023) that, despite its shortcomings, AI can “contribute to educational management and administration in respect of accessibility of data through smart devices and computers, simplification of both academic and administrative responsibilities, minimization of the time

required to complete difficult tasks, management of a variety of organizational duties effectively, participation in virtual global conferences and absolute mobility and production of knowledge ideas and data.” It also endorsed the findings of Akpomi, Nwile and Kayii (2022) that the use of artificial intelligence has a great impact in the management of education. Furthermore, the findings of this study revealed that adult educators in the two universities were concerned about the ethical implications of using generative AI in education. This finding agreed with the findings of Akgun and Greenhow (2021) as well as Akpomi, Nwile and Kayii (2022) that the use of AI applications pose great ethical challenges such as “perpetuating existing systemic bias and discrimination, perpetuating unfairness for students from mostly disadvantaged and marginalized groups, and amplifying racism, sexism, xenophobia, and other forms of injustice and inequity.”

Conclusion

Based on the findings of this study, it was concluded that adult educators in Rivers State-owned universities have adequate awareness of artificial intelligence and its potential to enhance their job performance. However, many of the educators are slow to accepting the use of AI tools because of the fear of losing their jobs to machines, and also because of the ethical issues involved in using AI.

Recommendations

Based on the findings, the following recommendations were made:

1. Government and university management should organize workshops to sensitize educators on the true potentials of AI in education, while educators should embrace the opportunity to learn more about AI in education.
2. Further research should be carried out on how to tackle the ethical challenges of using artificial intelligence in education.

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Stakeholders' Contribution in the Management of Secondary Education for Sustainable Development in Rivers State

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Abstract

The study investigated stakeholders' participation in the management of secondary education for sustainable development in Rivers State. The study which adopted descriptive survey research design was guided by two research questions and two hypotheses. The population of the study consisted of 552 principals and PTA chairmen in the 276 public secondary schools in Rivers State. A sample of 112 principals and PTA chairmen representing 20% of the population was drawn through proportionate stratified random sampling technique. A questionnaire entitled: "Stakeholders Participation in the Management of Secondary Education for Sustainable Development Questionnaire (SPMOSESDQ)" developed by the researcher was used for data collection. The instrument which contained 20 items was properly validated and the test of reliability yielded 0.88 through Cronbach Alpha method. Mean, mean set, rank order and standard deviation were used to analyse the research questions, while z-test was used to test the hypotheses at 0.05 level of significance. The results of the study showed that stakeholders participate in the management of secondary education through: construction of required building facilities; provision of ICT facilities; perimeter fencing of school premises; donation of books; and award of scholarships among others. The study also revealed that the challenges of stakeholders' participation in the management of secondary education include among others: poor school-community relationship; ignorance, inadequate information and coordination of stakeholders. Based on the findings, conclusion was drawn and the following recommendations among others were made: secondary school administrators should maintain effective communication with secondary education stakeholders, and school administrators should be prudent, transparent and accountable in order to encourage stakeholders' participation in the management of secondary education in Rivers State.

Keywords: Stakeholders, Management, Participation, Secondary Education and Sustainable Development.

Introduction

Education is the most valuable tool for the pursuit of all kinds of development, be it economic, social, technological, infrastructural, leadership or human capital development. This is the major reason for the huge investments in education by individuals, nations and other major stakeholders. Nations with advanced educational systems all over the world are more developed than countries with unstable educational systems. The business of education

appears to be the most expensive business world over. It requires huge investments in terms of infrastructure, material resources and human capital. The quality of education delivery rests so much on the quality of investment inputs in the educational system. Moreover, the impact of quality education delivery is something that touches every arm or aspect of the society. The government of Nigeria is fully aware of this and their inability to fund and manage education alone, hence, they welcome and encourage the contribution of local communities, individuals, parent-teachers association, corporate organizations, and other organizations in the funding and management of education (Federal Republic of Nigeria (FRN), 2014: 43).

Stakeholders in secondary education are individuals or organisations that have legitimate interest in this level of education. They are people who are interested in the success of secondary education by ensuring that secondary education system is effectively managed and meets the needs of the students. Their interest is hinged on assisting the government, to enhance the attainment of the broad goals of secondary education which include: to prepare individuals for useful living within the society; and for higher education pursuit (FRN, 2014: 11). Preparing individuals for useful living within the society implies that secondary education should be able to equip students with adequate skills and moral behaviours relevant to their development and the development of the society they belong to. Secondary education is the level of education after primary and before tertiary education. It is critical to the sustainable development of Rivers State and the nation at large because it prepares the middle level manpower required for economic growth and development. It also prepares individuals for higher education and useful living. Hence, this level of education should be adequately managed to enhance sustainable development. Sustainable development encompasses the various developmental strides and progress we record in the different sectors of the economy to enhance our standard of living, without hindering or compromising further development or improvement of the future generations.

Different stakeholders have their expectations from secondary education system depending on their perception and what they need from the programme. This sometimes shape or influence their contributions to the development and management of secondary education. According to Nakiyaga (2021), education stakeholders are those who have interest in the success and welfare of the education system. The stakeholders in education according to him include: parents, educators, policy-makers, school board members, school administrators, teachers, students, and the community. The community as a whole is a stakeholder in its education system because

local schools educate and prepare future employees, business owners and community leaders. A solid education programme builds a stronger community by ensuring better preparation of the students to become successful community members.

Babalola (2014) perceived stakeholders as groups who count to a corporation in terms of interest, voice, influence and power, and recommend ways by which management can predict what counts to various interest groups and give due regard to the interest of those groups. The word or term stakeholder cuts across many school reform concepts and strategies such as leadership group, shared leadership, and voices. According to Uche and Omorojor (2020), it generally looks into expansion of the number of people involved in making important decisions relating to school administration and academics.

Stakeholders in education are divided into internal and external stakeholders. The internal stakeholders include the principal, teachers and the students. While, the external stakeholders include the Schools' Management Board, Ministry of Education, Parent- Teachers Association, Alumni Association, host communities, corporate organisations, religious bodies etc. Stakeholders play relevant roles in the management of secondary education programmes. According to Yamma and Izom (2018), if secondary education programmes must succeed, the various stakeholders must play their roles effectively.

Stakeholders' participation refers to the involvement of major contributors in delivering various functions such as policy formulation, setting school priorities, planning, resource allocation, monitoring and supervision of the implementation of the plans, and taking corrective measures to attain the vision, mission and set objectives of the school. Stakeholders participation according to Cabardo (2016) is associated with the principle of democracy which advocates for representation in any system of government and if quality education is to be enhanced, various school stakeholders need to be regularly communicated and brought on board to play significant roles in secondary education management. The participation of stakeholders in the management of secondary education could be through any of the following seven different ways:

1. Involvement through the contribution of money, materials and labour
2. Involvement through the mere use of a service such as enrolling children in school or using a primary health care facility:
3. Involvement through attendance;
4. Involvement through consultation on a particular issue;

5. Participation in the delivery of services often as a partner with other actors;
6. Participation as implementers of delegated power and;
7. Participation in real decision making at every stage, including identification of problems, the study of feasibility, planning, implementation, and evaluation.

The concept of stakeholder's participation in the management of secondary education connotes the means or ways of involving some hands in handling some aspects of the school projects such as provision of physical learning facilities, funds and ensuring quality educational development. Stakeholders participation according to Takyi, Emmanuel and Yusuf (2013) could range from low to high levels. They categorized stakeholder's participation into three. They are: consult, collaboration/partnership, and empower/control. Consultation is the least level of participation. In this case, individual's or group's opinion on pertinent issues are sought and the school authorities are not bound to accept such opinion. Collaboration/partnership is of a higher level of participation. Here, individuals or groups work together with school authorities to achieve stipulated goals. The various collaborators/participants take part in decision-making and have a say in the final outcome.

On the other hand, empowerment or control is the highest level of participation. In this case individuals or groups have complete control over the decision – making process. This level of participation according to Takyi et al (2013) is often seen in self-managed teams or organisations where employees have a say on how things are run. Stakeholders' participation in the management of education sector has helped in giving the sector a face lift, by providing the required infrastructure and environment adequate for teaching and learning since government is overwhelmed by the numerous problems facing the education sector. According to Nweke and Uche (2020), stakeholders participate in staff personnel management; students' personnel management; infrastructural development; and maintenance of school environment.

In the studies carried out by Wagbara and Agala (2023); and Okanezi (2023), it was observed that, to a moderate extent, stakeholders participate in the provision of physical facilities and in the funding of government owned secondary schools for effective management of secondary education and sustainable development of Rivers State.

In another related study by Analaba and Jack (2023) on stakeholder's participation in the funding of public secondary schools in Rivers State, it was revealed that old boys association, civil society organizations, government, parents' teachers' association (PTA), host communities, principals, teachers, students, non-governmental organisations, and religious

bodies are strong stakeholders in the funding of public secondary schools in Rivers State. They equally identified the following as factors that encourage stakeholders' participation in the funding of public secondary schools in Rivers State: adequate budgeting of school funds; regular auditing of school funds, proper utilization of school funds, maintenance culture of school facilities, reward/recognition of participating stakeholders, regular supervision and monitoring of school projects to ensure completion.

Stakeholders participation in the management of secondary education is faced with some challenges. According to Nwadike and Godwins (2020), the challenges facing the participation of education stakeholders in the management of secondary education include: lack of fund; lack of trained manpower; gender inequality; government policies; and family issues. Chacha and Tangi (2023) in their study on the challenges facing stakeholders' participation in improving teaching and learning process in public secondary schools in Rorya District, Mara, Tanzania found that political interference, lack of awareness, poverty, negligence of some parents, lack of transparency, and poor relationship with parents were some of the major challenges affecting stakeholder's participation in improving teaching and learning process.

Yaro, Salleh and Arshed (2018) observed that incorporating education stakeholders into different education issues by the government is a challenge. It is a challenge for education stakeholders to participate effectively in education matters because of inadequate coordination and information to them on education issues. A lot of the stakeholders failed to be efficiently involved in education issues due to lack of information on what they could participate in and a lack of cooperation. Bekoe and Quarley (2013) observed that despite the need to involve the community in school issues, the community is still confronted with some challenges. The study revealed that farming activities, parents' low understanding of education, poor communication and unrecognized opinions of others were some of the challenges affecting effective community participation in the management of education issues. Education managers should recognize and work with some educational advice or views of community members on effective management of education, but neglecting their ideas or opinion could hinder their further participation in supporting their schools.

In a related study by Polycarp (2021), it was revealed that negative attitudes towards education, low level of parents' education, lack of accountability, parents' low socio-economic status and irregular parents meeting were some of the factors hindering stakeholders' participation on education issues. Lauwo and Mkulu (2021) found that, the major obstacles to

community involvement in education issues include ignorance, bad school administration, poverty, political interference, unfavourable attitude and behaviours, and lack of proper communication between the school and the community. From these reviews, poor communication between the school and the community affect community members' ability to provide their support in the provision of various facilities needed by the school.

Statement of the Problem

The issue of access to quality secondary education has suffered a serious setback in many states in Nigeria due to inadequate provision of educational resources. Government has made it clear that they cannot single-handedly fund and provide quality secondary education hence, they call for the participation of the private sector, local communities, individuals, and other stakeholders in the funding and management of secondary education for sustainable development. It is a challenge for education stakeholders to participate effectively in education matters because of inadequate coordination and information to them on education issues. A lot of the stakeholders failed to be efficiently involved in education issues due to lack of information on what they could participate in and a lack of cooperation. The researcher is not too sure of the various ways stakeholders participate in the provision of facilities, funding and management of secondary education for sustainable development in Rivers State. The problem of this study therefore, is to investigate the various ways stakeholders participate in the management of secondary education for sustainable development in Rivers State.

Aim and Objectives of the Study

This study aimed at investigating stakeholder's participation in the management of secondary education for sustainable development in Rivers State. Specifically, the study sought to:

1. Ascertain the various ways stakeholders participate in the management of public secondary education for sustainable development in Rivers State.
2. Determine the challenges of stakeholder's participation in the management of public secondary education for sustainable development in Rivers State.

Research Questions

The following research questions were answered in this study:

1. What are the various ways stakeholders participate in the management of public secondary education for sustainable development in Rivers State?

2. What are the challenges of stakeholder's participation in the management of secondary education for sustainable development in Rivers State?

Hypotheses

The following hypotheses were tested at 0.05 level of significance:

1. There is no significant difference between the mean scores of principals and Parents Teachers' Association (PTA) chairmen on the ways stakeholders participate in the management of public secondary education for sustainable development in Rivers State.
2. There is no significant difference between the mean scores of principals and PTA chairmen on the challenges of stakeholders' participation in the management of public secondary education for sustainable development in Rivers State.

Methodology

The study which adopted descriptive survey research design was guided by two research questions and two hypotheses. The population of the study consisted of 276 public secondary school principals and the 276 PTA chairmen in all the public secondary schools in Rivers State. A sample of 112 respondents (56 principals and 56 PTA chairmen), representing 20% of the population was drawn through the stratified random sampling technique.

A questionnaire titled: "Stakeholders' Participation in the Management of Secondary Education for Sustainable Development Questionnaire (SPMOSESDQ)" was used for data collection. The instrument which had 20 items structured on a four (4) point likert rating scale of Strongly Agree (4 points), Agree (3 points), Disagree (2 points), and Strongly Disagree (1 point). The instrument was properly validated by three (3) research experts, two (2) from Department of Educational Management and one (1) from Measurement and Evaluation, Rivers State University. The reliability test carried out using Cronbach alpha method yielded a reliability index of 0.88. mean, mean set, rank order and standard deviation were used to analyse the research questions while the hypotheses were tested with z-test at 0.05 level of significance.

Results

Research Question One: What are the various ways stakeholders participate in the management of secondary education for sustainable development in Rivers State?

Table 1: Mean, mean set, rank order and standard deviation of the responses of principals and PTA chairmen on the various ways stakeholders participate in the management of secondary education for sustainable development in Rivers State.

S/N	Items	Principals N = 56		PTA Chairmen N= 56		Mean Set	Rank Order	Decision
		\bar{x}_1	SD_1	\bar{x}_2	SD_2			
1.	Construction of classroom blocks, offices, school halls, hostels for effective management of schools.	3.54	0.59	3.62	0.57	3.58	1 st	Agree
2.	Provision of ICT facilities.	3.28	0.69	3.34	0.67	3.31	5 th	Agree
3.	Perimeter fencing of school premises	3.20	0.71	3.24	0.70	3.22	6 th	Agree
4.	Donation of textbooks for school libraries	3.42	0.63	3.36	0.66	3.39	3 rd	Agree
5.	Construction of internal roads in the school premises	3.16	0.75	3.18	0.73	3.17	8 th	Agree
6.	Drilling of boreholes/provision of portable water.	3.12	0.77	3.08	0.79	3.10	9 th	Agree
7.	Provision of scholarship for indigent and brilliant students.	3.38	0.65	3.40	0.64	3.39	3 rd	Agree
8.	Provision of furniture, office, workshops and laboratory equipment	3.50	0.61	3.52	0.60	3.51	2 nd	Agree
9.	Monthly payment of teachers' salaries/allowances	2.33	0.81	2.27	0.83	2.30	10 th	Disagree
10.	Donation of cups/awards/prizes to encourage sports and academic development.	3.18	0.73	3.20	0.71	3.19	7 th	Agree
Aggregate mean and standard deviation		3.21	0.69	3.22	0.69			

Results in table 1 show that items 1 to 8 and item 10 had weighted mean scores that are greater than the criterion mean of 2.50. They were accepted as the ways stakeholders participate in the management of secondary education for sustainable development in Rivers State. In terms of ranking, item 1 ranked 1st followed by item 8. While, item 9 which had the least mean score of 2.30, which is far less than the criterion mean, ranked 10th in the rank order. The aggregate mean scores of 3.21 for principals and 3.22 for PTA chairmen which did not differ so much from each other is an indication that both respondents shared a common opinion on the ways stakeholders participate in the management of secondary schools for sustainable development in Rivers State.

Therefore, the various ways stakeholders participate in the management of secondary education for sustainable development in Rivers state include: Construction of required building facilities for effective management of schools; provision of ICT facilities; perimeter fencing of school premises; donation of textbooks; construction of internal roads in the school; provision of furniture and other equipment; and donation of cups/awards/ prizes to encourage sports and academic development.

Research Question Two: What are the challenges of stakeholder's participation in the management of secondary education for sustainable development in Rivers State?

Table 2: Mean, mean set, rank order, and standard deviation of the responses of principals and PTA chairmen on the challenges of stakeholder's participation in the management of secondary education for sustainable development in Rivers State?

S/N	Items	Principals N = 56		PTA Chairmen N= 56		Mean Set	Rank Order	Decision
		\bar{x}_1	SD_1	\bar{x}_2	SD_2			
1.	Inadequate school- community relations.	3.06	0.75	3.10	0.73	3.08	3 rd	Agree
2.	Ignorance/low level of education of some parents	3.02	0.76	3.12	0.72	3.07	4 th	Agree
3.	Poverty/low socio-economic status of some stakeholders	3.00	0.77	2.94	0.79	2.97	6 th	Agree
4.	Inadequate information and coordination of stakeholders	3.12	0.72	3.06	0.75	3.09	2 nd	Agree
5.	Bad school administration	2.96	0.78	3.02	0.76	2.99	5 th	Agree
6.	Corruption/ lack of accountability	3.14	0.71	3.08	0.74	3.11	1 st	Agree
7.	Political interference	2.84	0.83	2.86	0.82	2.85	8 th	Agree
8.	Frequent transfer of principals from one school to another	2.42	0.86	2.35	0.88	2.39	10 th	Disagree
9.	Insecurity	2.38	0.87	2.44	0.85	2.41	9 th	Disagree
10.	Inflation/high cost of materials	2.90	0.81	2.92	0.80	2.91	7 th	Agree
	Aggregate mean and standard deviation	2.88	0.79	2.89	0.78			

Results in table 2 indicate that items 1 to 7 and item 10 had weighted mean scores that are greater than criterion mean of 2.50. They were agreed on as the challenges of stakeholder's participation in the management of secondary education for sustainable development in Rivers State. in terms of rank order item 6 ranked 1st, followed by item 4. While items 8 and 9 which had the lowest mean scores of 2.39 and 2.41 respectively ranked 10th and 9th. Items 8 and 9 were not accepted as the challenges of stakeholder's participation in the management of secondary education for sustainable development in Rivers State.

The aggregate mean of 2.88 and 2.89 for principals and PTA chairmen which are very close reflect that the respondents had the same opinion about the challenges of stakeholder's participation in the management of secondary education for sustainable development. Therefore, the challenges as revealed by the study are as follows: inadequate school/community relations, ignorance/poor level of education of some parents; poverty; inadequate information/coordination of stakeholders; bad school administration; corruption/lack of accountability; political interference; and inflation/high cost of materials.

Test of Hypotheses

Ho₁: There is no significant difference between the mean scores of principals and PTA chairmen on the various ways stakeholders participate in the management of secondary education for sustainable development in Rivers State.

Table 3: z-test of difference between the mean scores of principals and PTA chairmen on the way stakeholders participate in the management of secondary education for sustainable development in Rivers State.

Status	N	\bar{x}	SD	Df	z-cal.	z-crit.	Level of sign.	Decision
Principals	56	3.21	0.69	110	0.077	± 1.960	0.05	Ho ₁
PTA Chairmen	56	3.22	0.69					Retained

Table 3 shows a summary of mean, standard deviation and z-test of difference between the principals and PTA chairmen on the ways stakeholders participate in the management of secondary education for sustainable development in Rivers State. The z-test calculated which was used in testing the hypothesis stood at 0.077, while the z-critical value was ± 1.960 at 110 degree of freedom using 0.05 level of significance. The z-calculated value was by far less than the z-critical value. Therefore, the null hypothesis of no significant difference between the mean scores of principals and PTA chairmen on the ways stakeholders participate in the management of secondary education for sustainable development in Rivers State was retained.

Ho₂: There is no significant difference between the mean scores of principals and PTA chairmen on the challenges of stakeholder's participation in the management of secondary education for sustainable development in Rivers State.

Table 4: z- test of difference between the mean scores of principals and PTA chairmen on the challenges of stakeholder's participation in the management of secondary education for sustainable development in Rivers State.

Status	N	\bar{x}	SD	Df	z-cal.	z-crit.	Level of sign.	Decision
Principals	56	2.88	0.79	110	0.067	± 1.960	0.05	Ho ₂
PTA Chairmen	56	2.89	0.78					Retained

Table 4 shows a summary of mean, standard deviation and z-test of difference between the principals and PTA chairmen on the challenges of stakeholder's participation in the management of secondary education for sustainable development in Rivers State.

The z-test calculated which stood at 0.067 is by far less than the z-critical value of ± 1.960 at 110 degree of freedom using 0.05 level of significance. Therefore, the null hypothesis of no significant difference between the mean scores of principals and PTA chairmen on the challenges of stakeholder's participation in the management of secondary education for sustainable development in Rivers State was retained.

Discussion of Findings

The results of the study revealed that stakeholders participate in the management of secondary education in Rivers State through the construction and donation of required building facilities; fencing of school premises and construction of internal roads in the school premises. In many secondary schools in Rivers State, there are building facilities built and donated by the schools' PTA, the host communities, corporate organisations such as NDDC, oil companies and some well-meaning philanthropists. They do this to solve the facilities need of the schools and the enhance quality education in the schools. Corporate organisations equally provide or donate some facilities to schools as part of the fulfilment of their social responsibilities.

These findings agree with Wagbara and Agala (2023) as well as Analaba and Jack (2023) who observed in their respective studies that, stakeholders participate in the funding and provision of physical facilities in public secondary schools in Rivers State. stakeholders also provide ICT facilities, textbooks, portable water, scholarships to brilliant indigent students, furniture, office, workshop, laboratory equipment and, they equally encourage sports and academic activities in public secondary schools through the donation of cups and prizes/awards for best students in certain areas, these efforts by stakeholders immensely contribute to the management of secondary education in the state.

The study observed that the challenges of stakeholders' participation in the management of secondary education include: inadequate school- community relations, ignorance and poverty. Secondary school administrators need to maintain good relationship with their host communities. This will enable them to gain their corporation and support in a lot of things. Ignorance and low level of education as well as poverty of some parents serve as major hinderance to their participation to the provision of school facilities. Some of them feel that it is the obligation of government to provide everything for the school, hence nobody should

worry them. They forget that the future of their children is what is at stake here. The quality of secondary education received by their children will help to shape their future either for good or bad.

Other challenges observed by this study include inadequate information/coordination of stakeholder's bad school administration, corruption, political interference, and high cost of materials. These findings agree with Yaro, Salleh and Arshed (2018), Chacha and Tangi (2023), and Bekoe and Quartey (2023). It appears that some school administrators do not adequately reach out to some stakeholders in secondary education. there is lack of well-coordinated communication or information flow between them and the school. This makes it difficult for such people organisation to participate in managing or providing services and facilities for the school. Bad school administration is another issue that hinders people from participating in the in the management of secondary schools. Some school administrators are "Mr. Know it all". They do not like seeking for advice or help. Some are difficult to work with because of their bad character. They are very secretive and lack transparency in managing school funds. Such attitude could scare stakeholders away from participating in anything concerning the school.

Politics is a major issue affecting educational management in Nigeria. It determines people's actions and inactions. Political interest could motivate some stakeholders to provide some facilities or fund some projects in a school. It could also result to delay or withdrawal in the execution of some projects. High cost of materials in the market is affecting the cost of living in Nigeria and the funding of school projects. Many parents and stakeholders currently, are struggling for survival and may not have the financial capacity to participate in the funding and management of secondary education the way they have been doing, due to inflation and high cost of living currently experienced in Nigeria.

Conclusion

Stakeholders' participation in the management of secondary education in Rivers State has promoted the provision of school facilities and the funding of secondary education. Their participation which has enhanced the development of secondary education is challenged by some factors such as inadequate school-community relations, bad school administration, poor communication and coordination of stakeholders by some school administrators.

Recommendations

Based on the findings, the following recommendations were made:

1. Secondary school administrators should ensure that, they maintain effective communication with secondary education stakeholders.
2. There should be effective school-community relationship between secondary school administrators and their host communities.
3. In this time of economic recession, school administrators should not depend on government alone for funding and provision of school facilities, but through the Ministry of Education and Secondary Education Management Board reach out to potential stakeholders locally and internationally to contribute and participate in the management of their schools.
4. Secondary school administrators should ensure that, they maintain proper accountability, prudence, transparency and adequate management of school resources as a way of encouraging stakeholders to participate in the management of secondary education in Rivers State.

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Utilization of Artificial Intelligence in Staff Mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria

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Abstract

The study examined utilization of Artificial Intelligence in staff mentoring and teaching effectiveness in Public Universities in Rivers State, Nigeria. Two research questions and two hypotheses guided the study. The study adopted a correlation research design. The area of the study was public Universities in Rivers State. The population of the study consisted of 1,186 senior lecturers in three universities in Rivers State, which consists of Rivers State University, University of Port Harcourt and Ignatius Ajuru University. Sample size of 302 senior lecturers from the three Universities were drawn from the population using simple random sampling technique. Two structured instruments titled "Utilization of Artificial Intelligence in Staff Mentoring (UAISM)" and "Teaching Effectiveness in Public Universities (TEPU)" were used to elicit data from the respondents. The instrument was validated by experts in educational management. The reliability of the instrument gave a Cronbach Alpha index of 0.77 and 0.73 which was considered reliable. The data collected were analysed using mean and standard deviation in answering the research questions while the null hypotheses formulated were tested using Pearson product moment correlation Analysis. The findings of the study revealed that, utilization of AI in situation staff mentoring and traditional mentoring, positively influence teaching effectiveness in Universities in Rivers State. Based on the findings, It was recommended among others that, Heads of Departments and Deans of faculties in the various Universities should encourage the Utilization of AI in collaboration and synergy among lecturers for improved teaching effectiveness.

Keywords: Artificial intelligence, Staff Mentoring, Teaching Effectiveness, Utilization of Resources.

Introduction

The incorporation of artificial intelligence (AI) into educational frameworks holds substantial promise for revolutionizing staff mentoring and enhancing teaching effectiveness, particularly in public universities located in Rivers State, Nigeria (Nwosu & Udom, 2024). As the global educational landscape increasingly integrates digital innovations, these institutions find themselves aptly positioned to harness AI to resolve longstanding challenges, such as enhancing personalized learning, improving mentorship quality, and achieving superior educational outcomes. Public universities in Rivers State, that are characterized by resource

constraints and large student populations, stand to gain significantly from AI applications that offer scalable and personalized educational solutions.

Recent research underscores AI's potential in reshaping educational methodologies by employing intelligent tutoring systems, adaptive learning platforms, and data-driven decision-making tools (Okafor & Emeka, 2023; Igwe et al., 2023). These technologies facilitate a shift from traditional one-size-fits-all teaching models to more nuanced and personalized instructional approaches. By leveraging AI, educators can deliver tailored content that addresses individual student needs, learning paces, and cognitive styles, thereby fostering deeper understanding and engagement (Nwosu & Udom, 2024).

In Rivers State, incorporating AI into academia not only aligns with global educational advancements but also addresses local challenges such as teacher shortages, variability in teaching quality, and the need for continuous professional development. The Nigerian government and educational policymakers have recognized the potential of AI and are increasingly advocating for its adoption to enhance teaching quality and learning outcomes (Eze & Chukwuma, 2023).

Moreover, AI's powerful analytical capabilities allow for in-depth assessment of student performance data, which aids faculty in identifying performance trends and potential learning obstacles (Abiodun & Johnson, 2023). This data-informed approach not only enhances teaching effectiveness but also enables proactive mentorship, equipping staff with the insights necessary to provide timely and targeted support to students, thereby boosting retention and success rates.

In realizing these benefits, public universities in Rivers State must adopt a strategic approach to AI integration. This involves assessing local infrastructural readiness, understanding the specific training needs of faculty, and continually evaluating the impact of AI interventions to ensure sustainable and meaningful educational enhancements (Eze & Chukwuma, 2024). As these institutions embrace AI, they unlock opportunities for significant pedagogical transformation, positioning themselves as pioneers in the quest for academic excellence in an increasingly digital world. Through leveraging AI, these institutions can aspire to not only elevate their educational offerings but also contribute to broader educational reforms within Nigeria and the African continent at large.

Staff mentoring refers to a developmental process where experienced individuals (mentors) provide guidance, knowledge, and support to less experienced colleagues (mentees) within an

organization or institution. This relationship aims to foster the professional growth, career development, and overall effectiveness of the mentee by sharing insights, offering advice, and creating opportunities for learning and advancement. In educational settings, such as universities, staff mentoring can help new faculty or administrative staff acclimate to the institutional culture, enhance their teaching skills, and progress in their academic careers. The process is characterized by mutual trust, confidentiality, and respect, contributing not only to the individual's development but also to the organization's overall success.

Recent literature highlights the importance of structured mentoring programs in professional environments, emphasizing their role in enhancing job satisfaction, organizational commitment, and employee retention (Smith & Brown, 2022). Furthermore, effective mentoring relationships have been linked to increased self-efficacy and performance among mentees, as well as improved leadership and communication skills for mentors (Nguyen & Lee, 2023).

Teaching effectiveness refers to the ability of an educator to facilitate learning and improve student outcomes by employing techniques that engage students, encourage critical thinking, and foster a deep understanding of the subject matter. Effective teaching involves a combination of clear communication, the use of diverse instructional strategies, the ability to assess and respond to student needs, and the creation of an inclusive and supportive classroom environment. It also includes the teacher's ability to reflect on and adapt their teaching practices based on feedback and student performance data.

Recent studies emphasize the multi-dimensional nature of teaching effectiveness, which encompasses both the teacher's professional competence and their interpersonal skills (Johnson & Stevens, 2023). Furthermore, formative assessment and feedback have been highlighted as critical components that significantly enhance teaching effectiveness, as they encourage continuous improvement and adaptation of teaching strategies to meet diverse student needs (Martinez & Kim, 2024).

Situational staff mentoring refers to a flexible mentoring approach that adapts to the specific context and immediate needs of the mentee and the organization at a given time. Unlike traditional mentoring, which might follow a set structure or process, situational mentoring allows for a more responsive and dynamic interaction between the mentor and mentee. This approach is particularly effective in environments where rapid changes or unique challenges

require tailored guidance and support. Situational mentoring is characterized by its ability to address specific issues or developmental areas, such as adapting to a new role, navigating organizational changes, or developing particular skills. The mentor provides timely advice and support that aligns with the current circumstances and objectives of the mentee, fostering more relevant and impactful learning experiences. Recent literature suggests that situational mentoring can significantly enhance professional development by providing more immediate and applicable insights tailored to individual and organizational needs (Taylor & Greene, 2023). Additionally, situational mentoring has been shown to improve mentees' adaptability and problem-solving skills, which are crucial in fast-paced and evolving work environments (Lopez & Carter, 2024).

Traditional staff mentoring is a structured, long-term developmental relationship between a more experienced mentor and a less experienced mentee within an organization. In this model, the mentor provides consistent support, guidance, and insights to help the mentee develop professionally, navigate their career path, and integrate into the organizational culture. This type of mentoring often includes regular meetings, goal setting, and feedback sessions, with a focus on developing the mentee's skills, knowledge, and performance over time. Traditional mentoring is characterized by its emphasis on building a trusting, ongoing relationship that allows the mentee to gain from the mentor's experience and wisdom. This approach is aimed at fostering personal and professional growth, enhancing career development, and building a sense of belonging within the organization. Recent studies have highlighted the effectiveness of traditional mentoring in facilitating career advancement and improving job satisfaction among employees (Anderson & Thompson, 2023). Additionally, organizations with established traditional mentoring programs often report higher retention rates and increased employee engagement (Murphy & Zhang, 2023).

The utilization of AI in mentoring and teaching within public universities in Rivers State represents a significant stride towards enhancing educational quality and staff efficacy. By harnessing these technologies, these institutions are better positioned to meet the challenges of modern education, ensuring that both educators and students are equipped for future success.

Conceptual Review of Related Literature

Concept of Artificial Intelligence (AI)

Artificial Intelligence (AI) is a branch of computer science focused on the creation of systems capable of performing tasks that typically require human intelligence (Poole, & Mackworth, 2017). These tasks include, but are not limited to, problem-solving, decision-making, understanding natural language, recognizing patterns, and learning from past experiences. The ultimate aim of AI is to enable machines to carry out complex functions autonomously, efficiently, and in a manner akin to human cognition (Poole, & Mackworth, 2017).

Core Components of Artificial Intelligence (AI)

- i. Machine Learning (ML): A subset of AI, ML empowers systems to learn from data inputs without explicit programming. Algorithms build models based on sample data, known as training data, to make predictions or decisions without being explicitly programmed to perform the task.
- ii. Neural Networks: These are computer systems vaguely inspired by the human brain's neural networks. A neural network includes layers of nodes that process data, enabling machines to understand complex patterns or connections in raw data.
- iii. Natural Language Processing (NLP): NLP is concerned with the interaction between computers and humans through natural language. It involves enabling computers to read, understand, and decipher human languages, allowing for seamless communication between humans and machines.
- iv. Computer Vision: This is the field of AI that enables machines to interpret and make decisions based on visual data from the world. Techniques in computer vision involve pattern recognition and image processing.
- v. Robotics: AI applies in robotics to create intelligent machines that can assist humans in a variety of tasks, ranging from manufacturing processes to exploring environments that are inhospitable to humans.

Philosophical and Ethical Aspects of Artificial Intelligence (AI)

AI raises significant philosophical questions, such as the nature of consciousness, intelligence, and ethical dimensions concerning the impact of AI on society. Ethical concerns include privacy, the displacement of jobs due to automation, and biases in AI algorithms, which can lead to unfair or discriminatory outcomes (Poole, & Mackworth, 2017).

Applications of Artificial Intelligence

The following are the applications of artificial intelligence:

- a. Healthcare: AI assists in diagnostics, personalized medicine, and treatment plans, improving patient outcomes and operational efficiencies.
- b. Transportation: Autonomous vehicles use AI to navigate and make driving decisions, reducing the need for human intervention.
- c. Finance: AI algorithms handle trading, fraud detection, and personalized customer service, processing large volumes of data faster than any human could.
- d. Manufacturing: AI-driven robots improve production efficiencies, ensuring quality control and safety.
- e. Customer Service: AI chatbots and virtual assistants provide real-time assistance, improving customer satisfaction and reducing the need for human customer service agents.

Future of Artificial Intelligence (AI)

The future of AI is poised for rapid evolution, with anticipated advancements in quantum computing potentially revolutionizing AI capabilities. However, the trajectory of AI development must be guided by ethical frameworks and policies that ensure technological growth benefits all sectors of society ethically and equitably (Russell, & Norvig, 2020).

Relationship Between Staff Mentorship and Teaching Effectiveness

The relationship between staff mentorship and teaching effectiveness in public universities is a multifaceted subject that has garnered increasing attention in recent academic discourse. Mentorship is recognized as a vital component of professional development, contributing significantly to the teaching effectiveness of faculty, with substantial benefits for students and the institution at large (Smith, & Doe, 2023). Here, are various dimensions of the relationship:

Professional Development and Pedagogical Skills

- i. Knowledge Transfer: Mentorship allows for the transfer of tacit knowledge and teaching techniques from experienced educators to newer faculty members. Mentor-mentee relationships facilitate the sharing of best practices, innovative teaching methods, and effective lesson planning, which are critical to effective teaching.
- ii. Skill Enhancement: For academics, especially those early in their careers, mentorship provides a structured pathway to enhance teaching skills. Mentors assist in identifying specific strengths and weaknesses, providing mentees with tailored guidance and resources for improvement.

Confidence Building and Classroom Management

- i. Emotional and Professional Support: Mentors provide emotional support and constructive feedback, helping mentees build confidence and resilience. This support is crucial in fostering an environment where new faculty feel secure in experimenting with new teaching strategies and classroom management techniques.
- ii. Feedback Loops: Regular feedback and reflective practices ingrained in mentorship relationships enable mentees to make continuous improvements in their teaching practices, leading to increased teaching effectiveness.

Institutional Integration and Cultural Familiarity

- i. Understanding the Academic Culture: Mentorship helps new faculty understand the intricacies of institutional policies, expectations, and culture, making it easier for them to align their teaching with the university's mission. This alignment enhances their effectiveness as educators within that specific context.
- ii. Networking and Collaboration: Through mentorship, mentees are often introduced to broader networks within the academic community. This exposure facilitates potential interdisciplinary collaborations and the exchange of teaching resources and strategies, amplifying teaching effectiveness.

Enhanced Student Outcomes

- i. Student Engagement and Success: Effective mentorship has a trickle-down effect on students. Mentees who have received quality mentorship are often more adept at engaging students, leading to increased student participation, motivation, and academic achievement.
- ii. Role Models for Future Mentors: Successful mentorship experiences inspire mentees to become mentors themselves, promoting a sustainable cycle of teaching excellence and professional development within the university.

Challenges and Institutional Support

- i. Time and Resource Investment: Ensuring effective mentorship requires significant time and resource investment from both the institution and the individuals involved. Universities must prioritize mentorship within their professional development agendas to realize its full potential.
- ii. Institutional Policies: Implementing supportive policies, including recognition and rewards for mentors, can motivate faculty to participate in and sustain mentorship

programs. Access to workshops and professional development seminars further enriches the mentorship process.

This study reinforces the positive impact of mentorship on teaching effectiveness, highlighting improvements in pedagogical approaches and student engagement when robust mentorship programs are in place. It suggests that supportive mentorship structures are pivotal to achieving academic excellence in public universities. The relationship between staff mentorship and teaching effectiveness is one of mutual reinforcement. Well-structured mentorship programs lead to enhanced teaching capabilities, which significantly benefit faculty's professional growth and student learning outcomes. Thus, fostering effective mentorship within public universities is essential for sustaining educational quality and institutional success (Smith, & Doe, 2023).

Mentorship in Public Universities

Mentorship and teaching effectiveness are pivotal to the success and improvement of public universities, impacting both faculty and student outcomes. Mentorship in academic settings involves the support and guidance provided by faculty or staff to students or junior staff members. This relationship can lead to academic success, professional growth, and personal development. Mentorship helps mentees navigate challenges, develop skills, and build networks that are essential for career advancement.

a. Benefits of Effective Mentorship

- i. **Beneficial to Students:** Students gain a deeper understanding of their academic material and receive guidance on research, internships, and career opportunities. Mentorship can also enhance students' motivation and persistence in their studies (Crisp & Cruz, 2009).
- ii. **Beneficial to Faculty and Staff:** Serving as mentors can fulfill faculty's teaching roles beyond the classroom, foster a sense of contribution, and provide opportunities for personal and professional satisfaction (Eby et al., 2008).

b. Challenges in Mentorship:

Time constraints, large student-to-faculty ratios, lack of formal training in mentoring, and varying levels of commitment from both mentors and mentees can impede effective mentorship (Johnson, 2015).

c. Strategies for Improving Mentorship

Establish formal mentorship programs with clear objectives, training for mentors, and resources to facilitate regular interactions. Encourage peer mentorship and create platforms for sharing best practices (Allen et al., 2006).

Concept of Situational Staff Mentorship

The concepts of situational staff mentorship and teaching effectiveness, emphasizing how these practices can significantly enhance learning outcomes and professional development. Situational staff mentorship is an adaptive approach to professional development that focuses on tailoring mentorship styles and strategies to the unique needs and circumstances of the mentee (Johnson, & Ridley, 2023). This approach recognizes that a flexible, responsive style of mentorship is crucial for addressing the diverse challenges and opportunities faced by individuals within an organization.

Components of Situational Staff Mentorships

- i. **Personalization:** Mentors assess the individual strengths, weaknesses, and learning preferences of their mentees. This personalized approach helps in formulating a mentorship plan that is most effective for each individual.
- ii. **Context Sensitivity:** Situational mentorship involves understanding the specific professional and organizational contexts in which a mentee operates. This includes being aware of industry trends, organizational culture, and specific job requirements.
- iii. **Adaptability:** Effective mentors adjust their methods according to the evolving needs of the mentee. This might involve applying different mentoring styles such as coaching, counseling, or providing constructive feedback.
- iv. **Goal Alignment:** Mentors and mentees collaborate to set and achieve specific, measurable, attainable, relevant, and time-bound (SMART) goals. This ensures mentorship efforts are focused and outcomes-driven.
- v. **Feedback Mechanism:** Continuous feedback is a critical component. Constructive feedback helps mentees understand their progress and areas for improvement, fostering a growth mindset.

Teaching Effectiveness

Teaching effectiveness is the ability of an educator to facilitate learning and foster intellectual growth and development in students. It involves employing various strategies to enhance cognitive, emotional, and social learning experiences (Johnson, & Ridley, 2023).

Components to Teaching Effectiveness

- i. **Instructional Design:** Effective teachers use well-structured lesson plans that incorporate diverse instructional strategies catering to various learning styles. Techniques such as active learning, collaborative projects, and problem-based learning are often incorporated.
- ii. **Engagement:** Successful educators employ methods to keep students engaged. This can involve interactive activities, discussions, and the use of technology to make learning more accessible and interesting.
- iii. **Assessment and Feedback:** Regular assessments, both formative and summative, help in measuring student learning outcomes. Timely feedback helps students understand their progress and areas needing improvement.
- iv. **Adaptability:** Just as in mentorship, effective teachers are flexible in adjusting their strategies to meet diverse students' needs and changing classroom dynamics.
- v. **Reflective Practice:** Educators reflect on their teaching methods and student outcomes to continuously improve their teaching effectiveness. This practice involves gathering student feedback and being open to change and innovation.

Concept of Traditional Staff Mentorship in Public Universities

Traditional staff mentorship involves experienced faculty or staff members providing guidance and support to less experienced colleagues or students. This relationship is typically structured yet flexible, and it's aimed at facilitating professional development, knowledge transfer, and career advancement.

Benefits of Traditional Mentorship

- i. **Mentees Benefit:** They benefit from personalized advice, skill development, and network building, which can lead to increased confidence, academic achievement, and career progression (Anderson & Thompson, 2023).
- ii. **Mentors Benefit:** Mentors gain satisfaction from helping others, honing their leadership skills, and staying connected with new developments and fresh perspectives (Murphy & Zhang, 2023)

Challenges in Traditional Mentorship

Issues such as mismatched expectations, lack of time, and insufficient institutional support can hinder effective mentorship. Furthermore, traditional mentorship can sometimes perpetuate existing academic hierarchies and biases (Crisp & Cruz, 2021).

Improving Traditional Mentorship

- i. Formal Programs: Establish clear goals, mentor training sessions, and guidelines to promote effective mentoring relationships. Pair mentors and mentees based on interests, needs, and goals (Allen et al., 2006).
- ii. Feedback and Evaluation: Regularly solicit feedback from both mentors and mentees to assess the effectiveness of current mentorship practices and make necessary adjustments.

Statement of the Problem

In recent years, the rapid advancement of technology has significantly transformed various sectors globally, including education. Public universities in Rivers State, Nigeria, face a multitude of challenges that affect the quality of education and staff development, with mentoring and teaching effectiveness at the forefront. Traditional methods of staff mentoring and teaching have proven insufficient in catering to the diverse needs of educators and students in today's fast-evolving academic environment. This has resulted in gaps in skill development, inadequate performance feedback mechanisms, and stagnation in instructional methodologies.

There is a growing imperative to leverage innovative solutions such as Artificial Intelligence (AI) to enhance these educational facets. AI offers promising tools that can revolutionize mentoring by providing personalized coaching, continuous feedback, and customized professional development paths for academic staff. Similarly, AI in teaching can lead to more effective instructional strategies through adaptive learning technologies that cater to individual student needs, thus improving learning outcomes and engagement.

However, the extent to which AI has been integrated into mentoring and teaching practices within public universities in Rivers State remains unclear. Furthermore, there is limited empirical evidence on the impact of AI utilization on staff performance and teaching effectiveness in this region. These gaps indicate a critical need for comprehensive research to explore the potential and challenges of using AI tools in these academic settings. This study seeks to address the following critical questions: How can Artificial Intelligence be effectively utilized to enhance staff mentoring and teaching effectiveness in public universities in Rivers State? What are the perceived benefits and potential challenges faced by these institutions in integrating AI solutions into their educational and administrative frameworks? By exploring these questions, the research aims to provide actionable insights that can contribute to policy formulation, strategic implementation, and the overall enhancement of educational quality in the region.

Purpose of the Study

The purpose of the study is to examine Utilization of Artificial Intelligence in Staff Mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria. The specific objectives of this study are to:

1. Determine the relationship between Utilization of AI in situation staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria.
2. Examine the relationship between Utilization of AI in traditional staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria.

Research Questions

The following research questions guided the study:

1. What is the relationship between Utilization of AI in situation staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria?
2. What is the relationship between Utilization of AI in traditional staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria?

Hypotheses

The following hypotheses were tested at 0.05 level of significance;

1. There is no significant relationship between Utilization of AI in situation staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria.
2. There is no significant relationship between Utilization of AI in traditional staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria.

Methodology

The study adopted a correlation research design. The area of the study was public Universities in Rivers State. The population of the study consisted of 1,186 senior lecturers in three universities in Rivers State, which consists of Rivers State University, University of Port Harcourt and Ignatius Ajuru University. Sample size of 302 senior lecturers from the three Universities were drawn from the population using simple random sampling technique. Two structured instruments titled “ Utilization of Artificial Intelligence in Staff Mentoring (UAISM)” and “Teaching Effectiveness in Public Universities (TEPU) were used to elicit data from the respondents. Responses to the questionnaire items were structured on a four- point summated rating scale of: Strongly Agreed (SA) – 4points, agreed (A) – 3points, disagreed (D) – 2points and Strongly Disagree (SD). The instrument was validated by experts in educational

research. The reliability of the instrument gave a Cronbach Alpha index of 0.77 and 0.73 which was considered reliable. The data collected were analyzed using mean and standard deviation in answering the research questions while the null hypotheses formulated were tested using Pearson product moment correlation Analysis. For research question 1 and 2 , mean value less than 2.50 was considered as “ Disagree (D) while items with mean value equal to 2.50 and above was considered as “ Agree (A) “.

Result

Research Question 1: What is the relationship between Utilization of AI in situation staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria?

Table 1: Mean Ratings of the relationship between Utilization of AI in situation staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria

S/N	Questionnaire on Utilization of AI in Situation Staff Mentoring	Male Lecturers (N ₁ = 202)			Female Lecturers (N ₂ = 100)			
		Mean	Std. Deviation	Decision	Mean	Std. Deviation	Average Mean	Decision
1.	AI can be integrated into work platforms and tools, allowing employees to access relevant guidance and resources on demand.	4.42	1.29	Strongly Agreed	4.35	1.32	4.39	Strongly Agreed
2.	AI can analyse data about the employee's current task, past performance, and organizational policies to offer tailored advice and recommendations.	3.67	1.46	Agreed	4.20	1.37	3.94	Agreed
3.	Help in Adaptive Learning. As the AI gathers more data, it becomes even more adept at providing relevant and helpful support.	4.25	1.34	Agreed	3.63	1.76	3.94	Agreed
4.	AI can analyse data to identify potential issues and proactively suggest solutions or preventative measures.	4.17	1.24	Agreed	4.39	1.23	4.28	Strongly Agreed

5.	Helps to reduced Fear of Failure.	3.83	1.39	Agreed	4.28	1.22	4.06	Agreed
Grand Scores of male and female Lecturers.		4.10	1.34		4.17	1.38	4.12	

Source: Field Data, 2024

Table 1 revealed that the respondent Agreed that Utilization of AI in situation staff mentoring relates to Teaching Effectiveness in Public Universities in Rivers State, Nigeria with grand mean of 4.10 and 4.17 respectively. The first item have a mean score of 4.42 and 4.35, second item have a mean score of 3.67 and 4.20 respectively, third item have a mean score of 4.25 and 3.63 respectively, fourth have mean score 4.17 and 4.39 respectively, fifth item have mean score of 3.83 and 4.28 respectively with an average of 4.12. This implies that Utilization of AI in situation staff mentoring relates to Teaching Effectiveness in Public Universities in Rivers State, Nigeria.

Research Question 2: What is the relationship between Utilization of AI in traditional staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria?

Table 2: Mean Ratings on the relationship between Utilization of AI in traditional staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria

S/N	Questionnaire on Utilization of AI In traditional Staff Mentoring	Male Lecturers (N ₁ = 202)			Female Lecturers (N ₂ = 100)			
		Mean	Std. Deviation	Decision	Mean	Std. Deviation	Average Mean	Decision
6.	Helps in Personalized Learning Plans.	4.25	1.20	Agreed	4.15	1.23	4.20	Agreed
7.	AI can also automate assessment processes, providing mentors with objective insights into mentees' progress.	4.25	1.15	Agreed	4.24	1.31	4.25	Agreed

8.	AI can match mentees with mentors who possess the specific skills and experience needed for their development.	3.75	1.75	Agreed	3.73	1.54	3.74	Agreed
9.	Helps streamlines the learning process and ensures mentees have access to the most relevant and effective materials.	4.33	1.22	A greed	4.19	1.09	4.26	Agreed
10.	AI can be used to gamify the learning process, making it more engaging and motivating for staff members.	3.67	1.89	Agreed	4.22	1.10	3.95	Agreed
Grand Scores of male and female Lecturers.		4.05	1.44		4.10	1.30	4.08	

Source: Field Data, 2024

Table 2 revealed that the respondent Agreed that Utilization of AI in traditional staff mentoring relates to Teaching Effectiveness in Public Universities in Rivers State, Nigeria with grand mean of 4.05 and 4.10 respectively. The first item has a mean score of 4.25 and 4.15, the second item has a mean score of 4.25 and 4.24 respectively, the third item have a mean score of 3.75 and 3.73 respectively, fourth item have mean score 4.33 and 4.19 respectively, fifth item have mean score of 3.67 and 4.22 respectively with an average mean of 4.08. This implies that Utilization of AI in traditional staff mentoring relates to Teaching Effectiveness in Public Universities in Rivers State, Nigeria.

Test of Hypotheses

- There is no significant relationship between Utilization of AI in situation staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria.

Table 3: Relationship between Utilization of AI in situation staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria.

Variables	N	$\sum X^2$	$\sum Y^2$	Df	SD	Sig	r-cal	r-crit	Decisions
AI in Situation Staff Mentoring & Teaching Effectiveness	302	2,458	1,119	300	2.71	0.05	2.120	1.645	Rejected

Source: Field Data, 2024

Table 3 indicated the computed r- value (2.120) is greater than the critical r value (1.645) for a tailed test at 0.05 level of significance. There is every reason to reject the null hypothesis and accept the alternate hypothesis that, there is a significant relationship between Utilization of AI in situation staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria.

2. There is no significant relationship between Utilization of AI in traditional staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria.

Table 4: Relationship between Utilization of AI in traditional staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria.

Variables	N	$\sum X^2$	$\sum Y^2$	Df	SD	Sig	r-cal	r-crit	Decisions
AI in Traditional Staff Mentoring	302	4,312	6,401	300	4.01	0.05	2.329	1.645	Rejected
&									
Teaching Effectiveness									

Source: Field Data, 2024

Table 4 indicated the computed r -value (2.329) is greater than the critical r value (1.645) for a tailed test at 0.05 level of significance. There is every reason to reject the null hypothesis and conclude that, there is a significant relationship between Utilization of AI in traditional staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria.

Discussion of Findings

Based on the analysis of the data it was found that there is a significant relationship between Utilization of AI in situation staff mentoring and Teaching Effectiveness in Public Universities.

Table 1 revealed that the respondent Agreed that Utilization of AI in situation staff mentoring relates to Teaching Effectiveness in Public Universities in Rivers State, Nigeria with grand mean of 4.07 and 4.17 respectively. Table 3 indicated the computed r- value (2.120) is greater than the critical r value (1.645) for a tailed test at 0.05 level of significance. There is every reason to reject the null hypothesis and accept the alternate hypothesis that, there is a significant relationship between Utilization of AI in situation staff mentoring relates to Teaching

Effectiveness in Public Universities in Rivers State, Nigeria. This finding was in line with Eze, & Chukwuma, (2024) found that situation staff mentoring predicts Teaching Effectiveness in Public.

Table 2 revealed that the respondent Agreed that Utilization of AI in traditional staff mentoring relates to Teaching Effectiveness in Public Universities in Rivers State, Nigeria, with grand mean of 4.05 and 4.11 respectively. Table 4 indicated the computed r -value (2.329) is greater than the critical r value (1.645) for a tailed test at 0.05 level of significance. There is every reason to reject the null hypothesis and conclude that, there is a significant relationship between Utilization of AI in traditional staff mentoring and Teaching Effectiveness in Public Universities in Rivers State, Nigeria. This finding was in line with Abiodun, & Johnson, (2023) who found that Utilization of AI in traditional staff mentoring predicted greater Teaching Effectiveness over time. AI Helps streamlines the learning process and ensures mentees have access to the most relevant and effective materials

Conclusion

The utilization of AI in staff mentoring and teaching effectiveness in public universities in Rivers State possesses significant potential to revolutionize educational practices. By strategically leveraging AI technologies, these institutions can not only improve educational outcomes but also position themselves as leaders in innovative educational practices within the region and beyond. This exploration into AI's role in higher education highlights several key insights. First, AI technologies have the potential to bridge gaps in traditional teaching and mentoring approaches by providing customized, data-driven solutions that accommodate diverse learning and teaching styles. By harnessing AI, universities can offer more targeted professional development opportunities for staff, increasing instructional proficiency and overall educational quality. Furthermore, while AI can significantly enhance educational processes, it is imperative to maintain a balance between technology and human interaction. The mentorship process, in particular, thrives on personal connections and the human touch, elements that must be preserved even as AI tools are deployed to augment these interactions. Continued research and investment in AI-driven educational strategies will be vital in ensuring that public universities in Rivers State meet the evolving demands of the modern educational landscape, ultimately contributing to enhanced learning experiences and outcomes for both staff and students.

Recommendations

Based on the findings of the study, the following recommendations are made;

1. Heads of Departments and Deans of faculties in the various Universities should encourage the Utilization of AI in collaboration and synergy among lecturers for improved teaching effectiveness.
2. The findings of this study are expected to guide stakeholders, including university administrators, policymakers, and educators, in making informed decisions about adopting AI technologies.
3. Ultimately, the research endeavors to promote a sustainable and dynamic educational environment that prepares staff and students in Rivers State for the demands of the 21st century.

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Quality Assurance and Triple Helix Partnership: Tools for Enhancing University Education for Sustainable Development

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Abstract

The Triple Helix partnership offers significant benefits for sustainable development in higher education. It encourages innovation through collaboration, provides diverse funding sources, and ensures that educational programs align with real-world demands and sustainability goals. This paper discussed the quality assurance and triple helix partnership, tools for enhancing university education for sustainable development. Sustainable development is the development that meets the demands of today and the future. The paper enumerated the challenges of quality assurance and triple helix partnership in enhancing sustainable development including potential conflicts of interest, varying priorities among partners, and difficulties in maintaining long-term cooperation. To address these challenges the paper suggested establishing clear communication channels, setting mutually agreed-upon goals, and creating adaptive frameworks that can evolve with changing circumstances. Regular assessments and feedback mechanisms are also crucial for ensuring ongoing alignment and improvement. The implication is that implementing the Triple Helix Model can lead to a more dynamic, responsive, and impactful educational system that is better equipped to address global sustainability challenges.

Keywords: Quality assurance, Triple helix partnership, University education, Sustainable development, Tools

Introduction

Quality is phenomenal in determining the worthiness of products or services but attracts different perceptions to different people. It determines the relevance and goodness of products or services concerning money and time vested in them. Interestingly, quality varies depending on individuals' perceptions and what it tends to achieve. Since quality means different things to different people it becomes difficult to have a uniform definition. Wordu (2022) states that quality seems elusive because it is expressed in relative terms and is based on noticeable features that individuals use to differentiate a product or service. Quality assurance is the process of monitoring and ensuring that the standard of products is achieved. In the

educational system, it is a process to ensure that input, process and output adhere to the stipulated standards in attaining educational goals.

It is expedient to observe that; quality assurance has been on the front burner among educationists and practitioners due to globalization and the upturn of digital technology. The world is now a global village and what affects one nation has a resultant effect on other nations. Unfortunately, it seems that higher education in Nigeria is not meeting the desired expectations. There is the paucity of funds, infrastructure deficit, non-digitalization and other sundry problems that have hindered the attainment of educational goals. Higher education whose primary function is installing capability, skills and experience on individuals to live a productive life and contribute positively to the development of society. Is reneging on the core function of refining and rigging individuals for a world of work. The graduates of tertiary education are roaming the street in search of white-collar jobs and the entrepreneurs are agitated that many are unemployable, academia complaining and the government is testy that the investment in education is not yielding the desired result.

The triple helix partners are agitated that there is a need to overhaul the educational system, especially higher education whose mandate is to build the manpower needs of society. The triple helix partnership consists of the government, industry and university. Ranga and Etzkowitz (2013), opined, that in a knowledge society, there is a need for synergy between the university, industry and government to create new institutions and social structures for producing, sharing, and applying knowledge. University as the hub of research needs to collaborate with the industry through community engagement, advocacy, outreach and leadership in instilling the basic capability that will help graduates in the trajectory of life and the world of work. The government is saddled with the responsibility of providing an enabling environment for academics and industry to subsist. Unfortunately, this collaboration where it existed has not yielded the desired result. There is a high rate of poverty, unemployment, gender disparity, infrastructure decay, poverty and hunger. The excruciating problems are caused by poor leadership and corruption that have ravaged every facet of Nigeria's economy making life unbearable to the citizens. This unwholesome act, in no small measure, has hindered growth and sustainable development.

This has prompted various questions that are begging for answers. Despite the proliferation of higher education why are there increases in unemployment, poverty and hunger? Is there any gap between what is taught in school and industry? Is the government not living up to their

responsibility? It is in view to provide plausible solutions to these questions that the study discusses quality assurance and the triple helix partnership, tools for enhancing higher education for sustainable development. To achieve this the paper is structured after the introduction, concepts clarification related to the topic, enhancing university education through quality assurance and triple helix partnership, the mix, sustainable development and triple helix partners, challenges of quality assurance and triple helix partners in the attainment of sustainable development, conclusion and suggestions.

Concept of Quality Assurance

Quality is a concept that has attracted various definitions based on individual perception and the worthiness of the product or service to the individual. It behooves the author to put in perspective the meaning of quality as used in this work. Quality means anything that worth its value, has standards, and has zero defects. Ezugoh, Agu, and Egwu (2022) conceptualized quality as having exceptional standards, being purposeful, fulfilling its intended aims, providing value for money, and demonstrating consistency and transformative change. Quality assurance in the educational system is the process of ensuring that educational input, process and outcome are monitored to ensure that, standard is maintained and educational resources are effectively and efficiently utilized in the attainment of educational goals. So, quality assurance measures input in educational organizations to achieve the expected outcome. (Ekott and Jimmy, 2022). Quality assurance in education is interested in ensuring that the right quality of students are admitted, the necessary infrastructures are provided and the learning outcome achieved which will meet the needs of end users. Quality assurance encompasses a series of activities involving inputs, processes, and outputs. These activities are aimed at ensuring proper control, organization, and coordination to meet expected quality standards and achieve goals (Owam and Agunwa, 2019).

The history of quality assurance in education from inception was the responsibility of the minister of education saddled with the onus task to maintain standards, and quality in the country in line with the National Minimum Standard on Education and establishing Institution Act 16 of 1985 in conjunction with the 1999 constitutions of the Federal Republic of Nigeria (Anene, 2021: Opuyemi, 2022). To ensure a uniform standard the responsibility was bestowed on the Federal Inspectorate Service Department. It becomes necessary to state that decree No. 16 of 1985 was used to empower the Federal Ministry of Education through the National Universities Commission for accreditations of universities in Nigeria.

It is imperative to state that, the National Universities Commission is one of the pillars used to ensure standards are maintained in all universities in Nigeria. The commission was established in 1974 as an advisory agency in the cabinet office. It has grown in limits and bounds to become an influential office saddled with the responsibility to ensure quality in university education as well as carry out accreditations of programs in public and private universities in Nigeria (Wordu and Nwanguma, 2023). Other ways through which NUC ensure quality assurance in the universities are through institutions and programs accreditations, establishment of quality assurance units in various universities, imposition of sanction to universities that failed to maintain quality, constant review of the curriculum to meet international best practices, provision of quality assurance guideline and the training and organization of workshop and staff development among others.

It is enlightening to state that, there are other internal mechanisms through which quality is maintained in universities. Internal Quality Assurance Unit IQA, is a critical unit of the university's commitment to excellence and continuous improvement to ensure that, the highest standards are maintained. It involves all processes and procedures through which the university ensures that quality is maintained in the university by the university authority. In compliance with the NUC, Rivers State University established a quality assurance directorate in September 2018. It is saddled with the responsibility among others, developing a university quality assurance policy assessment framework, coordinating students' evaluation of staff teaching effectiveness and programmes, encouraging self-assessment of teaching staff, ensuring the adequacy, maintenance and proper allocation of support structure and service coordinating internal assessment of programmes and program delivery.

It is instructive to note that, the essence of quality assurance in universities is to ensure that, institutions of higher learning meet certain standards of excellence in their academic programs, research, and operations. Through prioritizing quality assurance, university graduates can be adequately prepared, not only for the demands of life but also for engaging in research and innovation that greatly contribute to societal development.

Triple Helix Partnership (3HP)

The Triple Helix Model of innovation refers to the collaboration among the academia, industry and government. Its primary purpose is for robust interaction among the trio to foster economic and social development in a knowledge economy and society (Leydesdorff, 2012). The theory was originally proposed by Etzkowitz and Leydesdorff in 1998. The model describes the

interactions and relationship between academia, industry and government in fostering innovation within a knowledge-based economy (Etzkowitz and Leydesdorff 2000). In the same vein, the Triple Helix Partnership is a collaboration among the university, industry and government for sustainable development. In a knowledge-based society, it becomes imperative that academia, industry and government synergize to ensure that graduates are instilled with the skills and knowledge that enhance them in the world of work and personal development.

In the past, universities, industry and government were traditionally segmented and each operated independently. Universities were primarily focused on knowledge generation and research while industries concentrated on applied research and commercialization of research products. The government provided an enabling environment for businesses to thrive through policy formulation and implementation. With the emergence of a knowledge-driven society, there is a need for interconnectivity among the Triple Helix Partners in knowledge production, technology progress, and economic development as essential for economic relevance and global competitiveness. The Triple Helix Model emphasizes integrated and dynamic interaction among the three sectors. According to Cai and Etzkowitz (2020), the Triple Helix Model emerged in the early 1980s due to the entrepreneurial university paradigm, where academic institutions actively promote regional development through knowledge-based activities. Universities have experienced a substantial transformation, fundamentally reshaping the core functions of education and research. The contemporary imperative has driven this paradigm shift for universities to reposition themselves as entrepreneurial universities (Fernandez, Fernandez, Ray and Bobillo 2019). This new order in universities, including the transfer of knowledge, has gained great relevance in recent years because it is considered a key element that impacts economic development (Martinez-Ardila, Castro-Rodriguez, and Camacho-Pico 2023). These authors believed that entrepreneurial spin-offs represent a primary force in directly commercializing university intellectual property. These also serve as catalysts for local and national economic expansion and potentially yield significantly greater financial returns for universities when compared to patent licensing.

This marked the beginning of a paradigm shift where universities transitioned from being entities focused on knowledge generation to becoming entrepreneurial institutions actively engaged in economic development. This underscores the importance of triple helix partners, and collaborations of universities, industry and government. Universities started participating in technology transfer, patenting, and the establishment of spin-off companies, aligning more

closely with industry requirements and market needs. Industries progressed from being passive recipients of academic knowledge to active contributors in the innovation sphere. Companies increasingly sought partnerships with universities to gain access to cutting-edge research and a pool of skilled graduates. These collaborations enabled companies to jointly develop technologies and innovative solutions, enhancing their competitiveness in global markets. The government played a pivotal role in promoting this partnership by formulating policies and frameworks that encouraged cooperation. Initiatives like funding schemes, tax benefits, and the creation of innovation hubs and research groups facilitated closer connections between academia and industry. These policies aimed to establish an environment conducive to innovation and the swift commercialization of research outcomes.

It is pertinent to note with the upturn of digital technology and globalization of knowledge, there is a need to rethink the existing relationships in the traditional triad which led to the Quintuple Helix Model QHIM. The new social and economic concerns have led to the expansion of the nonlinear model of innovation to QHIM which includes society and the environment. The Quintuple Helix Model was proposed by Elis G. Garayannis and David J. Campbell in 2010 recognizing the importance of the fifth helix in fostering sustainable development and innovation (Mineiro et al, 2021). They highlighted the importance of universities, industry, government as well as civil society for innovation and sustainable development.

Enhancing University Education through Quality Assurance and Triple Helix Partnership

In the rapidly growing digitalization of educational institutions and globalization of the economy, the collaborations of the university, industry and government are seen as critical players in fostering innovation, economic development and social well-being. Quality assurance mechanisms ensure that the educational standards meet the evolving needs of society and industry. By integrating quality assurance processes with triple helix partners, universities can design and implement curricula aligned with sustainable development goals, thus preparing graduates to address global challenges. It becomes instructive to state some of the various ways of enhancing university education through quality assurance and triple helix partners such as:

1. Curriculum Design and Sustainable Development.

Curriculum design is crucial for integrating sustainable development into higher education. Universities should adopt interdisciplinary approaches that emphasize the interconnectedness

of social, economic, and environmental issues. Sustainable curriculum design integrates sustainability principles into courses, fostering critical thinking and prompting real-world problem-solving. Maraques, Farronan, Espinoza, Farronan, Anajera and Armenteros (2024) opined that integrating sustainable development goals (SDGs) into education can improve students' understanding of sustainability and equip them with the skills to address global challenges. This makes education more relevant and prepares students to become agents of change in their communities. According to Tommasclla, Akor, Lawson, Howarth and Bedford (2024), integrating SDGs into education fosters collaboration with business communities and promotes the real-world application of sustainable practices. The importance of integrating curriculum design and sustainable development cannot be overstated. From a societal perspective, the integration can result in a more knowledgeable workforce that prioritizes sustainable development in their professional practices, ultimately contributing to significant societal goals such as poverty reduction and environmental protection (Kharo and Steward, 2024).

It is imperative to note that the quality assurance framework ensures that sustainability is consistently integrated across disciplines, fostering an institutional culture that prioritizes sustainability. The integration of sustainability principles into the educational system, this alignment can lead to improved operational efficiency and stakeholders' satisfaction (Khaireddine, Lacombo and Jar-Boui 2023). In the same context, it is argued that integration of sustainable practice and quality assurance not only enhances the quality product, fostering a sustainable orientation but also contributes to long-term development goals that benefit all stakeholders (Yasir and Mamdouh 2023; De-Menezes, Escri-Tena and Bou-Liusar 2022),

The implementation of a robust quality assurance framework ensures the consistent integration of sustainability across various disciplines, thus fostering an institutional culture that places a high priority on sustainability. Furthermore, it promotes the ongoing review and adaptation of the curriculum in response to emerging global trends and challenges.

2. Teaching and Learning Methods for Sustainable Development

Effective teaching and learning methods are essential for imparting knowledge and skills related to sustainable development. Universities should adopt innovative pedagogical approaches, including project-based learning, experiential learning, and digital tools, to engage students in active learning. These methods enable students to apply theoretical knowledge to

practical situations, thereby deepening their understanding of sustainability issues. Song and Koeun (2024) assert that integrating sustainability concepts into educational curricula enhances students' comprehension and dedication towards environmental issues. The authors further advocated for the adoption of teaching methodologies that encompass meaningful interactions, utilization of eco-friendly materials, and engaging activities, alongside the involvement of families and communities, as a means to foster sustainable development within environmental education.

Scholars posit that integrating digital technologies alongside effective teaching strategies bolsters educator efficacy, elevates teaching quality, infuses curricula with Sustainable Development Goals (SDGs), and promotes innovative pedagogical approaches, ultimately equipping educators to contribute to sustainable development. (Maja, Krabonja, Kustec, Skrbinjek, Abersek, and Andrej 2024; Zuliyati, et al, 2024). The integration of digital tools in education provides increased flexibility and accessibility, enabling a larger number of students to participate in sustainability-focused programs. Some of the most effective pedagogical strategies for promoting sustainable development among students include experiential, inquiry-based, problem-oriented, and project-centred learning methodologies. According to Singha and Singha (2024), these approaches foster the practical application of knowledge, encourage the exploration of concepts, engage students with real-world challenges, and promote leadership roles. In doing so, they empower students to advocate for sustainability and drive positive change.

3. Assessment and Evaluation in Sustainable Development

Evaluation tools need to be designed to assess how well sustainability is integrated throughout the curriculum. The adoption of assessment and evaluation strategies can maximize effectiveness by analyzing goals achievement factors, adapting to changing environment and identifying areas for improvement to achieve results (Khokhuliak (2023). This involves monitoring the alignment of course outcomes with sustainability goals and ensuring that teaching methods promote critical thinking and problem-solving skills related to sustainable development Kloup and Voulvoulis, (2019).

So, the combination of quality assurance and the Triple Helix partnership provides a strong framework for improving university education. By prioritizing curriculum design, teaching and learning methods, and assessment strategies that are in line with sustainable development, universities can help create a more sustainable and fair future. Ongoing collaboration between

academia, industry, and government is crucial to ensure that higher education stays relevant and adaptable to global challenges.

The Mix, Sustainable Development and Triple Helix Partners

The concept of development is globally acknowledged as an improvement in the standard of living. It is associated with better lives in every facet of human endeavour. The concept has garnered considerable attention recently, aiming to meet current needs while safeguarding future generations' ability to fulfil their requirements (Brundtland Commission 1987). Sustainable development is a framework aimed at sustaining finite resources necessary to provide for the needs of future generations by meeting current societal needs, addressing societal problems, and learning to live sustainably. (Igbo, 2016: Amadi, Chinelo and Dike 2021). Sustainable development encompasses life coping skills like literacy, communication and life learning skills that enhance sustainable development. Thus, governments globally put resources, fiscal policies and programmes that will enhance the quality of life, governance, economic growth and social inclusion. Nwankwo and Uzoezie (2016), posit that, sustainable development encompasses inter-generational equality, gender parity, and establishment of just and peaceful societies, social inclusivity, environmental preservation and restoration, poverty alleviation, and the conservation of natural resources. Thus, the core of sustainable development lies in the integration of economic expansion, ecological preservation, and societal inclusivity.

The concept involves striving for a harmonious balance between economic pursuits, environmental preservation, and the overall well-being of the community. It emphasizes the idea that the advancement of one should never come at the expense of the others. The Sustainable Development Goals represent a blueprint for transforming our world through 17 key areas. They encompass a wide range of societal aspects, with a focus on the quality of basic education as a fundamental driver for sustainable development. Improving the quality of education is seen as a catalyst for increased productivity, higher living standards, and the overall development of a healthier nation. It becomes imperative to state that higher education institutions play a crucial role in promoting sustainable development through teaching, research, and community services. The Triple Helix model, which emphasizes collaboration among academic institutions, businesses, and governmental bodies, has emerged as a vital framework for advancing the objectives of Sustainable Development Goals (SDGs). These goals necessitate the collaborative efforts of multiple sectors, encompassing academia, industry,

and government. Each sector assumes a distinct yet interconnected role in propelling sustainable development.

The Academia

University education epitomizes the culminating stage of academic pursuit within an individual's educational trajectory. It offers the necessary infrastructure and framework to achieve educational goals. Serving as a repository of knowledge, it is responsible for nurturing, developing, and enhancing individuals for the betterment of both individuals and society as a whole. (Wordu and Wodi 2024; Emeka, 2018). The university as the research hub is not only saddled with the responsibility of conducting research and development in sustainable technology but also providing education and training on sustainable development. This is consistent with UNESCO, a prominent agency for sustainable development, which assists countries in creating and expanding educational activities that concentrate on sustainability issues such as climate change, biodiversity, disaster risk reduction, water, and sustainable lifestyles (UNESCO, 2024).

Also, it is within the purview of the university to create knowledge and disseminate for sustainable development and inculcate sustainable mindset and practices. University through research, collaborates with other research institutions to provide useful data and advice that develop frameworks and tools that harness the complexity of sustainable development agenda (Lahi, 2019). Therefore, there is no gain in saying that the university is crucial in generating knowledge and the know-how that underpins sustainable development. Through community engagement, leadership and advocacy, universities can provide knowledge clusters, and research hubs in the community that will drive innovations and sustainable practices. Additionally, academia strives to increase awareness and provide education, preparing the next generation to advocate for sustainable mindsets and practices.

Industry

Industry plays a crucial role in the advancement of sustainable development, being a significant contributor to environmental challenges while also serving as key actors in the implementation of solutions. Industries can serve as a driving force for sustainable development by integrating environmental, social, and economic considerations into their practices. According to Karimov and Dadashova (2023), this can be achieved through innovative practices potential, utilizing balanced scorecard indicators, and fostering scientific and industrial interaction to ensure sustainable enterprise practices. Interestingly, industries used to be the prime mover of

economic development when it was industrial society. However, with the advent of knowledge society, it became imperative for effective collaboration of the triple helix. It is important to note that, the triple helix model is anchored on collaboration among the three for sustainable development. It is enlightening to observe that, industries are adopting sustainable approaches, including the reduction of emissions, waste management, and efficient resource utilization. Universities generate the knowledge while the commercialization of the knowledge becomes the responsibility of industries. Consequently, industries can help in sustainable development in the following ways,

- i. Collaborating with universities and the government to develop new technologies and address sustainable challenges, developing innovative solutions, and ensuring that practices align with regulatory standards and international best practices.;
- ii. develop sustainable technology and adopt sustainable practices;
- iii. create employment opportunities that will enhance economic growth and development;
- iv. building employee capacity through training and investing in sustainable technology and practices that enhance both the environment and financial performance.
- v. investment in sustainable technologies and practices through the reduction of waste and emissions to minimize environmental impacts.

Government

The government is one of the triple helixes that plays a crucial role in the development of educational institutions and industries by providing a framework and enabling environment for businesses to thrive. Government achieve this through policy-making, funding and setting standards and criteria that industries must adhere to ensure environmental protection and resource conservation. Governments can promote sustainable development by implementing appropriate laws and regulations, allocating necessary resources, developing strategies at all levels, establishing frameworks for public participation in urban planning, and initiating education and awareness campaigns (Sarabdeen, 2024). It is also within the purview of the government to provide funds for sustainable projects and research, encouraging industries to adopt green technologies and practices. Also, they engage in international cooperation to address global sustainability challenges and ensure that national policies align with global sustainability development goals.

In sum, the triple helix is a path for sustainable development and can be achieved through a collaborative journey that requires the active participation of academia, industry and government. Each of the helixes plays a crucial role but must be in collaboration. The academia drives innovations and educates future leaders, industries implement sustainable practices and technology, and the government provides the framework and the funding for research, innovation and technology that encourage sustainable development. These sectors play a significant role in the attainment of sustainable development but of importance also the quintuple helix partners which consist of academia, industry, government, civil society and the environment. This underscores the importance of collaboration and synergy among the helixes. The civic societies through advocacy will address the complex challenges, promote innovations and achieve sustainable development. In all, these helixes will recognize the sustainability of and the need to consider ecological impacts in innovation and development.

Challenges of Quality Assurance and Triple Helix Partners in the Attainment of Sustainable Development.

The Triple Helix Partners has widely gained traction as a framework for fostering innovation and sustainable development. Despite the potential for development in Nigeria, there have been numerous challenges that hinder effective collaboration and contribution to sustainable development. One of the fundamental challenges of the triple helix partnership is differing priorities among the partners. Academia is primarily concerned with knowledge creation, dissemination, and academic pursuit. The industry is driven by profit maximization and seeks innovations for commercial purposes. The government is concerned with policy formulation, and implementation to foster economic growth and the welfare of the people. The industries in these countries are too weak, and the governments are too bureaucratic to play the roles envisaged by the triple helix partners. (Dzisah and Etzkowitz, 2008). These divergent priorities often lead to conflicts and difficulties in achieving a common goal of sustainable development.

It is enlightening to observe that higher educational institutions' core functions are teaching, learning and research. In the process, technology and innovations are established. Lecturers are interested in protecting their academic property and this may vary with the industrial sectors whose driving force is to make profits. The apprehension regarding the potential loss of academic freedom in research, combined with the differing priorities of firms and academic institutions, may hinder the exchange of knowledge and present challenges to collaborative projects. (Ranga and Etzkowitz, 2013). The absence of trust can lead to scepticism and

resistance to change, hindering the implementation of sustainable development. Also, certain behaviours and procedures may contradict certain university norms, procedures and reward systems which if not addressed will impede projects of sustainable development.

The intricacy of sustainable development necessitates a comprehensive, interdisciplinary approach as opposed to a narrow focus on single scientific disciplines in research. However, implementing such an approach in practice can be quite challenging. (Zinstag et al, 2011). The Triple Helix Partner faces challenges in aligning their activities with the principles of sustainable development. According to Wals and Corcoran (2012), the complexity, power dynamics, rhetoric, and uncertainty associated with sustainability issues contribute to the challenges in addressing unsustainability. Moreover, the partners may have varying interpretations of sustainable development, leading to confusion and inconsistency in their efforts. Another pitfall is the challenge of measuring and evaluating the impact of sustainable development. The complexity of sustainable development makes it difficult to develop effective indicators and assessment tools (Holmberg and Larsson, 2018). This will make it difficult for the partners to have a uniform perspective of what constitutes success in sustainable development, leading to difficulties in evaluating their collaborations.

Another challenge noteworthy is the lack of effective communication and trust among the Triple Helix Partners. Issues such as language barriers, cultural differences, and varying levels of expertise can create problems for effective collaboration. The absence of clear policies, regulations, and incentives can result in ambiguity and perplexity, consequently hindering the efficient execution of sustainable development (Bulkeley and Betsillok, 2003). It is important to note that, the Triple Helix Model has been widely accepted and used as a framework for driving innovation and development. However, one issue is the emergence of additional helices, such as the media and civil society, leading to the concept of the Quintuple Helix Model. This expansion aims to represent the growing knowledge economy. The Quintuple Helix Model is valuable for spreading responsible research and innovation practices (European Commission 2016).

Conclusion

Quality assurance in educational institutions is phenomenal in ascertaining the worthiness of educational outcomes to societal demands. It is a process of monitoring and evaluating the education inputs, processes and outcomes to ensure that they align, not only with industrial demands but also with international best practices. The Federal Government of Nigeria is

responsible for ensuring standards are maintained through its agency, the National Universities Commission NUC. The NUC ensures these through accreditations of universities, and monitoring and evaluation of academic programs among others. Interestingly, with the upturn of an information-knowledge-driven society, there is a need for collaboration of stakeholders to ensure sustainable development. This is the crux of this paper, ensuring that, quality assurance and triple helix partners enhance university education for sustainable development. With the rapidly growing digitalization of tertiary education and the globalization of the economy, triple helix partners recognize the importance of collaboration between academia, industry and government in discharging their respective functions. By integrating quality assurance processes with triple helix partners, universities can design and implement curricula aligned with sustainable development goals, thus preparing graduates to address global challenges. Also, by aligning educational practices with the principles of sustainability, universities can contribute to creating a more equitable, sustainable, and prosperous future. Despite the benefits of Triple Helix Partners, there are challenges which called for the expansion of the Triple Helix Partners to integrate civil society and the environment. The Quintuple Helix, the additions of civil society and environment, civil society through advocacy and social engagement ensures that all interests are protected. While in the drive for development, emphasis should be placed on how to safely guide the environment for generational usage.

Suggestions

The following suggestions are proffered to strengthen tertiary educational institutions and triple helix partners in attaining sustainable development.

1. The government should establish a framework of shared vision and goals, develop a collective understanding of sustainable development objectives and ensure that funding and resources support collaborative initiatives.
2. There should be regular stakeholder engagement, and joint strategic planning to develop common objectives and establish principles guiding collaborative work.
3. The triple helix partners should create a shared vision and understanding of sustainable development and develop a dispute resolution mechanism for resolving conflict among members.

4. The triple helix partners should encourage the training and retraining of partners on capacity-building programs on sustainable practices.
5. The triple helix partners should establish clear communication channels, set mutually agreed-upon goals, and create adaptive frameworks that can evolve with changing circumstances.
6. There should be regular assessments and feedback mechanisms which are essential components for ensuring continuous alignment and improvement within the triple helix framework.

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Managing Innovative Education in Public Secondary Schools for Sustainable Development in Rivers State

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Abstract

The study examined managing innovative education in public secondary schools for sustainable development in Rivers State. Three objectives with corresponding research questions and hypotheses guided the study. The design of the study was descriptive survey with the population of 6,153 principals and teachers in 320 public senior secondary schools in Rivers State, from which 615 representing (10%) of the population were selected as sample, using the proportionate stratified sample sampling technique. Respondents responded to a validated 18 item instrument of which was a questionnaire, titled: Managing Innovative Education in Public Secondary Schools for Sustainable Development Questionnaire (MIEPSSDQ) designed by the researcher after the modified 4-points Likert scale model, with a reliability index of 0.89, obtained using Cronbach alpha statistics. Mean and standard deviation were used in answering the research questions, while z-test was used in testing the hypotheses at 0.05 level of significance. The findings of the study revealed that sustainable development cannot be achieved except administrators play their role by ensuring that essential ingredients required for managing innovative education in public secondary schools properly implemented, even though there may be some factors hindering the managing of innovative education for sustainable development. Consequently, it was recommended among others that administrators in schools should work with outstretched arms with their subordinates to ensure that they play their roles very well to achieve proper management of innovative education for sustainable development. This is because collaboration and effective communication are important for innovations to take place in schools. Also, school administrators should be carefully selected and trained to ensure that the essential ingredients required for managing innovative education in public secondary schools are effectively implemented for attainment of sustainable development.

Keywords: Managing, Innovative Education and Sustainable Development

Introduction

Sustainable development is a clarion call from the United Nations (UN) for states to speed up their human and economic development and meet the needs of the people without compromising the earth. The earth has been severely damaged and brought to great ruins by the indiscriminate activities of man. Moreover, research has shown that humans are overusing productive land, the oceans are under threat because of pollution; humans are destroying nature, accelerating climate change, endangering biodiversity, and depleting natural resources as a result of the more highly industrialized livestock-based food systems. Natural occurring

resources such as sand, water, fossil fuel, trees, and soil have been overused and depleted at almost double the rate at which they can regenerate (McNeill, 2022). The United Nations (UN) report reminds the world that the present generation has the responsibility to bequeath to future generations a planet that is not irreversibly damaged by human activities (United Nations Report, 2019).

Environmental, economic, and social indicators show that the world's current method of progress is unsustainable and looming great danger if not checked. Sustainable development is seen by Dernbach and Cheever (2015) as a decision-making framework that responds to the deteriorating environmental conditions around the world and strives to ensure that development is just, balance and environmental protective and restorative with the slogan "humans are to live in harmony with nature rather than at its expense". Sustainable development according to the Brundtland Report in 1987 is defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. Similarly, Ahenkan and Osei-Kojo as cited in Okeke (2023) define it as a development path along which the maximization of human well-being for today's generation does not lead to the decline in the well-being of future generations. The point being made in both definitions is that the process of development in the world today needs to be enhanced, conserved, and managed so that the future generation has something to live on and the cycle of life continues without an abrupt halt.

The objectives of sustainable development is to create a vibrant economy that is sustainable and growing in the right direction; secondly to protect and enhance the natural environment by minimizing pollution and waste; thirdly, to give all quality education and ensuring equal social opportunity to all which aims at supporting and creating healthy global communities (UNESCO, 2017). Many scholars believed that the environmental dimension of sustainable development is the most important, and sustainability is often focused on countering major environmental problems such as climate change, loss of biodiversity, loss of ecosystem services, land degradation, and air and water pollution (Purvis, Mao & Robinson, 2019). To the Intergovernmental Science-policy Platform on Biodiversity and Ecosystem Services global report (IPBES) (2019), nature is declining globally at unprecedented rates, species extinction is accelerating, with grave impacts on people around the world. Without biodiversity, life would not sustain. This is because a healthy ecosystem provides man with oxygen and food.

The United Nations sustainable development report recommends the following actions in order to reduce human-caused damages to the earth and its ecosystem: countries should protect and restore the world's wetlands; reduce food waste; move away from reliance on natural resources, fight ocean acidification; reduce the falling of trees, fight species extinction and increase protections identified as key for global biodiversity (McNeil, 2022). For sustainable development to run a clean cause, innovative education has to be the priority of every country and properly managed. Education is a key to unlocking sustainable development, it is a veritable tool in inculcating values, skills, critical thinking and capabilities in the individual. It will help to accelerate the rate of sustainable development and impact the well-being of man. Hence, innovative education needs to be properly managed and reoriented to build a better future for all (Hargreaves, 2020).

Innovative education has to do with doing things differently and coming up with a process and product that yield an educational value. It also deals with seeking knowledge to support new and unique ideas in instructional techniques and strategies and remove outdated thinking that cannot support global changes. In educational innovation, methods and strategies of teaching and learning are challenged to support the success of teachers and students (Oluwuo, 2021). Innovative education involves a different way of looking at problems and solving them. The thinking processes that go into it will help students develop their creativity and their problem-solving skills. Innovative education is a change that is deliberate, purposeful and can be on a small or large scale; it is a departure from an existing practice that can be sustained for some time. When widely adopted, an innovation becomes a reform. Innovative education encourages teachers and students to explore, research and use all the tools to uncover something new (Jamguza, as cited in Aguba, 2021).

Innovative education is not merely technology (tangible innovation) but also the use of technology to empower students to become lifelong learners as well as achieve better educational outcomes (intangible technology). The students are compelled to use critical thinking and creativity to solve problems in education and real life. It equally means keeping oneself educated about new trends and technology in education. It makes education delivery effective, efficient and productive. Innovators look beyond the current method of doing work and develop novel ideas that help do a job in a new way to maximize educational outcomes. Through innovation, students' competencies are developed to enable them reflect on actions that may affect economic, social and environmental issues locally and internationally. Life

skills can be developed with managing of innovative education capable of addressing a number of sustainable development objectives (Oluwuo, 2021).

Managing innovative education is the process of introducing new things to develop the educational sector. It is equally a process of managing innovative ideas and a way of developing new ideas and refining them until they become real and dissemble. It is a way of managing the school organisation innovation procedure starting from the initial stage of ideation to its final stage of successful implementation, encompassing the decisions, activities and practice of devising and implementing an innovation strategy. Managing of innovative education drives a sustainable innovation process and helps in creating positive change and culture within a society. More so, it is the promotion of innovations in the school organisation, and this includes tasks of planning, organisation, management and controlling, dealing with all measures to promote and support innovation in a school to reap the maximum benefit (Oluwuo, 2021). Chukwu (2014) lists the following as some of the benefits of managing innovative education;

- enhances the child's capacity to learn
- ensures that handicapped children are better placed to participate in teaching and learning activities
- makes teaching and learning processes more interesting
- brings about improved teaching methodology
- enhances the achievement of stated school objectives
- improves societal wellbeing as it improves various sectors of the economy of nations.

One could therefore infer from the fore-going that innovative education is essentially needed for any educational system to be functional, efficient, and effective.

However, there are two forms of managing innovative education, according to Williams as cited in Oluwuo (2021), first is the creation of framework conditions so that ideas are generated everywhere in the school organization and turned into successful innovation. Second is the actual innovation, the active search development and implementation of ideas requiring creativity and project management, including set of tools that allow administrators, teachers and other school users to cooperate with a common understanding of processes or goals. The school organization is allowed to respond to external or internal opportunities by using its creativity to introduce new ideas, processes or products. Furthermore, managing innovative education involves the process where all the stakeholders in education are allowed by the administrators of schools to participate actively in curriculum planning and execution. Their

creativities are combined so that they form a synergy to enable education institutions derive the full benefit of their establishment. The administrator cannot do this alone.

Consequently, the managing of innovative education involves administrators developing the right attitude in students, parents, and local community without which innovation cannot thrive. Administrators, teachers, and students should not be afraid to try new things. They should allow their imaginations to flow and flourish un-hindered, keeping themselves educated about new trends and technology in education, and be creative with the use of resources. Students should be allowed to take risk and fail so as to learn. Also, the process has to do with the administrators of schools adopting technology, and not seeing it as a silver bullet since more technology does not mean better learning. Instead, Technology should be used to boost academic productivity. In managing innovative education, it is expected that administrators of schools should create successful environment that promotes internal cohesion and freedom of action as well as stimulation of ideas.

Positive school climate where cross-fertilization of ideas is rife remain key to the managing of innovative education because a school environment replete with rancor and leg pulling is not a fertile environment for innovation to be nurtured and developed. Collaboration and synergy are required. The stakeholders in education like the administrators, teachers, students, parents, government as well as the local community should be allowed to contribute their quota in the education of children. The environment should be congenial for them to contribute in the administration of schools. Technology integration in education can be successful only when human element is taken into consideration, no one should be left behind.

Unarguably, innovative education has direct bearing with the attainment of sustainable development. All the SDGs are driven by Goal 4 (education). For examples, eradication of poverty, hunger, healthy lives, gender equality, water and sanitation, modern energy, economic growth, industrialization, climate change, peaceful societies, global partnership etc are all dependent on the functionality and innovative nature of our educational system for their attainment. Experts in Economics of Education severally assert that there are incontrovertible empirical evidence which shows that there is relationship between education and national development (Brewer, 2020). Education is the surest gateway to national greatness and development. Even the Federal Republic of Nigeria (2014) postulates that education is regarded as the greatest instrument for national development and social change.

Japan cannot boast of natural resources but she takes pride in her functional and innovation-based education. Japanese education inculcates in the Youth the spirit of hard work. Today, Japan is one of the strangest economies in the world. Japan is on the right footing to achieving quite substantial number of the Sustainable Development Goals by 2030. This is made possible essentially due to their innovative education which is both qualitative and functional. Finland is another country with one of the best education systems in the world. Finnish education is quite innovative and pragmatic, it has direct relationship with their cultural, economic and political life. Finnish education system has great capacity to serve as premise for the realization of the SDGs in Finland by the year 2030. Other examples of countries with high impact innovative educational systems include Canada, Australia, South Korea, United States of America, United Kingdom, Germany etc. Martin Luther King in Aguba (2021) asserts that, “the prosperity of a country depends not on the abundance of its revenues, not on the beauty of its public buildings, but it consists in the number of its cultivated citizens, in its men of education, enlightenment and character. If Nigeria builds the road and airport without building the mind, the undeveloped mind will naturally destroy the road and the airport. No nation has ever and can ever rise above the quality of its educational system. A nation is the product of its educational system. Hence, the crux of this paper was to examine the topic ‘managing innovative education in public secondary schools for sustainable development in Rivers State.

Statement of the Problem

Managing innovative education for sustainable development remains a significant challenge for public secondary schools in Rivers state as observed many researchers, as many students lack access to relevant, effective, and inclusive learning experiences that prepare them for success. Despite the growing need for sustainable development, these public schools struggle to integrate innovative and effective approaches to teaching and learning that prepare students to address the complex environmental, social and economic challenges of the 21st century. Traditional teaching methods and curricula often fail to equip students with critical thinking, creativity, and collaboration skills necessary to drive sustainable development. Furthermore, limited access to resources, inadequate teacher training and insufficient community engagement hinder the adoption of innovative education approaches, resulting in significant gap between education and the needs of sustainable development. Therefore, there is a pressing need to develop and implement effective strategies for managing innovative education that fosters sustainable development and prepares students to thrive in a rapidly changing world.

Aim and Objectives of the Study

The aim of this study was to examine managing innovative education in public secondary schools for sustainable development in Rivers State. Specifically, the objectives of the study sought to:

1. Determine the role of educational administrators in managing innovative education for sustainable development in public secondary schools in Rivers State.
2. Ascertain the innovative education practices in public secondary schools for sustainable development in public secondary schools in Rivers State.
3. Identify factors hindering the management of innovative education in public secondary schools for sustainable development in public secondary schools in Rivers State.

Research Questions

The following research questions guided the study:

1. What is the role of educational administrators in managing innovative education for sustainable development in public secondary schools in Rivers State?
2. What are the innovative education practices in public secondary schools for sustainable development in Rivers State?
3. What are the factors hindering the management of innovative education in public secondary schools for sustainable development in Rivers State?

Research Hypothesis

The following hypotheses were tested at 0.05 level of significance:

1. There is no significant difference between the mean ratings of principals and teachers on the role of educational administrators in managing innovative education in public secondary schools for sustainable development in Rivers State.
2. There is no significant difference between the mean ratings of principals and teachers on innovative education practices in public secondary schools for sustainable development in public secondary schools in Rivers State.
3. There is no significant difference between the mean ratings of principals and teachers on the factors hindering the management of innovative education in public secondary schools for sustainable development in Rivers State.

Methodology

This study adopted a descriptive survey design. The population consisted of 6,153 academic staff (i.e. 320 principals and 5,833 teachers) in 320 public senior secondary schools in Rivers State. Source: Rivers State Senior Secondary Schools Board, January, 2024. The sample size was 615 respondents representing 10% of the entire population. Nwane in Kpee (2015) considered such percentage appropriate to serve as an acceptable sample for a population running into thousands. Proportionate stratified sampling technique was used to select 32 schools from 6 Local Government Areas spread across 3 Senatorial District in Rivers State (i.e. Rivers South-East, Rivers West and Rivers East), where respondents were drawn for equal representation. The instrument used for data collection was a questionnaire. The questionnaire was developed by the researcher and it was titled: Managing Innovative Education in Public Secondary Schools for Sustainable Development Questionnaire (MIEPSSSDQ). It consisted of Sections A and B. Section A deals with demographic information of the respondents while Section B deals with variables from the research questions which were used to elicit information from the respondents. The items are structured after the modified four-point Likert type rating scale of Strongly Agreed (SA) = 4 points, Agreed (A) = 3 points, Disagreed (D) = 2 points and Strongly Disagreed (SD) = 1 point, respectively. The reliability of the instrument was determined through Cronbach alpha which yielded an index of 0.89. As part of data collection, the researcher designed and distributed 615 copies of questionnaire to the respondents. Five hundred and ninety-four (594) copies were retrieved and found suitable for analysis resulting in 96% return rate. Data collected from the study were analyzed using mean and standard deviation statistics to answer two research questions, while z-test was used to test two null hypotheses at 0.05 level of significance. 2.50 served as the criterion mean for judgment.

Results and Data Analysis

Research Question 1: What is the role of educational administrators in managing innovative education in public secondary schools for sustainable development in Rivers State?

Table 1: Mean (\bar{x}) and Standard Deviation of Respondents on the Role of Educational Administrators in Managing Innovative Education in public secondary schools for Sustainable Development in Rivers State

SN	Items	Principals N = 29		Teachers N = 565		Mean Set	Decision
		\bar{X}_1	SD ₁	\bar{X}_2	SD ₂		

1.	Development of the right attitude in school personnel not to be afraid to try new things.	3.90	0.49	3.89	0.50	3.89	Agreed
2.	Ensuring that technology is seen as a tool for an innovative teacher and learner.	3.70	0.51	3.65	0.43	3.67	Agreed
3.	Stakeholders in education should be allowed by school administrators to contribute their quota in the managing of innovative education.	3.82	0.38	3.54	0.49	3.68	Agreed
4.	Encourage innovative practices that are needed for sustainability.	3.41	0.81	3.78	0.41	3.59	Agreed
5.	Creation of teamwork among staff and a positive work environment for innovative practices to thrive.	3.38	0.66	3.42	0.73	3.40	Agreed
6.	Integration of sustainable development goals and objectives into the school's overall goals.	3.32	0.51	3.16	0.64	3.24	Agreed
Average Mean/Standard Deviation		3.58	0.56	3.57	0.53	3.58	

Source: Researcher's Computed Data, 2024.

Note: In the above table, the decision of “**Disagreed**” means that the respondents did not agree with the item statement (which is below the criterion mean of **2.50**) while “**Agreed**” means that the respondents agreed with the item statement (which is above the criterion mean of **2.50**).

Data in Table 1 showed the mean scores of respondents on the role of educational administrators in managing innovative education for sustainable development in Rivers State. From the table, it is observed that the respondents agreed on all the items because their mean scores are greater than the criterion mean of 2.50.

The average mean score of 3.58 showed that the role of educational administrators in managing innovative education for sustainable development in Rivers State include; development of the right attitude in school personnel not to be afraid to try new things, ensuring that technology is seen as a tool for an innovative teacher and learner, allowing of stakeholders in education to contribute their quota in the managing of innovative education, encouraging innovative practices that are needed for sustainability, creation of teamwork among staff and a positive work environment for innovative practices to thrive, and integration of sustainable development goals and objectives into the school's overall goals.

Research Question 2: What are the innovative education practices in public secondary schools for sustainable development in Rivers State?

Table 2: Mean (\bar{x}) and Standard Deviation of the Innovative Education Practices in Public Secondary Schools for Sustainable Development in Rivers State

SN	Items	Principals N = 29		Teachers N = 565		Mean Set	Decision
		\bar{X}_1	SD ₁	\bar{X}_2	SD ₂	X_1X_2	
7.	Well motivated and properly trained teachers to drive innovative education.	3.39	0.61	3.41	0.75	3.40	Agreed
8.	Provision of relevant facilities needed to create innovativeness in the teaching and learning processes.	3.19	0.70	3.86	0.35	3.52	Agreed
9.	Committed students who are prepared to participate in innovative education process.	3.26	0.63	3.67	0.47	3.47	Agreed
10.	Successful school environment that promotes internal cohesion and freedom of action as well as stimulation of ideas.	3.63	0.45	3.53	0.50	3.58	Agreed
11.	Flexibility in the management of innovation in education.	3.49	0.54	3.86	0.35	3.68	Agreed
12.	Seeking support from staff members by administrators about innovations before implementation.	3.60	0.49	3.30	0.88	3.45	Agreed
Average Mean/Standard Deviation		3.43	0.57	3.60	0.55	3.53	

Source: Researcher's Computed Data, 2024.

Data in Table 2 showed the mean scores of respondents on the essential ingredients required for managing innovative education in public secondary schools for sustainable development in Rivers State. From the table, it is observed that the respondents agreed on all the items because their mean scores are greater than the criterion mean of 2.50.

The average mean score of 3.53 showed that the innovative education practices in public secondary schools for sustainable development in Rivers State include; well motivated and properly trained teachers to drive innovative education, provision of relevant facilities needed to create innovativeness in the teaching and learning processes, committed students who are prepared to participate in innovative education process, successful school environment that promotes internal cohesion and freedom of action as well as stimulation of ideas, flexibility in the management of innovation in education, and seeking support from staff members by administrators about innovations before implementation.

Research Question 3: What are the factors hindering the management of innovative education in public secondary schools for sustainable development in Rivers State?

Table 3: Mean (\bar{x}) and Standard Deviation of Respondents on the Factors Hindering the Management of Innovative Education in Public Secondary Schools for Sustainable Development in Rivers State

SN	Items	Male N = 253		Female N = 291		Mean Set $\bar{X}_1\bar{X}_2$	Decision
		\bar{X}_1	SD ₁	\bar{X}_2	SD ₂		
13.	Limited knowledge in the application of innovative process and methods.	3.52	0.52	3.34	0.84	3.43	Agreed
14.	Poor preparation and training for school personnel in innovative management	3.58	0.49	3.34	0.64	3.46	Agreed
15.	Fear of feasible failure in the transition period.	3.56	0.63	3.53	0.50	3.55	Agreed
16.	Resistance to change by school personnel.	3.30	0.59	3.25	0.61	3.27	Agreed
17.	Increased loss of public interest in public schools as a result of decreasing academic standard.	3.44	0.56	3.13	0.70	3.28	Agreed
18.	Dearth of facilities and relevant infrastructure in the schools.	3.60	0.49	3.30	0.88	3.45	Agreed
Average Mean/Standard Deviation		3.50	0.54	3.31	0.69	3.41	

Source: Researcher's Computed Data, 2024.

Data in Table 3 showed the mean scores of respondents on the factors hindering the managing of innovative education in public secondary schools for sustainable development in Rivers State. From the table, it is observed that the respondents agreed on all the items because their mean scores are greater than the criterion mean of 2.50.

The average mean score of 3.41 showed that the factors hindering the management of innovation in education for attainment of sustainable learning environment in public secondary schools in Rivers State include; limited knowledge in the application of innovative process and methods, poor preparation and training for school personnel in innovative management, fear of feasible failure in the transition period, resistance to change by school personnel, increased loss of public interest in public schools as a result of decreasing academic standard, and dearth of facilities and relevant infrastructure in the schools.

Test of Hypotheses

H₀₁: There is no significant difference between the mean ratings of principals and teachers on the role of educational administrators in managing innovative education in public secondary schools for sustainable development in Rivers State.

Table 4: z-test Analysis on the Difference between the Mean Ratings of Principals and Teachers on the Role of Educational Administrators in Managing Innovative Education in Public Secondary Schools for Sustainable Development in Rivers State

Category	N	\bar{X}	SD	df	z-cal	z-crit.	Remarks
Principals	29	3.58	0.56	542	0.053	± 1.960	Not Significant
Teachers	565	3.57	0.53				Accept H_{01} (z-cal. < z-crit.)

Table 4 revealed that principals have mean and standard deviation scores of 3.58 and 0.56, while teachers have mean and standard deviation scores of 3.57 and 0.53 respectively. The figured z-calculated of 0.053 is less than the z-critical of 1.960, meaning the null hypothesis is accepted. By implication, there is no significant difference in the mean ratings of principals and teachers on the role of educational administrators in managing innovative education for sustainable development in Rivers State.

H₀₂: There is no significant difference between the mean ratings of principals and teachers on innovative education practices in public secondary schools for sustainable development in Rivers State.

Table 5: z-test Analysis on the Difference between the Mean Ratings Principals and Teachers on Innovative Education Practices in Public Secondary Schools for Sustainable Development in Rivers State

Category	N	\bar{X}	SD	df	z-cal	z-crit.	Remarks
Principals	29	3.43	0.57	542	-	± 1.960	Not Significant
Teachers	565	3.60	0.55		0.881		Accept H_{02} (z-cal. < z-crit.)

Table 5 revealed that principals have mean and standard deviation scores of 3.43 and 0.57, while teachers have mean and standard deviation scores of 3.60 and 0.55 respectively. The figured z-calculated of -0.881 is less than the z-critical of -1.960, meaning the null hypothesis is accepted. By implication, there is no significant difference in the mean ratings of principals and teachers on innovative practices education in public secondary schools for sustainable development in Rivers State.

H₀₃: There is no significant difference between the mean ratings of principals and teachers on the factors hindering the management of innovative education in public secondary schools for sustainable development in Rivers State.

Table 6: z-test Analysis on the difference between the Mean Ratings of Principals and Teachers on the Factors Hindering the Management of Innovative Education in Public Secondary Schools for Sustainable Development in Rivers State

Category	N	\bar{X}	SD	df	z-cal	z-crit.	Remarks
Principals	29	3.50	0.54	542	1.029	± 1.960	Not Significant
Teachers	565	3.31	0.69				Accept H ₀₃ (z-cal. < z-crit.)

Table 6 revealed that principals have mean and standard deviation scores of 3.50 and 0.54, while teachers have mean and standard deviation scores of 3.31 and 0.69 respectively. The figured z-calculated of 1.029 is less than the z-critical of 1.960, meaning the null hypothesis is accepted. By implication, there is no significant difference in the mean ratings of principals and teachers on the factors hindering the managing of innovative education in public secondary schools for sustainable development in Rivers State.

Discussion of Findings

The finding of the study revealed that the role of educational administrators in managing innovative education for sustainable development in Rivers State include; development of the right attitude in school personnel not to be afraid to try new things, ensuring that technology is seen as a tool for an innovative teacher and learner, allowing of stakeholders in education to contribute their quota in the managing of innovative education, encouraging innovative practices that are needed for sustainability, creation of teamwork among staff and a positive work environment for innovative practices to thrive, and integration of sustainable development goals and objectives into the school's overall goals. Also, the corresponding hypothesis tested established that there is no significant difference in the mean ratings of principals and teachers on the role of educational administrators in managing innovative education for sustainable development in Rivers State. These findings are in consonance with Curic, Lazarevin and Brzakovc (2018), Minott, Ferguson and Minott (2019), United Nations (2019), Oluwuo (2021) and Okeke (2023) whose studies provided information on the role of educational administrators in managing innovative education for sustainable development as identified above. This implies

that if sustainable development is to be attained, educational administrators need to play their role in managing innovative education.

The second finding of the study showed that the innovative education practices in public secondary schools for sustainable development in Rivers State include; well-motivated and properly trained teachers to drive innovative education, provision of relevant facilities needed to create innovativeness in the teaching and learning processes, committed students who are prepared to participate in innovative education process, successful school environment that promotes internal cohesion and freedom of action as well as stimulation of ideas, flexibility in the management of innovation in education, and seeking support from staff members by administrators about innovations before implementation. Also, the corresponding hypothesis tested establishes that there is no significant difference in the mean ratings of principals and teachers on innovative education practices in public secondary schools for sustainable development in Rivers State. These findings are in line with Aguba (2013), Davis (2018), Muller (2021), and Alarifi, et al (2022), who empirical and scholarly contributions to knowledge attest to the essential ingredients identified above. This implies that these essential ingredients are inevitable for sustainable development.

The third finding of the study revealed that the factors hindering the management of innovation in education for attainment of sustainable learning environment in public secondary schools in Rivers State include; limited knowledge in the application of innovative process and methods, poor preparation and training for school personnel in innovative management, fear of feasible failure in the transition period, resistance to change by school personnel, increased loss of public interest in public schools as a result of decreasing academic standard, and dearth of facilities and relevant infrastructure in the schools. Also, the corresponding hypothesis tested establishes that there is no significant difference in the mean ratings of principals and teachers on the factors hindering the managing of innovative education in public secondary schools for sustainable development in Rivers State. These finding are in line with Chukwu (2014), Hanna (2018), Lochner (2020), Oluwuo (2021) and Aguba (2021) whose academic contribution mention and identified the above as the factors hindering the managing of innovative education for attainment of sustainable development. Explanations for these findings may be in the fact that many schools in the state under review suffer infrastructural dearth. These findings may imply that schools without adequate facilities that can promote innovative education, sustainable development becomes difficult.

Conclusion

Based on the findings of this study, it was concluded that sustainable development cannot be achieved except administrators play their role by ensuring that essential ingredients required for managing innovative education in public secondary schools properly implemented, even though there may be some factors hindering the managing of innovative education for sustainable development.

Recommendations

The following recommendations are proffered based on the findings of the study:

1. Administrators in schools should work with outstretched arms with their subordinates to ensure that they play their roles very well to achieve proper management of innovative education for sustainable development. This is because collaboration and effective communication are important for innovations to take place in schools.
2. School administrators should be carefully selected and trained to ensure that innovative education practices in public secondary schools are effectively implemented for attainment of sustainable development.
3. Civil society groups and other social activists should join hands with the government and school administrators in ensuring that factors hindering the management of innovative education are addressed for sustainable development. This can be achieved through advocacy, negotiations, protests, occupation of sensitive government offices, lobbying, etc.

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Digital Disconnect in Education: The Administrative Challenge of Aligning Rhetoric and Reality in the Implementation of AI-powered and Non-AI digital tools

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Abstract

Despite the hype surrounding digital transformation in education, a persistent gap between rhetoric and reality threatens to undermine the promise of technology-enhanced learning. The accelerating pace of artificial intelligence and digital tool development has created a pronounced disconnect where administrative capacities and framework are increasingly hard-pressed to match the speed of technological change. This paper delves into the complex interplay between policy, practice, and technology, exposing the administrative challenges that fuels the digital disconnect. Through a critical examination of the gap between policy rhetoric and implementation reality, this research revealed the need for a more refined understanding of the administrative role in shaping digital initiatives. By highlighting the tensions between technological potential and practical implementation, this paper aimed to spark a critical conversation on the future of digital education and the administrative competencies required to bridge the digital disconnect, the paper concluded that effective alignment of administrative imperatives with technological advancement is crucial to bridge the digital disconnect and harness the full potential of AI and other digital solutions in education. The paper suggested amongst others that educational institutions should invest in developing administrators' capacity for digital leadership, including training in AI and digital tool implementation.

Keywords: Digital Disconnect, Administrative, Rhetoric and Reality, Artificial Intelligence, Digital Tools implementation

Introduction

The advent of artificial intelligence (AI) and other advanced digital tools in education heralds a new era of learning which is capable of unlocking unprecedented opportunities for students' growth and achievement. The possibilities of this modern education is far reaching; as it promises to improve and tailor learning experiences to individual needs and abilities, reduce the intensity of teachers' workload by helping out with non-instructional responsibilities like marking, grading, observing, evaluating, and preparing lessons amongst others. Artificial intelligence empowers individuals with disability; facilities and learning plans are available to support people with disability. This will lead to improved academic outcomes, increased

participation and a more positive learning environment since students with disability will be availed equal access to education and opportunities to succeed. The integration of intelligent digital solutions such as scalability, has the potential to democratize access to high-quality education, making it more inclusive and accessible to a broader audience, particularly in underserved areas. Harnessing the power of this particular technology provides equal opportunities for all students to succeed regardless of their geographical location or social economic background. This will also help the system bridge all sorts of educational divides. The most striking and crucial potential of AI in modern education lies in its ability to empower students with the necessary 21st-century skills that will enable them navigate and succeed in an increasingly complex, technology-driven world. By harnessing the power of digital tools with and without AI capabilities, educators can transform the learning experience, create dynamic, personalized and inclusive learning environment that equips students with the skills, knowledge and adaptability needed to thrive in the 21st century.

Despite the excitement around technology in education, the adoption of AI-driven and standard digital platforms in education is not a straightforward success story. There is a serious mismatch between what is expected and what actually happens in reality. Most schools often find it difficult to make intelligent and conventional digital tools work well which leads to frustration and disappointing results. They are expected to maintain a seamless integration with the existing systems but they are mostly confronted with compatibility issues, integration challenges and fragmented data. Commonsensically, educational institutions believe that the implementation of intelligent digital solutions will lead to immediate organizational efficiency and cost saving. It is anticipated that these technologies will automate manual processes, reduce labour cost and increased productivity. But the reality is far more complex than what it is observed. Implementing digital tools with or without AI capabilities often requires a significant upfront cost which will cover for software licensing, hardware upgrades, training and consulting fees. Sustaining efficiency gains from AI and other digital solutions require ongoing investment in training, support, maintenances and periodic upgrades and replacement. Consequently, for technology to flourish, individuals and organizations must be willing to invest time, effort and resources in the transition process. They must recognize that implementing new technologies requires an initial investment and that patience and dedication are essential to allow these innovations to mature and yield their full benefits. It is very crucial to give technology the time and space to develop, integrate and optimize before expecting to reap its reward. In spite of the widespread adoption and investment in intelligent and conventional digital tools in Nigeria,

many educational institutions still grapple with integration issues leading to a persistent gap between rhetoric and reality. This gap in digital access and proficiency not only limits the full potential of technology but also worsens existing differences and compromises efforts to equip students with the skills necessary for success in an increasingly digital world. This paper seeks to address the challenges that school administrators face when trying to implement digital technologies in education. In spite of the numerous benefits that technology promises; the vision remains elusive for many schools as they are unable to effectively use it. Therefore, this paper exposes the complexities involved in implementing digital technologies in education. It will explore the administrative hurdles, policy pitfalls and practical challenges that hinder progress. By shedding light on these obstacles, the researcher aims to identify actionable strategies for overcoming them, ultimately bridging the gap between technological promise and educational reality. Educational managers and administrators must join forces to make technology a transformative force in education, rather than just a distant dream.

The Rhetoric-Reality Gap

There is a big difference between what people say technology can do for education and what is actually happening in schools. Technology is not living up to the expected hype of transformation in teaching and learning process in schools. In fact, the gap between what is promised and what happens in reality is a major challenge. The enthusiasm for technology in education can distract from intricate issues and essential needs of students and teachers, potentially neglecting the problems it aims to address. Overzealous adoption of technology can lead to “innovation blindness” where fascination with novelty overshadows established practices, hindering meaningful progress. (Selwyn, 2019). The issues of rhetoric-realty gap will be uncovered under the following sub titles.

Overpromising and Under Delivering

When educational technology comes up with new technologies, their sales team and marketers tend to blow the product out of proportion. They often exaggerate the capabilities and benefits of their products just to get the needed attention, make massive sales and attract investors for the company. Educational technologists often ‘oversell and under deliver’, promising revolutionary changes that never materialize, leaving educators frustrated and disillusioned (Reich, 2018). Another category of persons that make elaborate promises are the politicians and policy makers, they often assure the citizenry of revolutionary changes in different sphere; including education just to win their votes and secure funding. In most cases they do not fully

understand the complexities of implementation. For instance, Goodluck Jonathan, former president of Nigeria during his presidential campaign promised to prioritize education and ensure that every child has access to quality education by 2010. That promise of universal access to quality education had remained a mirage till date as, millions of school-age children, particularly those from disadvantage communities and low-income families have continued to be denied the opportunity to learn, thereby worsening the already staggering number of out-of-school children in Nigeria. Educational administrators and leaders will not be exempted from the group of persons who over promise and under deliver. In a bid to remain relevant and trendy, or even to attract grants and funding, school leaders may over promise the benefits of technology. School administrators that are eager to appear innovative and attract funding grants often adopt technology without sufficient consideration of its pedagogical value (Cuban, 2021). The under deliverers in the context of digital tool implementation in education comprises of teachers, IT staff, and students. These categories of persons face numerous challenges that hinder their ability to effectively utilize technology. Teachers who are the primary facilitators of learning often struggle with lack of training and support, insufficient professional development opportunities leave them unprepared to integrate digital tools into their teaching practices. According to the national educational technology plan (2017) teachers' lack of proficiency in using technology is not due to lack of zeal or effort but rather a lack of opportunity to develop the necessary skills and knowledge. Similarly, the rigidity in the structure of curriculum and assessment can constrain teachers' ability to innovate and experiment with new technologies making them stuck with the regimented traditional ways (National Center for Education Statistics, 2019). Technological issues such as poor internet connectivity, outdated hardware and general compatibility problems are capable of frustrating the efforts of the teacher and making them resort to traditional teaching routines (National Education Association, 2018). The IT staff is responsible for maintaining the digital infrastructure and they encounter their own fair share of challenges in the implementation of digital tools. They face limited resources; ranging from inadequate funding, insufficient personnel and outdated equipment. These issues can hinder the effective implementation of digital tools. The increasing complexity of digital tools and system can lead to maintenance fatigue; causing IT staff to become unfulfilled and demoralized by the constant need to update, troubleshoot and maintain complex technologies (Forrester Research, n.d). Students and intended beneficiaries are not left out in the struggles of digital tool implementation. Digital literacy is one big challenge amongst students, particularly digitally native peers. Situations like

this creates digital divides amongst students and consequently results in unequal access to information, limited opportunities for online learning and social isolation amongst others. Another challenge of digital learning for students is information overload; too much volume of available information makes it difficult for students to decipher what is relevant and what is not (UNESCO, 2020).

Disconnection between Policy and Practice

Programme managers, policy makers, government, administrators and all other stakeholders should learn how to clearly define goals and objectives that will guide effective programming and lead to meaningful outcomes. Many goals and initiatives in Nigeria's educational system suffer from lack of clarity, specificity and concrete objectives, which can lead to ineffective programming, unrealistic expectation, wasted resources, confusion amongst stakeholders and difficulty in measuring progress amongst others. According to Bryson (2018) ambiguity in goals and objectives can lead to confusion, miscommunication, and lack of focus among stakeholders. When policies are unclear or conflicting, implementers may struggle to understand what is expected of them, leading to confusion, frustration and ineffective implementation (O'Toole, 2010). It is worthy of note to mention that defining educational goals and objectives should be a shared responsibility amongst various stakeholders especially those who will be impacted by the initiative. Collaborations of this nature ensure that goals are realistic, achievable, measurable, time-bound and relevant. Hoy and Miskel (2013) opined that shared goal setting amongst educational managers and stakeholders is crucial for educational leadership because it promotes accountability, collective ownership, improved communication and commitment to achieving common goals. Furthermore, when educational goals and objectives are vague and unclear; they begin to lack the appropriate direction and purpose leading to uncertainty, poor focus, misinterpretation, inefficient resource allocation, lack of accountability amongst others. The only way to avert the aforementioned negative effects is to ensure that stakeholders work with well-defined goals. Goals that are elusive or overly broad are unlikely to inspire commitment or guide decision making, which may result in frustration and wasted resources (Kaplan & Norton, 2006). A very good case study is the UBE programme in Nigeria launched in 1999. The programme promised a vague goal of providing free and compulsory education for all Nigerian children. The vagueness of the programme contributed to its limited success and unfulfilled learning outcomes encircled by persisting disparities. Actually, the UBE programme has been criticized for its elusiveness and lack of clear

implementation strategies, leading to a disconnection between policy and practice; implementers struggle to know what is expected of them (Oke, 2015).

Ignoring Existing Challenges

Downplaying or disregarding practical realities on ground can be very detrimental to the current goals and visions of policy makers and leaders. They should adequately consider the obstacles, difficulties and complexities that already exist in the system for a smooth sail. Inadequate planning, lack of understanding, fear of criticism, overconfidence could be the reasons why leaders and policy makers ignore existing challenges. They believe that their current solution and initiative is so powerful to overcome any existing obstacle and so they avoid discussions of challenges to prevent criticism or negative feedback. Many leaders may ignore all the harbingers and proceed with the initiative just to promote their own political interests. Self-confidence, fear of disapproval can cause leaders to ignore warning signs, dismiss dissenting voices and prioritize their own interest over the well-being of their organization or community (Brown, 2018).

Administrative Hurdles

Administrative hurdles are those obstacles, barriers or challenges that educational administrators face when implementing AI and other digital solutions in education. These hurdles are capable of hindering the effective integration of technology which will eventually lead to digital disconnects between the promised benefits (rhetoric) and the actual outcomes (reality). Below are the highlights of hurdles that administrators are confronted with as it concerns the implementation of intelligent digital solutions.

Bureaucratic Red Tapes

Educational leaders go through frustrating procedures when it comes to decision-making and action within an organization or institution. They are majorly characterized by excessive paperwork, they draft numerous forms of reports and documentations that require approvals, delays in paperwork approvals can have a ripple effect, leading to inefficiencies, increased cost and a slower pace of innovation. Unnecessary delays can be a major hindrance to success (Burrus, 2020). Sadly, educational leaders have to go through multi layered approval processes which increase the likelihood for rejections or revisions. A case study worth noting is the Edo state's education technology initiative which was officially introduced in 2018. The initiative is to provide digital learning resources and internet connectivity to public schools and this magnitude of project required approval from the Ministry of Education and Universal Basic

Education Commission (UBEC). Due to bureaucratic hurdles, the approval process was delayed for 9 months resulting in increased cost; inflation, exchange rate fluctuations and vendor price changes increased the project cost by 25%. More so, the delay caused certain inefficiencies in implementation which extended the timeline of the project by three months. And of course, all the arising issues generally slowed down the pace of innovation in education technology adoption in Edo state (Adebayo, 2023). Strict adherence to inflexible procedures can make it very difficult to adhere to changing circumstances, especially as it concerns innovation. Cordelia and Tempini (2015) revealed that opportunities for improved efficiency and effectiveness in public services may be missed due to rigid regulatory frameworks that are capable of impeding the adoption of innovative technologies.

Resistance to Change

Embracing change often triggers a sense of unease, as individuals are uncertain whether the new path will yield better outcomes than their current circumstance. This natural apprehension coupled with the fears of the unknown, comfort with familiarity and doubts about the potential benefits can lead to reluctance to adapt, causing people to resist change. One key reason why implementers or educators resist change is due to fear of the unknown, they are skeptical about how this new technology will impact their job security, roles and responsibilities. The biggest challenge we face in the adoption of technology in Nigerian schools is not the technology itself but the mindset of the teachers. Teachers must shift from being sole knowledge providers to becoming facilitators of learning, guiding students in their educational journey (Ajayi, 2020). Additionally, when teachers lack the needed digital skills, understanding or training about the new technology, they begin to oppose the change because of their inadequate preparation to receive it (Oye & Olamide, 2020). Teachers have an unmatched familiarity with the traditional workflow in schools which keeps them very comfortable. The fear of being replaced by automation and AI fuels teachers' anxieties leading to resistance to technological changes in the classroom. In a rapidly evolving world, the biggest risk lies in avoiding uncertainty, the surest path to failure is reluctance to take bold action. (Zuckerberg, 2019). Generational differences may also cause resistance to change; of course the digital natives will have higher levels of acceptability when it comes to integrating technology as opposed to those who were born before the widespread use of digital technology. Younger generations are more likely to embrace technology, with a significant proportion excited about its impact on their lives (Deloitte, 2022).

Inadequate Funding

Another key administrative hurdle is the problem of insufficient funding. Lack of adequate funding can hinder effective management and operation of the educational institution. An educational leader may be constrained by budget to make tough choices that may impact staffing levels. They may decide to reduce the number of staff to what they can conveniently cater for; which means that the remaining employees will be expected to carry the workload of the actual staff population, causing them to easily burnout and display decreased morale amongst others. Employers can feel undervalued and overworked due to staff reductions which can lead to chronic work related stress, reduced productivity and increased turnover rates (De Lange, 2022). Lack of sufficient funds may prevent investment in modernized infrastructure; as schools will continue to struggle with the use of outdated infrastructure leading to inefficiencies and decreased productivity. According to a recent study by Wakefield research (2022) outdated technology can significantly reduce staff productivity leading to 65% of employees working longer hours to compensate for inadequate tools and 56% of employees missing deadlines due to insufficient technology. Furthermore, inadequate funding for schools can limit students' access to technology, thereby hindering their ability to develop crucial skills necessary for success in the digital age (National Education Association, 2020). Insufficient funding for educational institutions may also cause reduced innovation, difficulty meeting regulatory requirements, problems with attracting and retaining talents and inability to invest in growth.

Policy Pitfalls

The integration of technology in education has the potential to transform learning but it is often hindered by unintended consequences. Well-meaning policies can sometimes create obstacles leading to a digital disconnect that leaves some students behind. This disconnect can result from inadequate distribution of digital resources, insufficient support or inadequate access. As policy makers strive to harness the benefits of technology, they must navigate complex challenges and avoid common pitfalls. Insufficient funding is a significant policy pitfall and the lack of it can disrupt needed maintenances and upgrades causing equipment to become obsolete and ineffective. Inadequate funding for technology can lead to a range of issues including outdated devices, limited access, and insufficient technical support and worsening digital equity concerns, ultimately leaving students in a state of digital darkness (McLeod, 2017). Lack of clear guideline is one major policy shortcoming that may hinder the effective use of technology in education. Most teachers may not be sure about what is expected of them in the classroom

with regards to technology, they may also lack the needed support and resources to run a smooth technology integrated classroom, however, when there are explicit guidelines on the expected operational standards, teachers may become confident and prepared to carry out their expected responsibilities. Puentedura (2013) affirmed that without explicit guidelines for technology integration, classroom can devolve into a ‘pedagogical free-for-all’ where the tool dictates instruction rather than the effective pedagogy driving technology use. Inadequate teacher training and support for digital literacy is an underrated aspect which reveals policy weakness. It explains the lack of sufficient preparation and resource provided to teachers to effectively integrate technology into their teaching practices. These can definitely decrease teacher morale and to address this; educational policies should prioritize teacher capacity building and mentorship initiatives that foster digital proficiency, enabling educators to thrive in an ever-evolving world. Educational policies should place strong emphasis on building teachers’ digital literacy to ensure they can create learning environments that cater to the needs of modern students (OECD, 2019). A study on “digital divide in Nigerian schools: a case study of inequitable distribution of digital resources” was conducted by Adebayo and Fakeye (2020). The researchers found out that affluent private schools had better digital infrastructure including, computers, internet connectivity and other digital tools. They also enjoy greater access to digital resources, including online materials and digital textbooks while their counterpart in public schools face challenges like outdated hardware, limited internet access and poor digital literacy among teachers. The research uncovered a significant policy gap in Nigeria’s education sector; it also emphasized the need for policymakers to revisit the existing policy to bridge the digital divide. Policy pitfalls in Nigerian education also covers issues of neglecting digital safety, privacy and security concerns, overemphasis on technology as a replacement for human amongst others.

Bridging the Gap; Strategies for Effective Implementation

The preceding section of this paper explored the various administrative challenges hindering the effective implementation of AI and digital tools in education. It is very evident that a significant gap exists between policy promises and reality. To bridge this gap, educational leaders, policymakers and stakeholders must come together to develop and implement strategies that will unflinchingly address these challenges. This will call for an all encompassing approach that utilizes best practices, innovative solutions and collaborative efforts. Below are the strategies for effective implementation that can bridge the gap and ensure the potentials of AI and digital tools are realized.

Develop Unambiguous Implementation Plans: educational leaders and policymakers should ensure that goals and objectives are specific, it should clearly define what is to be achieved after which a realistic timeline for implementation will be established. The schedule could feature milestone and deadlines for precision. A realistic timeline is essential for a successful technology implementation, as rushing the procedure could lead to disappointing outcomes, user frustration and wasted resources (Smith, 2021). The plan should also include clearly defined roles responsibilities of different personnel that will be involved for clarity and preparedness. The needed resources for implementation should be determined and be made available, be it human, financial or technological. Potential challenges must be anticipated with corresponding mitigation plans to arrest the challenges. Strategic planning is not just about creating a plan, but also about preparing for the unexpected. It is essential to identify potential risk and develop contingency strategies to navigate the inevitable challenges that will arise (Mintzberg, 2018).

Provide Ongoing Professional Development: providing ongoing professional development is very crucial to bridging the gaps of digital disconnect. Ensure regular upskilling and reskilling during which knowledge and skills needed to effectively integrate technology will be acquired. It also enables educators stay updated on current trends and best practices. Furthermore, professional development will go a long way in addressing issues of digital divides. The most effective strategy for bridging the digital divide is through continuous training and support, empowering individuals with the necessary skills and knowledge to fully engage in a digital society (NTIA, 2020). According to ISTE (2010) ongoing professional development boosts teacher confidence in using technology to support students learning.

Monitor Progress and Evaluate Impact: the effectiveness of digital inclusion initiatives should be regularly tracked and assessed. More so, data for key indicators like digital literacy rates, online engagement and participation as well as devices and internet access rates should be monitored; all these are done for the purpose of identifying areas of improvement and adjust the strategies accordingly. Regular assessments and evaluation are crucial to ensure that technology is enhancing student learning, and to pinpoint areas where teachers need further training and support to effectively integrate digital tools (McGuire, 2017).

Conclusion

The digital disconnect in education is a pressing administrative challenge that demands urgent attention. Fixing this, requires educational managers and school administrators to match words with actions when introducing new digital tools. This means making sure everyone has equal access, training teachers properly, and regularly evaluating progress. By doing so, administrators can unlock technology's potential to create a fair, effective, and student-focused learning environment. Ultimately, the successful integration of digital solutions will be pivotal in shaping the future of education.

Suggestions

The following suggestions were made;

1. Educational institutions should develop a comprehensive digital literacy programme for teachers and administrators
2. Educational institutions should invest in developing administrators' capacity for digital leadership, including training in AI and digital tool implementation
3. Policymakers makers should be encouraged to prioritize funding for digital infrastructure
4. Research on effective technology integration strategies and digital tools evaluation methods should be supported and encouraged by the appropriate stakeholders

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Integration of Artificial Intelligence in Educational Leadership for Sustainable Development in Nigeria

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Abstract

The critical role education plays in accomplishing the aforementioned developmental objectives, the importance of artificial intelligence and educational leadership in today's society cannot be understated in the pursuit of sustainable development. Sadly, there are a number of obstacles that Nigerian educational authorities must overcome in order to fully utilize AI for sustainable growth. Given the roles that teachers play in the delivery of educational services, this has not only adversely affected their efficacy but also prevented them from achieving the goals of education in the nation to the fullest extent possible. This paper provided insights into how to use educational leadership and artificial intelligence to achieve sustainable development in Nigeria. This paper specifically looked at artificial intelligence, sustainable development and educational leadership. Additionally, by highlighting the functions of artificial intelligence and its implications for sustainable development, the paper emphasized the necessity of artificial intelligence-fortified educational leadership for sustainable development. Additionally, it takes into account the mitigating strategies, which include providing infrastructure and funding, technical expertise, policies and regulations, ethical concerns, public awareness, and education to address them, as well as the associated challenges, which include inadequate infrastructure and funding, a lack of technical expertise among educators and educational administrators, a lack of policies and regulations, and a lack of public awareness.

Keywords: Education, Educational Leadership, Integration, Artificial Intelligence, Sustainable Development.

Introduction

One integral part of sustainable development is education, sustainable development serves as a solution to quality education problems. Solving such problems requires a long-term and comprehensive strategy that takes into account the relationship between the educational, social, and economic systems. It therefore means that, educators and educational leaders prepare students who will be able to thrive and meet the challenges of the future. Sustainable development in education involves creating systems that are equitable, inclusive, and capable of adapting to future needs. This includes integrating technology to support lifelong learning and ensure educational opportunities for all. The preparations should be geared towards

qualitative improvement in diverse areas such as social justice, social equality, peace, health, environment and education amongst others, for sustainable development.

According to Leithwood, Harris, and Hopkins (2020), educational leadership encompasses several key elements, including creating a shared vision, building relationships, developing people, managing resources, and fostering learning communities. Hence, the evolvement of technology has created a growing interest in the use of artificial intelligence in educational settings, which, if further inculcated into educational leadership, has the potential to improve leadership, learning outcomes, and sustainable development. Artificial intelligence is a technological machine that is growing rapidly to transform global sustainability initiatives as a result of its capability to perform tasks that typically require human intelligence. It is essential for educational leadership because, it simplifies administrative tasks like scheduling, grading, record-keeping, and decision-making. It also improves teaching and learning by pointing out areas that need improvement and providing tailored support to teachers and students, which will ultimately result in sustainable development.

(Obadimeji and Oredein, 2022). Therefore, the aim of this study is to contribute to the growing body of research by exploring ways in which artificial intelligence can be used in educational leadership for sustainable development.

Educational leadership plays a major role in the successful running of educational institutions, as it encompasses procedures used in leading and managing educational organizations such as schools, colleges, and universities towards actualizing stated goals and objectives. According to Sergiovanni and Starratt (2013), educational leadership is a critical factor in determining the success of educational institutions. A shared objective can be achieved by staff members who are inspired and motivated by effective educational leaders. Consequently, they are able to develop an environment in the school that fosters learning and the wellbeing of all parties involved. Similarly, promoting equality and social justice in education also requires strong educational leadership. According to Emdin (2020), educational leaders must be committed to addressing systemic inequalities and ensuring that all students have access to high-quality education. They must also be eager to engage in critical self-reflection and work to develop inclusive and culturally sensitive learning environments. The characteristics, dispositions, actions, patterns, and leadership styles of the educational leader include, but are not limited to, instructional leadership, transformational leadership, servant leadership, ethical leadership, distributed leadership, and digital leadership.

Artificial Intelligence first attempts to create machines that could think and learn like people were made in the 1950s, which is when artificial intelligence was first studied. Rule-based systems, neural networks, machine learning, and deep learning are just a few of the stages that artificial intelligence research has gone through. Russell and Norvig (2021) stated that, recent advances in artificial intelligence have been fueled by the availability of large datasets, improved computing power, and sophisticated algorithms. Artificial intelligence can be classified into two main types: narrow or weak artificial intelligence and general or strong artificial intelligence. Narrow artificial intelligence is designed to perform specific tasks, such as playing chess or detecting fraud, and it operates within a limited domain. General artificial intelligence, on the other hand, is designed to perform any intellectual task that a human can do, and it is not limited to a specific domain (Charlotte, 2022). A few sectors with a broad range of applications for artificial intelligence are healthcare, banking, transportation, and education. Artificial intelligence is being applied to healthcare to analyze x-ray images, diagnose conditions, and develop customized medications. Artificial intelligence is also being utilized in finance to analyze financial markets, identify fraud, and provide personalized investment advice. In a similar vein, artificial intelligence is being used in the transportation sector to develop driverless cars and enhance traffic flow.

In education, artificial intelligence is being used to personalize learning analyses, student performance, and develop intelligent tutoring systems (Chui, Manyika, Miremadi, Henke, Chung, Nel and Malhotra, 2018). It is a machine that makes use of algorithms and statistical models to learn from data and make decisions or predictions based on that learning. It provides the opportunity to use a large scale of knowledge that is in some way structured and suitable for use in the educational process to solve certain educational problems and that is personalized for each student (Yuskovych, Zhukovska, Poplavska, Diachenko, Mishenina, Topolnyk, and Gurevych (2022). However, there is a need for accountability and transparency in the development and deployment of artificial intelligence systems to ensure that they are used in ways that are consistent with ethical principles (Floridi, Cows, Beltrametti, Chatila, Chazerand, Dignum and Luetge, 2018).

Sustainable Development Goal (SDG) aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." This goal is essential in fostering sustainable development, reducing inequalities and enabling individuals to reach their full potentials. Achieving SDG involves addressing various challenges, including disparities in

access to education, gender inequalities, and the need for quality educational resources. The key targets of SDG include: ensuring that, all citizens of primary school age complete free, equitable, and quality primary and secondary education, expanding access to quality in early childhood development, and eliminating gender disparities in education. Furthermore, the goal emphasizes the importance of lifelong learning, which includes access to affordable vocational training, higher education, and opportunities for continuous skill development. Educational management plays a critical role in achieving SDG by improving the quality of education, ensuring efficient use of resources, and promoting policies that support inclusive and equitable education. Through research and the development of evidence-based strategies, educational managers can contribute to closing gaps in educational access and quality, thereby supporting the broader objectives of sustainable development. (Bharat, 2024).

The notion of sustainable development has received a lot of attention in recent years. The Brundtland report, which was released in 1987 by the International Commission on Development, was the first to establish the idea of sustainable development. According to the report, sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Wang, 2021). Sustainable development encompasses three basic dimensions: economic, social, and environmental. These dimensions are often referred to as the "triple bottom line" (Slaper and Hall, 2011). Economic sustainability involves promoting economic growth and developmental while ensuring that, resources are used efficiently and that economic benefits are distributed fairly. Social sustainability involves promoting social equity, justice, inclusion and ensuring that everyone has access to basic needs such as food, shelter, and healthcare. Environmental sustainability involves protecting natural resources and reducing pollution and waste.

The concept of the "Triple Bottom Line" (TBL) is closely related to the goals of sustainable development, including the Sustainable Development Goals (SDGs). The three bottom lines of TBL are: People (Social) this aspect focuses on social well-being and equity. It involves ensuring fair labor practices, community engagement, and improving the quality of life for people. In the context of the SDGs, this aligns with goals related to reducing inequality, improving education, and promoting health and well-being. Planet (Environmental) This line emphasizes environmental responsibility. It includes practices that protect and preserve natural resources, reduce pollution, and combat climate change. This corresponds to SDGs focused on environmental sustainability, such as climate action, life on land, and life below water. Profit

(Economic) In TBL, profit is considered alongside social and environmental impacts. The goal is sustainable economic growth that benefits society without degrading the environment. This aligns with SDGs related to decent work, economic growth, and responsible consumption and production (Slaper and Tanya, 2011).

These three dimensions encourage organizations to achieve a balance between social equity, environmental sustainability, and economic viability, which is the essence of sustainable development. However, the balancing of the economic, social, and environmental components is one of the difficulties of sustainable development. This requires taking a holistic approach to development that takes into account the interconnections between these dimensions. Another important development in sustainable development was the adoption of the United Nations Sustainable Development Goals (SDGs) in 2015. The SDGs are a set of 17 goals and 169 targets that aim to end poverty, protect the planet, and promote prosperity for all and quality education among others (United Nations, 2015). The SDGs provide a framework for governments, businesses, and civil society to work together to achieve sustainable development.

Artificial Intelligence for Sustainable Development:

Artificial intelligence can be defined as a computational mechanism that enables computerized robots or software systems to engage in critical thinking and problem solving activities in a manner that resembles the thinking patterns of an intelligent human. It is an advanced technology that has the potential to make significant contributions to sustainable development in areas such as transportation, agriculture, healthcare, energy, and education, among others. Artificial intelligence can also help address global challenges such as climate change, poverty, and hunger, which are key objectives of sustainable development. Similarly, artificial intelligence can also help deliver sustainable education content that promotes quality education and fosters sustainable behaviors among students (Schoormann, Strobel, Möller, Petrik and Zschech, 2023). Below are specific roles that artificial intelligence can play in actualizing sustainable development goals:

- **Personalized learning:** learning experiences that are tailored and catered to each student's needs can be made using artificial intelligence by analyzing data on their learning preferences, interests, and passions. Students may benefit from this as they get the skills and information necessary to contribute to a future that is more sustainable, as well as a greater understanding of difficult sustainability-related themes.

- **Data analysis:** With artificial intelligence, it is possible to find trends, patterns, and areas for improvement in complex data relevant to sustainability, such as climate data or environmental impact assessments. This will aid educators and policymakers in making data driven judgments about sustainability initiatives and interventions.
- **Research and innovation:** Artificial intelligence can aid in promoting research and innovations in the field of sustainability by evaluating data, modelling scenarios, and spotting new prospects, amongst others. Sustainable development goals can be achieved more quickly as a result of this.
- **Accessibility:** Artificial intelligence has the potential to make education more accessible for students who have special needs or who might have trouble adjusting to traditional classroom settings. Artificial intelligence-driven voice assistants and chatbots, for instance, may offer students individualized support and direction, and virtual and augmented reality technologies can produce immersive learning experiences that are accessible from any location. Artificial Intelligence and Educational Leadership for Sustainable Development,

The 21st century has witnessed a rapid advancement in technology that has revolutionized various aspects of life. Artificial Intelligence (AI) has emerged as one of the most transformative technologies in recent times (Goksel and Bozkurt 2019). Artificial Intelligence (AI) has emerged as a revolutionary technology that has the potential to transform various sectors, including education. In recent years, AI has been adopted in various educational institutions as a means of improving learning outcomes and enhancing the quality of education (Wang, 2021). Educational leadership, in particular, can leverage AI to improve the quality of education, enhance the effectiveness of teaching, and increase the efficiency of administrative processes (Tapalova, Zhiyenbayeva and Gura, 2022). One of the critical roles of AI in educational leadership is to provide personalized learning experiences for students. AI powered educational platforms can use data analytics to monitor students' progress and provide customized learning materials based on their individual learning styles, interests, and abilities (Seo, Tang, Roll, Sidney and Dongwook, 2021). By doing so, AI can help ensure that every student receives the education that suits their needs, thereby improving learning outcomes. Another role of AI in educational leadership is to support teachers in their daily tasks. AI powered tools can help teachers assess student performance, grade assignments, and provide feedback in real-time (Sharma, Undheim, and Nazir, 2022). This can free up teachers' time and allow them to focus on higher-order tasks such as lesson planning, curriculum development,

and mentoring students. AI can also help identify students who need extra support, enabling teachers to provide timely and targeted interventions. AI can also play a crucial role in administrative processes in educational institutions. AI-powered systems can automate routine administrative tasks such as student record-keeping, scheduling, and course planning (Okonkwo and Abejide 2021). This can save time and reduce administrative errors, enabling educational institutions to allocate more resources to core educational activities. The implications of AI in educational leadership for national development are immense. By leveraging on AI, educational institutions can improve the quality of education, increase access to education, and reduce educational inequalities (Avurakoghene, Oredein and Igbokwe, 2023). This can lead to a better educated workforce, which can help drive economic growth and development. AI can also help bridge the digital divide by providing access to education to students who may not have access to traditional educational resources (Wang, 2021).

Challenges Faced by Educational Leaders in Maximizing Artificial Intelligence for Sustainable Development in Nigeria.

The integration of Artificial Intelligence (AI) in the education sector has the potential to transform the way students learn and teachers teach, ultimately leading to sustainable development. However, educational leaders in Nigeria face several challenges in maximizing the use of AI for sustainable development. According to Goksel and Bozkurt (2019), some of those challenges include:

- **Inadequate Infrastructure and Funding:** inadequate infrastructure and funding pose a significant challenge. AI requires high-speed internet connectivity, advanced computer hardware, and software systems, which are often lacking in many educational institutions in Nigeria. Furthermore, the cost of acquiring and maintaining such infrastructure is high, and most educational institutions in Nigeria may not have the financial capacity to invest in such technology.
- **Lack of technical expertise among educators and education administrators** is another significant challenge. Educational leaders in Nigeria need to understand the technical aspects of AI, including the development of AI applications, data analysis, and algorithm design. However, most educators and education administrators in Nigeria lack the necessary technical skills, which made it difficult for them to maximize the use of AI.
- **To direct the integration of AI into the education sector, suitable policies and regulations must be developed.** Education leaders find it challenging to make well-informed

judgments about the integration of artificial intelligence due to the lack of policies and regulations, which creates a climate of uncertainty.

- Optimizing artificial intelligence (AI) for sustainable development in Nigeria is hindered by ethical issues. Concerns exist over the possible biases that AI systems, particularly those created in foreign nations, may include. As a result, it's essential to create moral standards that guarantee just and equal application of AI in education. The public has to be better informed about the advantages and possible drawbacks of artificial intelligence. The majority of Nigerians may be dubious about the utilization of AI in education, and they are unaware of its possible advantages. As a result, leaders in education need to communicate with the public and raise awareness of the potential benefits of artificial intelligence in educational settings.

Ways of Addressing the Challenges Faced by Educational Leaders in Maximizing Artificial Intelligence for Sustainable Development in Nigeria.

Addressing the challenges faced by educational leaders in maximizing artificial intelligence for sustainable development in Nigeria will require a multi-faceted approach involving various stakeholders. Here are some ways to address the challenges:

- Infrastructure and funding: government and private organizations should invest in the development of AI infrastructure in schools and other educational institutions. This includes providing high-speed internet connectivity, advanced computer hardware, and software systems. Public-private partnerships can be established to fund the development of AI infrastructure in schools, which will help reduce the financial burden on educational institutions.
- Technical expertise: educational managers in Nigeria should collaborate with AI experts to develop training programs for teachers and education administrators. These programs should focus on equipping educators with the necessary technical skills needed to integrate AI into the education sector.
- Policies and regulations: the government should formulate policies and regulations to guide the integration of AI in the education sector. These policies should address issues such as data privacy, ethical concerns, and bias in AI systems. Educational leaders should also be involved in the development of these policies to ensure that they are relevant to the Nigerian context.
- Ethical concerns: educational leaders should develop ethical guidelines that address issues such as bias, data privacy, and transparency. These guidelines should be enforced

to ensure that the use of AI in the education sector is fair and equitable. Public awareness and education: educational leaders should engage with the public and increase awareness about the benefits of AI in education. This can be done through community outreach programs, workshops, and seminars.

- Additionally, AI-based educational resources can be developed and distributed to schools to help students understand the technology and its applications. (Goksel and Bozkurt, 2019).

Conclusion

The integration of artificial intelligence in educational leadership has the potential to promote sustainable development. It underscores the importance of artificial intelligence, which can facilitate personalized learning, data analysis, research and innovation, and accessibility for sustainable development. Furthermore, the study recognizes the need for artificial intelligence and educational leadership to transform education and contribute to sustainable development. The article also addresses the challenges faced by educational leaders in maximizing the potential of artificial intelligence in educational leadership for sustainable development and suggests ways to overcome these challenges. In summary, this paper reveals the potential of educational leadership and artificial intelligence for advancing sustainable development goals, which will benefit students, stakeholders, and society as a whole.

Suggestions

By leveraging on the potentials of artificial intelligence, educational leaders, students and stakeholders can help build a sustainable future through the following suggestions:

1. Encourage educators and students to think creatively and explore new ways to leverage on artificial intelligence development to promote sustainable development. Provide them with the resources and support they need to develop and implement innovative ideas.
2. Educate students and teachers about the potential of artificial intelligence to address sustainability challenges, and help them understand the ethical, social, and economic implications of artificial intelligence adoption.
3. Bring together experts from various disciplines, such as computer science, engineering, business, and environmental studies, to collaborate on artificial intelligence-driven sustainable development projects.

4. Equip educators and students with the skills they need to work with data, including how to collect, analyse, and visualise data to drive informed decision-making for sustainable development.
5. Build partnerships with industry and government to access funding and expertise, as well as to ensure that artificial intelligence applications align with sustainable development goals.

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Accessing Student Soft Loans and Academic Performance of Students in Rivers State

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Abstract

The study examines the effects of student soft loans on the academic performance of students in the state-owned universities in Rivers State. Questionnaires were administered to 248 postgraduate students of River State University (RSU) and Ignatius Ajuru University of Education (IAUE). Taro Yamen formula was determined used to determine the sample size, while the simple random sampling technique was adopted proportionately to select the respondents from each university. Findings shows that student soft loans exert a positive and significant influence on the academic performance of students and significantly influence on their study habits for continuous and sustained improvement in the academic performance. The studies concluded that student soft loans have significant role to play in enhancing the academic performance of students in Rivers State especially students in the universities. The recommendation is that educational officials, institutions and authorities in Rivers State should take proactive measures to improve the accessibility of soft loans for students in the universities in Rivers State, Nigeria. This involves streamlining application processes, increasing awareness, and establishing support systems to guide students through the loan application process. This can empower students to make informed borrowing decisions, ensuring they understand the terms and conditions of soft loans.

Keywords: Soft Loans, Students, Academic, University, Rivers State, Performance

Introduction

The pursuit of higher education has long been considered a paramount avenue for personal and societal advancement. As a result, various financial mechanisms have been devised to ensure equitable access to tertiary education. One such mechanism is the provision of soft loans, a prevalent approach employed by many governments and institutions globally. Soft loans are typically low-interest loans tailored to students to help alleviate the financial burdens associated with pursuing higher education. The rationale behind these loans is to ensure that financial constraints do not impede students' academic aspirations, ultimately leading to increased graduation rates and enhanced academic performance.

Soft loans being a channel for mitigating financial barriers in schools are posited to positively impact students' ability and capability by allowing students to focus more on their studies and academic engagement rather than doing menial jobs in schools and outside the schools to raise funds to pay for their fees in school. Concurrently, academic performance, as measured by GPA and other indicators, is expected to be positively influenced by reduced financial

stress, leading to enhanced focus on coursework and academic endeavours (Floyd, 2015). education like every other thing that captivates the attention and attraction of vast interest, does not come very cheap. Recently, the high demand for education and the problem of lack of adequate finance have caused the development of various platforms where students can get students soft loans in Nigeria to finance their schooling. In Nigeria, President, Bola Ahmed Tinubu recently passed the “Access to Higher Education Act, 2023”, an important bill meant to provide interest-free education loans (soft) to students in tertiary institutions in Nigeria (Chukwu, 2023). It is a soft loan because its interest rate is below market interest. This type of loan is also called soft financing. Soft loans often provide added concessions to borrowers, like, interest holidays or long repayment periods. The government provides loans for students after it has been considered as a worthwhile project and the soft loan is only meant for students in the tertiary institution. The scheme is also known as the Student Loan Act, or the Education Loan Fund, which is designed to support Nigerians in financing higher education. The scheme states that students can repay the loan on an instalment basis, beginning two years after they complete their participation in the National Youth Service Corps (NYSC) program.

The effectiveness of soft loans varies across different institutional settings, socio-economic backgrounds, and academic disciplines. Cultural and societal norms, loan repayment terms, and the overall economic context also contribute to the intricate landscape in which these variables interact. However, a nuanced interplay of factors shapes the relationship between soft loans and academic performance. The influence of financial factors, including student loans, on higher education outcomes has garnered substantial attention in educational research. Previous studies have primarily focused on the broader impact of financial aid and loans on access, loans and teachers’ performance, enrolment, and persistence rates among students (Baker & Montalto, 2019; Scott-Clayton, 2011). However, limited research has delved comprehensively into the specific effects of soft loans on academic performance especially in Nigeria. This study seeks to bridge the gap in the existing literature by conducting a comprehensive assessment of the influence of students' soft loans on the academic performance of students in Nigeria, with a particular concentration in Port Harcourt. By employing a mixed-methods approach, integrating quantitative analysis of institutional data and qualitative insights from student experiences, this study aims to provide a holistic understanding of the multifaceted dynamics involved.

One of the foremost issues currently bedevilling learning in Nigeria is the rising costs associated with higher education which have led to concerns regarding equitable access and timely

completion of academic programs. Soft loans, characterized by their lower interest rates and more lenient repayment terms, have gained prominence as a “means to an end” by enhancing students' ability to pursue education at different institutions and levels. However, the difficulty in its availability and accessibility due to documentation needed as a prerequisite to access the loans from financial and non-financial institutions, student eligibility for the loan, intuitional approval, and eligibility of the institution for soft loans to students have made students soft loans a difficult task and process to be embarked upon by the students who need these loans to enhance their ability to complete their education. The effect of the obstacle in accessing the soft loan is mostly predominant amongst those students with very poor family backgrounds who cannot afford to pay the required school fees and have enough for their upkeep. The problems associated with the students' soft loans which have been heralded as a potential catalyst for ensuring students' timely graduation and elevating their academic performance have become a challenge for institutions of higher learning. To this end, the study specifically determines the influence of access to students' soft loans on academic performance of students in the state-owned universities in Rivers State.

The study examines the impact of the availability of students' soft loan to postgraduate students on their academic performance, and then analyses the effect of students' soft loans on academic performance of students in the postgraduates' level of education in Rivers state. The study is relevant because in recent years, the demand for tertiary education has maintained a constant increase both locally and internationally, the significance of student soft loans as a pivotal factor in shaping students' academic journeys has gained prominence. The proposed research, which aims to comprehensively assess the influence of students' access to soft loans on both on their academic performance, stands to provide invaluable insights into the dynamics of educational financing and its consequences. The Port Harcourt context is particularly germane due to its vibrant education landscape, where the pursuit of higher education has become increasingly intertwined with economic challenges, potentially rendering soft loans a decisive determinant for students' academic outcomes.

Student Soft Loans

Student soft loans, as a financial mechanism within the realm of higher education, hold significant importance in facilitating access to learning opportunities and mitigating the financial barriers that many students face (Mgaiwa, 2018). At its core, a soft loan embodies a commitment to the principle that economic circumstances should not be a hindrance to pursuing

a college or university education. These loans are structured with terms that are more favourable to students compared to conventional loans, typically offering lower interest rates and more flexible repayment options (Ogunode et al., 2023). One of the fundamental purposes of student soft loans is to promote equitable access to education. They play a vital role in democratizing higher education by providing financial resources to students who may not have the means to cover the costs associated with tuition, books, accommodation, and other essential expenses (Herzog, 2018; Stoddard et al., 2018). By doing so, soft loans contribute to diversifying the student body, fostering inclusivity, and levelling the playing field, particularly for individuals from underprivileged backgrounds. This accessibility is paramount in addressing social inequalities and advancing societal progress.

Furthermore, soft loans are not merely financial instruments; they also possess the potential to impact students' educational experiences and outcomes (Montalto, et al., 2019; Teferra, 2015). The receipt of a soft loan can alleviate financial stress, allowing students to focus more on their studies and participate in extracurricular activities. This, in turn, may positively influence academic performance and retention rates. However, the influence of soft loans on academic success is a multifaceted and dynamic phenomenon, influenced by factors such as the timing of disbursements, utilization patterns, and the socio-economic backgrounds of the recipients. Hence, a comprehensive understanding of the intricacies of soft loans is essential for optimizing their role in enhancing educational access and outcomes (Uhunmwuango, & Diakpomrere, 2019).

Federal Government of Nigeria Education Loan

The president of Nigeria on June 12 2023 approved and signed the Students Loan (Access to Higher) Bill into law. This approval includes the establishment of education banks and student loan boards by states at concessionary interest rates to allow students easy access to funds. The federal government also approved the establishment of education funds by all states of the federation. Special emphasis is on funding teacher development and secondary education, as well as establishing a special intervention fund for individuals with special needs (Abada et al., 2023; Chukwu, 2023).

Eligibility of Student Soft loan in Nigeria

A student loan is created to assist students in paying for their education and its accompanying fees (upkeep). This type of loan varies from others in the sense that the interest rate is comparatively lower, and the repayment schedule is a lot more flexible. The question is who is

eligible to collect students' loans in Nigeria? The entitlement conditions for any student who wishes to apply for soft loans include proof of admission into any of the public tertiary institutions in Nigeria, a provision of not less than two guarantors, and a family income of less than N500,000 per annum. Usually, Federal student soft loans offer lower interest rates and improve borrower protections, hence, students should apply for those types of loans first. However, if the student needs more funds after he/she has exhausted the federal loan options, that's when the student can consider private student soft loans to assist him/her in completing the remaining financing need (Ogunode, et al, 2023).

Empirical review

In the empirical literature, studies have beamed searchlight on the suitability of soft loan in funding the education of postgraduate students in the universities, or instance, Some African countries, such as Kenya, have reported improvements in academic performance following the introduction of subsidized loans (Mokaya, 2017). However, other nations like Nigeria have faced challenges in translating increased access to higher education into tangible improvements in academic outcomes (Mohundro, Joanis, & Burnley, 2020). Research by Dynarski, & Scott-Clayton (2013) in the United States, for instance, suggests that access to subsidized student loans positively correlates with higher academic outcomes. Similarly, Schleicher (2020) highlights that countries with well-structured student loan programs tend to exhibit higher tertiary education completion rates. These findings align with the theoretical framework proposed by (Mohundro, et al., 2020) which posits that soft loans can mitigate financial barriers and promote educational attainment. However, it's crucial to note that the worldwide perspective also reveals nuances. For example, research by Floyd (2015) in Nepal opined that while soft loans increase enrolment rates, they may not always translate into improved academic performance. This discrepancy underscores the importance of considering regional and contextual factors when assessing the impact of soft loans on students' educational outcomes.

Methodology

The study employs a descriptive research design because information will be collected from respondents who are postgraduate students from the two state owned universities in Rivers State about their perceptions and experiences on students' soft loans and academic performance. As confirmed by Orodho (2009) a descriptive survey is a way of collecting the necessary information by administering a questionnaire to a sample of respondents. This study explores the literature on availability of student's soft loans, accessibility and repayment options other

relevant areas in order to highlight relevant lessons to mostly students in Rivers State and, in general terms, to students in Nigeria.

The population of the study consists of postgraduate students from two state owned universities in Rivers State. The universities are River State University (RSU) and Ignatius Ajuru University of Education (IAUE) for 2022/2023 session. The two universities were chosen because of their contributions towards the improvement of education in Rivers State. The sample size of the study was 248 which was determined using the Taro Yamen formula, while the simple random sampling technique was adopted proportionately to select the respondents from each university. This is to have accurate information and response about the student soft loans and academic performance of students in the universities.

The questionnaire was administered to only those postgraduate students that are willing to participate in the survey. The data collection instrument used in the study is questionnaires, which contained structured and semi- structures questions. The survey questionnaire contained five indicators which are relevant to the variables and the questionnaires were administered and collected timely. The data collected in the study is analysed using descriptive statistics and inferential statistics.

Results

Demographic Results

The method used in analyzing the results from the administered questionnaires is multiple regression analysis. These data are analysed using the Predictive Analytical Soft Ware (PASW) Statistic 18, formerly known as Statistical Package of Social Science (SPSS). The descriptive statistics of the demographic features of the respondents are presented in the tables below;

Demographic Distribution of the Postgraduates Students

	Frequency	Percentage
Gender of Respondents		
Male	130	52.4
Female	102	41.1
No Response	16	6.5
Total	248	100
Educational Level:		
PGDE	122	49.2

MSc	87	35.0
PhD	23	9.3
No Response	16	6.5
Total	248	100

Source: Researcher's field Result, 2023

Table above indicates that under the gender respondent's category, 130 respondents representing 52.4% of the postgraduates' students were male while 102 respondents representing 41.1% were female. This implies that more postgraduate students in both Ajuru University of Education and Rivers state university were male than female. It is overt from the result that more male postgraduate students responded to my questions than female. This gender disparity could be based on the fact that more male students are gaining admissions for postgraduate studies than female or more male students are readily assessable than female.

Again, table displays the distribution of the educational level of postgraduate students. The data reveals that out of the 248 postgraduate students, 122 representing 49.2% are studying PGDE, 87 representing 35.0% are doing MSc while 23 representing 9.3% are studying PhD and 16 respondents representing 6.5% did not provide response. The report implies that a greater number of postgraduates are studying PGDE degrees while lower number of students 23 are offering PhD degree.

Analysis of Research Questions

Research Question: Does access to student soft loan influence the academic performance of students in state owed universities in Rivers State?

Unidimensionality Analysis of the relationship between Student Soft Loan and Academic Performance of students in state owed universities in Rivers State.

Instruments	Initial	Extraction
Availability of student soft loans significantly influences my ability to focus on academic studies. ASSL1	1.000	0.988
Access to soft loans decreases my financial pressure, permitting me to concentrate better on my studies. ASSL2	1.000	0.991
The ease of obtaining student soft loans positively impacts my overall academic performance. ASSL3	1.000	0.986
Soft loans contribute to my capability to have the funds for essential academic resources such as textbooks,		

study materials, and technology. ASSL4 1.000 0.527

The knowledge of funds availability through access to student soft loans have positively motivated my decision to study more intensely, to improve my academic performance. ASSL5 1.000 0.950

Table shows unidimensionality analysis that indicates the validity aspect of the instrument under objective one that assesses how accurately the instrument measures what it is planned to measure (Indihadi et al., 2022; Josa & Aguado, 2020). Table 4.2 reveals that the range of figures obtained from the unidimensionality analysis for objective one is between 0.527 to 0.988 which confirmed that the instruments under objective one can accurately measure the relationship between students' soft loan and academic performance of students which it sets to measure.

Table 4.3- Internal Reliability for Objective one: Analysis on Accessing Student Soft Loan and Academic Performance of students in state owed universities in Rivers State.

<u>ASSL</u>		
Cronbach's	Alpha	Number of Items
	0.866	5

Source: Researcher's field Result, 2023

The analysis in Table 4.3 shows that 0.866 is figure obtained from the Cronbach alpha analysis. The result reveals that the latent construct in objective one is above the predetermined (acceptable) value of 0.7. The result indicates clearly that the instruments used in objective one is internally reliable.

4.2 Descriptive Analysis of the Constructs

Table 4.4: Descriptive Statistics

	Min	Max	Mean	Std Dev
ASSL1	1	4	3.55	0.797
ASSL2	1	4	3.56	0.796

ASSL3	1	4	3.55	0.797
ASSL4	1	4	3.40	0.886
ASSL5	1	4	3.62	0.789

Source: Researcher's field Result, 2023

Table 4.4 shows the univariate analysis or descriptive statistics of the constructs. The result on table 4.4 reveals that the variables have a minimum and maximum value of 1 and 4, while the standard deviation (SD) are all between 0.79 and 0.88. This implies that deviations from the mean is very high and the values in the data are closely related to the mean.

4.3 Test of Hypothesis

The test of each hypothesis involves the measurement of the instruments under each construct (latent variables) to ascertain their relevant and degree of relationship amongst each other. variable.

Hypothesis 1: There is no significant relationship between student soft loans and academic performance of students in state owed universities in Rivers State.

Table 4. 5: Descriptive Analysis of the relationship between Access to Student Soft Loans enhances my academic performance (ASSL)

Instruments	No Response	VLE	LE	HE	VHE
ASSL1	16	18	27	50	137
	(6.5)	(7.3)	(10.9)	(20.2)	(55.1)
ASSL2	16	18	27	65	122
	(6.5)	(7.3)	(10.9)	(26.2)	(49.1)
ASSL3	16	18	34	71	109
	(6.5)	(7.3)	(13.7)	(32.7)	(44.0)
ASSL4	16	30	36	55	111
	(6.5)	(12.1)	(14.5)	(22.2)	(44.8)
ASSL5	16	18	27	52	135.0
	(6.5)	(7.3)	(10.9)	(12.4)	(54.4)

Source: Researcher's field Result, 2023: VLE = Very Low Extent; LE = Low Extent; HE = High Extent; VHE = Very High Extent

Table 4.5 reveals that in the response obtained in the first question/instrument (ASSLI) under this construct, 45(18.1%) of the student respondents indicated a very low extent or low extent, 187(75.4%) indicated a high extent or very high extent and 16(6.5%) did not respond. This suggests that the majority of the student respondents indicated that the availability of student soft loans significantly influences their ability to focus on academic studies. The second instrument (question), ASSL2 showed that 45(18.1%) of the student respondents indicated a very low extent or low extent, 187(75.4%) indicated a high extent or very high extent and 16(6.5%) did not respond. This suggests that the majority of the student respondents indicated that access to soft loans decreases their financial pressure, permitting them to concentrate better on their studies.

The third instrument (question), ASSL3 shows that 52(21%) of the student respondents indicated a very low extent or low extent, while 212(85.5%) indicated a high extent or very high extent 16(6.5%) did not respond. This suggests that the majority of the student respondents accept that the ease of obtaining student soft loans positively impacts their overall academic performance. The fourth instrument (question), ASSL4 reveals that 66(26.6%) of the student respondents indicated a very low extent or low extent. However, 166(66.9%) indicated a high extent or very high extent and 16(6.5%) did not respond. This suggests that the majority of the student respondents believe that soft loans contribute to their capability to have the funds for essential academic resources such as textbooks, study materials, and technology.

The fifth instrument (question), ASSL5 reveals that 45(18.1%) of the student respondents indicated a very low extent or low extent, while 187(75.4%) indicated a high extent or very high extent and 16(6.5%) did not provide response. This suggests that the majority of the student respondents consider the knowledge of funds availability through access to student soft loans to positively motivate their decision to study more intensely, to improve their academic performance.

The results on table 4.5 show that more students agree that access to students' soft loans can enhance their academic performance. The implication of the result is that access to a student's soft loan is beneficial to the student's academic performance, hence, it can motivate students to study harder for improved performance in school. Therefore, the researcher rejects the null hypothesis that there is no significant relationship between access to student soft loans and the academic performance of students and accepts the alternative hypothesis that a significant

relationship exists between access to student soft loans and the academic performance of students in the state owned universities in Rivers state.

Discussion of Findings

The findings of this research provide robust evidence in favour of the proposition that student soft loans have a significant influence on the academic performance of students in state-owned universities in Rivers State, Nigeria. The results indicate a high level of consensus among participants, as seen by the weighted mean scores ranging from 3.40 to 3.60. This finding supports the previous empirical research conducted by Baker et al. (2019), which indicated that access to student loans would provide graduates with better academic performance. Both studies concur in their findings that the reduction in financial stress through the provision of soft loans can create an environment conducive to effective learning, potentially leading to improved academic performance

Conclusions

This study examined the influence of access to students' soft loans on academic performance of students in two state-owned universities in Rivers State. In the study, 232 responses were obtained from respondents through the use of a well-structured questionnaire. All the respondents were postgraduate students from the two state owned universities in Rivers State adopted in the study, including those at PhD level, Masters in Education and Post Graduate Diploma in Education depending on the willingness of such students to participate in the survey. Findings revealed that access to students' soft loans exerts a positive and significant impact on the academic performance of these students and significantly impacts on the capacity to study hard for sustained and continuous academic improvement. We, therefore, recommend that educational officials, institutions and authorities in Rivers State should take proactive measures to improve the accessibility of soft loans for students in the universities in Rivers State, Nigeria. This involves streamlining application processes, increasing awareness, and establishing support systems to guide students through the loan application process. This can empower students to make informed borrowing decisions, ensuring they understand the terms and conditions of soft loans.

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School Administration and Artificial Intelligence Towards Community Sustainable Development in Nigeria

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Abstract

An emerging trend that has great promise to improve the efficacy and sustainability of educational systems is the incorporation of artificial intelligence (AI) into school management. The use of AI in school administration and its effects on sustainable community development are examined in this paper. It makes the case that artificial intelligence (AI) may enhance decision-making, expedite administrative procedures, and establish customized learning environments—all of which support the more general objective of sustainable community development. AI allows educators and administrators to focus on more meaningful activities like strategy planning and community involvement by automating repetitive chores like scheduling, resource management, and data analysis. Furthermore, by promoting energy efficiency, cutting waste, and enabling more intelligent resource allocation, AI-driven solutions can assist sustainable educational practices.

Keywords: School Administration, Artificial Intelligence, Community Sustainable Development

Introduction

Education is the foundation for community sustainable development, which is essential for solving problems in the society. Sustainability requires a holistic approach that incorporates the interrelated dynamics of social, economic, and environmental systems (UNESCO, 2021). Therefore, it is the duty of educators and educational leaders to successfully prepare students to navigate and address future difficulties. These preparations should concentrate on improving quality in important areas such as environmental stewardship, social justice, equality, peacebuilding, and health education. according to UNICEF (2019) and Sterling (2020), an integrative approach like this guarantees that education plays a major role in creating a sustainable future.

Avurakoghene and Oredein (2023) emphasize that the development of individuals is a crucial aspect of educational leadership, with technology playing a pivotal role in facilitating this goal. Technology significantly enhances the quality of education across all levels of society,

contributing to improved learning outcomes and administrative efficiency. Akinoso (2018) highlights that contemporary society is increasingly dominated by the use of technology, defined as the application of scientific knowledge to address practical problems in human environments. Similarly, Bawa and Moyijo (2015) describe technology as a systematic and integrated process that involves identifying, analysing, and solving problems through the implementation, management, control, and evaluation of solutions.

Indeed, as technology advances, there is increasing interest in using AI in educational settings. AI technologies have the potential to transform various facets of education, including administrative functions, teaching methods, and leadership practices. AI tools can support personalized learning experiences, assist in identifying students' needs, and enable more efficient use of educational resources. Furthermore, when integrated into educational leadership, AI could enhance decision-making processes, optimize school management practices, and improve communication within school systems (Luckin, Holmes, Griffiths, & Forcier, 2019). This technological integration can lead to improved learning outcomes by providing data-driven insights and creating adaptive learning environments tailored to individual student needs (Chen, Zou, Cheng, & Xie, 2021).

Artificial intelligence has the capacity to carry out activities that have historically required human intelligence; it is a rapidly developing technology that has the potential to completely transform global sustainability initiatives. AI is essential to educational leadership because it makes administrative tasks like scheduling, record-keeping, grading, and decision-making much more efficient. Furthermore, by pinpointing areas for development and providing tailored assistance to teachers and students, AI enhances teaching and learning and can eventually help long-term community growth (Holmes, Bialik & Fadel 2021; Luckin, Holmes & Griffiths & Forcier 2018). The purpose of this paper is to investigate how AI can be successfully incorporated into educational leadership to support sustainable community development and this study seeks to add to the expanding body of research in this area.

Conceptual clarification

Concept of School Administration

School administration plays a major role in the successful running of educational institutions. as it encompasses procedures used in managing educational organizations such as schools, colleges, and universities towards actualizing stated goals and objectives. According to

Akram, Shah, & Rauf, (2018) educational leadership is a critical factor in determining the success of educational institutions. A shared objective can be achieved by staff members who are inspired and motivated by effective educational leaders

The term "school administration" refers to the methodical management of educational establishments, which includes organizing, directing, and controlling school operations in order to successfully meet learning objectives. It includes a variety of duties, including as creating curricula, managing personnel, allocating resources, and establishing school rules that promote a positive learning environment. Since school administrators operate as a liaison between educational demands and classroom implementation, they play a crucial role in developing educational policies and procedures. In addition to guaranteeing adherence to regional, state, and federal laws, efficient school management fosters creative approaches that address the many requirements of the community and children (Maqbool, Mahmood, & Iqbal 2022).

Additionally, school administration is essential in encouraging cooperation amongst community members, parents, and teachers, among other stakeholders. School administrators can develop rules that address the particular difficulties the school faces while reflecting community values and expectations by include these groups in the decision-making process. In the end, this cooperative approach improves student learning outcomes and fosters fairness within the educational system by ensuring that instructional techniques are effective and relevant (Savage, 2024). The responsibility of school administration in creating flexible and responsive policies to address the needs of all students is becoming more and more important as educational environments continue to change.

Concept of Artificial intelligence

The term artificial intelligence (AI) describes how computer systems may mimic human intellectual functions such as perception, language comprehension, learning, reasoning, and problem-solving. Artificial intelligence (AI) technologies use data analysis and algorithms to carry out activities that normally need human intellect. Applications of artificial intelligence (AI) in education include automated grading, tailored learning platforms, intelligent tutoring systems, and predictive analytics for student performance. AI can improve educational experiences and results by utilizing machine learning and data-driven insights, enabling teachers to customize their methods to meet the needs of each unique student (Ertel,2024).

Since AI is revolutionizing conventional teaching strategies and administrative procedures, its significance in contemporary education is substantial. AI-powered solutions are able to analyse enormous volumes of data in order to spot trends in learning, evaluate students' progress, and give immediate feedback. By implementing tailored learning experiences that accommodate a range of learning styles and speeds, instructors can enhance student engagement and academic performance (Davenport, Brynjolfsson, McAfee & Wilson, 2019). AI can also expedite administrative work, giving teachers more time to concentrate on instruction and developing deep connections with their kids. The use of artificial intelligence (AI) holds great promise for addressing present issues and transforming teaching and learning methodologies as educational establishments continue adopt technology.

SUSTAINABLE COMMUNITY DEVELOPMENT

One of the main global goals is sustainable development, which focuses on addressing current demands without sacrificing the capacity of future generations to address their own. As the cornerstone of social inclusion, economic prosperity, and environmental preservation, communities are essential to attaining sustainable development. By encouraging education, diversity, and resource exchange, communities can match local customs with international sustainability goals. Community members actively participate in planning and decision-making processes through the participatory approach, which guarantees the effectiveness and equity of development projects. For example, localized solutions can solve global concerns through grassroots innovations in waste management and the adoption of renewable energy (Zaman, Ahsan, & Rahman, 2021).

Communities have a role in sustainable development that goes beyond building resilience to environmental and socioeconomic shocks. Microfinance programs are one example of a community-based effort that lowers poverty and encourages economic empowerment. The networks and connections that exist inside communities, or social capital, further improve the ability of the group to mobilize resources and solve problems. The Sustainable Development Goals (SDGs) of the UN, especially Goal 11, which promotes sustainable cities and communities, are in line with these activities. According to studies, more sustainable and habitable settings result from community people being involved in urban planning (Kovacic, Strand, & Völker 2020). This emphasizes how important community involvement is to the creation and application of policies.

Furthermore, ongoing investments in infrastructure, education, and capacity-building are necessary for communities to flourish sustainably. People who participate in educational programs that emphasize sustainable practices and environmental stewardship have the information necessary to make wise judgments regarding their environment. In a similar vein, technological and infrastructure advancements like water conservation systems and smart grids improve sustainability locally. To provide the required funding and policy support for these efforts, governments, businesses, and non-governmental groups must work together. Communities can become the cornerstones of sustainable development through a collaborative strategy that involves all stakeholders (Smith & Stirling, 2018).

ARTIFICIAL INTELLIGENCE FOR SUSTAINABLE COMMUNITY DEVELOPMENT

Artificial Intelligence (AI) is transforming sustainable community development by providing cutting-edge instruments and solutions that improve governance, community well-being, and resource efficiency. Data-driven decision-making is made possible by AI-powered systems, which help communities solve pressing issues like poverty, education, and environmental degradation while making the most use of scarce resources. To reduce energy waste and encourage the use of renewable energy sources, smart grids can be implemented thanks to AI's ability to analyse big datasets and find patterns in energy usage (Li, Zhang, & Zhao, 2022). These uses highlight AI's capacity to match regional development strategies with international sustainability objectives.

One of the significant contributions of AI is its ability to improve urban planning and infrastructure management. AI-powered tools like predictive modelling and geospatial analysis assist in designing smart cities that are resilient to environmental and social challenges. For example, AI can simulate the impact of climate change on urban areas, helping planners create adaptive infrastructure. Furthermore, real-time AI-driven monitoring systems improve waste management, traffic flow, and disaster preparedness, ensuring safer and more sustainable communities (Singh, Kumar, & Jain, 2021). These advancements are crucial for achieving Sustainable Development Goal (SDG) 11, which emphasizes sustainable cities and communities.

Artificial intelligence also promotes empowerment and inclusivity by resolving inequalities in access to financial, medical, and educational services. In order to close educational gaps and

improve human capital, AI-driven e-learning platforms offer individualized instruction to marginalized communities. Artificial intelligence (AI) applications in telemedicine also improve community health outcomes by bringing healthcare services to remote locations. According to Rahman, Kabir., & Alam (2023) Artificial intelligence helps small-scale farmers in agriculture by enabling precision farming systems that maximize crop yields while reducing their negative effects on the environment. AI plays a major role in building just and sustainable communities by lowering disparities and enhancing access to necessary services.

Even if AI has the potential to revolutionize community development, there are practical and ethical issues that must be resolved. Policies that guarantee the ethical use of AI are necessary, as evidenced by worries about algorithmic bias, data privacy, and the digital divide. Furthermore, promoting local ownership of AI-driven projects requires enhancing community AI capabilities through training and education. Governments, businesses, and non-governmental groups must work together to optimize AI's advantages while reducing its threats (Zhang & Wang, 2023). With careful application, artificial intelligence (AI) can be a potent accelerator for attaining sustainable development in local communities across the globe.

SCHOOL ADMINISTRATION AND ARTIFICIAL INTELLIGENCE FOR SUSTAINABLE COMMUNITY DEVELOPMENT

School administration is changing as a result of artificial intelligence (AI), which allows organizations to maximize their productivity and support long-term community growth. AI gives administrators more time to concentrate on strategic planning and student-centred activities by automating time-consuming administrative duties like scheduling, attendance tracking, and data analysis. By ensuring that resources are distributed efficiently, this operational efficiency reduces waste and promotes sustainability. AI systems, for example, can forecast resource requirements by analysing enrolment data, guaranteeing fair distribution and lowering the possibility of over- or under-utilization (Zhang & Liu, 2021).

AI also enhances educational resource management, which is critical for promoting environmental sustainability within schools. AI-powered energy management systems optimize electricity usage, reducing carbon footprints and operational costs. Digital learning platforms, supported by AI, reduce reliance on paper-based resources, promoting eco-friendly practices. Furthermore, virtual laboratories and simulations enable students to engage in experiential learning without the need for extensive physical materials, aligning with Development Goal (SDG) 12, which emphasizes responsible consumption and production (Li, Zhang, & Zhao,

2022). These technological advancements position schools as leaders in sustainable practices within their communities.

Sustainable development necessitates community engagement, and AI helps schools forge closer bonds with the community. Schools can continue to communicate with parents, local government representatives, and community organizations in a transparent and consistent manner thanks to AI-driven platforms. Schools can use predictive analytics to pinpoint community needs, like environmental campaigns or literacy initiatives, and work with stakeholders to successfully solve these issues. Additionally, schools can serve as centers for sustainability education thanks to AI, which encourages community members to take awareness and action together (Rahman, Kabir, & Alam, 2023).

AI integration in education also fosters inclusion, which is critical for long-term community growth. Intelligent tutoring programs offer individualized instruction to meet the various requirements of pupils, especially those from underrepresented groups or with disabilities. AI-driven language translation technologies promote fair educational opportunities by guaranteeing accessibility for students in multilingual environments. Furthermore, by identifying and assisting at-risk children, predictive analytics help school's lower dropout rates and enhance overall academic results. Such initiatives promote long-term sustainability and fortify communities' social cohesion (Singh & Gupta, 2022).

Challenges Encountered by School Administrators in Leveraging Artificial Intelligence for Sustainable Community Development in Nigeria.

There are many obstacles in Nigeria when it comes to implementing artificial intelligence (AI) in school administration to promote sustainable community development. The major problems are the absence of proper infrastructure, which includes erratic power supplies and spotty internet access, inadequate funding, lack of technical expertise, data privacy and ethical concerns and digital divide.

Erratic Power supply and spotty internet

When school administrators in Nigeria try to use artificial intelligence (AI) to support sustainable community development, they face major obstacles due to unstable internet connection and an unpredictable power supply. These infrastructure constraints make it more difficult to integrate AI technology, which need reliable electricity and fast internet to work at their best. This could make it harder for schools to adopt AI-powered teaching resources, data

analysis programs, and other AI applications that could help with community development projects. It is more difficult for educational institutions in underprivileged areas to fully utilize AI in promoting socioeconomic development because of the uneven supply of resources, which further widens the digital divide (Adamu & Mohammed, 2023; Okoye, Nwachukwu, & Chukwuma 2022).

Effective implementation of AI-based systems is challenging in many schools, particularly those in rural areas, which have limited technology infrastructure. The deployment and operation of AI tools for administrative and educational purposes are hampered in the absence of reliable energy and internet connection, leading to discrepancies in the adoption of AI technology (Adepoju & Salawu, 2021).

Inadequate funding

Inadequate funding for educational technology efforts is another problem. Due to financial limitations, many Nigerian schools give priority to necessities above new technology. The significant hardware, software, and training costs associated with implementing AI are frequently out of the price range of underfunded public institutions. Additionally, the lack of government funding for educational technology makes this problem even worse by depriving school administrators of the tools they need to successfully incorporate AI into their systems (Okafor, Olatunji, & Adeyemi, 2022).

Lack of Technical expertise

One major obstacle is the lack of technical skills among educators and school administrators. Many educators in Nigeria lack the abilities and know-how to implement and use AI solutions. The lack of thorough training programs designed to give educators the competences required for integrating AI further widens this skills gap. Because of this, administrators are unable to fully utilize AI's potential to improve school administration and promote community development (Adebayo & Adedoyin, 2023).

Data privacy and Ethical Concerns

Concerns about ethics and data privacy are also major barriers. Sensitive data about students, instructors, and communities is frequently gathered and processed when AI systems are used. Nigeria does not, however, have strong data protection laws to prevent abuse or security breaches. This deters schools from implementing AI technologies by bringing up ethical questions around the possible misuse of personal data. For Nigerian schools, maintaining

adherence to international data privacy requirements continues to be a major concern (Eze, Akinola, & Uche, 2021).

Digital Divide

Finally, the equitable use of AI for sustainable community development is further constrained by the digital divide between urban and rural schools. Rural schools frequently lack even the most basic digital resources, whereas urban schools could have access to basic technical infrastructure. This discrepancy erodes AI's potential to support sustainable development on a national level by maintaining disparities in community involvement and educational quality (Lythreathis, SSingh, & El-Kassar, 2022).

Conclusions

In conclusion, integrating artificial intelligence (AI) into school administration offers a promising way to promote sustainable community development in Nigeria. AI can improve educational management by simplifying administrative tasks, enhancing decision-making, and creating individualized learning environments for students. By integrating AI into school operations, administrators can monitor student progress, allocate resources optimally, and implement data-driven strategies that cater to the specific needs of their communities. This technological shift could result in more effective and efficient educational systems, which would ultimately benefit society as a whole.

However, resolving the issues of insufficient infrastructure, a lack of technological know-how, and resource accessibility is necessary for the effective use of AI in schools. Poor internet connectivity and erratic electricity supplies remain major challenges, particularly in rural areas. It is imperative that the public and commercial sectors work together to improve infrastructure, offer reasonably priced AI tools, and provide thorough training programs for educators and school administrators in order to get over these obstacles. The entire potential of AI in education can only be achieved with these coordinated efforts.

As long as local ideas, frameworks, and policies support the country's development objectives, artificial intelligence in Nigerian schools has a bright future. By solving local issues, encouraging sustainable behaviours in communities, and giving students the skills they will need for the workforce of the future, the efficient application of AI can spark greater societal change. Nigerian school administrators must continue to be flexible as AI technology develops, making sure that its uses are ethical, inclusive, and pertinent to the nation's socioeconomic

situation. AI has the potential to be a potent instrument in creating a sustainable and successful future for everybody in this way.

Suggestions

The following tactics can be put into practice to help school administrators in Nigeria overcome the obstacles they face when utilizing artificial intelligence (AI) for sustainable community development:

1. **Improved Infrastructure Investment:** Investments in dependable power and internet infrastructure should be given top priority by the Nigerian government and educational establishments. This can entail establishing solar-powered systems in isolated locations and forming alliances with telecom providers to guarantee that schools have access to fast internet.
2. **Adequate funding:** The education sector should receive adequate funding from the government to improve the usage of AI in the classroom.
3. **Capacity Building and Training:** Regular training on AI technologies and their applications should be provided to educators, students, and school officials. This will improve their technical proficiency and enable them to successfully incorporate AI tools into community development and school administration initiatives.
4. **Policy and Regulatory Frameworks:** Creating national rules that encourage the use of AI in education can give administrators and schools a clear path forward. To guarantee that AI is applied in a way that benefits all communities, these regulations should cover topics like data protection, AI ethics, and fair access to technology. The government of Nigeria should enact laws to protect artificial intelligence usage in Nigeria.
5. To end digital divide and guarantee that all schools, wherever they may be, may take advantage of AI advancements, certain regulations and funding are needed.

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School-Community Partnership and Effective Implementation of Financial Accounting Curriculum in Secondary Schools in Omuma Local Government Area of Rivers State

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Abstract

The study sought to investigate the relationship between School-Community Partnership and Effective Implementation of Financial Accounting Curriculum in Secondary Schools in Omuma Local Government Area of Rivers State. Two research questions and hypotheses guided the study. Correlational research design was adopted for the study. The area of the study was Omuma Local Government Area of Rivers State. The population of the study comprised 104 teachers in Secondary Schools in Omuma. The entire population was studied because the population was manageable. Two self-made questionnaires titled: "Questionnaire on School Community Partnership (QSCP) and Questionnaire on Effective Implementation of Financial Accounting Curriculum (QEIFAC)" were used to collect data for the study. Three experts, one in Measurement and Evaluation and two in Business Education Department of Rivers State University validated the instruments. The Cronbach Alpha Method was used to ascertain the reliability coefficients of the instruments which yield 0.86. A total of 104 questionnaires were administered and 101 were completely filled and returned for the study. Pearsons Product Moment Correlation Coefficient (PPMCC) statistics was used to answer the research questions and test hypotheses. Finding showed that the relationship between availability of educational resources and effective implementation of financial accounting curriculum is moderately positive. It was recommended amongst others that school heads should ensure good community relationship as this could help mobilize community members to increase their participation in school management particularly in the area of promoting financial support and literacy education to the school.

Keywords: Financial Accounting, School Community-Partnership, Curriculum, Curriculum Implementation, Secondary School.

Introduction

Generally, interest in community participation in schools is not a new phenomenon but started long time before independence, when parents were part and parcel of school. In those old days, the community worked hand in hand with schools to ensure the education that the children acquired was in line with their culture. It was envisaged that school was just an instrument employed by the community to preserve and maintain the culture of the local community, while also helping the children understand the culture of other societies (Gudrige, 2014). During colonial period, the role of the society changed from supporting the school to maintain the culture, controlling and monitoring self-control within the school-community partnership. The school community partnership came to be a part and parcel of

decentralization process in education system in the early 1980s. In this period, community participation was among the major theme in school reform in several education systems. (Effiong & Odey, 2012). The emphasis on community partnership in education was due to their participation in development (Kendall, 2017), which aimed at ensuring quality implementation and monitoring at lower levels of accountability. Consequently, community participation in supporting education was an agenda to achieve democratization of decision-making processes in schools.

School community partnership in education refers to the collaboration between schools and the communities they serve. This can include a wide range of activities and initiatives such as parental involvement in school governance, collaboration between schools and community organisations and joint efforts to address social issues such as health, poverty and crime. School community can be achieved through integrating the schools activities into those of the community within which the school is located, providing the necessary financial support to the school for development project such as construction and or renovation of classrooms, provision of instructional facilities, laboratories, libraries, and among others, provision of school facilities such as plants, equipments, buildings, furniture such as table, chairs and other infrastructural facilities to enhance effective implementation of the curriculum, maintenance of discipline amongst students, maintenance of conducive teaching/learning environment to raise academic standards in the schools and participation in management of the school.

This suggest that the role of community participation in supporting schools has been gaining prominence worldwide and this idea was discussed in the United Nations General Assembly as among the strategies to achieve Sustainable Development Goal 4 (SDG-4) (UN, 2015). In that discussion, the role of community in supporting education was considered as an important strategy to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (UN, 2015). Okumu (2008) found that education is an essential human right as well as a substance for economic activities and human development growth. In line with the opinion of Okumu, Epstein (2010), emphasized that community partnership must be understood as an important component of school effectiveness, since students learn more when parents and others in the community take active roles in the teaching and learning process. Schultz (2012) stated that investment in education contributes to a fast growth for developed and newly industrialized countries. This is the reason why developing countries especially in sub-Saharan Africa are now giving attention to supporting schools using all possible means

including involving the community. It is through the community that the schools can provide quality accounting education and competitive students who can effectively contribute to the development in the global economy (Liou & Miles, 2019).

Accounting may be as old as life. In business, accounting is often described as the language of business (Nwaeze, 2015). However, in senior secondary schools, it is the financial accounts that is offered as elective subject. Financial accounting is aimed at gathering information and producing reports on an organisation's financial activity. Financial accounting according to Robert (2004) in Nwokike and Jim (2016), is the process of collecting, recording, presenting and analyzing/interpreting financial statements. In other words, financial accounting is a specialized branch of accounting that keeps record of a company's financial transactions. In the view of the researchers, financial accounting is a branch of accounting that focuses on the preparation of financial statements and reports for external users, such as investors, creditors and regulators. It involves recording, summarizing and presenting financial transactions of a business entity in accordance with Generally Accepted Accounting Principles (GAAP) or International Financial Reporting Standards (IFRS). The primary financial statements produced through financial accounting include the income statement, balance sheet, and cash flow statement, providing a snapshot of a company's financial performance and position. Financial accounting is the process of collecting, recording, analyzing and reporting financial information about an organization. It is used to provide a comprehensive picture of an organizational health, and it is a critical tool for decision making and planning. Financial accounting is that aspect of accounting that is involved with the recordings, analyzing, classifying, summarizing of financial transactions of a business enterprise and the interpretation of such information to the potential users of the information. Miller (2012) define financial accounting as the art of recording, classifying and summarizing in a significant manner and in terms of money transactions, an events which are in part at least, of financial character and interpreting the results thereof. Financial accounting and financial accounting curriculum can be seen as complementary, with each supporting and reinforcing the other.

Financial accounting curriculum is the body of knowledge and skills that is taught to students studying finance, accounting or business-related fields. The curriculum typically covers topics like the nature and scope of accounting, the role of accountants, history, principles and conventions of accounting, double entry bookkeeping system, subsidiary books, the ledger, the trial balance and final accounts among others. Financial accounting curriculum is designed to

meet the following objectives: To provide specialized instruction to prepare students for careers in the accounting fields, provide accounting skills for personal use in the future, enable the senior secondary school candidates appreciate the basic rules, functions and principles of accounting and assess candidate's knowledge of basic accounting principles, practice and their application to modern business activities. Therefore, the primary objective of financial accounting in secondary school is to lay foundation for further study of accounting and allied courses of higher level. To achieve the set objectives of financial accounting, there should be proper implementation of its curriculum.

Financial accounting curriculum implementation refers to the process of putting the theoretical knowledge and principles of financial accounting into practice. This can take many forms, including classroom assignments, case studies, group projects and internships. The goal of financial accounting curriculum implementation is to help students develop the practical skills and competencies they needed to succeed in a career in financial accounting. It also aims to provide students with opportunities to apply what they have learned in a real-world context, so that they can gain experience and develop confidence in their abilities.

According to Ekpo and San (2019), the goal of financial accounting curriculum implementation is to equip students with the skills and knowledge they need to be successful in a variety of financial accounting and analysis roles. The curriculum should be designed to be relevant to the needs of the students and should provide them with the opportunities to apply their learning in real-world situations. Ekpo and San (2019), stated further that several factors influence effective implementation of accounting curriculum in secondary schools. These factors include inadequacy of qualified teachers, poor funding of school, inadequate infrastructural facilities and inadequate provision of instructional materials.

Inadequacy of Qualified Teachers: Another critical issue in implementing secondary education financial accounting curriculum is the inadequacy of professionally qualified teachers. For any programme to be successfully implemented, the implementer must be qualified and adequate. It is disheartening to note that in most public secondary schools in Nigeria, very few teachers are in existence to the extent that in most cases, teachers are compelled to teach subjects that are not their areas of specialization. For instance, a situation where a teacher who read Christian Religion knowledge is allowed to teach English language and mathematics, one wonders the type of knowledge he/she is going to impart to the learners since no teacher teaches what he does not know.

Poor Funding of Schools: Is a major issue that affects implementation of secondary school financial accounting curriculum. As observed by Nwagwu (2013), one impressive feature of educational institutions in Nigeria since independence has been the phenomenal increase in number of students and students' population. For this expansion and development to be effective, there must be massive investment of resources in the form of funds. Unfortunately, all indicators point to a chronic gross under-funding at the school system. This is a serious issue in accounting curriculum implementation in the secondary education. Every project requires money for its effective implementation. Confirming this, Mkpa (2015) noted that, funds allocated to education in Nigeria are grossly inadequate and this affected the implementation of a well- designed curriculum. A situation where there is no money for payment of teachers' salaries, purchase of equipment, books, furniture and other facilities, will hinder teachers' effective performance (Mkpa, 2015).

Inadequate Infrastructural Facilities: One of the major issues that affect implementation of secondary school financial accounting curriculum is the inadequate instructional facilities in schools. Instructional facilities refer to the basic structures and facilities necessary for effective teaching and learning in schools. Facilities are plants, equipments, buildings, and furnitures which ensure teachers' service delivery for effective teaching/learning thereby leading to attainment of the set minimum standard. However, Adesina in Saad (2014) stated that infrastructural facilities are 'material resources that could be used to achieve the stated goals in an organization'. The school infrastructural facilities according to author include classrooms, offices, staffroom, laboratories and workshops, school library, assembly hall, stores, staff quarters, toilet facilities, school vehicles and parks, Kitchen, dormitories, water and electricity, school farm etc. Facilities are not provided adequately. What is found in most secondary schools in Nigeria are dilapidated buildings, leaking roofs, lack of chairs and desks for students and teachers to use. This has negative effects on effective implementation of financial accounting curriculum. Lamenting on the type of building found in our secondary schools, Akampurira (2016) remarked that the public sector of education has witnessed stagnation and decay. Stating further that most schools are a caricature of what schools should be in a modern state. Ehiametalor (2011) argued that school facilities are the operational inputs of every instructional programme. The school is like a manufacturing organization where plants and equipment must be in a top operational shape to produce result. The author noted that to ensure that financial accounting curriculum must be effectively implemented, infrastructural facilities, equipment tools and materials must be provided sufficiently. This suggests that quality of education that

our children receive bear direct relevance to the availability and lack of physical facilities and overall atmosphere in which learning take place.

Inadequate Provision of Instructional Materials: Is another implementation issue in secondary education financial accounting curriculum. Instructional materials which John (2014), described as alternative channels of communication which a teacher can use to compress information and make them more vivid to his learners is needed for effective implementation of secondary education financial accounting curriculum. Instructional materials are ways and means of making the teaching and learning process easy, more meaningful and understandable. These instructional materials are lacking in Nigerian secondary schools, as a consequence, teachers take to teacher chalk and talk as they have no visual or audio-visual materials which the students can see, touch, smell and hear in the process of teaching and learning. John observed that when instructional materials are not available, learners cannot do well. This means that when learners are not doing well, the set objectives of education cannot be achieved. This accounted for the obvious reasons why school community partnership and effective implementation of financial accounting curriculum in Omuma Local Government Area of Rivers State cannot be overemphasized.

Statement of the Problem

School-community partnership is the collaboration between schools and the communities they serve. It covers a wide range of activities which includes, parental involvement in school governance, collaboration between schools and community organizations and joint efforts to address social issues such as poverty and crime. School-community partnership focuses more on helping accounting students to gain real-world experience by working with community organization on financial projects, developing in accounting students important networking skills through interaction with diverse people from different backgrounds and by helping accounting students to gain a sense of satisfaction and pride from giving back to the community. Unfortunately, reverse is the case as this is evident in the incidences and cases of unemployment ravaging our society. Given that school community partnership is expected to enhance effective implementation of accounting curriculum in secondary schools, the question is put: Do community support secondary schools with the needed funds and available education resources to effectively implement financial accounting curriculum in secondary schools in Omuma, Rivers State? There is a research-based gap in which this study will fill empirically.

Purpose of the Study

Purpose of this study was to investigate the relationship between school-community partnership and effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State. Specifically, the study sought to:

1. Determine how community support in terms of funding relates to effective implementation of financial accounting curriculum in Secondary Schools in Omuma, Rivers State.
2. Ascertain how the level of availability of educational resources in terms of textbooks relate to effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State.

Research Questions

The following research questions guided the study

1. How does community support in terms of funding relate to effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State?
2. How does availability of educational resources in terms of textbooks relate to effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State?

Hypotheses

The following hypotheses formulated were tested at 0.05 levels of significance

1. There is no significant relationship between community support in terms of funding and effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State.
2. There is no significant relationship between availability of educational resources in terms of textbooks and effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State.

Methodology

The correlation research design was adopted for the study. Golden (2022) described correlational research as one in which no independent variable is manipulated, instead two or more dependent variables are measured to identify possible systematic changes with the value

of each other. School-community partnership and effective implementation of financial accounting curriculum are measured in this study to identify possible variations and relationship amongst one another. The population for the study consisted 104 teachers in secondary schools, in Omuma, Rivers State. The entire population was studied because the population was of a manageable size. Two self-made questionnaires titled “Questionnaire on school community partnership (QSCP) and questionnaire on effective implementation of Financial Accounting Curriculum (QEIFAC) were used to collect data for the study. The questionnaires were designed on a 4-point ratings scale with options of Strongly Agree (SA-4points), Agree (A-3points), Disagree (DA-2points) and Strongly Disagree (SDA-1point) respectively. The questionnaires were validated by three experts, one in Measurement and Evaluation and two in Business Education Department of the Faculty of Education Rivers State University. The reliability of the instrument was established through Cronbach Alpha Statistics which yielded 0.86 and 0.75. for the first and second clusters. The aggregate reliability co-efficient of the instrument stood at 0.81. Copies of the instruments administered to the respondent were done through face-to-face contact with the aid of two research assistants. Out of 104 copies of the instruments administered, 101 copies were retrieved and used for the - analysis. Data collected were analysed using Pearsons Product Moment Correlation Coefficient (PPMC) to answer research questions in the following range:

0.75-0.99	Highly positive
0.50-0.74	Moderately positive
0.10-0.49	Low Positive
0.00-0.00	No Relationship
Below 0.00	Negative Relationship

A negative value of r-cal connotes negative relationship, while a positive value implied positive relation with varying degree depending on value. Null hypotheses were tested at 0.05 level of significance using t-transformation and correlation co-efficient. A hypothesis was not accepted if the observed t-value was greater than its critical equivalent, and accepted if otherwise.

Results

Research Question 1: How does the level of community support in terms of funding relates to effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State?

Table 1: Relationship between Community Support in Terms of Funding and Effective Implementation of Financial Accounting in Secondary Schools in Omuma, Rivers State

Variables	$\sum x$ $\sum y$	$\sum x^2$ $\sum y^2$	$\sum xy$	y-cal	Remark
Community support in terms of funding	271.51	730.4	810.80	0.89	Highly Positive
Effective implementation of financial accounting curriculum in secondary school in Omuma, Rivers State	307.26	911.84			

Source: Survey Data (2024)

Table 1 shows sums of square covariance and computed r-value of respondents on the relationships between community support and effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State. The observed covariance between community support and effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State were 810.80, while the coefficient of correlation was 0.89 indicating highly positive relationship. Therefore, the relationship between community support in terms of funding and effective implementation of financial accounting curriculum in secondary schools in Omuma in Rivers State is highly positive.

Research Question 2: How does the level of availability of educational resources relates to effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State?

Table 2: Relationship between Availability of Educational Resources and Effective Implementation of Financial Accounting Curriculum in Secondary schools in Omuma, Rivers State

Variables	$\sum x$ $\sum y$	$\sum x^2$ $\sum y^2$	$\sum xy$	y-cal	Remark
Availability of educational resources	262.08	674.37	775.55	0.74	Moderate positive relationship

Effective implementation of financial accounting curriculum in secondary school in Omuma, Rivers State	307.26	911.84
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Source: Survey Data (2024)

Table 2 reveals respective sums of responses of 262.08 and 307.26 for availability of educational resources and effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State, sums of squares of 674.37 and 911.84. It also revealed that they covary with 775.55, while their co-efficient of correlation was 0.74 which is moderately positive. This suggest that availability of educational resources has a moderately positive relationship with effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State.

Hypothesis 1:

There is no significant relationship between the level of community support in terms of funding and effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State.

Table 3: Significance of Relationship between Community Support and Effective Implementation of Accounting Curriculum in Secondary Schools in Omuma, Rivers State

Variable	$\sum x$ $\sum y$	$\sum x^2$ $\sum y^2$	$\sum xy$	y-cal	df	α	t-cal	t-crit	Decision
Community support in terms of funding	271.51	730.4	810.80	0.89	99	0.05	20.00	1.98	Reject H ₀
Effective implementation of Financial Accounting Curriculum in Secondary School in Omuma, Rivers State	307.26	911.84							

Source: Survey Data (2024)

Table 3 showed that at the significance level of 0.05, and at 99 degree of freedom, a critical t-value of 1.98 was found, while the observed value was 20.00. Since the observed value was greater than the critical value, it implies that the observed value is significant and cannot be due to chance Hence, the null hypothesis of no significant relationship was rejected and the alternative accepted. This implies that there is a significant relationship between community support in terms of funding and effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State

Hypothesis 2

There is no significant relationship between the level of availability of educational resources and effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State.

Table 4: Significance of Relationship between Availability of Educational Resources and Effective Implementation of Accounting Curriculum in Secondary Schools in Omuma, Rivers State

Variable	$\sum x$ $\sum y$	$\sum x^2$ $\sum y^2$	$\sum xy$	y-cal	df	α	t-cal	t-crit	Decision
Availability of Educational Resources in terms of funding	262.08	674.37	775.55	0.74	99	0.05	11.27	1.98	Reject H_0
Effective implementation of Financial Accounting Curriculum in Secondary School in Omuma, Rivers State	307.26	911.84							

Source: Survey Data (2024)

Table 4 reveals a computed t-value of 11.27 and a critical ratio of 1.98, at 0.05 level of significance, and a 99 degree of freedom. The computed t-value is significant since it is greater than the critical t-value. Consequently, the null hypothesis was rejected and its alternative accepted. This implies that there is significant relationship between the level of availability of educational resources and effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State.

Discussion of Findings

One major finding in this study on table 1 was that a highly positive significant relationship exists between community support in terms of funding and effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State. The research question revealed that the relationship was highly positive. In other words, if community supports secondary school through funding, the implementation of financial accounting curriculum is likely to be effective. This finding is in agreement with Ngwenya (2020), who stated that funding-related obstacles that schools face when implementing accounting curricula is the challenge of lack of funds for acquiring necessary teaching resources and the ineffective training provided to teachers on new curriculum changes.

Also, another major finding on Table 2 of this study was that, a moderately positive relationship exists between availability of educational resources and effective implementation of financial

accounting curriculum in secondary schools in Omuma, Rivers State. The tested hypothesis did not show a significant relationship, while the research question revealed that the relationship was moderately positive. This finding agrees with the finding of Makunja (2016), who explores how the shortage of resources, particularly textbooks, hampers effective curriculum implementation. Makunja stressed further that lack of textbooks and teaching materials often obstruct teacher's ability to teach the revised accounting curriculum.

Conclusion

Based on the findings of the study, it was concluded that school community partnership serves as a tool that enhance effective implementation of financial accounting curriculum in secondary schools in Omuma, Rivers State. School community partnership integrates a variety of factors such as funding and availability of educational resources. School community partnership leads to increased parent's involvement in their child education, as parents feel more connected to the school and invested in their child's success. It helps to create strong sense of community within the school and the surrounding area, as everyone works together towards a common goal. Hence, adopting community support in terms of funding and availability of educational resources will enable secondary school teachers to effectively implement financial accounting curriculum in secondary schools in Omuma, Rivers State.

Recommendations

Based on the finding of the study, and the conclusion made, the following recommendations were made:

1. School heads should ensure good school community relationship as this could help mobilize community members to increase their participation in school management particularly in the area of promoting financial support and literacy education to the school.
2. Government should enforce laws, regulations and sanctions that will compel parents and communities to be actively involved in the management of education.

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Revitalizing the Management Practices of Public Senior Secondary Schools in South-East Senatorial District for Sustainable Development in Rivers State

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Abstract

The design adopted for the study was descriptive survey design and the population comprised of 52 principals from the 52 public senior secondary schools in the district, with distribution across various local government areas, including Andoni, Eleme, Gokana, Khana, Opobo-Nkoro, Oyigbo, and Tai. The census sampling technique was employed, where all 52 principals from the 52 public senior secondary schools were selected for the study. A 21 self-structured questionnaire titled "Revitalizing the Management Practices of Schools for Sustainable Development Questionnaire" (RMPSSDQ), was employed to gather data. The questionnaire adopted a 4-point Likert rating scale. The instrument was duly validated by experts and a reliability index of 0.84 was established using Cronbach alpha. A criterion Mean of 2.50 was used as a cut-off mark while mean and standard deviation were used to answer the research questions. A t-test inferential statistics was used in testing all null hypotheses at 0.05 level significance. Statistical analysis was done using the statistical package for social science, SPSS version 23. Findings from the study revealed that unified structure of leadership, lack of capacity building for staff, inadequate resource allocation, weak monitoring and evaluation, and none involvement of educational stakeholders in schools were the management practices. Inadequate infrastructure, poor leadership styles, dearth of funds, lack of support from the government and lack of skilled manpower were the challenges of managing schools while lack of capacity building programme for staff, inadequate resource allocation, low stakeholder participation, weak monitoring and evaluation, unified leadership structure and so on should be revitalized. The study recommended amongst all others that the challenges affecting the management in schools in South-East Senatorial District of Rivers State should be identified and looked into and that heads of secondary schools should be trained and retrained on proficiency development.

Keywords: Management, Revitalizing, Rivers State, Senior Secondary Schools, Sustainable Development.

Introduction

Education is a fundamental human right and a key driver for sustainable development globally. The United Nations' Sustainable Development Goal 4 (SDG 4) emphasizes the importance of quality education in achieving sustainable development (United Nations, 2015). It is on this note that Nazar et al. (2018) affirmed that quality education is a vital tool for sustainable development since it tends to make individuals acquire knowledge, skills, and values that are needed to contribute to sustainable development. Nazar et al. (2018) further emphasized that

quality education is indispensable for achieving all the SDGs, as it helps individuals develop critical thinking, problem-solving, and communication skills, among others. In line with SDG 4, the National Policy on Education (NPE) in Nigeria emphasizes the need for education to prepare students for effective participation in the country's development (Federal Republic of Nigeria, 2014). The South-East Senatorial District in Rivers State, Nigeria, hosts numerous public senior secondary schools that play a critical role in shaping the minds of future generations. These schools are expected to provide outstanding education that prepares students for sustainable development. However, important these schools are in providing excellence services to the students and the general populace, they still face innumerable contests that hinder their ability to provide the required educational services required by them for enhanced sustainable development. This background sets the stage for the need to revitalize the management of public senior schools in South-East senatorial District in Rivers State.

As previously noted, despite the significant role these public senior secondary schools play in shaping students' lives, they continue to face numerous challenges. These include inadequate infrastructure, poor leadership and management, low academic performance, and limited resources, among others. Such issues not only compromise the quality of education but also hinder the schools' capacity to foster sustainable development practices. No wonder Pillay and Shipalana (2023) affirmed that lack of essential infrastructure, such as classrooms, libraries, and laboratories, further impedes the creation of a conducive learning environment.

Additionally, inadequate water and sanitation facilities, poor leadership and management are significant obstacles to effective school administration. In addition, if school principals and administrators lack the necessary skills and training to manage schools effectively, it could lead to inadequate resource allocation as well as poor decision-making the school system. Low academic performance is another challenge facing public senior secondary schools in the district. Students' performance in core subjects like Mathematics, English, Science, Marketing, and Civil Education is below average, hindering their ability to compete with their peers nationally and globally (Pillay & Shipalana, 2023). The limited resources available to schools are another significant challenge. Schools lack the necessary funds to provide essential resources, including textbooks, teaching materials, and technology. This limitation hinders the ability of teachers to deliver effective lessons and students to access quality education. The lack of resources also limits the ability of schools to promote sustainable development practices, including environmental education and community engagement (Coburn et al., 2013). Despite

these challenges, public senior secondary schools in the Southeast Senatorial District have strengths that can be leveraged for sustainable development. Dedicated teachers and staff, strong community support, and existing infrastructure and facilities are assets that can be built upon. Partnerships with local governments, private organizations, and community groups can provide access to funding, resources, and expertise, enabling schools to improve their infrastructure, leadership, and academic performance.

Revitalizing the management of public senior secondary schools in the South-East Senatorial District can create a conducive learning environment that nurtures academic excellence, personal growth, and sustainable development practices. This activity requires concerted effort from not only the school administrators but from teachers, students, parents, and the community at large. It is against this background that the researcher sought to investigate revitalizing the management practices of public senior secondary schools in South-East Senatorial District for sustainable development in Rivers State.

Statement of the Problem

Public senior secondary schools in the South-East Senatorial District of Rivers State are facing critical challenges that hinder their potential to contribute effectively to sustainable development. Despite their pivotal role in shaping the future of students and communities, these schools are burdened by severe infrastructure deficits, inadequate leadership, poor management practices, and limited resources. The resulting low academic performance, coupled with the lack of essential facilities such as classrooms, libraries, and laboratories, undermines the quality of education. Additionally, these challenges prevent the schools from embracing and implementing sustainable development practices that are crucial for fostering long-term educational and community growth. To achieve meaningful and lasting impact, it is imperative to revitalize the management practices within these schools. This will not only improve educational outcomes but also equip students with the skills and mindset needed to contribute to sustainable development goals. Addressing these issues through strategic interventions will help create an enabling environment for academic excellence, socio-economic progress, and sustainable community development in Rivers State. It is against this backdrop that the study aims to examine the revitalization of public senior secondary school management practices in the Southeast Senatorial District for sustainable development in Rivers State.

Purpose of the Study and Specific Objectives

The purpose of this study was to examine revitalizing the management practices of public senior secondary schools in the South-East Senatorial District of Rivers, Specifically the study;

1. Identified the management practices in public senior secondary schools in the South-East Senatorial District of Rivers State.
2. Identified the key challenges affecting the management of public senior secondary schools in the South-East Senatorial District of Rivers State.
3. Examined the management practices that should be revitalized in public senior secondary schools in the South-East Senatorial District of Rivers State for sustainable development.

Research Questions

1. What are the management practices in public senior secondary schools in the South-East Senatorial District of Rivers State?
2. What are the challenges affecting the effectiveness of leadership and management practices of public senior secondary schools in South- East Senatorial District of Rivers State?
3. What are the management practices that should be revitalized in public senior secondary schools in the South-East Senatorial District of Rivers State for sustainable development?

Hypothesis

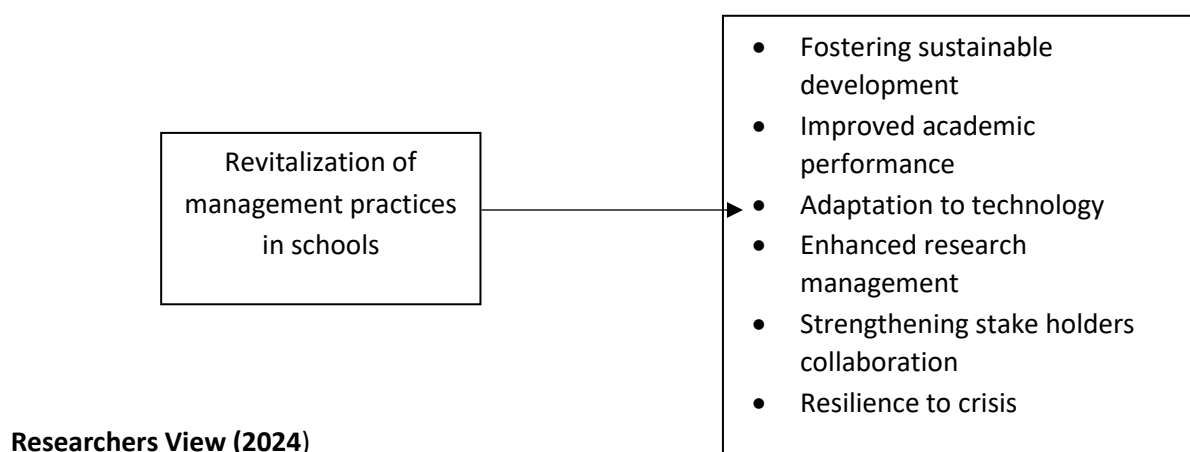
1. There is no significant difference in the mean scores of male and female respondents on the management practices in public senior secondary schools in the South-East Senatorial District of Rivers State.
2. There is no significant difference in the mean scores of male and female respondents on the challenges affecting the effectiveness of leadership and management practices in public senior secondary schools in South- East Senatorial District of Rivers State.
3. There is no significant difference in the mean scores of male and female respondents on the management practices that should be revitalized in public senior secondary schools in the South-East Senatorial District of Rivers State for sustainable development.

Theoretical Framework

This work is based on the Transformational Leadership Theory introduced by James Burns in 1978 and expanded by Bernard Bass in 1985. The theory posits that effective leaders inspire

followers to exceed expectations through a shared vision, personal growth, and innovation. It emphasizes building trust, fostering intellectual curiosity, and empowering individuals to achieve collective goals. Secondary school management encourages collaborative decision-making, innovative teaching methods, curriculum development, and resource management. This leadership style promotes continuous improvement and adaptation to modern challenges. Transformational leadership revitalizes management by encouraging teacher innovation, fostering collaboration, and setting high expectations. Schools adopting this approach become hubs of academic excellence and sustainable development. Pawar (2016) highlights how transformational leaders inspire exceptional results. Embracing this style enables educators to unlock growth, innovation, and progress. Ultimately, transformational leadership provides a framework for revitalizing education and shaping a brighter future.

Conceptual Framework



Conceptual Clarification

School Management

School management is a deliberate and organized process for achieving educational goals and objectives (Amanchukwu and Ololube 2015). It involves four essential functions: planning, organizing, leading, and controlling resources. For Oyelowo (2000), school management refers to planning, organizing, leading, and controlling resources to achieve educational goals and objectives. Furthermore, Harber et al (2005) viewed school management as an all-inclusive oversight and direction of all aspects of an academic institution, aligning with established policies and goals. It involves coordinating and integrating various components, including

policies, material and human resources, programs, activities, equipment, and facilities, to create a harmonious and productive whole.

Meaning of Revitalizing Management Practices

Sterling, (2010) defined revitalizing management practices in secondary schools as the deliberate process of reviewing, updating, and enhancing existing administrative and operational strategies to improve the overall functioning, effectiveness, and sustainability of school management. This process emphasizes aligning school policies and practices with modern educational goals, technological advancements, and sustainability principles to create a dynamic, inclusive, and efficient learning environment.

Importance of Revitalizing the Management Practices of Schools for Sustainable Development

Revitalizing management practices in schools is imperative to ensure the institutions stand the test of time in terms efficiency and effectiveness. It is on this note that some scholars affirmed the following as the importance of revitalizing the management practices of schools for sustainable development. These include;

Improve Academic Performance: Effective teaching methods, such as project-based learning, encourage hands-on learning and critical thinking. Updating the curriculum to include modern skills like coding and data analysis prepares students for the digital age. This approach enhances student engagement, creativity, and problem-solving abilities (Sasson et al., 2018). By implementing such methods, students become better equipped to excel academically and succeed in their future careers.

Enhance Infrastructure and Facilities: This is important for creating a conducive learning environment. Renovating and equipping schools with modern facilities fosters a culture of innovation and excellence (Berezi, 2014). Modern facilities promote safety, accessibility, and comfort, allowing students to focus on their academic pursuits.

Strengthen School Leadership and Management: Providing training and development programs for school leaders and administrators is essential for enhancing their skills and knowledge (Tingle et al., 2019). Such conferences offer a platform for leaders to share best practices, learn from industry experts, and develop strategic thinking.

Increase Community Engagement and Participation: Encouraging community involvement in school activities and decision-making processes is vital for building a supportive and engaged community. Establishing a Parent-Teacher Association (PTA) is an excellent way to promote parental involvement. The PTA provides a platform for parents, teachers, and administrators to collaborate, share ideas, and make decisions that benefit the school and students (Ferrara, 2017).

Promote Sustainable Development Practices: Integrating environmental education and sustainable practices into the curriculum empowers students to become eco-conscious citizens. Establishing a school garden and recycling program is a great example of this (Agbor et al., 2023). The school garden teaches students about sustainable farming practices, soil conservation, and the importance of locally grown produce.

Improve Teacher Quality and Retention: Providing ongoing professional development opportunities and incentives for teachers is essential for their growth and excellence (National Education Association, 2015). Offering workshops on innovative teaching methods, such as technology integration and project-based learning, enhances their pedagogical skills.

Enhance Student Safety and Well-being: Implementing safety measures and providing counselling services is crucial for ensuring students' well-being. Installing security cameras and hiring a school counsellor are excellent examples of this. Security cameras deter potential threats and provide a sense of security, while a school counsellor offers emotional support and guidance to students (Sprague & Walker, 2021).

Increase Access to Education: Expanding access to education for marginalized groups is essential for promoting equity and inclusivity. Establishing a scholarship program for girls from low-income families is a great example of this (Smith-Evans et al., 2014). Such initiatives help bridge the gender gap and provide opportunities for girls to pursue their educational dreams.

Types of Management Practices

Management practices in schools involve strategies and actions addressing operational and educational aspects to ensure efficiency, success, and competence. They create a productive environment for teaching and learning, especially in secondary education, where structured management impacts outcomes. Researchers like Akinbola (2020), Ofeogebu (2021), Adebayo (2019), Ogunyemi (2022), and Oluwole (2020) highlighted some major practices. These practices are also observed in public senior secondary schools in the South-East senatorial district. They include;

1. **Unified Structure of Leadership:** Many government secondary schools in Nigeria employ a centralized management system, with the principal as the primary decision-maker. While this promotes swift decision-making, it often excludes input from key stakeholders like parents and teachers, leading to poor accountability. This approach can diminish the effectiveness and efficiency of school policies (Akinbola, 2020).
2. **Lack of Capacity-Building Programs:** Teachers and administrators often lack access to training and professional development programs focused on educational management and resource optimization. This deficiency hampers their ability to manage resources effectively, implement quality education, and foster a positive school environment (Ofoegbu, 2021).
3. **Inadequate Resource Allocation:** Government schools frequently suffer from poor infrastructure, insufficient funding, and outdated materials. These issues stem from inadequate government allocations, leaving many schools in a state of disrepair and ill-equipped to support extracurricular activities or provide modern learning resources (Ogunyemi, 2022).
4. **Weak Monitoring and Evaluation Mechanisms:** Ineffective monitoring prevents schools from identifying underperformance and implementing necessary improvements. This weakens the overall quality of education (Adebayo, 2019).
5. **Low Stakeholder Involvement:** Limited participation from parents and communities in decision-making leads to poor transparency and accountability, hindering school development (Oluwole, 2020).
6. **Technology Management:** Effective integration of digital tools, including learning management systems and cybersecurity, enhances teaching, learning, and administration (Fullan & Langworthy, 2014).
7. **Sustainability Management:** Promotes eco-friendly practices like energy efficiency, waste management, and sustainability education within school operations and curricula (Sterling, 2010).

Methodology

The study adopted a descriptive survey design. The population was 52 principals from public senior secondary schools across Andoni, Eleme, Gokana, Khana, Opobo-Nkoro, Oyigbo, and Tai local government areas. Due to the manageable population size, a census sampling

technique was employed, involving all 52 principals. Data were collected using a self-structured 21-item questionnaire titled Revitalizing the Management Practices of Schools for Sustainable Development Questionnaire (RMPSSDQ), rated on a 4-point Likert scale: Strongly Agreed (SA-4), Agreed (A-3), Disagreed (D-2), and Strongly Disagreed (SD-1). Two experts in measurement and evaluation validated the instrument, establishing a reliability index of 0.84 through Cronbach's alpha. Data analysis used a criterion mean of 2.50 for decision-making, with mean and standard deviation answering all research questions while a t-test was employed to test null hypotheses at a 0.05 significance level. Statistical analysis was performed using SPSS version 23.

Data Analysis and Result

Answers to Research Questions

Research Questions

Research Question One: What are the management practices in public senior secondary schools in the South-East Senatorial District of Rivers State?

Table 1: Descriptive statistics of mean score and standard deviation of males and females on management practices in public senior secondary schools in the South-East Senatorial District of Rivers State.

S/N	Statement: Management practices include;	Male = 20		Female = 32		\bar{X} of \bar{X}_2	remark
		\bar{X}	SD	\bar{X}	SD		
1	Resource allocation	3.35	0.01	2.61	0.12	2.98	Agreed
2	Stakeholders' involvement	3.00	0.30	2.73	0.33	2.86	Agreed
3	Unified Funding	3.26	0.41	2.84	0.14	3.05	Agreed
4	Resource allocation	3.66	0.11	3.00	0.16	3.33	Agreed
5	Monitoring and evaluation	3.40	0.23	3.21	0.21	3.31	Agreed
6	Crisis Management	3.68	0.14	3.33	0.33	3.51	Agreed
7	Unified leadership structure	3.33	1.00	3.48	0.41	3.40	Agreed
8	Technology Management	2.96	1.01	3.01	0.11	2.98	Agreed
	Aggregate Mean	3.80	0.45	3.48	0.54	3.64	Agreed

Table 1 above shows the management practices in public senior secondary schools in South East Senatorial District for sustainable development in Rivers State. From the table, the respondents had 3.80 and 3.48 for male and female respectively. However, with an aggregate mean of 3.64 which is above the cut-off mean of 2.50, it shows that respondents agreed that

items 1-8 on the table are the management practices in public senior secondary schools in South East Senatorial District.

Research Question 2: What are the challenges of managing public senior secondary schools in South East Senatorial District in Rivers State?

Table 2: Descriptive statistics of mean score and standard deviation of males and females respondents on the challenges of managing public senior secondary schools in South East Senatorial District in Rivers State.

S/N	Statement	Male=20		Female=32		\bar{X} of \bar{X}_2	Remark
		\bar{X}	SD	\bar{X}	SD		
	Challenges of managing schools.						
9	Inadequate Infrastructure	2.86	0.41	2.61	0.10	2.74	Agreed
10	Poor leadership	3.00	0.43	2.63	0.26	2.82	Agreed
11	Lack of motivation	3.21	0.33	2.68	0.33	2.94	Agreed
12	Insufficient fund	3.33	0.10	3.32	0.34	3.22	Agreed
13	Lack of support from government	2.48	0.26	3.33	1.00	3.00	Agreed
14	Insufficient resources	2.96	0.38	2.91	1.62	2.93	Agreed
15	Lack of skilled manpower	3.00	0.41	2.84	1.01	2.92	Agreed
	Aggregate Mean	3.00	0.15	2.90	0.66	2.95	Agreed

Table 2 shows the challenges of managing public senior secondary schools in South East Senatorial District in Rivers State. From the table, it was revealed that both respondents agreed that items 9-15 are the challenges of managing public senior secondary schools in South East Senatorial District with a mean score of (3.00) and (2.90) for both male and female respondents respectively. However, the aggregate mean of (2.95) revealed that both respondents had an agreement that items 8-14 are the challenges of managing public senior secondary schools since the aggregate mean is greater than the criteria mean of 2.50.

Research Question 3: What are the management practices that should be revitalized in public senior secondary schools in the South-East Senatorial District of Rivers State for sustainable development?

Table 3: Descriptive statistics of mean score and standard deviation of males and females respondents on the management practices that should be revitalized in public senior secondary schools in South-East Senatorial District in Rivers State.

S/N	Statement	Male=20		Female=32		\bar{X} of \bar{X}_2	Remark
		X	SD	X	SD		
	Management practices that should be revitalized						
16	Financial	2.61	1.14	2.53	0.03	2.57	Agreed
17	Management Stakeholders	3.00	0.10	3.00	0.42	3.00	Agreed
18	Engagement Human	3.10	0.21	3.10	1.00	3.10	Agreed
	Resource						
19	Management Collaborative	2.64	0.31	2.61	1.21	2.62	Agreed
	management						
20	Crisis	3.41	0.33	2.74	1.41	3.08	Agreed
	Management						
21	Sustainable	2.66	0.41	2.81	0.01	2.74	Agreed
	Management						
	Aggregate	2.90	0.41	2.79	0.68	2.85	Agreed

Table 3 above shows the management practices that should be revitalized in public senior secondary schools in South-East Senatorial District in Rivers State. From the table, the male respondents have a mean score of (2.90), while the female respondents had a mean score of (2.79). However, an aggregate mean of 2.85 shows that both respondents agreed that items 16-21 are the management practices in South-East Senatorial District since the aggregate mean is greater than the criteria mean of 2.50.

Test of Hypotheses

H01: There is no significant difference in the mean scores of male and female respondents on the management practices in public senior secondary schools in the South-East Senatorial District of Rivers State.

Table 4: Independent sample t-test in the mean rating of male and female respondent on the management practices in public senior secondary schools in the South-East Senatorial District of Rivers State.

Gender	N	Mean	SD	DF	T. Value	P. Value	Remark
Male	20	3.80	0.49	50	1.489	0.094	Accept
Female	32	3.48					

Alpha level= 0.05

The result of hypothesis test in table 4 shows the independent sample t-test on the mean rating of male and female respondent on the management practices in public senior secondary schools in the South-East Senatorial District of Rivers State. From the table, it was revealed that the independent sample t-test yielded a p-value of 1.489 with a corresponding p-value of 0.094 at 0.05 level of significance. From the reported result, it is seen that the p-value obtained (0.094) was greater than the chosen alpha 0.05, thus the null hypothesis is accepted. The result, therefore reveal that there is no significant difference in the mean rating of the respondents on the management practices in public senior secondary schools in the South-East Senatorial District of Rivers State.

HO2: There is no significant difference in the mean scores of male and female respondents on the challenges affecting the effectiveness of leadership and management in schools in South-East Senatorial District of Rivers State.

Table 5: Independent sample t-test in the mean rating of male and female respondent on the challenges affecting the effectiveness of leadership and management of public senior secondary schools in South- East Senatorial District of Rivers State.

Gender	N	Mean	SD	DF	T. Value	P. Value	Remark
Male	20	3.00	0.40	50	1.638	0.092	Accept
Female	32	2.90					

Alpha level= 0.05

The result of hypothesis test in table 5 shows the independent sample t-test on the mean rating of male and female respondent on the challenges affecting the effectiveness of leadership and management of public senior secondary schools in South- East Senatorial District of Rivers State. From the table, it was revealed that the independent sample t-test yielded a p-value of 1.638 with a corresponding p-value of 0.092 at 0.05 level of significance. From the reported result, it is seen that the p-value obtained (0.092) was greater than the chosen alpha 0.05, thus the null hypothesis is accepted. The result, therefore reveal that there is no significant difference

in the mean scores of male and female respondents on the challenges affecting the effectiveness of leadership and management in schools in South- East Senatorial District of Rivers State.

HO3: There is no significant difference in the mean scores of male and female respondents on the management practices that should be revitalized in public senior secondary schools in the South-East Senatorial District of Rivers State for sustainable development.

Table 6: Independent sample t-test in the mean rating of male and female respondent on the management practices that should be revitalized in public senior secondary schools in the South-East Senatorial District of Rivers State.

Gender	N	Mean	SD	DF	T. Value	P. Value	Remark
Male	20	2.90	0.54	50	1.859	0.098	Accept
Female	32	2.79					

Alpha level= 0.05

The result of hypothesis test in table 6 showed that the independent sample t-test on the mean rating of male and female respondent in the management practices that should be revitalized in public senior secondary schools for sustainable development in the South-East Senatorial District of Rivers State. From the table, it was revealed that the independent sample t-test yielded a p-value of 1.859 with a corresponding p-value of 0.098 at 0.05 level of significance. From the reported result, it is seen that the p-value obtained (0.098) was greater than the chosen alpha 0.05, thus the null hypothesis is accepted. The result, therefore reveal that there is no significant difference in the mean scores of male and female respondents on the management practices that should be revitalized in public senior secondary schools in the South-East Senatorial District of Rivers State.

Discussion of Findings

Management practices in public senior secondary schools for sustainable development in South-East Senatorial District of Rivers State

The finding of this study revealed that the respondents agreed that items 1-8 are the management practices in public senior secondary schools in the South-East Senatorial District of Rivers State. These management practices aim to ensure success, efficiency, and competence while promoting a productive and enriching environment for teaching and learning. This finding of this study is in line with Akinbola (2020); Ofeogbu, (2021); Adebayo, (2019); Ogunyemi (2022) and Oluwole, (2020) who affirmed that the management practices in schools include; unified structure of leadership, lack of capacity building for staff, inadequate resource

allocation, weak monitoring and evaluation as well as none involvement of educational stakeholders in schools. The result of hypothesis therefore revealed that there is no significant difference in the mean rating of the respondents on the management practices in public senior secondary schools in the South-East Senatorial District of Rivers State.

Challenges affecting the effectiveness of leadership and management in schools in South-East Senatorial District of Rivers State

The finding of this study revealed that the respondents agreed that items 9-15 are the challenges affecting the effectiveness of leadership and management in schools in South- East Senatorial District of Rivers State. These challenges include inadequate infrastructure, poor leadership styles, dearth of funds, lack of support from the government as well as lack of skilled manpower. This is in line with Pillay and Shipalana (2023) who affirmed that lack of essential infrastructure, such as classrooms, libraries, and laboratories, further impedes the creation of a conducive learning environment. This finding is also in line with Coburn et al., (2013) who aver that lack of resources also limits the ability of schools to promote sustainable development practices, including environmental education and community engagement. The result of hypothesis 2 revealed that there is no significant difference in the mean scores of male and female respondents on the challenges affecting the effectiveness of leadership and management in schools in South- East Senatorial District of Rivers State.

Management practices that should be revitalized in public senior secondary schools for sustainable development in the South-East Senatorial District of Rivers State

The finding of this study revealed that the respondents agreed that items 16-21 are management practices that should be revitalized in public senior secondary schools for sustainable development in the South-East Senatorial District of Rivers State. These management practices that need revitalization for sustainable development include; lack of capacity building programme for staff, inadequate resource allocation, low stakeholder participation, weak monitoring and evaluation, unified leadership structure and so on. Revitalizing these management practices could create a conducive learning environment that nurtures academic excellence, personal growth, and sustainable development practices. This is in line with Sasson et al., (2018) who opined that revitalizing approach enhances student engagement, creativity, and problem-solving abilities. The results of hypothesis 3 revealed that there is no significant difference in the mean scores of male and female respondents on the management practices that

should be revitalized in public senior secondary schools in the South-East Senatorial District of Rivers State.

Conclusion

Revitalizing management practices in organizations helps to ensure that organizations such as the public senior secondary schools adapt to societal changes, high-tech improvements, and environmental challenges. It adopts a culture of continuous improvement and prepares students to prosper in a swiftly developing world.

Recommendation

1. The government and heads of secondary schools should identify the various types of management practices and work towards revitalizing them for sustainable development.
2. Challenges affecting the effectiveness of leadership and management in schools in South-East Senatorial District of Rivers State should be identified and looked into.
3. Heads of secondary schools should be trained and retrained on proficiency development.

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Constraints of Artificial Intelligence Integration in the 21st Century Human Resource Management in Higher Institutions in Nigeria

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Abstract

The integration of artificial intelligence (AI) in human resource management (HRM) has transformed the way organizations operate, but its adoption in higher institutions in Nigeria is faced with numerous constraints. The integration of AI in 21st HRM is germane in areas such as talent management, employee engagement, performance management, training and development and so on. This study identified and examined the constraints hindering the effective integration of Artificial Intelligence in the 21st century human resource management in Nigerian higher institutions. They include limited technical expertise, inadequate infrastructure, high cost of implementation, data privacy and security concerns, resistance to change from staff, limited access to funding, inadequate policy and regulatory framework, limited awareness and understanding of Artificial Intelligence benefits, dependence on manual processes, and limited availability of AI-powered human resource tools. These constraints pose significant challenges to the successful adoption of Artificial Intelligence in the 21st century Human Resource Management in Nigerian higher institutions, leading to inefficiencies, ineffectiveness, and lack of competitiveness. The study suggested strategies to address these constraints, including training and development programmes, infrastructure upgrades, cost-benefit analysis, data protection policies, change management, funding exploration, policy development, awareness creation, process automation, and collaboration with vendors. Addressing these constraints will enable Nigerian higher institutions to leverage Artificial Intelligence in Human Resource Management, enhancing their operational efficiency, effectiveness, and global competitiveness.

Keywords: Constraints, Artificial Intelligence Integration, Human Resource Management, Higher Institutions.

Introduction

The 21st century has witnessed a rapid evolution in technology, with artificial intelligence (AI) emerging as a transformative force across the sectors, including human resource management (HRM). In Nigeria, higher education institutions are increasingly recognizing the potential of AI to streamline human resource (HR) processes, enhance decision-making, and improve overall organizational efficiency. Artificial intelligence (AI) refers to the development of computer systems that can perform tasks that would typically require human intelligence, such as learning, problem-solving, decision-making, and natural language processing (NLP). UNICEF (2021) defined Artificial intelligence (AI) as machine - based system that can give a set of human-defined objectives, make predictions, recommendations, or virtual environment either directly or indirectly. UNICEF further stated that AI is crucial in

HRM for various reasons: enhanced efficiency, data-driven decision making, personalized employee experience, improved talent management, streamlined recruitment, compliance, risk management, and competitive etcetera. AI has transformed various industries, and its effects on human resource management are significant.

According to Elenwo & Ebom-Jebose (2024) human resource management is the process of managing the organizational staff in a structured and systematic manner which ensures the success of organization or company. Human resource management is a vital function in organizations, responsible for managing the workforce and optimizing performance. Despite the potential benefits of AI in transforming human resource management practices, higher institutions in Nigeria face significant constraints in integrating AI into their human resource management systems, including limited technical expertise, inadequate infrastructure, high cost of implementation, data privacy and security concerns and so on (Ojo, 2018). These constraints hinder the effective adoption and utilization of AI in human resource management, resulting in missed opportunities for improved efficiency, enhanced decision-making, and personalized learning experiences. Therefore, the study seeks to investigate the constraints of artificial intelligence integration in the 21st human resource management in higher institutions in Nigeria and provide suggestions for addressing these constraints to ensure effective artificial intelligence integration and utilization in human resource management practices.

Brief Overview of AI and Human Resource Management

Human resource management is a strategic and coherent approach to the management of an organizational most valued assets that is; the people working there who individually and collectively contribute to the achievement of its objectives. Elenwo and Nte (2024) referred to human resource management as the people who cuts across the rank and file in the organizations whose services aid in the achievement of organizational goals. Human resource management is any organization's critical function, managing the workforce and ensuring optimal performance.

Artificial Intelligence (AI) has emerged as a powerful tool in various industries, fundamentally transforming how organizations operate. In the realm of human resource management, AI applications are reshaping traditional practices, enhancing efficiency, and enabling data-driven decision-making (Jarrahi, 2018).

In HRM, AI encompasses a range of technologies, including machine learning, natural language processing, and data analytics, that automate and optimize HR processes. With the advent and

integration of artificial intelligent technology in organizations, HRM has witnessed significant transformation that have enhanced efficiency and effectiveness. In the context of human resource management in higher institutions, AI can be integrated in various areas, including but not limited to recruitment and selection, talent management, employee engagement, performance management, and training and development.

AI Integration in Recruitment and Selection

AI integration in recruitment and selection refers to the use of artificial intelligence technologies to streamline and enhance the hiring process. Cath (2020) stated that the recruitment and selection process has undergone a significant transformation with the advent of artificial intelligence (AI). This technological revolution has brought about a paradigm shift in the way organizations identify, attract, and hire top talent. According to Goodfellow (2016) AI-powered tools have streamlined the hiring process, reducing the time and effort required to find the best candidates and automated candidate sourcing has become a norm, with AI algorithms scouring social media, job boards to identify potential candidates. Also, predictive analytics has also emerged as a game-changer, enabling organizations to forecast the success of future candidates based on data from past hiring processes and chatbots and virtual assistants have taken over the initial stages of candidate engagement, providing personalized communication and timely updates.

Natural Language Processing (NLP) has enabled the analysis of resumes, cover letters, and other text-based data to identify top candidates as video interviewing has also become a popular tool, assessing candidate responses, body language, and tone to evaluate fit (Ford, 2019). The integration of AI has also helped reduce unconscious bias in hiring, focusing on skills and qualifications rather than personal characteristics, enhanced candidate experience has become a priority, with AI-powered tools providing personalized communication and timely updates throughout the hiring process and efficient screening has reduced the workload for recruiters and hiring managers, enabling them to focus on high-value tasks. Data-driven decision-making on the other hand has become the norm, with AI providing insights and analytics to inform hiring decisions.

AI Integration in Talent Management

The integration of artificial intelligent in talent management has revolutionized the way organizations approach human resources. This fusion has transformed talent acquisition, performance management, learning and development, succession planning, diversity and

inclusion, employee engagement, and workforce planning. Talent acquisition has become more efficient with AI- powered tools that identify top candidates, predict success, and enhance candidate experience (Goyal & Kumar, 2020). Dastjerdi and Gao (2017) opined that AI has achieved the following: performance management has evolved with AI-driven systems that analyze data, provide personalized feedback, and pinpoint areas for growth, learning and development have become tailored experiences, courtesy of AI-based platforms that offer customized learning recommendations and track progress, succession planning has transformed with AI algorithms that identify potential successors, predict talent gaps, and strategize for future talents, diversity, equity, and inclusion have been amplified with AI's ability to reduce bias in talent decisions, improve diversity metrics, and foster inclusivity, and employee engagement has been redefined with AI-powered tools that analyze sentiment, identify engagement drivers, and provide personalized recommendations. Bhattacharya and Chakraborty (2020) averred that workforce planning has become a predictive science, with AI forecasting talent needs, identifying skills gaps, and strategizing for future workforce requirements. The harmonious union of AI and talent management has yielded numerous benefits, including enhanced efficiency, improved accuracy, personalized experiences, data-driven decisions, increased diversity and inclusion, better employee engagement, and a future-ready workforce (Kaplan & Haenlein, 2019).

AI Integration in Employee Engagement

The integration of artificial intelligence in employee engagement has revolutionized the modern workplace. AI-powered tools have personalized communication, conducted sentiment analysis, predicted employee turnover, facilitated feedback, and offered wellness and support (Kaplan & Haenlein, 2019). Predictive analytics has also, forecasted employee retention, enabling proactive measures to retain top talent as recognition and rewards programs have been optimizing using AI-driven systems and striking the right chord. According to Srivastava and Singh (2020) AI-driven learning and development platforms have orchestrated personalized growth opportunities and benefits which includes enhanced employee experienced, improved productivity, increased retention, personalized support, data-driven insights, and competitive advantage.

AI Integration in Performance Management

AI integration in performance management refers to the use of artificial intelligence technologies to enhance and automate performance management processes, providing data-

driven insights and recommendations to improve employee performance and organizational success. Rasmussen & Ulrich, (2019) opined that the integration of artificial intelligence in performance management is transforming the way organizations evaluate and enhance employee performance. AI-powered tools are streamlining the performance management process, providing data-driven insights, and fostering a culture of continuous improvement. Also, AI-powered tools have automated performance tracking, predicted employee potential, and facilitated 360-degree feedback (Kumar & Goyal, 2020). Ojo (2018) stated that the benefits of AI integration in performance management include data-driven decision-making, improved accuracy and efficiency, enhanced employee experience, increased transparency and fairness, better talent management and competitive advantage. By integrating AI in performance management, organizations can create a more agile, data-driven, and effective performance management process, driving business success and employee growth.

AI Integration in Training and Development

In the 21st century, the field of training and development according to Ford, (2019) has undergone a significant transformation with the integration of AI. The traditional training methods, which were once static and one-size-fits-all, have now been revolutionized by AI-powered tools and technologies. The use of AI in training and development has become increasingly prevalent, with many organizations leveraging its capabilities to analyze employee skills and knowledge gaps, provide personalized learning recommendations, deliver interactive and immersive learning experiences, and track and measure employee progress and performance (Adeyinka & Oyelade, 2019). AI-powered tools such as machine learning, natural language processing, and predictive analytics are being used to create intelligent tutoring systems, virtual reality simulations, and gamified learning platforms. The integration of AI in training and development has also raised important questions about the future of work, the role of human instructors, and the potential biases in AI decision-making.

Current State of Human Resource Management in Higher Institutions in Nigeria

The current state of human resource management in higher institutions in Nigeria is characterized by:

1. **Inadequate Funding:** Many higher institutions in Nigeria suffer from chronic underfunding. This financial constraint affects their ability to recruit and retain qualified staff, invest in staff development programmes, and maintain competitive salaries and

benefits (Okebukola, 2019). Limited funding also hampers the adoption of advanced human resource management technologies, including AI.

2. **Bureaucratic Processes:** HRM practices in higher institutions are often characterized by bureaucratic red tape and inefficiencies. Mbah (2016) opined that lengthy administrative procedures for recruitment, promotions, and other HR functions can lead to delays and dissatisfaction among staff.
3. **Staff Shortages and Brain Drain:** There is a significant shortage of qualified academic staff in many Nigerian institutions. This is exacerbated by brain drain, where talented professionals migrate to other countries or sectors in search of better opportunities. This shortage impacts the quality of education and increases the workload for existing staff.
4. **Inconsistent Training and Development:** Professional development and training opportunities for staff are inconsistent and often inadequate. Many institutions lack structured programmes for continuous learning and development, which affects staff performance and career progression Onah (2018).
5. **Resistance to Change:** Resistance to adopting new HRM practices and technologies is a notable issue. Many staff members are accustomed to traditional methods and may be reluctant to embrace changes, including the integration of AI and digital tools in HRM processes.
6. **Data Management Issues:** Effective HRM relies on accurate and comprehensive data management. However, many Nigerian institutions struggle with outdated and fragmented data systems, leading to challenges in tracking employee information, performance metrics, and other critical HR data.

Constraints of Artificial Intelligence Integration in the 21st Century Human Resource Management in Higher Institutions in Nigeria

1. **Limited technical expertise:** Higher institutions in Nigeria lack the necessary technical skills and knowledge to effectively implement and manage AI-powered human resource systems. Oladimeji (2020) opined that the lack of technical expertise is a significant barrier to AI solutions.
2. **Inadequate infrastructure:** The poor state of digital infrastructure in Nigerian higher institutions hinders the adoption of AI-driven human resource management solutions. Bakare (2018) asserted that inadequate infrastructure including hardware and software hinders AI adoption in human resource management.

3. High cost of implementation: The high cost of purchasing and maintaining AI-powered human resource systems is a significant barrier to their adoption in Nigeria higher institutions. In the view of Adeoye (2019) higher institutions are not paying attention to cost-benefit analysis which is essential for justifying AI investments in human resource management.
4. Data privacy and security concerns: Higher institutions in Nigeria are concerned about the potential risks to data privacy and security posed by AI-powered human resource systems due to fear of job loss or change. Ogbuke, Nwankwo, and Ibhawoh (2020) averred that institutions are not compliant with data protection regulations.
5. Resistance to change from staff: Many staff members in Nigerian higher institutions are resistant to the adoption of AI-powered human resource management systems due to fear of job loss or change. Ibrahim (2019) stated that most human resource managers lack effective communication and training to address resistance to change amongst the staff.
6. Limited access to funding: Higher institutions in Nigeria often lack the necessary funding to invest in AI-powered human resource systems.
7. Inadequate policy and regulatory framework: Nigeria lack a clear policy and regulatory framework to guide the adoption of AI-driven human resource management solutions in higher institutions.
8. Limited awareness and understanding of AI benefits: Many stakeholders lack a clear understanding of the benefits and potential applications of AI-driven human resource management solutions.
9. Dependence on manual processes: Higher institutions in Nigeria still rely heavily on manual processes, making it difficult to integrate AI-powered human resource systems.
10. Limited availability of AI-powered human resource tools: There is a limited range of AI-powered human resource tools available that are tailored to the specific needs of higher institutions in Nigeria.

Conclusion

By leveraging AI, higher institutions can create a more agile, responsive, and student-centered human resource function, ultimately contributing to the success of the institution. As AI continues to evolve and improve, it is essential to consider the ethical implications of its integration in human resource management and ensure that it is used responsibly to benefit both organizations and employees. However, concerns around data privacy and security,

transparency and explainability, potential biases in AI algorithms, and human oversight, and accountability must be addressed. As organizations navigate this new landscape, they must balance the benefits and limitations of AI integration in recruitment and selection.

Suggestions

1. Higher institutions in Nigeria should provide training and development programmes for human resource staff on AI and its applications in human resource management and collaborate with other institutions to share knowledge and expertise.
2. Nigerian higher institutions should invest in upgrading digital infrastructure, including hardware and software and develop a comprehensive industrial training strategy that include AI-driven human resource management solutions.
3. Higher institutions in Nigeria should conduct a thorough cost-benefit analysis to justify AI investments and also, explore funding opportunities, such as grants or partnerships. Also, institutions of higher learning in Nigeria should develop a business case for AI investments to secure funding and consider cost-saving measures such as streamlining processes.
4. Nigerian higher institutions should develop and implement robust data protection policies and procedures and ensure compliance with relevant data protection regulations using artificial intelligence.
5. Higher institutions administrators should communicate the benefits and rationale for AI adoption clearly and transparently and also involve staff in the implementation process through training and feedback mechanisms.
6. Higher institutions administrators should advocate for policy and regulatory changes to support AI adoption and also collaborate with other institutions to share best practices.
7. Education and training programmes on AI and its application should be provided in human resource management across all the higher institutions in Nigeria.
8. Automation of manual processes where possible to free up resources for AI implementation and streamlining of processes to reduce complexity and increase efficacy should be encouraged in Nigerian higher institutions.
9. Nigerian higher institutions should collaborate with other institutions to develop tailored AI-powered human resource tools and also, work with vendors to develop customized solutions.

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Artificial Intelligence: A Paradigm Shift in Education and Management of Public Senior Secondary Schools in Rivers State

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Abstract

The study examined the relationship between artificial intelligence paradigm shift in education and the management of public senior secondary schools in Rivers State. 2 research questions and 2 null hypotheses guided the study. The study adopted a correlational research design. The population of the study was 311 principals from 311 senior secondary schools in the 23 local government areas of Rivers State. The entire population was used as the sample of the study, depicting census sampling technique. The instruments of the study were titled, "Artificial Intelligence: A paradigm shift in Education Questionnaire (AIPSE) and Management of Public Senior Secondary School (MPSSS) Questionnaire." The instruments were structured on a four-point rating scale and validated by experts. The Cronbach Alpha statistics were used to obtain the reliability indexes of 0.81 and 0.81. A total of 311 copies of the instruments were administered to the respondents, retrieved and used for data analyses. The research questions were answered using Pearson Product Moment Correlation, while the null hypotheses were tested using t-transformation statistics at 0.05. level of significance. The finding revealed that symbolic and machine-learning artificial intelligence have a significant relationship with the management of public senior secondary schools in River State. Based on the findings of the study, it was recommended, among others, that the government should provide the basic infrastructure and train principals on the basic skills needed for effective adoption of artificial intelligence in the management of public senior secondary schools for efficacy and effective achievement of educational goals and objectives.

Keywords: Artificial intelligence, Management, Symbolic artificial intelligence, and Numeric or Machine learning artificial intelligence.

Introduction

Artificial is made or produced by human beings rather than occurring naturally, especially as an imitation of, or as a substitute for something natural, for example, simulated artificial intelligence (Collins, 2024). Intelligence is the general mental capacity involving the ability to solve problems, learn from experience, reason, think abstractly, plan, learn quickly, and comprehend complex ideas, not just academic skills or test-taking smart; it has to do with a broader and deeper capacity for comprehending our surroundings, catching on, making sense of things, or figuring out what to do (Gottfredson, 1997). In the same vein, Sharma (2008) opined that, intelligence is the ability to perceive or infer information and to retain it as

knowledge to be applied to adaptive behaviour in an environment or context. Similarly, Hulter (2007), conceived that intelligence measures an agent's ability to achieve goals in a wide range of environments, which has been mathematically formalised. Goh, Nam and Park (2003) stated that, intelligence has been observed in plants, humans, and non humans. They further stated that, intelligence in a computer or other machine is called artificial intelligence. Mishlove (2011) opined that the term "artificial intelligence" was coined by Prof. John McCarthy in 1955, and in 1956 he organised an academic conference in Dartmouth that started AI as a field. Roberts (2016) stated that, Prof. John McCarthy, in 1955, defined artificial intelligence as the science and engineering of making intelligence machines, especially computers. Artificial intelligence is a technology that created machines imitating human intelligence using a process or set of rules to be followed in calculation or other problem-solving to stimulate human-like behaviours and decision-making (Priya, 2023). In the same vein, McCorduck (2004) opined that, artificial intelligence is computer-based intelligence as opposed to human.

Artificial intelligence encompasses advanced Web engines, for example, Google self-driving cars (way motion), generative or creative tools (chat, GPT, and AI art), automated decision-making, and recommended systems used by YouTube, Amazon, and Nelfix to understand human speech (such as Siri and Alexa) (Semaan, 2012). Artificial intelligence approaches can be grouped into two main categories. The numeric or machine artificial intelligence and symbolic artificial intelligence. Ben (2019) stated that, symbolic artificial intelligence is also known as classical artificial intelligence, rule-based AI, and good old-fashioned AI. It is the embedding of human knowledge and behaviour rules into computer programming using symbols. He further stated that symbolic artificial intelligence uses search as a method of solving problems, which means that the computer tries different situations step by step to validate the results. Rodney (1999) stated that, symbolic artificial intelligence uses tools such as semantic networks, log programs, and production rules to develop applications such as knowledge-based systems (extent systems), symbolic mathematics, automated theorems, and automated planning and scheduling systems. It was generally used in simple robotics, performing routine tasks with clearly defined variables and output, natural language processing, expert systems, and robotics. Data Camp (2024) stated that, symbolic AI is a technology that helps digital assistants like Siri comprehend natural language and respond to commands. Symbolic AI, a branch of artificial intelligence, excels at handling complex problems that are challenging for conventional AI methods. It operates by manipulating symbols to derive solutions, which can be more sophisticated and interpretable. This interpretability is particularly

advantageous for tasks requiring human-like reasoning, such as planning and decision-making, where understanding the AI's thought process is crucial (Walter, 2024). Symbolic AI algorithms work by processing symbols, which represent objects or concepts in the world, and their relationships. The main approach in symbolic AI is to use logic-based programming, where rules and axioms are used to make inferences and deductions (Jack, 2012). Jack further stated that symbolic AI is based on knowledge representation and reasoning, while machine learning learns patterns directly from data. The second main approach to AI is numerical or machine artificial intelligence. The term “ machine learning was coined by Arthur Samuel, an international business machine computer scientist and a pioneer in AI and computer games. Samuel designed a computer program for playing checkers. The more the program played, the more it learnt from experience, using algorithms to make predictions (Expertise AI, 2024).

Deepail (2024) claims that machine learning began in 1943 by Frank Rosenblatt, a psychologist at Cornell University, who was working on developing a machine that could recognise the letters in his name, alphabets Rosenblatt. 1957, 1959, and 1960. Discrete and analogue signals were used by this device. It also included a threshold component that distinguished between continuous and discrete impulses. It started out as an early version of contemporary artificial neural networks. The author further stated that its learning theory was similar to the learning theories of animals and humans in psychology. It was Rosenblatt who conducted the first mathematical studies of perceptions. However, the Novikoff theorem; Novikoff, 1962 which describes the requirements for a perceptron learning algorithm to be completed in a certain number of steps. Machine learning is a subset of AI, which uses algorithms that learn from data to make predictions. These predictions can be generated through supervised learning, where algorithms learn patterns from existing data, or unsupervised learning, where they discover general patterns in data. (Malt, 2024) Machine learning algorithms contribute to strategic decision-making in the management of educational institutions. These insights aid in designing effective policies, identifying potential dropout risks, and allocating resources judiciously to foster an environment conducive to teaching and learning success.

Applications of AI in education span from personalised learning to evaluation and feedback (Jay, 2019). Beyond the confines of the classroom, AIs impact on education resonates in management tasks such as optimising resource allocation to predict student outcomes and trends. Artificial intelligence (AI) can evaluate past data to predict student performance, identify students who are at risk of falling behind even more, and recommend early

interventions for teachers to provide early assistance that lowers dropout rates and improves overall student success with the use of predictive models that provide a more thorough understanding of student behaviours and results than human beings do (Ecker, Langer, Kong and Schmitz, 2018). Artificial intelligence (AI) can improve management effectiveness by personalising learning, supporting teachers, facilitating decision-making, and encouraging accessibility and inclusivity (Rose and Kim 2018). It has the capacity to greatly raise educational standards and make learning more effective, efficient, and accessible for both students and institutions.

The process of planning, organising, directing, and controlling resources, financial, and physical within an educational institution is known as educational management. It includes many different tasks, such as supervising teachers, evaluating student activities, and providing a conducive teaching and learning environment for the achievement of educational goals and objectives (Koko and Dike, 2022). They further stated that, for educational institutions to function effectively and give students a high-quality education, management of those institutions is crucial; educational institutions can be primary, secondary, or tertiary. Secondary education is the consumer of products from primary school and the producer of the product for higher education. The transition from primary to postsecondary education is facilitated by secondary education. It has a significant impact on national development because it aims to create middle-class workers for businesses, industries, and other related organisations. Enrolment ages of children in secondary schools are between 10 and 12 years. In achieving these aims and objectives, Bush and Glover (2014) opined that the realm of education stands on the brink of a technological renaissance, where the seamless integration of AI techniques offers transformative possibilities across multiple facets of the learning experience and holds the potential to reshape traditional educational paradigms and elevate education. A paradigm is a pattern or a model of something. While a paradigm shift is the fundamental change in approach or perspective within a discipline. Cammuffo and Gerli (2023) stated that, paradigm shift in educational management involves a transformation in methods and applications that guide the management of education, leading to a new way of using artificial intelligence, such as symbolic and machine-learning artificial intelligence, in the management of public secondary schools.

Statement of Problem

Education, as a transformative force, often struggles to effectively address the complex social, economic, and environmental challenges facing modern society. The current education system frequently prioritises rote in traditional management system and standardised testing over critical thinking, creativity, and emotional intelligence. However, the rapid advancement of Artificial Intelligence (AI) technologies presents both opportunities and challenges for education, highlighting the need for innovative solutions that harness AI's potential to enhance management, teaching, learning, and societal impact.

Despite the growing potential of artificial intelligence (AI) in transforming education, public senior secondary schools in Rivers State still face significant challenges in harnessing AI-driven solutions to improve teaching, learning, and administrative efficiency. The existing management systems in these schools are often characterised by insufficient resources and infrastructure for effective AI integration. The slow adoption of AI-driven solutions in public senior secondary schools hinders the realisation of these institutions' full potential by ultimately affecting the quality of education and the preparedness of students for an increasingly complex and technology-driven world. The question is, is there any relationship between artificial intelligence paradigm shift in education and the management of senior secondary schools? Proving solutions to these problems prompted the study.

Purpose of the Study

This study investigated the relationship between artificial intelligence paradigm shift in education and the management of public senior secondary schools in Rivers State. Specifically, the study sought to find the relationship between:

1. symbolic artificial intelligence and the management of public senior secondary schools in Rivers State.
2. numerical or machine-artificial intelligence and the management of public senior secondary schools in Rivers State.

Research Questions

The following research question guided the study.

1. What is the relationship between symbolic artificial intelligence and the management of public senior secondary schools in Rivers State?
2. What is the relationship between numeric or machine learning and the management of public senior secondary schools in Rivers State?

Hypotheses

1. There is no significant relationship between symbolic artificial intelligence and the management of public senior secondary schools in Rivers State.
2. There is no significant relationship between numeric or machine-learning artificial intelligence and the management of public senior secondary schools in Rivers State.

Methodology

This study investigated the relationship between the artificial intelligence paradigm shift in education and the management of public senior secondary schools in Rivers State. The study adopted a correlational survey research design. The population of the study comprised of 311 principals. The sample size of the study was 311 principals. This was so because the census sampling technique was adopted. The study utilised two major instruments, which were titled, Artificial Intelligence Paradigm Shift in Education Questionnaire (AIPSE) and Management of Public Senior Secondary Schools Questionnaire (MPSSS). The ratings of both AIPSE and MPSSS were on a four-point rating scale of Strongly Agree (SA) with a score of 4; Agree (A) with a score of 3; Disagree (D) with a score of 2; and Strongly Disagree (SD) with a score of 1. The instruments were validated by three experts in educational management and measurement and evaluation. Copies of the instruments were distributed to these experts for face and content validity. Appropriate adjustments were made on the instruments before the final copies were produced, which were used for data collection. The instrument was administered once to 20 respondents, comprising vice principals. The result was subjected to an internal consistency reliability test using Cronbach Alpha to obtain the reliability coefficients of 0.81 and 0.88. A total of 311 copies of the instruments were administered to the respondents. To enhance data retrieval of the instruments, four trained research assistants were used, which resulted in a 100% retrieval rate. The research questions were answered using the Pearson Product Moment Correlation to ascertain the relationship between artificial intelligence and management of public senior secondary schools. Values of r between 0 and 0.19 were considered negligible. Values of r ranging from 0.20 to 0.49 were considered weak. Values of r ranging from 0.50 to 0.69 were considered average, while values of r ranging from 0.70 to 1.00 were considered high. The hypotheses were tested by transforming the r -calculated values to t -calculated values using t -Transformation with a critical z -value of ± 1.96 .

Results

Research Question 1: What is the relationship between symbolic artificial intelligence and management of public senior secondary schools in Rivers State?

Table 1: Summary of the Pearson Product Moment Correlation on the Relationship between Symbolic Artificial Intelligence and the Management of Public Senior Secondary Schools in Rivers State

		Symbolic Artificial Intelligence	Management of Public Senior Secondary Schools
Symbolic Artificial Intelligence	Pearson Correlation	1	.818
	Sig. (2-tailed)		.000
	N	311	311
Management of Public Senior Secondary Schools	Pearson Correlation	.818	1
	Sig. (2-tailed)	.000	
	N	311	311

**. Correlation is significant at the 0.05 level (2-tailed).

Researchers' SPSS Data Output (2024)

The result on Table 1 above showed the summary of the Pearson Product Moment Correlation. on the relationship between symbolic artificial intelligence and management of public senior secondary schools in Rivers State. The result showed that, there is a high and positive relationship between symbolic artificial intelligence and management of public senior secondary schools in Rivers State with a Pearson Product Moment Correlation Coefficient value of .818. Based on the result, it was concluded that, symbolic artificial intelligence has a high and positive relationship with management of public senior secondary schools in Rivers State.

Research Question 2: What is the relationship between numeric or machine artificial intelligence and management of public senior secondary schools in Rivers State?

Table 2: Summary of the Pearson Product Moment Correlation on the Relationship between Numeric or Machine Artificial Intelligence and Management of Public Senior Secondary Schools in Rivers State

		Numeric or Machine Artificial Intelligence	Management of Public Senior Secondary Schools
Numeric or Machine Artificial Intelligence	Pearson Correlation	1	.738
	Sig. (2-tailed)		.000
	N	311	311
Management of Public Senior Secondary Schools	Pearson Correlation	.738	1
	Sig. (2-tailed)	.000	
	N	311	311

**. Correlation is significant at the 0.05 level (2-tailed).

Researchers' SPSS Data Output (2024)

The result on Table 2 above showed the summary of the Pearson Product Moment Correlation on the relationship between numeric or machine artificial intelligence and management of public senior secondary schools in Rivers State. The result showed that there is a high and positive relationship between numeric or machine artificial intelligence. and management of public senior secondary schools in Rivers State with a Pearson Product Moment Correlation Coefficient value of .738. Based on the result, it was concluded that, numeric or machine-artificial intelligence has a high and positive relationship with management of public senior secondary schools in Rivers State.

Hypothesis 1: There is no significant relationship between symbolic artificial intelligence and management of public senior secondary schools in Rivers State.

Table 3: Summary of t-Transformation Result on the Significant Relationship Between Symbolic Artificial Intelligence and Management of Public Senior Secondary Schools in Rivers State

Variables	N	Df	PPMCC	t-cal	t-crit	LS	Decision
Symbolic Artificial Intelligence	311						
		309	.818	24.905	±1.96	0.05	Rejected

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Senior Secondary Schools

Researchers: SPSS Data Output (2024)

The result on Table 3 above showed the summary of the t-Transformation on the significant relationship between symbolic artificial intelligence and management of public senior secondary schools in Rivers State. The result showed that, the calculated t-value of 24.905 was greater than the t-critical value of ± 1.96 . Therefore, the null hypothesis was rejected at 0.05 level of significance and 309 degree of freedom, while the alternative hypothesis was upheld, which states that, there is a significant relationship between symbolic artificial intelligence and management of public senior secondary schools in Rivers State.

Hypothesis 2: There is no significant relationship between numeric or machine artificial intelligence and management of public senior secondary schools in Rivers State.

Table 4: Summary of t-Transformation Result on the Significant Relationship Between Numeric or Machine Artificial Intelligence and Management of Public Senior Secondary Schools in Rivers State

Variables	N	Df	PPMCC	t-cal	t-crit	LS	Decision
Numeric or Machine Artificial Intelligence	311						
		309	.738	18.083	± 1.96	0.05	Rejected
Management of Public Senior Secondary Schools	311						

Researchers: SPSS Data Output (2024)

The result on Table 4 above showed the summary of the t-Transformation on the significant relationship between Numeric artificial intelligence and management of public senior secondary schools in Rivers State. The result showed that, the calculated t-value of 18.083 was greater than the t-critical value of ± 1.96 . Therefore, the null hypothesis was rejected at 0.05 level of significance and 309 degree of freedom, while the alternative hypothesis was upheld, which states that, there is a significant relationship between Numeric or machine Artificial Intelligence and management of public senior secondary schools in Rivers State.

Discussion of Findings

The result for Research Question 1 on Table 1 showed a high and positive relationship between symbolic artificial intelligence and management of public senior secondary schools in Rivers State with an r value of .818. The result for the corresponding hypothesis 1 on Table 3 also showed a significant relationship between symbolic artificial intelligence and management of public senior secondary schools in Rivers State with a t -transformation value of 24.905 which is greater than the t -critical value of ± 1.96 . The results are consistent with research by Igbokwe (2023), titled: application of artificial intelligence in educational management. The findings revealed that, the use of artificial intelligence (AI) in educational management has the potential to completely transform the industry. Igbokwe further stated that, AI can improve personalised learning and student engagement and help schools to optimise resource allocation, automate grading and assessments, and streamline administrative duties. AI in educational administration has enormous potential to raise educational standards and efficacy.

The result for Research Question 2 on Table 2 showed a high and positive relationship between numeric or machine artificial intelligence and management of public senior secondary schools in Rivers State with an r value of .738. The result for the corresponding hypothesis 2 in Table 4 above showed that, there is a significant relationship between numeric or machine artificial intelligence and management of public senior secondary schools in Rivers State with a t -transformation value of 18.083, which was greater than the t -critical value of ± 1.96 . The findings agreed with Aieman (2024), who carried out a study on the impact of artificial intelligence on the school management: a study of opportunities and challenges in Jordan, wherein the study revealed that, AI (numeric or machine learning AI) has demonstrated its potential to revolutionise administrative practices, enrich learning outcomes, and create tailored educational experiences. Aieman further stated that, the ongoing advancements in AI technology are reshaping traditional educational approaches, profoundly impacting school management worldwide. The integration of AI holds promise in optimising administrative and instructional procedures, refining decision-making processes, and managing resources efficiently. AI's role in education extends beyond routine tasks, contributing to elevated instructional quality, increased efficiency, enhanced student experiences, and many more.

Conclusion

Based on the findings of the study, it was concluded that, symbolic artificial intelligence and numerical or machine learning artificial intelligence have strong and high positive relationship with management of public senior secondary schools in Rivers State.

Recommendations

It was recommended, that:

1. the government should provide the basic educational infrastructure to encourage symbolic AI-powered platforms and tools in the management of public senior secondary schools in Rivers State for efficacy and effective achievement of educational goals and objectives.
2. the government should provide training and support professional development opportunities for principals to develop AI literacy to enable them to effectively integrate numeric or machine AI-powered tools in management of public senior secondary schools in Rivers state.

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Triple Helix Innovation in Universities in Administration and Planning in the Nigerian Sphere

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Abstract

This study examined the Triple Helix innovation system in universities in administration and planning in the Nigerian sphere. The Triple Helix partnership in education is the collaboration among academia (university), government, and industry. Thus, this study focused on the benefits and challenges of the Triple Helix partnership in educational administration and planning, providing insights for policymakers, educators, and those in charge of the industry. This partnership in educational administration and planning aims to facilitate infrastructural development, job creation, and strengthening the research-industry relationship. As a result, there will be great socio-economic benefits for the environment. The benefits can be seen in the enhancement of quality education, sustainability, and innovation advancement. Also, this partnership will further encourage social, economic, and environmental integration of sustainable development and allow room for the government to create a stable future for education in the society. Also worthy of note are the aspects of the Triple Helix, innovation, university education, administration, and planning within the sphere of the university that will be focused on. This partnership in educational administration and planning, including its aims, purposes, and the benefits that will accrue to its parties, will also be looked into and highlighted. However, problems may arise in realization of this paper's topic such as; funding and resource allocation, conflicting interests among the individuals involved, and a strong resistance to changes as new innovations and ideas emerge. Therefore, a detailed conclusion was made, with suggestions such as flexibility in structures, continuous learning, and encouragement of collaboration.

Keywords: Triple Helix Innovation, Universities, Administration, Planning

Introduction

The triple helix model refers to interactions made among the parties of the university, industry, and the government to foster socio-economic development in an environment. (Etzkowitz & Leydesdorf, 2000). Nigerian universities have been recognized for their conventional approach to instruction, learning, volunteer work, and information sharing. However, with the rise of innovation and technological advancements in the 21st century, these institutions are expanding their focus to embrace a knowledge-based economy driven by new ideas and forward-thinking,

in order to keep pace with digital developments and the nation's needs. Nonetheless, universities have evolved into entities that combine product and service development with business networking and knowledge transfer, contributing to a more productive society. The concept of entrepreneurial university education and the Triple Helix model are closely linked, with the latter positioning universities as key players in knowledge-based societies, particularly in technology diffusion, firm creation, and regional development. This is a significant shift from their traditional, more passive role in an industrialized nation. (Cai & Etzkowitz, 2020; Ife & Okoro, 2024). Oyelaran-Oyeyinka and Adebowale (2012), as cited in Umar and Michael (2022) emphasized that universities were set up and regulated with the express intent of carrying out well-defined tasks, such research, knowledge creation and educating while preserving a reasonable degree of independence from the general pressures occurring in national, cultural and political spheres. Conventionally, universities have focused on academic pursuits such as teaching and research while industries have marketed research outcomes and governments have provided regulatory frameworks for universities. (Megmgbeto, 2013). In today's knowledge driven society, universities are to undertake an increasingly diverse set of responsibilities, including education students, conducting high-quality research, starting collaborations and fostering civic values in the public domain (Barrioluengo, Uyarra & Kitagawa, 2016).

Notably, the triple helix model of innovation has blurred the boundaries of traditional basic roles of university, industry and government. Universities increasingly take part in commercial activity through patenting and licensing, moving beyond the production of basic research. The next step is the emergence of intermediaries between the three elements as well as the hybridization of the three entities. Each, entity retains a strong primacy in its original field of expertise: the university remains the main source of knowledge production, industry is the primary vehicle of commercialization and the government remains its regulatory role (Ife & Okoro, 2024). The Triple Helix model of innovation has further obscured the conventional boundaries between universities, industries, and governments. This is seen from the fact that universities are now more involved in monetization strategies such as intellectual property management and surpassing merely engaging in research. This model also facilitates the emergence of middlemen and the synthesis of roles among the three entities, with each maintaining its core expertise: universities as the primary source of knowledge production, industries as the main agents of commercialization, and governments as administrators (Ife & Okoro, 2024).

For this reason, Abreu and Grinerich (2013), as cited in Nwogu and Adieme (2018), suggested that through the harmonization of the Triple Helix, universities can adopt an entrepreneurial approach which will equip students with innovative insights and business acumen which are essential for revitalization and workforce expansion in a society that increasingly requires such contributions. Consequently, this paper aimed to illustrate the role that Nigerian universities are playing in promoting industrial development within Nigeria and West Africa while utilizing the Triple Helix model. The strengthening of connections between universities and industries is anticipated to create a dynamic industrial sector in West Africa, one that can stimulate growth in productive areas, reduce economic vulnerability, and align better with industry needs. (Tsauni, 2024)

The “Triple Helix Innovation model” refers to a collaborative framework that integrates universities, industries, and governments to foster economic and social development through innovation. This model, developed by Etzkowitz and Leydesdorff, emphasizes the interdependence and co-evolution of these three sectors to promote a knowledge-based economy. Universities play a key role by generating knowledge, while industries transform that knowledge into commercial applications, and governments create conducive policies to support innovation and development. The synergy between these entities accelerates technological advancement, regional development, and economic growth (Etzkowitz & Leydesdorff, 2000).

In the context of modern economies, the Triple Helix model is increasingly recognized as an essential approach to fostering innovation ecosystems, particularly in knowledge-intensive sectors. By facilitating a flow of knowledge and resources between academic research, entrepreneurial activities, and public policy, the model helps bridge the gap between theory and practice. Governments act as regulators and facilitators, enabling industries to capitalize on academic research while addressing societal needs, ultimately driving sustainable development (Cai, 2020). This collaboration leads to dynamic innovations that not only enhance competitiveness but also contribute to addressing global challenges like climate change and economic inequality.

The model integrating the trio of main players which explains the organisational development in knowledge-based economics is recognized as the “triple helix model” (Leydesdorff, 2018). This model is comprised of the industry, the government and the university. Traditionally, the industry was regarded as “wealth generator”, the university “novelty producer” while the government which is sandwiched between the two was viewed as “public controller” (Omer,

Emily, & Lynette 2015). As such, Cai and Lattu (2021) opined that it is vital to understand the strong points and weaknesses of the triple helix model (as well as the quadruple model) in order to appreciate the innovation network that embodies the ideals for a future society. Also, triple helix academics have continuously been developing the notional foundations of the triple helix model with efforts to realize the dynamics of sustainable growth in the present-day society (Cai & Etzkowitz, 2020).

Universities

University education is education one receives after passing through the primary and secondary levels of education. Notably, universities are part of higher education and are thought to be constructed on the level of capability, knowledge and skills ordinarily attained through secondary education. (Anyanwu, 2020) as cited in Ofor-Douglas, 2021a). Universities also have a significant impact on social change and community development. By housing science parks, incubators, and innovation hubs, they establish ecosystems that support regional growth and entrepreneurship. By modifying educational programs to satisfy changing industry expectations and guaranteeing that skills are in line with labour market demands, they also aid in workforce development. Because they spearhead multidisciplinary research projects and public awareness campaigns, universities are crucial to accomplishing the Sustainable Development Goals (SDGs), according to recent studies (Bennewort, Pinheiro, & Karlsen, 2020). Thus, universities are not just centres of learning but active agents of innovation, societal advancement, and economic resilience in an increasingly complex world.

Moreover, Ofor-Douglas (2023b) highlighted the following as benefit of university education which includes:

1. Individuals who have gone through university education would be able to contend with their peers internationally.
2. Individuals with university degrees would be well-versed and would be able to make sound contributions on things that mark on their society.

The “Triple Helix Innovation model” places universities at the core of the innovation process, recognizing them as key drivers of knowledge creation and dissemination in modern economies. Universities, in this model, have shifted beyond their traditional roles of education and research to become active participants in fostering innovation ecosystems. By collaborating with industries and governments, universities contribute to technological advancements and regional development. According to Cai and Lattu (2019), universities are increasingly seen as

"entrepreneurial actors" capable of generating not only intellectual capital but also contributing to social and economic innovation through technology transfer, patents, and the formation of start-ups. This expanded role reflects their centrality in knowledge-based economies, where the ability to innovate is critical to maintaining competitive advantages.

Moreover, universities serve as hubs for interdisciplinary collaboration and innovation in the Triple Helix model, providing expertise and resources that can be applied to real-world problems. By partnering with industries, they help translate theoretical research into practical solutions, while governments support these initiatives through funding and policy frameworks. Benner and Sörlin (2020) argued that the interplay between these three sectors fosters a fertile environment for innovation, as universities also engage in joint research and development projects, training, and incubating new technologies. This shift towards an innovation-oriented approach positions universities as essential nodes in the knowledge economy, catalyzing growth and addressing societal challenges through collaborative efforts.

Administration

In the context of the "Triple Helix Innovation model," administration plays a critical role in coordinating and facilitating interactions between universities, industries, and governments. Effective administrative structures are necessary to manage the complex partnerships that emerge from these collaborations. According to Ranga and Etzkowitz (2018), administration within the Triple Helix framework involves the creation of policies, regulations, and institutional frameworks that promote innovation and ensure efficient communication and resource-sharing among the three sectors. Administrative bodies in universities, government agencies, and industrial organizations need to work together to establish governance mechanisms, monitor progress, and evaluate the impact of innovation projects. This process often requires transparency, flexibility, and adaptability to address the dynamic needs of innovation ecosystems.

Furthermore, administrative functions within the Triple Helix model are essential for securing funding, managing intellectual property, and ensuring compliance with legal and ethical standards. Cai, Pugh and Liu (2020) emphasize the role of administration in coordinating research activities, providing logistical support, and fostering networks that encourage collaborative projects. Administrative entities act as mediators, ensuring that the diverse goals of universities, industries, and governments are aligned to maximize the potential for innovation. By streamlining processes such as technology transfer, patent management, and

regulatory approval, administration supports the efficient commercialization of academic research, contributing to economic growth and societal advancement.

The term administration otherwise known as management denotes a class of personnel whose responsibility is to direct and regulate (wholly or partially) an organization's process. (Bowtes, 2022) as cited in Ofor-Douglas, 2023b). Likewise, Arowosegbe (2021) pointed it out clearly that administration is a societal process that deals with recognising, preserving, inspiring, directing and merging formally and informally systematized human and material resources inside a cohesive system intended precisely to accomplish fixed purposes. Similarly, Campbell (2017) reasoned that educational administration is a device for good governance because the means by which administrators make verdicts and take steps to realize educational aims and purposes. Likewise, educational administration is fundamentally an activity or instrument through which the central aims of the educational process may be copiously realised. In the same vein, Orji (2015) indicated that educational administration consists of the activities of preparation, establishing, coordinating, regulating, appraising, recruitment and motivation of staff, students and others towards the fulfilment of the overall objectives of the university. Consequently, it is these qualified individuals who develop the critical thinking skills that drive local financial backing, impart knowledge to children, lead efficient governments and make vital decisions which touch the whole society (Bwambale, Mulegi & Bulhan, 2024).

Planning

In the realm of administration, effective planning is crucial to ensure that the goals of an organization or institution are met efficiently and align with long-term strategic objectives. In particular, within the Triple Helix Innovation model, planning involves aligning the efforts of universities, industries, and governments to foster collaborative innovation. According to Cavallini, Soldi, Friedl and Volpe (2019), planning in this context requires administrators to develop strategies that integrate resources, manage timelines, and anticipate challenges that may arise from coordinating multiple stakeholders. This involves setting clear goals, determining necessary resources, and creating a roadmap for successful collaboration. By doing so, administrators can better manage partnerships and promote innovation in a structured and organized way

Moreover, planning in administration goes beyond merely organizing current projects. It includes forecasting future needs, assessing emerging trends, and preparing the institution for potential shifts in the economic or policy environment. Di Nauta, Merola, Caputo & Evangelista

(2018) note that planning is critical in managing innovation ecosystems because it helps align the diverse interests of universities, industries, and governments while ensuring that resources are used effectively. Long-term planning also allows institutions to adapt to technological advancements and shifts in regulatory frameworks, helping them stay competitive and relevant in the global knowledge economy. Therefore, planning serves as the backbone of administrative efforts to drive innovation and foster sustainable growth within the Triple Helix framework.

Ololube (2019) averred that “planning is the selecting and relating of facts, making and using of assumption regarding the future in the visualization and formulation of purposed activities believed necessary to achieve desired results”.

Organizing

In the context of “administration”, organizing refers to structuring and coordinating resources, tasks, and personnel to achieve set objectives efficiently. Within the Triple Helix Innovation model, organizing plays a critical role in managing the collaborations between universities, industries, and governments. Effective organizing requires administrators to establish clear frameworks for communication, decision-making, and resource allocation across these sectors. According to Leydesdorff and Ivanova (2021), organizing in this context ensures that all stakeholders have defined roles, responsibilities, and reporting mechanisms to streamline operations and maintain a coherent structure. This organizational alignment allows for smoother collaboration, reducing redundancies and improving the efficiency of joint innovation efforts.

Furthermore, organizing within administration entails creating networks and platforms that facilitate knowledge sharing and cooperation. Gnaiger, Kravcenko, & Holocher-Ertl, (2020) emphasized the importance of administrative bodies in organizing interdisciplinary teams, cross-sector partnerships, and innovation networks that bring together academic expertise, industrial resources, and governmental support. By establishing organizational frameworks such as innovation hubs, research consortia, and public-private partnerships, administrators can enhance the collaborative capacity of institutions and accelerate the translation of research into marketable products and solutions. This level of organization is vital for fostering sustainable innovation ecosystems, as it ensures that the dynamic interactions between universities, industries, and governments are systematically managed and strategically directed.

Staffing

Staffing in administration refers to the process of recruiting, training, and managing personnel to ensure that an organization has the human resources needed to achieve its objectives. In the context of the Triple Helix Innovation model, staffing is crucial as it directly impacts the efficiency and effectiveness of collaboration between universities, industries, and governments. Ensuring the right mix of skills, expertise, and leadership is essential for successful innovation management. As noted by Benneworth, Pinheiro and Karlsen, (2019) staffing in Triple Helix collaborations involves not only filling technical and administrative roles but also recruiting individuals who can bridge the gap between academia, industry, and government sectors. These individuals, often referred to as "boundary spanners," play a key role in facilitating communication, building trust, and managing the complex interactions that are necessary for innovation. Moreover, staffing in the Triple Helix model requires continuous development and training to adapt to rapidly changing technological and economic environments. Adequate staffing means ensuring that personnel are not only qualified but also equipped with the knowledge and skills to manage interdisciplinary teams and navigate the diverse interests of different stakeholders. García-Teruel et al. (2020) highlight the importance of leadership in this context, stressing that leaders who understand both the academic and business worlds can guide innovation processes effectively. Staffing decisions should thus focus on fostering talent that can work across sectors, promote knowledge transfer, and lead collaborative innovation projects in line with institutional and societal goals.

Controlling

Controlling in administration refers to the process of monitoring, evaluating, and ensuring that an organization's activities are aligned with its strategic objectives. In the context of the "Triple Helix Innovation model", controlling is essential for managing the complex interactions between universities, industries, and governments. Effective control mechanisms help administrators track the progress of collaborative innovation efforts, ensuring that resources are used efficiently and goals are met within the established timelines. According to Cunningham and O'Reilly (2018), controlling in Triple Helix partnerships involves setting clear performance indicators and regularly assessing project outcomes to ensure that innovation processes are yielding the desired results. This oversight is vital for identifying bottlenecks, mitigating risks, and making necessary adjustments to stay on track.

In addition, controlling within the Triple Helix model involves maintaining accountability and transparency among the collaborating sectors. Since these partnerships often involve public funding and private investments, there must be mechanisms in place to ensure financial accountability and ethical conduct. Zomer and Benneworth (2021) highlight the importance of governance structures in ensuring that all stakeholders adhere to agreed-upon regulations and policies. Administrative bodies are responsible for developing control systems that enforce compliance, monitor the use of intellectual property, and ensure that innovation outcomes contribute to broader societal goals. By establishing robust controlling processes, administrators can create an environment that promotes sustainable innovation, fosters trust among partners, and maximizes the impact of collaborative efforts.

Directing

Directing in administration refers to guiding and overseeing activities to ensure that an organization's objectives are achieved. In the context of the Triple Helix Innovation model, directing involves ensuring that universities, industries, and governments work together effectively toward common innovation goals. Effective directing within these collaborations requires strong leadership that can align the diverse interests of the three sectors. Administrators play a key role in setting the strategic vision, facilitating communication, and coordinating efforts across the Triple Helix actors. According to Carvalho and Santos (2018), directing entails providing clear guidance on innovation priorities, delegating responsibilities, and motivating stakeholders to contribute to the collective goals of the partnership. This leadership ensures that innovation initiatives are well-coordinated and progress smoothly toward the desired outcomes. Additionally, directing within the Triple Helix framework involves fostering a culture of innovation and ensuring that all partners are engaged in the collaborative process. Successful directing requires administrators to not only oversee day-to-day operations but also inspire creativity and collaboration. As highlighted by Cai et al. (2020), leadership in Triple Helix partnerships must focus on building trust and promoting interdisciplinary collaboration, as this is essential for effective knowledge transfer and innovation. By setting clear directions, providing feedback, and addressing any emerging conflicts, administrative leaders can ensure that the collaboration remains productive and aligned with both short-term goals and long-term societal impacts.

Evaluation/ Feed Back

Evaluation and feedback are critical components of effective administration, particularly within the framework of the Triple Helix Innovation model. Evaluation involves systematically assessing the outcomes of collaborative initiatives among universities, industries, and governments to determine their effectiveness and impact. In this context, administrators must establish metrics and indicators that accurately reflect the performance of innovation projects. According to Fischer, Hatzichronoglou, and van der Waal (2020), conducting evaluations allows stakeholders to identify strengths, weaknesses, and areas for improvement within their collaborative efforts. By employing both qualitative and quantitative assessment methods, administrators can gather comprehensive insights into how well the partnership is functioning and whether it is meeting its strategic objectives. This evaluative process is essential for fostering accountability and transparency among partners, ensuring that all stakeholders are aligned with the goals of the innovation ecosystem.

Feedback is a vital aspect of the evaluation process, as it provides the necessary information for continuous improvement. Within the Triple Helix model, effective feedback mechanisms help facilitate open communication among partners, enabling them to share experiences, lessons learned, and best practices. As emphasized by Evers et al. (2021), timely and constructive feedback promotes adaptive learning and encourages stakeholders to make informed adjustments to their strategies and operations. This iterative process of evaluation and feedback not only enhances the effectiveness of individual projects but also strengthens the overall innovation ecosystem by fostering a culture of collaboration and mutual support. Ultimately, robust evaluation and feedback processes empower administrators to guide their organizations more effectively, drive innovation, and respond proactively to emerging challenges and opportunities.

Issues

The “Triple Helix Innovation model” presents a robust framework for fostering collaboration among universities, industries, and governments. However, several issues can arise that may hinder its effectiveness. Here are five notable challenges:

1. **Misalignment of Goals:** One significant issue in Triple Helix collaborations is the misalignment of goals among the three sectors. Universities often prioritize academic research and knowledge dissemination, industries focus on profit and marketability, while governments aim for policy compliance and public welfare. This divergence can lead to conflicts and

inefficiencies in collaborative projects. As noted by Ranga and Etzkowitz (2018), ensuring that all partners share a common vision and objectives is crucial for the success of these collaborations.

2. **Communication Barriers:** Effective communication is essential for collaboration, yet communication barriers often exist between the sectors. Differences in language, culture, and operational practices can lead to misunderstandings and hinder collaboration. As highlighted by Gnaiger, Kravcenko and Holocher-Ertl (2020), administrators must establish clear communication channels and foster a culture of openness to facilitate knowledge sharing and ensure all stakeholders are informed and engaged.

3. **Resource Allocation:** The allocation of resources can be contentious in Triple Helix partnerships, as each sector has its own priorities and constraints. Disparities in funding, access to technology, and human resources can create imbalances in collaboration. Fischer et al. (2020) pointed out that effective resource management and equitable distribution are necessary to support the sustainability of innovation projects and maintain stakeholder engagement.

4. **Intellectual Property Issues:** Intellectual property (IP) management is a critical concern in Triple Helix collaborations, as the sharing of knowledge and technology can raise legal and ethical questions. Disagreements over ownership and commercialization rights can lead to conflicts and inhibit cooperation. According to Zomer and Benneworth (2021), establishing clear IP agreements and frameworks is essential for fostering trust and encouraging open collaboration among partners.

5. **Evaluation Challenges:** Assessing the outcomes of Triple Helix collaborations poses significant challenges, as traditional evaluation metrics may not adequately capture the complexity of these partnerships. Measuring the impact of collaborative innovation requires comprehensive and flexible evaluation frameworks that account for various qualitative and quantitative factors. Evers, Karlsen and Klitkou (2021) emphasized the need for adaptive evaluation processes that can effectively assess performance, provide feedback, and inform future strategies.

Conclusion

Applying the triple helix model into the administration of Nigerian universities is a viable strategy to ensure the financial and sustainable development of the nation. Thus, encouraging the collaboration of universities, industries and the government is necessary as this approach

can address some issues plaguing Nigeria's education system such as lack of funding, graduate skills gaps, security of campuses etc. This approach can also ensure there are more practical learning sessions in contrast to majorly theoretical sessions. This can only be possible with supplies, facilities, space and qualified staff - a sure provision if the triple helix model is utilized. As such, potential stakeholders and university administrators need to take the first leap to secure partnerships and collaboration with industries and the government by actively communicating and strategizing with them to ensure alignment of decisions to address the needs of universities nationwide. Moreover, when integrated effectively, the triple helix model can improve Nigeria's standing internationally by promoting the image of an innovative and forward-thinking nation.

Suggestions

To address the issues associated with the "Triple Helix Innovation model", several strategic suggestions can be implemented to enhance collaboration among universities, industries, and governments. Here are four key suggestions:

1. **Establish Common Goals and Objectives:** To mitigate the issue of misalignment among stakeholders, it is crucial to develop a shared vision and clear objectives for collaborative projects. This can be achieved through facilitated workshops and joint planning sessions where representatives from each sector can express their priorities and expectations.
2. **Enhance Communication and Knowledge Sharing:** Overcoming communication barriers requires the establishment of formal and informal channels for dialogue among partners. Regular meetings, collaborative platforms, and networking events can facilitate knowledge exchange and foster trust among stakeholders.
3. **Resource Allocation:** For effective implementation of Triple Helix innovations in universities, strategic resource allocation is crucial. Universities should prioritize investing in research and development (R&D) infrastructure, fostering collaborations between academia, industry, and government. This involves allocating funds for advanced laboratories, incubators, and interdisciplinary research centres that encourage innovation. Additionally, universities must invest in professional development programs for faculty and students to enhance their innovation capacities. Equally important is the allocation of resources for knowledge transfer mechanisms, such as technology transfer offices, intellectual property management, and entrepreneurship programs. By ensuring an equitable and strategic distribution of resources,

universities can drive sustainable innovation and contribute significantly to economic and societal growth.

4. Develop Clear Intellectual Property Agreements: To address intellectual property concerns, it is essential to establish transparent IP management frameworks that clearly outline ownership, rights, and responsibilities from the outset of a collaboration. Legal agreements should be collaboratively developed to ensure that all parties are informed and in agreement regarding IP issues.

5. Implement Flexible Evaluation Frameworks: To effectively assess the outcomes of Triple Helix collaborations, it is important to adopt flexible evaluation frameworks that encompass both quantitative and qualitative metrics. This approach should account for the diverse nature of collaborative projects and the various impacts they may have on stakeholders.

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Utilization of Artificial Intelligence in School Supervision for Effective Administration in Public Secondary Schools in Rivers State, Nigeria

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Abstract

The integration of Artificial Intelligence (AI) in school supervision has the potential to enhance the efficiency and effectiveness of administrative processes in public secondary schools in Rivers State, Nigeria. This study investigated the utilization of AI in areas such as teacher performance evaluation, resource management, and academic integrity monitoring, highlighting its transformative impact on supervision practices in public schools. However, challenges such as inadequate technological infrastructure, financial constraints, limited digital literacy, and ethical concerns hinder its widespread adoption. The study proposes strategies to address these barriers, including investing in localized AI solutions, enhancing digital literacy, and implementing robust data privacy policies. The study concluded that the utilization of AI technologies, schools improves teacher performance evaluations, optimize resource management, and detect academic irregularities with unprecedented precision and speed. It suggested among others that Government and educational stakeholders should prioritize the provision of reliable technological infrastructure, such as high-speed internet, modern hardware, and uninterrupted power supply.

Keywords: Artificial Intelligence, School Supervision, Educational Administration, Digital Literacy, Educational Technology

Introduction

The Nigerian educational system has to do with different categories which include pre-primary, primary, and junior secondary schools, as well as Post-primary school and tertiary education. Secondary schools help in bridging the gap between primary and university education, preparing learners for higher education and career paths. Secondary education is important to nation building and is defined as the education received after successfully completing ten years of basic education and passing relevant examinations.

Effective supervision is crucial in the objectives of secondary school education. School supervision as opined by Chogwu and Daniel (2024) as leadership aimed at improving instruction and student learning, plays an important role in enhancing teaching quality. School supervision has long been recognized as a foundation for adopting educational quality and

accountability in public secondary schools. It involves activities aimed at enhancing teacher performance, student learning outcomes, and overall school effectiveness through systematic monitoring and support (Ogunleye, 2021). Effective supervision ensures that schools operate within set educational standards, helping teachers implement instructional practices that align with national objectives and local contexts (Adedayo & Okoye, 2022). In Nigeria, particularly in Rivers State, supervision remains crucial due to the ongoing challenges related to resource management, instructional consistency, and teacher support across public secondary schools (Njoku, 2023). Traditional approaches to supervision, often reliant on periodic visits and paper-based assessments, have limitations in terms of scalability, timeliness, and depth of insights (Akpan, 2020). However, the rapid evolution of artificial intelligence (AI) offers an opportunity to revolutionize school supervision, making it more responsive, data-driven, and efficient. AI technologies, including machine learning and data analytics, enable administrators to gather real-time insights into classroom practices, student performance, and teacher effectiveness, facilitating prompt and informed decision-making (Eze & Anya, 2021).

The integration of AI in school supervision also aligns with global educational trends, where digital innovations increasingly shape administrative practices. For instance, AI can be utilized in automating attendance monitoring, performance analysis of teachers and students and detection of academic dishonesty. (Aluko, 2022). Furthermore, AI-powered platforms can support adaptive supervision by generating predictive insights, identifying schools or teachers needing support, and offering customized feedback (Chukwu, 2023). This data-informed approach enhances supervisors' capacity to address issues proactively, reducing disparities in school quality and improving educational outcomes across the state. Given the importance of supervision and the promising potential of AI, this study examines the extent to which AI can be utilized in school supervision in Rivers State's public secondary schools. By exploring current applications, challenges, and opportunities, the study aims to provide evidence-based insights on AI's role in advancing educational management and accountability in the Nigerian context.

Artificial Intelligence (AI) has transformed traditional attendance management by introducing automated systems that influence biometric technologies or facial recognition. These systems ensure real-time and accurate attendance tracking for students and teachers, eliminating manual errors and preventing attendance fraud (Adedayo & Okon, 2022). For supervisors, this provides reliable records, enabling them to monitor punctuality, identify absenteeism trends, and address issues effectively.

Furthermore, AI-powered attendance systems generate detailed reports that highlight attendance patterns, such as frequent absences or tardiness, and their potential impact on overall school performance (Eze, 2023). Such systems save time and enhance administrative efficiency, allowing supervisors to focus on strategic interventions to improve the learning environment (Okafor & Anya, 2023). By promoting accountability and enabling data-driven decisions, AI enhances the effectiveness of school supervision in public secondary schools.

Artificial Intelligence (AI) provide powerful tools for analyzing the performance of teachers and students, providing directives for school supervision and administration. AI systems can process large volumes of data from assessments, lesson plans, and classroom activities to evaluate teaching effectiveness and student learning outcomes (Chukwu & Ekene, 2022). The use of artificial intelligence platforms also enables supervisors to track trends in student performance, identifying gaps in knowledge or skills and suggesting targeted interventions (Okoro, 2023). For teachers, these systems can provide personalized feedback based on classroom observations and student results, fostering continuous improvement (Adebayo, 2022). Furthermore, predictive analytics powered by AI can forecast potential performance issues, allowing proactive measures to be taken to address challenges before they escalate (Eze & Nwachukwu, 2023). By utilizing AI for performance analysis, supervisors can enhance accountability, improve teaching and learning processes, and ensure educational objectives are met in public secondary schools.

Statement of Problem

School supervision is important for maintaining quality education, ensuring effective teaching, and fostering students' academic success. In an ideal situation, supervision should be consistent, efficient, and data-driven to address instructional gaps and improve learning outcomes. However, the current situation in public secondary schools in Rivers State reveals several shortcomings in the supervision process. Supervisory activities often rely on traditional methods that are manual, time-consuming, and prone to errors, leading to delays in addressing critical issues affecting school administration.

Over time, various steps have been carried out by scholars to improve school supervision which include regular supervisory visits, the introduction of digital record-keeping, and periodic training for supervisors. Despite these efforts, significant challenges persist. Supervisors are often unable to comprehensively monitor all schools due to inadequate personnel, limited resources, and logistical constraints. As a result, supervision remains passive rather than active, failing to achieve its intended goals.

The outcome of this problem are far-reaching as inefficient supervision contributes to poor teacher accountability, suboptimal instructional delivery, and declining student performance. It also hinders timely identification and resolution of administrative and instructional challenges, which affects the overall quality of education in the state. If a lasting solution is not found, the consequences could be severe, including continued decline in educational outcomes and widening disparities between schools. However, the study tends to achieve the following objectives which are to determine the extent to which AI technologies are utilized in school supervision in public secondary schools in Rivers State, identify the challenges associated with the implementation of AI in school supervision and propose strategies for effective integration of AI in school supervision practices. While studies on AI in education exist, there is limited research specifically addressing its application in school supervision within the Nigerian educational system. Therefore, this study seeks to bridge this gap by investigating on the utilization of Artificial Intelligence in school supervision in public secondary schools in Rivers State, with the aim of improving supervisory efficiency and enhancing educational quality.

Conceptual Clarifications

Artificial Intelligence (AI) in Education

Artificial Intelligence (AI) refers to the simulation of human intelligence processes by machines, especially computer systems (Russell and Norvig, 2016). AI encompasses various technologies that enable machines to perform tasks that typically require human intelligence, such as learning, reasoning, problem-solving, perception, language understanding, and decision-making. Chukwuma et al., (2021) sees the definition of artificial intelligence (AI) as the development of computer systems capable of performing tasks that typically require human intelligence, such as problem-solving, decision-making, and imitating the human knowledge. In education, AI encompasses a range of technologies, including machine learning, natural language processing, and predictive analytics, which are used to enhance teaching, learning, and administrative processes (Ogunleye & Olanrewaju, 2022).

AI applications in education aim to automate repetitive tasks, analyze large volumes of data, and provide personalized learning experiences for students. For instance, AI-powered platforms can assist teachers by identifying individual student needs, tracking academic progress, and recommending tailored interventions (Adeoye, 2022). Similarly, AI tools can support

administrators in decision-making processes, such as resource allocation and performance evaluations, thereby improving the efficiency of educational institutions (Ibrahim et al., 2021). One of the most transformative roles of AI in education is its ability to provide real-time feedback and support. AI-driven systems like intelligent tutoring programmes and virtual assistants can deliver instant responses to student queries, monitor their engagement levels, and adapt instructional materials to suit their learning pace (Babalola & Oladipo, 2022). These capabilities not only enhance student learning outcomes but also reduce the workload on teachers, allowing them to focus on more complex instructional tasks (Ojo & Akinbode, 2020). Again, AI is instrumental in educational supervision by enabling data-driven monitoring and evaluation. For example, AI algorithms can analyze school performance data, track teacher effectiveness, and identify trends that inform policy development (Okafor & Ojo, 2023). By leveraging predictive analytics which administrators can proactively address challenges, such as student dropout rates and resource inefficiencies, before they intensify into major issues (Ezeani & Onuoha, 2023). AI is reshaping education by enhancing efficiency, personalizing learning experiences, and providing actionable insights for educators and administrators. Its integration into school supervision and administrative practices holds significant promise for improving educational outcomes in the 21st century. Despite the fact that it is Artificial in nature, it can not take away the fact it is artificial in nature as against competing with the human brain. However, it was advised by Okebukola (2024) that;

- *100% Dependence on AI is abomination for the scholar*
- *AI should be your “Boy”, Boy” not your Master*
- *Your Creativity and innovation must show when you use AI and*

School Supervision and Effective Administration

School supervision has to do with the systematic process of monitoring, evaluating, and supporting educational activities to ensure that schools achieve their academic and administrative objectives. It involves overseeing teaching practices, learning outcomes, and the general management of school resources to foster an environment conducive to quality education. Effective school supervision plays a critical role in achieving educational goals by providing guidance, facilitating professional development, and ensuring compliance with established standards and policies (Adebayo & Omotayo, 2021).

The core aim of school supervision is to enhance the teaching and learning process. Supervisors, often school administrators or external inspectors, ensure that instructional methods align with curricular objectives and that teachers employ effective strategies to meet students' needs.

Supervision activities also focus on providing constructive feedback to teachers, addressing instructional challenges, and identifying areas for improvement (Okafor & Nwankwo, 2022). This process promotes accountability and professional growth among educators, ultimately contributing to improved student outcomes.

Effective administration complements school supervision by ensuring the efficient management of human, financial, and material resources within a school. It involves planning, organizing, staffing, directing, and controlling all school activities to achieve set objectives. Administrators must balance supervision responsibilities with administrative duties, such as budgeting, infrastructure maintenance, and stakeholder engagement, to create a well-functioning school system (Nwoke & Obi, 2020). In modern education, school supervision and effective administration are increasingly intertwined. Administrators rely on supervisory processes to make data-driven decisions, ensure the proper implementation of policies, and maintain high academic standards. For instance, supervisory feedback can guide resource allocation, curriculum adjustments, and teacher training initiatives, thereby aligning administrative practices with the school's strategic goals (Ibrahim & Adeola, 2021).

School supervision also helps in fostering a positive school climate. By monitoring the performance of teachers and students, supervisors can identify and address issues such as absenteeism, low morale, or inadequate instructional materials. This proactive approach ensures that schools remain responsive to the needs of their stakeholders, including students, parents, and the wider community (Chukwuma et al., 2022). However, challenges such as limited funding, lack of training for supervisors, and resistance to change can hinder effective school supervision and administration. Addressing these challenges requires a collaborative effort among educational stakeholders to provide adequate resources, build capacity, and promote a culture of continuous improvement (Adeleke & Onyekachi, 2023). School supervision and effective administration are integral to achieving quality education. By ensuring that educational practices align with institutional goals and providing the necessary support for educators and students, these processes lay the foundation for academic excellence and sustainable school development.

Utilization of AI Technologies in School Supervision in Public Secondary Schools in Rivers State

The integration of AI in school supervision has the potential to revolutionize how schools are monitored, evaluated, and managed. Traditional supervisory methods, often labour-intensive and reactive, can benefit significantly from AI's ability to provide timely, data-driven insights

that enhance decision-making and improve school administration outcomes. In public secondary schools in Rivers State, AI technologies can play critical roles in several dimensions:

Teacher Performance Evaluation

Teacher performance evaluation plays a vital role in ensuring quality education by assessing instructional practices, enhancing accountability, and promoting professional development. Traditional methods, often based on manual observations and subjective assessments, are limited in scope and efficiency. Artificial Intelligence (AI) technologies, however, provide a more robust framework for evaluating teacher performance by utilizing data-driven tools and analytics to generate comprehensive insights into teaching effectiveness (Chukwu & Ekene, 2022).

One of the most significant contributions of AI to teacher performance evaluation lies in its ability to analyze vast amounts of data from classroom activities, lesson plans, and assessments. AI systems can track how teaching strategies align with student outcomes, identifying areas of strength and potential improvement. For example, algorithms can measure the effectiveness of instructional methods by analyzing student engagement and comprehension during lessons. This approach ensures a more objective evaluation compared to traditional methods, where biases and inconsistencies may arise during manual reviews (Eze & Nwachukwu, 2023).

AI technologies also facilitate real-time feedback mechanisms, which are critical for fostering teacher growth. Supervisors can use AI tools to provide personalized feedback based on classroom interactions and student performance data. This feedback highlights specific areas for improvement, such as time management, the use of teaching aids, or engagement strategies, enabling teachers to refine their practices and enhance learning outcomes. Personalized feedback systems are particularly beneficial in large school systems where supervisors may struggle to provide detailed reviews for every teacher (Adedayo & Okoye, 2022).

Another essential aspect of AI in teacher performance evaluation is predictive analytics. These technologies can forecast potential challenges in teaching effectiveness by identifying trends in teacher behavior or student performance. For instance, if a teacher consistently underperforms in managing classroom engagement, predictive models can flag this issue early, prompting targeted interventions such as training or mentoring. This proactive approach minimizes the risk of prolonged instructional gaps, which can adversely affect students' academic progress (Okoro, 2023).

AI-powered platforms also support peer comparison and benchmarking by analyzing data across multiple teachers within a school or district. Such systems highlight best practices and set performance standards that encourage healthy competition and professional excellence. Teachers can learn from their peers who demonstrate high performance, adopting methods and strategies that contribute to improved teaching outcomes. Benchmarking fosters a culture of continuous improvement while maintaining transparency and accountability in the evaluation process (Okafor & Anya, 2023). Moreover, AI systems ensure fairness in teacher evaluations by reducing biases that often characterize manual assessments. Traditional evaluations may be influenced by personal perceptions or isolated observations, leading to inconsistent appraisals. In contrast, AI provides a holistic view of teacher performance by integrating diverse data sources, such as classroom activities, test results, and student feedback. This comprehensive evaluation framework enhances the credibility and reliability of the appraisal process (Chogwu & Daniel, 2024).

The integration of AI in teacher performance evaluation also promotes efficiency by automating routine tasks associated with data collection and analysis. Supervisors no longer need to spend significant time gathering and processing information manually. Instead, AI tools handle these tasks, freeing up supervisors to focus on strategic decision-making and the development of targeted support initiatives for teachers. This increased efficiency is particularly critical in under-resourced public secondary schools in Rivers State, where limited supervisory personnel may hinder effective monitoring (Eze, 2023). Despite its advantages, the application of AI in teacher performance evaluation is not without challenges. Issues such as inadequate technological infrastructure, data privacy concerns, and resistance to change among educators may impede the adoption of AI-driven systems. Addressing these challenges requires collaborative efforts from educational stakeholders to provide the necessary resources, training, and support for seamless integration. Building trust among teachers regarding the use of AI in evaluations is equally important, as skepticism about fairness and accuracy may hinder acceptance (Adebayo, 2022).

Artificial Intelligence offers transformative potential in teacher performance evaluation, enhancing objectivity, efficiency, and actionable feedback. By leveraging AI tools, supervisors can gain a deeper understanding of teaching practices, provide tailored support, and foster a culture of continuous improvement in public secondary schools. These advancements align

with the broader goals of educational accountability and quality enhancement, ensuring that teachers are well-equipped to meet the evolving demands of 21st-century education.

AI in Resource Management for Public Secondary Schools

Resource management is a critical aspect of educational administration, ensuring that human, material, and financial resources are effectively allocated to meet institutional objectives. In public secondary schools, resource management involves activities such as staff allocation, budgeting, infrastructure maintenance, and procurement of teaching and learning materials. Traditional methods often rely on manual processes, which can be prone to inefficiencies, delays, and inaccuracies. Artificial Intelligence (AI) offers transformative solutions to these challenges by automating processes, enhancing decision-making, and promoting optimal utilization of resources (Okafor & Ojo, 2023).

AI technologies enable data-driven decision-making in the allocation of resources. Machine learning algorithms can analyze historical data, such as student enrollment trends, teacher availability, and school performance metrics, to predict future needs and allocate resources accordingly. For instance, AI systems can suggest optimal teacher-to-student ratios based on class size and subject requirements, ensuring that human resources are effectively deployed to address educational demands. This predictive capability helps administrators in public secondary schools in Rivers State to plan proactively, reducing the likelihood of resource shortages or over-allocations (Eze & Anya, 2021).

In financial resource management, AI-powered tools can streamline budgeting and expenditure tracking. These systems provide real-time insights into financial data, helping school administrators identify discrepancies, avoid overspending, and ensure that funds are allocated to priority areas. For example, AI algorithms can analyze spending patterns and recommend cost-saving measures, such as identifying suppliers that offer competitive prices for school materials. This enhances transparency and accountability in the management of school finances, which is particularly crucial in contexts where resources are limited (Okoro, 2023).

Infrastructure maintenance is another area where AI can significantly enhance resource management. AI systems equipped with sensors and IoT (Internet of Things) devices can monitor the condition of school facilities in real-time, identifying issues such as faulty equipment, structural damage, or energy inefficiencies. By generating alerts and maintenance schedules, these systems enable timely repairs, reducing downtime and extending the lifespan

of school assets. For example, AI tools can predict when a generator or air conditioning unit is likely to fail, allowing administrators to address the issue before it disrupts school activities (Chukwu & Ekene, 2022).

AI also facilitates effective inventory management by automating the tracking and replenishment of teaching and learning materials. Systems equipped with AI can monitor inventory levels, predict usage patterns, and generate procurement orders when supplies run low. This ensures that essential materials such as textbooks, laboratory equipment, and stationery are always available, supporting uninterrupted teaching and learning processes. Such automation reduces the administrative workload and minimizes the risk of stockouts or excess inventory, which can strain financial resources (Ezeani & Onuoha, 2023). Again, AI fosters resource optimization by promoting energy efficiency in school operations. Smart energy management systems use AI algorithms to monitor and regulate energy consumption in real-time, adjusting lighting, heating, or cooling systems based on occupancy and environmental conditions. Such systems reduce energy costs and contribute to environmental sustainability, aligning with global trends in green education practices (Babalola & Oladipo, 2022).

Detection of Academic Dishonesty and Irregularities Using Artificial Intelligence

Academic dishonesty, including plagiarism, cheating, and other forms of malpractice, poses significant challenges to maintaining the integrity of educational systems. In public secondary schools, detecting and addressing these issues is essential for fostering a culture of honesty, fairness, and accountability. Traditional methods for identifying academic dishonesty often rely on manual supervision, periodic reviews, or post-incident investigations, which can be limited in effectiveness due to resource constraints and human biases. Artificial Intelligence (AI) provides innovative tools that significantly enhance the ability to detect and prevent academic dishonesty and irregularities in a more accurate, efficient, and proactive manner (Okafor & Anya, 2023).

AI technologies have revolutionized plagiarism detection by leveraging natural language processing (NLP) algorithms and vast databases of digital content. These systems analyze textual similarities between submitted work and existing sources, identifying instances of copied or paraphrased content with remarkable precision. Tools such as Turnitin Pro, Stealth AI, and Grammarly, powered by AI, are commonly used in educational settings to evaluate the originality of student assignments. By comparing documents against extensive repositories of

published and unpublished materials, these systems can detect even subtle forms of plagiarism, such as sentence restructuring or synonym substitution (Adedayo, 2022). This capability not only discourages dishonest behavior but also educates students on proper citation practices and intellectual property ethics.

AI systems are also instrumental in identifying cheating during examinations. AI-powered proctoring tools, such as ProctorU and ExamSoft, utilize facial recognition, gaze tracking, and behavior analysis to monitor test-takers in real time. These systems can detect suspicious activities, such as looking away from the screen repeatedly, the presence of unauthorized individuals, or the use of restricted devices. Advanced algorithms analyze these behavioral patterns to flag potential instances of cheating for further review by supervisors. Such technologies are particularly valuable in online or hybrid learning environments where traditional invigilation methods may be inadequate (Eze & Nwachukwu, 2023).

Beyond individual misconduct, AI can uncover systemic irregularities in assessments and grading processes. For example, machine learning models can analyze patterns in test results to identify anomalies, such as unusually high scores in specific subjects or discrepancies between classroom performance and examination outcomes. These patterns may indicate instances of collusion, test leaks, or grading biases. By providing actionable insights, AI tools enable educational administrators to address these issues promptly and uphold the integrity of assessment systems (Chukwu & Ekene, 2022).

Challenges Associated with the Implementation of AI in School Supervision

The integration of Artificial Intelligence (AI) into school supervision offers numerous benefits, such as improved efficiency, enhanced decision-making, and data-driven insights. However, its implementation is not without challenges, especially in public secondary schools in regions such as Rivers State, Nigeria. These challenges are multifaceted, encompassing infrastructural, financial, ethical, and cultural aspects. One significant challenge is the lack of adequate technological infrastructure. AI systems require reliable internet connectivity, advanced hardware, and sophisticated software to function effectively. In many public secondary schools, particularly in underfunded areas, access to basic technological resources remains limited. Poor internet penetration, outdated computers, and inconsistent electricity supply make it difficult to deploy and maintain AI-driven systems. These infrastructural deficits not only hinder the

adoption of AI technologies but also reduce their effectiveness when implemented (Okoro, 2023).

Financial constraints pose another major obstacle to AI implementation in school supervision. AI technologies often come with high upfront costs for purchasing, installing, and maintaining the necessary equipment and software. Additionally, there are recurring expenses associated with software updates, system maintenance, and licensing fees. For schools operating within tight budgets, allocating funds for these technologies can be challenging, especially when other pressing needs, such as teacher salaries, infrastructure development, and learning materials, compete for limited resources (Adedayo & Okoye, 2022).

The limited digital literacy among school administrators and staff is another challenge. Effective use of AI in school supervision requires training and technical expertise to operate and interpret AI tools. However, many educators and supervisors may lack the necessary skills or familiarity with AI systems, leading to resistance to adoption or suboptimal usage. Training programs are essential but require time, resources, and a willingness among staff to adapt to new technologies (Chukwu & Ekene, 2022).

Ethical and data privacy concerns also present significant barriers. AI systems often collect and analyze large volumes of data related to students, teachers, and school operations. Without proper safeguards, this data could be vulnerable to breaches, misuse, or unauthorized access. Parents, teachers, and other stakeholders may express concerns about the surveillance capabilities of AI tools, such as facial recognition or behavior tracking, perceiving them as intrusive. Balancing the need for supervision with respect for individual privacy is critical to fostering trust and acceptance of AI in educational settings (Ezeani & Onuoha, 2023).

Resistance to change is another factor that can impede the implementation of AI in school supervision. Teachers and administrators accustomed to traditional methods may view AI as a threat to their roles or autonomy. Some may fear that AI tools will replace human judgment or undermine their expertise, leading to skepticism and reluctance to embrace the technology. Overcoming this resistance requires clear communication about the benefits of AI and its role as a supportive tool rather than a replacement for human decision-making (Babalola & Oladipo, 2022).

The issue of contextual relevance is also significant. Many AI solutions are developed in contexts that may not align with the specific needs and realities of public secondary schools in Nigeria. For example, algorithms designed for advanced educational systems in developed countries may fail to address the unique challenges of overcrowded classrooms, resource scarcity, or multilingual environments common in Nigerian schools. Adapting AI tools to fit the local context is necessary but often requires additional customization and development efforts (Okafor & Anya, 2023).

Policy and regulatory gaps further complicate AI adoption in education. The absence of clear guidelines and standards for the use of AI in schools can lead to inconsistent implementation, ethical dilemmas, and accountability issues. For instance, there may be a lack of clarity on data ownership, the roles of various stakeholders, or the long-term implications of AI-based decisions in educational administration. Establishing robust policies and frameworks is crucial to ensuring the responsible and effective deployment of AI technologies (Adebayo, 2022).

Despite these challenges, the potential of AI in transforming school supervision remains immense. Addressing these barriers requires a coordinated effort among stakeholders, including government agencies, educational institutions, technology providers, and the wider community. Investments in infrastructure, capacity-building initiatives, and the development of localized AI solutions can help overcome many of these hurdles. Moreover, fostering an inclusive dialogue about the ethical use of AI and building trust among educators, parents, and students are essential for ensuring its successful implementation.

Proposed Strategies for Effective Integration of AI in School Supervision Practices

The integration of Artificial Intelligence (AI) into school supervision practices offers opportunities for enhancing efficiency, accountability, and data-driven decision-making. However, realizing these benefits requires deliberate strategies to address potential barriers and optimize the use of AI technologies in educational administration. The following strategies outline how public secondary schools can effectively integrate AI into their supervision practices.

- 1. Invest in Technological Infrastructure:** A foundational step in integrating AI is providing the necessary technological infrastructure. Schools must invest in reliable internet connectivity, modern hardware, and up-to-date software to support AI tools. Additionally,

governments and educational stakeholders should prioritize electrification in rural areas to ensure consistent power supply.

- 2. Develop Localized and Context-Appropriate AI Solutions:** To ensure relevance and effectiveness, AI tools should be tailored to address the unique challenges and realities of the local educational context. This involves adapting algorithms and systems to account for specific issues such as multilingual classrooms, resource constraints, and overcrowded schools.
- 3. Enhance Digital Literacy through Training and Capacity Building**
Effective AI integration requires that school administrators, teachers, and supervisory staff possess the necessary technical skills to operate and manage AI systems. Regular training programs should be organized to enhance digital literacy and provide hands-on experience with AI tools.
- 4. Implement Robust Data Privacy and Security Policies:** Since AI systems rely on data collection and analysis, protecting sensitive information is critical. Schools must establish and adhere to stringent data privacy and security policies to prevent breaches, misuse, or unauthorized access.
- 5. Foster Collaborative Partnerships:** Integrating AI in school supervision requires collaboration among various stakeholders, including government agencies, educational institutions, technology providers, and non-governmental organizations.
- 6. Establish Clear Policies and Regulatory Frameworks:** Governments and educational bodies should develop comprehensive policies and regulatory frameworks to guide the ethical and effective use of AI in schools. These policies should address issues such as accountability, transparency, and the roles of various stakeholders in managing AI systems.
- 7. Promote Awareness and Cultural Acceptance:** Resistance to change is a common barrier to adopting new technologies. Efforts should be made to educate school staff, students, and parents about the benefits of AI in improving school supervision. Clear communication about how AI supports, rather than replaces, human decision-making can alleviate fears and promote a positive attitude toward its adoption.

Conclusion

The utilization of Artificial Intelligence (AI) in school supervision presents a transformative opportunity for enhancing the efficiency and effectiveness of educational administration in public secondary schools in Rivers State, Nigeria. The utilization of AI technologies, schools

improves teacher performance evaluations, optimize resource management, and detect academic irregularities with unprecedented precision and speed.

Suggestions

1. Government and educational stakeholders should prioritize the provision of reliable technological infrastructure, such as high-speed internet, modern hardware, and uninterrupted power supply.
2. Government should organize regular training programs for school administrators and teachers to enhance their digital literacy and familiarize them with AI tools.
3. Develop comprehensive user manuals and offer technical support to address challenges during the implementation process.
4. Government should Create clear policies and regulatory frameworks for the ethical use of AI in schools, addressing concerns such as data privacy, accountability, and transparency.
5. School administrators should ensure all AI applications used in schools are transparent, explainable, and free from biases that could adversely affect decision-making.

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Principals' Knowledge of Legal Issues in the Admissions of Junior Secondary School Students in Rivers State

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Abstract

The study investigated principals' knowledge of legal issues in the admissions of junior secondary school students in Rivers State. The study adopted the descriptive survey research design. Two research questions and two hypotheses guided the study. The population of the study consisted of all 208 junior secondary school principals in Rivers State. The multistage sampling techniques were adopted in selecting the sample size of 132. A structured questionnaire titled principals' understanding of legal issues in the admissions of junior secondary school students' questionnaire was used as instrument for data collection. Three experts validated the instrument and Cronbach Alpha Method was used to obtain an average reliability coefficient of 0.83. 132 copies of the questionnaire were administered to the respondents but only 121 which 92% of return rate were retrieved and used for the study. The items were rated on a four (4) point rating scale; mean and standard deviation was used to analyze the research questions while z-test was used in testing the formulated hypotheses. The findings reviewed that, junior secondary school principals in Rivers State to a high extent understand government policies and education law in the admissions of students. The researcher recommended that principals should abide by the government policies guiding the admissions of students into secondary schools in the study area to avoid unnecessary court cases against them and principals should be trained and retrained on education law to enable them to increase their understanding of students' fundamental right as regards their admissions into secondary schools.

Keywords: Principals' understanding, Legal issues, Admissions, Government policies, Education law

Introduction

Secondary school education is the form of education received after the basic primary school. The Federal Government of Nigeria (2014) defines secondary school education as the form of education children receive after primary school and before the tertiary stage. The importance of secondary education in educational system cannot be overemphasized. Apart from serving as the link between primary and tertiary education, it provides opportunity for a child to acquire additional knowledge, skills, and traits beyond the primary level. Someone who is in charge of the affairs in the secondary school is referred to as the principal and is responsible for running of the school. In the view of Akpan (2018), principals occupy a unique position in the secondary education system hence becomes an agent who executes or transmits rules and regulations

handed down by the employer. On this note, the main task is seen as interpretation of policies and execution of instructional programmes as it affects education process, personnel, funds, school plants and school-community relations.

In secondary schools, legal provisions have been established to guide admissions of student into the secondary school. For principals to comprehend fully the nature of their duties and obligation to the secondary schools, it becomes imperative to have some basic understanding and knowledge of the legal provisions of secondary school system (Biokoro, 2017). School laws and the educational system that determine students' rights are contained in several school documents including logbook, state edict, memos, administrative code, ordinances, school minute books, bulletins, government policies decision, administrative procedure Act, choice law Act, statutory policies among others. These documents are resource materials schools' authorities should draw inference from towards knowing how to relate with students in the matter that concerns their rights. Although, these documents are valuable tools in equipping the school head in legal matters, they cannot replace their training in education laws.

Educational law is an administrative orders, ethics, legislations, rules and regulations put in place by government and enforceable through judicial process to guide educational decisions. According to Peretomode (2014), educational law is a heterogeneous body of regulations which directly and indirectly affect the educational and administrative processes of the educational system. Education laws are meant for the protection of the human rights of staff and students in a school setting. It therefore implies that education laws are protective, providing the necessary framework and procedure for institutional management. As a result, its knowledge by those operating the education system cannot be overemphasized since schools are the ideal context for legal education activities. In sequence, legal knowledge of admission enables school principals to encourage respect for the rule of law and fundamental principles of justice built into international human right treaties. According to Obun, Akpama and Ayang (2012), public school principals must be prepared to apply understanding of school law in a variety of situations. Some of such situations apply to school discipline, decision making and law by judicial decision - a judicial interpretation which is an important element of the legal process under the doctrine of *Stare decisis* (stand by the decision) and decision on examination malpractices, imposition of corporal punishment, expulsion of students from school and the rights of students. They also argued that school principals and educators in general should have

understanding of education law in order to minimize their own legal liability and to prevent potential legal problems in the school system.

With so many aspects of schooling affected by law, principals must ensure that they are proactive in minimizing the possibility of breaking any law that stem from any of the issues in the school system. Laws in Nigeria which applied to admission of students into secondary schools are enshrined in the 1999 constitution of the Federal Republic of Nigeria in chapter 4 containing the fundamental rights from where education laws derive its strength. These laws are fundamental human rights such as right to life; right to dignity of human person; right to fair hearing; right to freedom of movement; right to freedom of expression; right to freedom of assembly and association and right to freedom from discrimination (Peretomode, 2014). These are laws that prevent the school principals from acting indiscriminately when dealing with students and staff. Arong and Ogbadu (2015) noted that, principals must have the ability to anticipate possible dangers and take steps to avoid them and regulate school life in such a way that learning is taking place while the rights of all are being respected.

The laws of the Rivers State stipulate that schools and institutions whether private or public should keep vital records and books such as: a register of admission, progress and withdrawal, a register of attendances and fees, a logbook, a cash account of the public institution showing every item of receipt and expenditure. They should also have a copy of the law and all regulations and amendments of the state and country. Principals should have a time-table approved by the ministry, weekly diaries of literacy and practical work and teachers' working notes of at least one lesson per day, a visitor's book, a corporal punishment book, and a record of progress on which promotions in primary and senior secondary have been based (Oramisi, 2017).

The general provisions relating to education as enacted in 2014 stated that:

It shall be the duty of the person in charge of a school or institution to ensure that no racial qualification shall be required of any member of the staff, teacher or pupil in any institution, and no such member, teacher or pupil shall be under any disability or suffer any disadvantage or be accorded any advantage on the grounds of race or nationality: nor shall any pupil be refused admission to any school or institution or be under any disability or suffer any disadvantage or be accorded any advantage on the grounds of religion (Cap E2, p.5).

Laws are made to avoid litigations and administrative efficiency or probity. The government has often conceived and implemented policies to enhance the admission and enrolment of students into the secondary school system. A policy serves the purpose of ensuring that every official action of an organisation must have a basis or a backing. Ndu (2017) considers that a policy is an overall guide that gives the general limits and direction in which administrative action will take place. In this regard Gallant (2014) suggested that school principals should be knowledgeable about school law not only as a response to the growing number of education-related court cases but also as a proactive way of providing an effective defence against possible litigation. He went further to state that, school principals who possess understanding of law may be better positioned to make informed decisions concerning legal issues in their administrative practices. They may be better able to anticipate legal problems that may arise from their disciplinary actions and decisions that may infringe on students' rights. Also, they would be able to consider the legal implications and respond appropriately.

Statement of the Problem

Functionally, law is normative as it regulates, guides, and evaluates human conduct. It therefore helps society determine the extent to which specific acts, commission and omissions conform to acceptable standard of behaviour or otherwise (Asuru in Elenwo, 2023). The administration of secondary education in some parts of the country appears to have school principals who may not have acquired the relevant legal understanding required for a holistic school operation; whereas the management of a school involves the rule of the law that should regulate the conduct of administrators, staff, and students. Informed principals, with knowledge about law, understand the discharge of their duties is guided by the rules and regulations governing their schools. Consequently, litigation becomes inevitable where discipline and decision made by school authorities infringe on students' and staff's rights.

It is this background, that studies need to be carried out to investigate the extent of principals' understanding of legal issues in the admissions of secondary school students in Rivers State.

Purpose of the Study

The purpose of the study was to investigate principals' knowledge of legal issues in the admissions of Junior Secondary School Students in Rivers State.

Specifically, the study sought to:

1. ascertain the extent of principals' knowledge of government policies in the admissions of Junior Secondary School Students in Rivers State.

2. examine the extent of principals' knowledge of education law in the admissions of Junior Secondary School Students in Rivers State.

Research Questions

This study was guided by the following research questions:

1. To what extent is principals' knowledge of government policies in the admissions of Junior Secondary School Students in Rivers State?
2. To what extent is principals' knowledge of education law in the admissions of Junior Secondary School Students in Rivers State?

Hypotheses

The following null hypotheses were formulated and tested in the study at 0.05 level of significance:

1. There is no significant difference in the mean responses of the male and female principals on the extent of principals' knowledge of government policies in the admissions of Junior Secondary Schools Students in Rivers State.
2. There is no significant difference in the mean responses of the male and female principals on the extent of principals' knowledge of education law in the admissions of Junior Secondary Schools Students in Rivers State.

Methodology

The study adopted a descriptive survey design. This study was carried out in Rivers State. The population of the study comprised 208 junior secondary schools' principals in Rivers State. The population of the study is made up of 154 male principals and 54 female principals. The sample of the study consisted of 132 principals made up of 96 male principals and 36 female principals. In selecting the sample size for the study, multistage sampling technique was adopted.

The instrument for data collection is titled; Principals' Knowledge of Legal Issues in the Admission of Junior Secondary School Students Questionnaire (PKLIJSSSQ). The instrument was designed by the researcher. The instrument had two sections, A and B. Section A had items designed to review personal information about the respondents. Section B had two clusters with 5 items each which focused on answering the research questions. The response format adopted was a four-point rating scale as follows: Very High Extent (VHE=4), High Extent (HE=3), LE (Low Extent=2) and Very Low Extent (VLE=1). The instrument was subjected to validation by three experts: one from the Department of Educational Management and two from the

Department of Measurement and Evaluation in the Faculty of Education, Rivers State University. The reliability of the instrument was also established using 20 junior secondary schools' principals randomly sampled from junior secondary schools which were not sampled. Data gathered from their responses were computed and the scores yielded a reliability coefficient of 0.84 and 0.81 respectively. The reliability coefficient showed the instrument was reliable. The researcher through the help of her two trained research assistants administered the questionnaire directly to the respondents. Out of the 132 questionnaires distributed, only 121 were completely completed while 11 questionnaires from male principals were not recovered. There was 92% of return rate and it took the researcher and her trained assistants two weeks for completion of the exercise. Data collected from the respondents were analyzed using Mean and Standard Deviation. To test the two null hypotheses formulated for this study at 0.05 level of significance, z-test was used. The formulated null hypotheses were rejected when the calculated z value is greater than or equals to the z-critical value of ± 1.96 at 0.05 level of significance and failed to reject null hypotheses when the z-calculated value is less than the z-critical value of ± 1.96 at .05 level of significance.

Results

Research Question 1: To what extent is principals' knowledge of government policies in the admissions of Junior Secondary School Students in Rivers State?

Table 1: Mean Responses of Female and Male Principals on the Extent of Principals' Knowledge of Government Policies in the Admissions of Junior Secondary School Students in Rivers State.

S/No	Items	Males		Decision	Females		Decision
		— X	SD		— X	SD	
1	Principals respect the laws, rules and regulations made by the government regarding students' admission.	3.12	0.95	HE	2.86	1.09	HE
2	Principals follow laid down procedures when dealing with students' admission	2.74	1.08	HE	2.94	0.99	HE
3	Adhering to government policy on admission absolves principals of litigation	2.71	1.15	HE	2.75	1.03	HE
4	Principals' decision on admission is consistent with government policy.	2.94	1.03	HE	2.78	0.92	HE
5	Principals have knowledge that non-compliance of government policies on admission is tantamount to suing	2.88	0.92	HE	2.72	1.00	HE
Grand Mean/SD		2.88	1.03	HE	2.81	1.01	HE

Source: Researcher's Field Result, 2024.

Table 1 above shows principals' knowledge of government policies in the admissions of Junior Secondary School Students in Rivers State is to a high extent with the following mean values for items (1-5) for male principals: 3.12, 2.74, 2.71, 2.94 and 2.88 and for female principals: 2.86, 2.94, 2.75, 2.78 and 2.72 respectively.

Research Question 2: To what extent is principals' knowledge of education law in the admissions of Junior Secondary School Students in Rivers State?

Table 2: Mean Responses of Female and Male Principals on the Extent of Principals' Knowledge of Education Law in the Admissions of Junior Secondary School Students in Rivers State.

S/No	Items	Males		Decision	Females		Decision
		\bar{X}	SD		\bar{X}	SD	
6	Principals have knowledge of students' right to freedom of discrimination in school admission	2.86	1.02	HE	2.97	0.96	HE
7	Principals have that that trampling upon students' rights as regards admission can lead to litigation	2.55	1.15	HE	2.56	1.01	HE
8	Principals have knowledge that that denying a student admission based on the state of origin amounts to violation of students' fundamental right	2.91	1.00	HE	2.86	1.06	HE
9	Principals have knowledge that that denying student admission based on racism violates students right	2.93	0.90	HE	2.67	1.05	HE
10	Principals have knowledge that setting irregular standard between both genders for admission in same school can fuel litigation	3.22	0.87	HE	2.89	1.02	HE
Grand Mean/SD		2.89	0.99	HE	2.79	1.02	HE

Source: Researcher's Field Result, 2024.

Table 2 above shows principals' knowledge of education law in the admissions of Junior Secondary School Students in Rivers State is to a high extent with the following mean values for items (6-10) for male principals: 2.86, 2.55, 2.91, 2.93 and 3.22 and for female principals: 2.97, 2.56, 2.86, 2.67 and 2.89 respectively.

Hypothesis 1: There is no significant difference in the mean responses of the male and female principals on the extent of principals' knowledge of government policies in the admissions of Junior Secondary Schools Students in Rivers State.

Table 3: Z-Test Analysis of the Responses on Principals' Knowledge of Government Policies in the Admissions of Junior Secondary School Students.

Respondents	N	\bar{X}	SD	DF	LS	z-cal	z-crit	Decision
Male Principals	85	2.88	1.03	119	.05	0.35	± 1.96	Failed to reject no significant difference
Female Principals	36	2.81	1.01					

Source: Researcher's Field Result, 2024.

Table 3 above shows no significant difference in the mean responses of male and female principals on the extent of principals' knowledge of government policies in the admissions of Junior Secondary Schools in Rivers State. The z-calculated value of 0.35 was less than the z-critical value of ± 1.96 ($0.35 \leq \pm 1.96$) for degree of freedom of 119 at .05 level of significance. Therefore, the null hypothesis was accepted which states that there is no significant difference in the mean responses of male and female principals on the extent of principals' knowledge of government policies in the admissions of Junior Secondary Schools in Rivers State.

Hypothesis 2: There is no significant difference in the mean responses of the male and female principals on the extent of principals' knowledge of education law in the admissions of Junior Secondary Schools Students in Rivers State.

Table 4: Z-Test Analysis of the Responses on Principals' Knowledge of Education Law in the Admissions of Junior Secondary School Students.

Respondents	N	\bar{X}	SD	DF	LS	z-cal	z-crit	Decision
Female Teachers	85	2.89	0.99	119	.05	0.50	± 1.96	Failed to reject no significant difference
Male Teachers	36	2.79	1.02					

Source: Researcher's Field Result, 2024.

Table 4 above shows no significant difference in the mean responses of male and female principals on the extent of principals' knowledge of education law in the admissions of Junior Secondary Schools in Rivers State. The z-calculated value of 0.50 was less than the z-critical value of ± 1.96 ($0.50 \leq \pm 1.96$) for degree of freedom of 119 at .05 level of significance. Therefore, the null hypothesis was accepted which states that there is no significant difference in the mean responses of male and female principals on the extent of principals' knowledge of education law in the admissions of Junior Secondary Schools in Rivers State.

Discussion of Findings

The findings to research question 1 which focused on the extent of principals' knowledge of government policies in the admissions of Junior Secondary School Students in Rivers State with grand mean of 2.88 and 2.81 for male and female principals respectively revealed that the respondents agreed to the statements that, principals respect the laws, rules and regulations made by the government regarding students' admission; principals follow laid down procedures when dealing with students' admission; adhering to government policy on admission absolves principals of litigation; principals' decision on admission is consistent with government policy and principals have knowledge that non-compliance of government policies on admission is tantamount to suing. So, the study revealed that principals to a high extent have knowledge of government policies in the admissions of Junior Secondary Schools in Rivers State. The finding agreed with the findings of Peretomode (2014) which suggested that the school administrators, including principals, should employ preventive legal management strategies in their students' management. They observed that legal aspects that border on educational administration being an emerging issue in Nigerian educational system are important and indispensable tools for on-the-job survival of educators, principals and teachers today. They revealed further that legal aspects which relate to school administrative practices, including students' management, particularly in the secondary schools, find their sources from the constitution, legislation in form of decrees, edicts, government policies, bye-laws and common laws (courts decisions or judgment laws)

Result on hypothesis 1 with a z-calculated value of 0.35 which is less than z-critical of ± 1.96 proved that there is no significant difference in the mean responses of male and female principals on the extent of principals' knowledge of government policies in the admissions of Junior Secondary School Students in Rivers State. This indicated that both group of respondents; male and female principals, agreed to the fact that principals have knowledge of government policies in the admissions of Junior Secondary School Students in Rivers State.

The findings to research question 2 which focused on the extent of principals' knowledge of education law in the admissions of Junior Secondary School Students in Rivers State with grand mean of 2.89 and 2.79 for male and female principals respectively revealed that the respondents agreed to the statements that, principals have knowledge of students' right to freedom of discrimination in school admission; principals have knowledge that trampling upon students' rights as regards admission can lead to litigation; principals have knowledge that denying a student admission based on the state of origin amounts to violation of students' fundamental right; principals have knowledge that denying student admission based on racism violates students' right and principals have knowledge that setting irregular standard between both genders for admission in same school can fuel litigation. Hence, the study revealed that principals to a high extent have knowledge of education law in the admissions of Junior Secondary Schools in Rivers State. The finding was in agreement with the findings of Arong and Ogbadu (2015) who found that school principals must be knowledgeable and be able to use and make moral judgement and decisions with the dignity of each person in mind, while promoting equality in all aspects of education,

Result on hypothesis 2 with a z-calculated value of 0.50 which is less than z-critical of ± 1.96 proved that there is no significant difference in the mean responses of male and female principals on the extent of principals' knowledge of education law in the admissions of Junior Secondary School Students in Rivers State. This indicated that both group of respondents; male and female principals, agreed to the fact that principals' knowledge education law in the admissions of Junior Secondary School Students in Rivers State.

Conclusion

In the light of the findings of the study, it was concluded that principals' knowledge of the legal issues in the admissions of Junior Secondary Schools in Rivers State is significantly high.

Recommendations

The study recommends that:

1. Principals should abide by the government policies guiding the admissions of students into secondary schools in the study area to avoid unnecessary court cases against them.
2. Principals should be trained and retrained on education law to enable them increase their understanding of students' fundamental right as regards their admissions into secondary schools.

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Educational Management in Nigeria: Issues and Way-Forward.

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Abstract

This paper examined educational management in Nigeria: issues and way-forward. Educational management is a necessity for the advancement of educational programmes and objectives in Nigeria. Effective management is a crucial element that all organisations use in order to enhance production. Management has become a phenomenon and has changed the world's economic and social landscape. But despite all of these, there are still some emerging issues militating against effective management of education in Nigeria. It is for the above reason that this paper looked into the following concepts, management, concept of educational management, scope of educational management, functions of educational management, educational management as a field, as well as issues in educational management in Nigeria, and the way-forward. It concluded that for Nigeria to achieve the sustainable development goals, the professional status, vibrancy, quality, and competence of planners and managers of education in the country need to be revived and sustained. The paper suggested that government and the private sector should ensure that more effort and resources are made towards effective management of education.

Keywords: Education, Management, Emerging, Educational Management

Introduction

Education is the process by which students are exposed to a sequence of educational encounters, with the purpose of instilling information, beliefs, attitudes, and skills, ultimately aiming to cultivate their ability to contribute effectively to society. Okoroma, (2012). Educational management refers to the systematic coordination and oversight of an institution's operations, including the planning, organisation, direction, and control of activities. This involves the judicious use of both people and material resources to achieve the objectives of teaching, extension work, and research in an effective and efficient manner. The National Policies on Education aim to foster societal progress in terms of social, economic, and cultural aspects by prioritising the development of human resources via education. Education, as such, need curriculum that are more relevant, adaptable, and capable of empowering students to effectuate favourable societal changes, all while upholding the commendable elements of our current society.

Management is an essential and active component of the organisations it oversees, providing vitality and sustenance. Indeed, there exists an inverted relationship between management and institutions, wherein they elucidate and complement one another for mutual benefit. Therefore, it may be argued that it has not only a cultural orientation but also functions as a catalyst for cultural development, exerting influence on both society and culture. The field of management emerged prominently during the Second World War, marking a significant milestone in its evolution as both a practical application and an academic study, which had been developing for almost a century.

Management is considered a social function that is deeply intertwined with society, since it is influenced by several aspects such as traditions, values, practises, beliefs, as well as governmental and political systems. Management, therefore, exhibits a people-centric approach, whereby the achievements or shortcomings of managers directly correspond to the accomplishments or setbacks of individuals inside an organisation. These individuals provide significant value to the overall efficacy of the management process. While tasks and processes play a crucial role, it is the effective organisation of human resources that takes on a prominent position in every management operation. The field of management has emerged as a significant and transformative force, exerting a profound impact on the global economic and social fabric.

According to Umesi, (2024). Educational Management as a field of study and practice was derived from Management principles first applied to industry and commerce, mainly in United States. Theory development largely involved the application of industry models to Educational settings. As the subject become established as an academic field in its own right, its theorists and practitioners begin to develop alternative models based on their observation of, and experience in, schools and colleges. By the 21st century, the main theories, had either been developed in the Educational context or had been adopted from industrial models to meet the specific requirement of schools and colleges. Educational Management has progressed from being a new field dependent upon ideas developed in other setting to become an established field with its own theories and research.

The national development goals require the professional management of education to bring about the effective and efficient functioning of Educational Institutions. The scope of Educational Management is wide and include the history and theories of management science, roles and responsibilities of an educational manager along with the requisite managerial skills.

The area of educational management emerged as a result of the application of management ideas that were first used in the industrial and commercial sectors, primarily inside the United States. The process of theory formation primarily included the use of industrial models within educational contexts. As the discipline gained recognition as an independent academic topic, scholars and professionals within this domain started to construct different theoretical frameworks derived on their empirical observations and practical involvement inside educational institutions. By the onset of the 21st century, the predominant theories in the field of education had either originated within the educational context or had been modified from industrial models to cater to the unique needs and demands of educational institutions such as schools and colleges. The area of educational management has evolved from its nascent stage, when it relied on concepts borrowed from other domains, to a well-established discipline characterised by its own unique theories and empirical investigations.

The achievement of national developmental objectives necessitates the use of professional management practises in the field of education, in order to ensure the optimal and proficient operation of educational institutions. The field of Educational Management encompasses a broad range of topics, including the historical development and theoretical foundations of management science. It also examines the many duties and responsibilities of educational managers, as well as the necessary managerial skills required for effective leadership in educational settings.

Conceptual Clarification

Management

Effective management is a crucial element that all organisations use in order to enhance production. Management may be described as the use of leadership abilities to provide direction on the handling of operations. According to Ndugu and Koori, (2020), organisations that generate significant profits have implemented well-organized management divisions to ensure the efficient operation of their programmes. These divisions include, management science, the responsibilities and duties of an educational manager, and the essential managerial skills. Educational administration often encompasses the management of human, physical/material, and ideation resources. The rationales for education management include several aspects, including programme planning and progress, control of the implementation process, organisation of available resources, and establishment and enforcement of organisational standards.

According to Chakma, (2019). The characteristics of educational management encompass its association with various organisations, institutions, societies, and countries. Furthermore, it is intricately linked with other disciplines, serving as an art form that embodies a humanitarian perspective. As a social science, educational management addresses the complexities of human beings and their surrounding environments. Additionally, it functions as a profession, involving the effective management in order to accommodate the evolving policies and principles, it is necessary to implement new policies and take appropriate actions. The attainment of particular goals serves as a guiding concept for successful management. The presence of effective management is essential for the longevity of any entity. It entails a collective effort by persons who possess a shared awareness and desire to attain a mutual objective. Furthermore, management is a social activity that bestows both social advantages and obligations onto individuals or organisations.

Management and administration are often used interchangeably. Scholars have made efforts to provide precise definitions for these notions have culminated in the compilation of comprehensive lists including all the actions that include the roles and responsibilities of administrators or managers. This depiction of management and administration implies the existence of many approaches to school management. According to Resser as cited in Akilaiya, (2008), the concept of management involves the effective utilisation of both physical and human resources, achieved via collaborative endeavours that include the activities of planning, organising, staffing, directing, and regulating.

Management as an institution is an organ of a society, existing to make specific contribution and to discharge specific social function. Management can be best defined or understood in relation to its performance-dimensions and of the demands of performance on it. The emergence of management during the last century may have been a pivotal event of history as it signalled a major transformation of society into a pluralistic structure of institutions of which it is the effective organ. It is described as an organized body of knowledge having universal application.

Management is the life-giving dynamic organ of the institutions that it manages. In fact, management and institutions are inversely related, explaining each other to mutual advantage. As such, it is not only culture oriented but also a culture conditioner, as it shapes society and culture. Management, after more than a century of development as a practice as well as a discipline, burst into prominence after the Second World War Management is a social function and, therefore, resides in society, responding to its traditions, values, customs and beliefs, and

to its governmental and political systems. Management, therefore, is people oriented: every managerial success or failure is the success or failure of individuals, of people, of men in an organization who add a real plus value to the entire management operation. Though tasks and procedures are vital, it is the organization of human resources that assume prominence in any management operation. Management has become a phenomenon and has changed the world's economic and social landscape.

Management refers to the judicious use of means and resources in a suitable and appropriate manner. The term management in education is related to the following components:

- Educational administration.
- Educational organization.
- Educational planning.
- Educational supervision.

Concept of Educational Management

Two notable specialists who provide explanations of the concept of management are Frederick W. Taylor and Henry Fayol. The proponents introduced the scientific management movement. The field of educational administration is, also shaped by the perspectives of individuals. Taylor, (1911) proposed the use of performance criteria, specifically emphasising the attainment of anticipated levels of labour productivity. A goal refers to an objective that an organisation strives to accomplish. The standard serves as a performance metric, the achievement of which leads to the attainment of the predetermined objective. Another notable management specialist is Okoroma & Uwalaka, (2012). In their seminal work, "Administration Industrielle et Generale," which was later translated as "General and Industrial administration" in the United States, the author pioneered the development of the philosophy of administrative administration. The individual recognised the distinction between operational and managerial tasks, with a desire to explore avenues for enhancing managerial practises. Fayol's primary emphasis is in the realm of operational matters. The author delineated five concepts that subsequently evolved into managerial roles, namely planning, organising, commanding, coordinating, and controlling. The word "administration" has been often used by individuals to refer to the concept of management. Administration is a broad category of human behaviour that is often seen within an organisational context.

Administration is a procedural mechanism through which choices are deliberated and determined. Administration refers to the systematic management and oversight of activities inside a social organisation, such as educational institutions or industrial settings. It encompasses the processes of guiding and supervising many aspects of organisational activity. Alternatively, it may be argued that management can be classified as a scientific discipline, since it pertains to the study of how individuals collaborate in order to achieve organisational objectives Kimani, (211). Educational management entails the use of management ideas within the realm of education. Kiman,i (2011) asserted that educational administration and educational management are distinct topics of study that are implemented in practise. Educational management is a discipline within the subject of management that is focused on practical applications. Educational, management may be inferred as the use of management theory and practise within the realm of education or educational institutions. Educational administration refers to the systematic method of procuring and distributing resources with the aim of attaining predefined educational objectives.

Scope of Educational Management

The scope of a topic or discipline fundamentally pertains to its subject matter, including the region and authority it encompasses. The aforementioned scenario is applicable within the domain of educational management, which serves as a topic of scholarly inquiry within the broader area of education. The visualisation of issues pertaining to educational management encompasses all elements that are directly or indirectly associated with the educational process.

They include:

1. Management of human resources

This pertains to the process of recruiting, cultivating, and maintaining personnel inside the educational institution. Human resource managers are responsible for developing operational policies and processes that have a direct impact on the performance and attitudes of staff members.

2. Management of Financial Resources

This entails the supervision of the financial policies pertaining to educational institutions, including administrative help in areas such as financial aid, revenue management, and school finances. Financial aid encompasses many forms of support provided by the government, including subsidies, allowances, and grants. These forms of assistance are allocated based on characteristics such as income levels, age, and the institution attended.

3. Management of Material Resource

This encompasses the physical assets controlled by the educational institutional system, including infrastructural amenities such as furniture, air conditioners, office stationery, buildings, and grounds.

4. Management of Educational Technology

This encompasses the incorporation, strategic organisation, execution, and administration of information and communications technology (ICT) to facilitate efficient learning and instruction.

5. Management of Means or Methods

This pertains to the systematic arrangement of concepts and doctrines inside educational establishments. The process encompasses the implementation of the curriculum, which involves incorporating the ideas upon which it was constructed. Additionally, it entails organising various subject-based learning experiences or activities, using suitable methodologies.

Functions of Educational Management

The process of educational management consists of three basic functions, namely planning, implementing and controlling. A manager uses these functions to achieve educational organization goals and objectives. Therefore, educational Management has the following functions:

Planning: Planning is the first step of educational management. Kimani, (2011) said “Planning is a rational and systematic way of forecasting the future of an organization. Planning must be adaptability, adoptability, flexibility, and scientific. Educational planning is the starting point to make the perfect Educational Management. It should be adapted and adopted by everyone, flexible to anticipate any possibilities, and based on the obtained and accurate need and information. Planning is a very important function of management. This helps in setting goals.

Organization: This is the combination of necessary human effort, materials equipment in systematic and effective correlation to accomplish the desired results.

Evaluation: This is a good way to find out success or failure of a project or program. And also, to ascertain how and why it succeeded or failed.

Motivation: Motivation aims to make the employee to be cheerfully willing to do the job they are expected to do.

Supervision: This is basically to bring ‘about a continuing improvement in the instructional programme.

Implementing: Implementing is equivalent with doing. It means we must implement the plan into the real actions.

Organizing: This is a process of putting together human material resources in order to achieve organizational goal. In a school situation it may involve putting together teachers, non-teaching staff, and building, teaching and learning materials to ensure pupils learn effectively.

Directing: Directing is similar to leading, motivating and coordinating, which is the integrating of people with the educational organization to get their cooperation for the achievement of its goal. Directing is a process through which educational personnel are motivated to make effective and efficient contribution to the realization of organizational goals. Directing requires some organizational commitment. It needs integration of organizational goals with those of individual and groups.

Controlling: Controlling is a management function, which monitors whether the activities on going well or not. Controlling is needed to update plans, to protect organizations assets from inefficiency and waste and to appraise employee’s performance. It means this educational management function trying to control individual and organizational aspect.

Decision-making: This is a key factor in educational management. In taking policy decisions, those that will be affected must be taking into consideration. This should be done by considering various alternative and consequences of each course of action, and choosing the one that is suitable and most appropriate. Guess work, arbitrary exercise of authority, ill advise and hasty decisions should have no place educational management.

Educational Management as a Field of Study

Educational management primarily encompasses three fundamental responsibilities, namely planning, implementation, and control. In order to achieve optimal outcomes, it is essential to establish a cohesive partnership between the various roles of educational administration and the corresponding field research area. According to Engkoswara, (2001).

Educational Management encompasses three primary areas of study, namely:

- Human resource management, which focuses on the students, educational employees, and stakeholders, including the community as users of educational services.

- Learning resources, such as tools, are used in the planning process as a means of media or curriculum.
- The availability of facilities and financial resources are important aspects that contribute to the successful implementation of education. The use of the functions and scope of the discipline of educational management serves as a framework for guiding organizational endeavours towards the achievement of educational objectives that yield positive outcomes.

Within this particular domain of research, the area of educational management aims to enhance the effectiveness and efficiency of educational processes in order to maximise productivity.

Issues in Educational Management in Nigeria

There are several emerging challenges that hinder the effective management of education in Nigeria. These challenges encompass the presence of inexperienced and insufficiently skilled educational managers, inadequate management of records and data, political instability and interference, frequent policy changes, inadequate funding for education, limited availability of planning and management tools, corruption, and a lack of professional development and training opportunities for education managers. These are discussed below:

- 1. Quality:** The maintenance of desired quality standards in educational establishments is the duty of government entities such as the Ministry of Education of different states and university administration. Regrettably, they are unable to do this task. There exists a range of educational institutions that exhibit varying degrees of excellence or inadequacy in terms of their educational quality and management practises. Certain institutions are able to rival the top institutions globally, however, the majority of institutes face various challenges such as faculty shortages, inadequate infrastructure, outdated curricula, limited academic autonomy, financial difficulties, ineffective administration and management, insufficient engagement in knowledge generation and dissemination, as well as limited interaction with the community and economy.
- 2. Commercialization:** Educational institutions in Nigeria have been compelled to implement tactics aimed at augmenting income and reducing costs. The majority of educational institutions operate with a profit-oriented purpose, and the lack of effective government oversight may be attributed to deficiencies in existing legislation. In contemporary times, the field of education has transformed into a sector that is susceptible to exploitative practises for financial gain.

3. **Equity:** Significant disparities exist among different demographic groups depending on factors such as gender, religion, ethnicity, and socioeconomic status. Ethnic and religious discrepancies in recruitment and placement within educational institutions, as well as the unequal distribution of institutions among states in Nigeria, are evident.
4. **Inexperienced and Inadequate Educational Managers:** A significant proportion of administrators within our educational system lack the requisite level of expertise necessary to adequately and proficiently strategize and oversee the system. Within the realm of education ministries and boards, there exists a scarcity or absence of professional education managers, and even among those present, their competence may not meet the necessary requirements. The lack of well-prepared educational administrators may have impeded the improvement of performance and productivity within the field of education (Noun, 2009). In order to accomplish effective educational management in Nigeria, it is essential for governments at all levels to engage or reassign highly skilled and competent educational managers inside their respective education ministries.
5. **Poor records and data management:** In Nigeria, the problem of inadequate records and data management has emerged as a significant obstacle to the efficient and high-quality administration of education. In many instances, the documentation of educational data in Nigeria, similar to several other sectors, is often characterised by inadequate record-keeping practises, resulting in the misplacement or misappropriation of information.
6. **Political instability and interference:** Political instability and intervention are significant rising challenges that have a detrimental impact on the efficient administration of education in Nigeria. The occurrence of frequent changes in governments or political office holders often leads to sudden shifts in policy, even though such policy changes are necessary for the sector's required transformation at that particular moment. This phenomenon may also occur as a consequence of political groups holding divergent beliefs. If educational management are granted permission by politicians, they may implement educational programmes, strategies, and goals that would be advantageous to the sector. According to Gbenu, (2012), there is a tendency for politicians to redirect resources that were originally intended for the advancement of the educational sector for their own personal gain.
7. **Frequent changes in policies:** Policies serve as the fundamental components that sustain the vitality of an organization's objectives and activities. However, in the context of Nigeria, the implementation of these policies is hindered by the frequent fluctuations in the political, social, and economic landscape of the country throughout its history. The education system

has the potential to achieve a good and progressive position when policies are effectively implemented in a timely manner.

- 8. Poor funding of Education:** The allocation of resources to the Nigerian education system has been a cause for concern in recent years Ololube, (2013). Insufficient distribution of funds to the education sector has rendered it incapable of adequately addressing the requirements and issues it faces. Due to these factors, the effective and efficient administration of education in Nigeria seems to be an insurmountable challenge. The attainment of effective execution of an educational plan may be realised by ensuring adequate allocation of resources, including financial support, human capital, and facilities. The issue of inadequate funding in education may have been exacerbated by the worldwide economic downturn, as well as the recent emergence of the Covid-19 pandemic. This is due to the diversion of financial assistance and grants from international organisations, originally designated for educational purposes, towards other sectors of the economy, such as healthcare and infrastructure.
- 9. Corruption:** Corruption in Nigeria continues to be a pervasive problem that has had a detrimental impact on all sectors and institutions within the country, including the educational system. The mismanagement of money initially allocated for education planning and management purposes is a common issue among officials in the ministries of education at both the federal and local government levels.
- 10. Lack of Professional Development and Training for Education Managers:** The deficiency in professional development among educational managers employed in educational agencies and departments at the federal, state, and municipal levels is a contributing factor that hampers effective educational management. Numerous educational administrations may have been deprived of the possibilities to engage in further professional training or retraining courses. Consequently, this phenomenon has resulted in the managers experiencing a state of stagnation. Consequently, they lack exposure to contemporary and effective methodologies for the purposes of planning and management.
- 11. Unavailability of ICT and Use:** Insufficient information and communication technology (ICT) infrastructure and utilisation are prevalent in several educational institutions, companies, and governmental bodies inside Nigeria. The aforementioned issue has impeded the practise of efficient educational administration, including both the artistic and scientific aspects. The aforementioned shortcomings have had a significant impact on the planning and administration of education inside the nation, particularly in light of the

unforeseen COVID-19 epidemic. This global crisis has particularly caught Nigeria off guard.

12 Lack of planning and Management Training Institutes: In Nigeria, the presence of specialised institutions dedicated to the study and mastery of educational management is limited or non-existent.

Way Forward

The following is hereby recommended to address the problems confronting educational management in Nigeria:

- Government should allocate more fund if possible, 26 percent of her total budget as recommended by UNESCO to education sector for it to be effectively and efficiently managed.
- Educational managers must ensure that standards are maintained.
- There should be a harmonious collaboration between the educational management functions and its field study area.
- Teacher should be well motivated in terms of salary and other allowances so as to enable them discharged their duties properly, for effective management of education.
- Students should develop more interest while the school authority should introduce innovative and interesting programmes in education.
- Policy and curriculum planners should plan for meaningful and purposeful change over time based on circumstances.
- Government and politicians should not politicize education in the country as it will hamper effective management.

Implications for Educational Management

In order to promote the effectiveness and long-term viability of educational management in Nigeria, it is imperative to establish a legal requirement for adequately trained educational managers to consistently assess, monitor, and evaluate the degree to which educational plans, policies, and management issues are being implemented across all levels of education, including primary, secondary, and tertiary. Educational managers are responsible for supplying the ministries and boards of education at all levels with assessment reports pertaining to the status of educational management within the nation. This measure will significantly contribute to the establishment of a dynamic and effective educational management system in Nigeria.

Conclusion

The implementation of educational management is vital for the progression of educational programmes and goals within the context of Nigeria. In order to effectively attain the sustainable development objectives in Nigeria, it is imperative to restore and maintain the professional standing, vitality, quality, and competency of education planners and managers inside the nation. Therefore, the pressing concerns pertaining to educational administration, as elucidated in this study, need immediate attention and deliberation. Overall, it is imperative for education stakeholders to engage in a process of reassessment, repositioning, and providing support to educational managers, as well as the ministries responsible for planning and management, inside both governmental and non-governmental institutions and organisations, with a particular focus on Nigeria. Therefore, it is imperative that evaluators who have received formal education training actively engage in the process of evaluating and providing recommendations for the administration of education in Nigeria.

Suggestions

- It is essential for both the government and the private sector to prioritise the allocation of increased effort and resources towards the implementation of efficient education management.
- It is important to consistently provide instruction and reorientation to educational managers and other stakeholders in the Nigerian education system about the importance of attaining educational objectives.
- An impartial committee tasked with inspection should be established in order to frequently oversee the actions of educational administrators, given the current ineffectiveness of the present inspection unit.

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Effectiveness of AI-Predictive Analytics in Enhancing Academic Research among Postgraduate Educational Management Students in Universities in Rivers State

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Abstract

The study was conducted to find out how effective AI-Predictive Analytics enhance Academic Research among Postgraduate Educational Management Students in public universities in Rivers State. The study was guided by two specific objectives, two research questions and two hypotheses. A descriptive survey design was adopted with a population of 431 postgraduates' students of Educational Management from three public universities which were entirely used as sample for the study because of the manageable size. Data for the study were collected through a questionnaire validated by three experts and with reliability coefficient of 0.81 obtained through test retest method. Data gathered were analysed using mean to answer research questions and analysis of variance for testing the hypotheses at 0.05 level of significance. The result of the study shows that there is no significant difference in respondents' mean scores of state-owned universities and the federal university on data collection using AI-Predictive Analytics in enhancing academic research among postgraduate Educational Management students in universities in Rivers State and that there is no significant difference in respondents' mean scores of state-owned universities and the federal university on data organization using AI-Predictive Analytics in enhancing academic research among postgraduate Educational Management students in universities in Rivers State. Based on the result, it was recommended that Universities should provide targeted training and support to students and researchers on effectively using AI-Predictive Analytics. This training should address common challenges related to data accuracy and error minimization to improve the overall effectiveness of AI tools in data collection and institutions should integrate AI tools more seamlessly into research workflows to help address concerns about inconsistency in data organisation.

Keywords: AI-Predictive Analytics, Academic Research, Data Collection, Data Organisation, Educational Management

Introduction

Enhancing academic research involves employing strategies, tools, and methodologies that significantly improve the quality, efficiency, and impact of research activities within academic institutions. This enhancement encompasses various aspects such as fostering innovation, ensuring rigorous data analysis, improving research skills, and facilitating the dissemination of research findings. In today's academic landscape, the integration of

advanced technologies, particularly artificial intelligence (AI), has become pivotal in enhancing research processes. AI-Predictive Analytics, for instance, has emerged as a transformative tool that aids researchers in making data-driven decisions, predicting trends, and optimizing resource allocation. By leveraging these technologies, academic institutions can overcome traditional research challenges, thereby accelerating the advancement of knowledge and contributing to sustainable development (Ineye-Briggs, 2024).

Academic Research refers to a systematic investigation conducted to establish facts, generate new knowledge, or solve specific problems within various fields of study. It is characterized by its methodological rigour, critical analysis, and reliance on empirical data. Academic research can be categorized into several types, including basic research, which aims to expand foundational knowledge; applied research (Nwineh & Nwineh, 2019), which focuses on practical applications of scientific discoveries; and translational research, which seeks to bridge the gap between laboratory findings and real-world applications (Nwankwo, 2016; Ololube & Kpolovie, 2012). The process of academic research typically involves identifying a research question or hypothesis, conducting a comprehensive literature review, designing a study methodology, collecting and analysing data, and disseminating findings through publications, conferences, or other academic forums. Key attributes of high-quality academic research include originality, validity, reliability, and ethical integrity (Kayii & Kwakye, 2024). Therefore, Academic research is defined as the systematic, methodical pursuit of knowledge involving data collection, analysis, and interpretation aimed at generating new insights or solving specific problems within an academic framework using AI-predictive analytics.

Today, AI-Predictive analytics plays a crucial role in enhancing the effectiveness of academic research by offering sophisticated tools for data analysis and forecasting. These AI-driven methodologies enable researchers to identify patterns, predict future trends, and make informed decisions with greater precision and accuracy (Nwile & Befii-Nwile, 2024; Kayii & Kwakye, 2024). By automating complex data analysis processes, AI-Predictive Analytics reduces the time and effort required for manual data handling, allowing researchers to focus on higher-order thinking and innovative problem-solving. For instance, in a study conducted by Smith, Johnson and Thompson (2023) at Stanford University, AI-Predictive Analytics was used to forecast student performance and identify factors contributing to academic success. The study demonstrated that predictive models could accurately predict student outcomes based on historical data, enabling educators to implement targeted interventions. Similarly, a local study

by Adebayo (2022) in Nigeria explored the use of AI-Predictive Analytics in optimizing resource allocation in university research departments. The findings revealed that AI tools significantly improved the efficiency and effectiveness of resource distribution, leading to enhanced research productivity.

Moreover, AI-Predictive Analytics facilitates interdisciplinary research by integrating diverse datasets and providing insights that span multiple fields of study. This capability is particularly valuable in addressing complex, multifaceted research questions that require a holistic approach. For example, the integration of AI in medical research has led to significant breakthroughs in disease prediction and personalized medicine, as reported by Zhang, Li, and Wang (2022) in their comprehensive review of AI applications in healthcare.

AI-Predictive Analytics has revolutionized data collection and organization in academic research, offering unparalleled precision and efficiency. Traditional data collection methods often involve manual processes that can be time-consuming and prone to errors. In contrast, AI technologies automate and streamline these processes, enhancing data accuracy and reliability. For instance, AI-driven tools can scrape vast amounts of data from various digital sources, including academic databases, social media, and online surveys, thus significantly broadening the scope of research data available to scholars (Smith, Johnson, & Thompson, 2023).

Moreover, AI-Predictive Analytics aids in the organization of large datasets, ensuring that data is structured in a manner conducive to thorough analysis. This capability is particularly beneficial in handling big data, where the volume, variety, and velocity of data can overwhelm traditional data management systems. AI algorithms can classify and categorize data based on predefined criteria, facilitating easier retrieval and analysis. According to Zhang, Li, and Wang (2022), the use of AI in data organization allows researchers to quickly identify relevant data points, draw meaningful correlations, and generate actionable insights. This streamlined process not only saves time but also enhances the overall quality and integrity of the research. In the context of academic research, AI-Predictive Analytics enables researchers to handle diverse and complex datasets with greater efficacy. For example, in a study by Adebayo (2022) on optimizing resource allocation in university research departments, AI tools were employed to organize data related to funding, resource distribution, and research outputs (Ikpesu & Kayii, 2023; Eze, Nnaji & Okeke, 2021). The AI system could predict future resource needs and identify trends, allowing for more strategic and effective allocation of resources. This predictive

capability is crucial in academic settings, where resource management directly impacts research productivity and innovation.

Furthermore, AI-Predictive Analytics supports dynamic and real-time data collection, providing researchers with up-to-date information that reflects the latest trends and developments in their field. This real-time capability is particularly valuable in rapidly evolving disciplines (Dambo & Kayii, 2022), such as technology and medicine, where staying current with the latest data is essential for producing relevant and impactful research (Smith, Johnson & Thompson, 2023). AI tools can continuously monitor and update datasets, ensuring that researchers have access to the most current information available.

The integration of AI-Predictive Analytics in data collection and organization also enhances the reproducibility and transparency of academic research. By automating data processes, AI reduces the likelihood of human error and bias, thereby increasing the credibility of research findings. Moreover, AI systems can provide detailed logs and documentation of data handling processes, which is essential for verifying and replicating studies. This transparency is crucial for maintaining the integrity of academic research and fostering trust within the scholarly community (Aleru, 2024; Zhang et al., 2022; Gamage, Ayres, Behrend & Smith, 2022).

Arguably, AI-Predictive analytics significantly enhances the efficiency, accuracy, and reliability of data collection and organization in academic research. By automating data processes and providing real-time updates (Iftakhar, 2016; Hrastinski, 2008), AI technologies allow researchers to manage large and complex datasets effectively. These advancements not only improve research productivity but also ensure the integrity and reproducibility of research findings, thereby contributing to the overall advancement of knowledge. As demonstrated by recent studies, the adoption of AI in academic research processes is instrumental in achieving these goals (Adebayo, 2022; Smith et al., 2023; Zhang et al., 2022).

Smith, et al, (2023) evaluated the impact of AI-Predictive Analytics on student performance data collection and analysis. The researchers developed AI models to forecast student outcomes based on historical data. The study demonstrated that AI significantly enhanced the accuracy and efficiency of data collection, allowing for more precise identification of at-risk students and timely interventions. The AI tools automated the gathering of data from multiple sources, reducing manual effort and potential errors, thus significantly improving the quality and comprehensiveness of the collected data. Similarly, Adebayo (2022) examined the application

of AI-Predictive Analytics in collecting and analyzing data related to resource allocation in Nigerian universities. The research demonstrated that AI tools improved the efficiency of data collection processes by automating data scraping and integration from various institutional databases. The enhanced data collection capabilities enabled more accurate predictions of resource needs and trends, leading to better-informed decisions and strategic resource management in academic settings. While, Nnaa and Surajo (2020) demonstrated that AI tools enhanced the efficiency and accuracy of data collection by automating survey distribution and response aggregation. Additionally, AI algorithms were used to organize and categorize the collected data, facilitating easier analysis and interpretation. The researchers concluded that the use of AI significantly improved the overall research process, leading to more reliable and impactful findings.

Zhang and Wang (2022) examined various applications of AI in healthcare, including its role in data organization for academic research. The authors highlighted how AI algorithms classified and structured large datasets, facilitating easier retrieval and analysis. The study found that AI tools not only managed vast amounts of data efficiently but also ensured that data was organized systematically, improving the researchers' ability to draw meaningful insights and correlations. This capability was particularly beneficial in handling complex medical research data, enhancing the overall quality and reliability of the research findings. Brown and Green (2021) investigated the benefits and challenges of using AI for research data management, particularly in organizing academic research data. The authors found that AI significantly streamlined the organization of large and complex datasets, making them more accessible and easier to analyse. The study highlighted that AI tools automated the classification, tagging, and indexing of data, reducing the time and effort required for data management. This improved data organization enabled researchers to focus more on analysis and interpretation, thereby enhancing the overall efficiency and effectiveness of academic research. Despite the evident benefits of AI-Predictive Analytics in enhancing the efficiency and accuracy of data collection and organization across various fields, there remains a lack of comprehensive research on its long-term impact on the sustainability and reproducibility of academic research outcomes among students.

Statement of the problem

Despite the rapid advancements in technology, postgraduate Educational Management students in universities in Rivers State face significant challenges in conducting effective academic

research. Many students struggle with the manual and often error-prone processes of data collection and organization, leading to inefficiencies and inaccuracies in their research. These issues not only hinder the quality of their work but also extend the time required to complete their research projects. Specifically, the potential benefits of Artificial Intelligence (AI) in predictive analytics, which could greatly enhance the efficiency and accuracy of data collection and organization, remain largely untapped or underutilized. This raises a critical question: How effective can AI-predictive analytics enhance the processes of data collection and organization to enhance academic research among postgraduate Educational Management students in universities in Rivers State?

Purpose of the Study

The aim of the study was to find out how effective AI-Predictive Analytics enhance Academic Research among Postgraduate Educational Management Students in Universities in Rivers State. In specific terms, the study sought to examine the:

1. effectiveness of data collection using AI-Predictive Analytics in Enhancing Academic Research among Postgraduate Educational Management Students in Universities in Rivers State.
2. effectiveness of data organization using AI-Predictive Analytics in Enhancing Academic Research among Postgraduate Educational Management Students in Universities in Rivers State.

Research Questions

The investigation was guided by the following research questions:

1. How effective is data collection using AI-Predictive Analytics in enhancing Academic Research among Postgraduate Educational Management Students in Universities in Rivers State?
2. How effective is data organization using AI-Predictive Analytics in enhancing Academic Research among Postgraduate Educational Management Students in Universities in Rivers State?

Hypotheses

The following formulated hypotheses guide the study:

1. There is no significant difference in respondents' mean scores of state-owned universities and the federal university on the effectiveness of data collection using AI-Predictive

Analytics in Enhancing Academic Research among Postgraduate Educational Management Students in Universities in Rivers State.

2. There is no significant difference in respondents' mean scores of state-owned universities and the federal university on the effectiveness of data organization using AI-Predictive Analytics in Enhancing Academic Research among Postgraduate Educational Management Students in Universities in Rivers State.

Methodology

The research design adopted for this study is analytic descriptive design. This study used analytic descriptive design because the sampled strata are compared through the use of hypotheses. The population for this study is 431 post graduate students (Masters and Doctoral), which comprises of 101 from Rivers State University, 252 from Ignatius Ajuru University of Education, and 78 from University of Port Harcourt in public tertiary institutions offering Educational Management at graduate level. There was no sampling technique since the population was considered to be very manageable. Structured questionnaire was developed by the researchers which were used for data collection based on the review of related literature on AI-Predictive Analytics in enhancing Academic Research in Tertiary Institutions. The instrument is categorically structured into two sections. Section A was respondent's demographic data, while Section B sought information on AI-Predictive Analytics in enhancing Academic Research in Tertiary Institutions. The instrument was subjected to face and content validation to determine its adequacy and appropriateness for the study and for its proper wordings. In order to establish the reliability of the instrument that was used for the study, a test-retest method was used. The reliability coefficient for the validated instrument is 0.81. Data collected from the administered questionnaire which numbered 362 copies were analysed using mean ratings and standard deviation to answer the two (2) research questions posed for the study, while the two (2) null hypotheses were tested using one-way Analysis of Variance (ANOVA) statistical tool at 0.05% level of significance.

Results

Research Question 1: How effective is data collection using AI-Predictive Analytics in enhancing Academic Research among Postgraduate Educational Management Students in Universities in Rivers State?

Table 1: Mean Scores on data collection using AI-Predictive Analytics in enhancing Academic Research

S/N	Data Collection using Ai-Predictive Analytics	RSU (n=101)			IAUE (n=183)			UP (n=78)		
		M	S.D.	RMK	M	S.D.	RMK	M	S.D.	RMK
1	AI-Predictive Analytics simplifies the data collection process for my research.	3.08	1.00	AG	3.15	0.90	AG	3.29	0.99	AG
2	Using AI-Predictive Analytics ensures more accurate data collection compared to traditional methods.	1.96	0.98	DA	2.15	1.21	DA	1.76	0.75	DA
3	The use of AI-Predictive Analytics reduces the time needed for data collection.	3.08	0.81	AG	3.54	0.97	AG	3.41	0.71	AG
4	AI-Predictive Analytics helps in gathering more comprehensive data for my research	2.04	0.89	DA	1.85	0.90	DA	1.76	0.83	DA
5	Using AI-Predictive Analytics minimizes errors in data interpretation	1.72	0.94	DA	1.92	0.49	DA	2.00	1.06	DA
6	AI-Predictive Analytics reduces the workload associated with data management.	2.88	1.01	AG	3.38	0.65	AG	3.12	0.99	AG
7	I have encountered technical difficulties when using AI-Predictive Analytics for data collection.	1.84	1.03	DA	1.92	0.95	DA	1.59	0.62	DA
	Grand Mean	2.37	0.95	DA	2.56	0.87	AG	2.42	0.85	DA

The grand mean scores of table 1 suggest that overall, students at RSU and UP are more likely to disagree (DA) with the effectiveness of AI-Predictive Analytics in enhancing data collection, while students at IAUE tend to agree (AG) with its effectiveness. While AI-Predictive Analytics is perceived as simplifying the data collection process and reducing the time and workload associated with data management, there are concerns about its accuracy, comprehensiveness, and error minimization. The students at IAUE have a slightly more favourable view of AI tools compared to those at RSU and UP. Technical difficulties are acknowledged but are not seen as a major issue. The mixed responses indicate that while AI-Predictive Analytics has its benefits, there are significant areas for improvement to enhance its effectiveness in academic research.

Research Question 2: How effective is data organization using AI-Predictive Analytics in enhancing Academic Research among Postgraduate Educational Management Students in Universities in Rivers State?

Table 2: Mean Scores on data Organization using AI-Predictive Analytics in enhancing Academic Research

S/N	data Organization using AI-Predictive Analytics	RSU (n=101)			IAUE (n=183)			UP (n=78)		
		M	S.D.	RMK	M	S.D.	RMK	M	S.D.	RMK
8	AI-Predictive Analytics effectively organizes large datasets for academic research	2.88	0.93	AG	2.92	1.04	AG	2.82	1.29	AG
92	The use of AI-Predictive Analytics simplifies the process of data categorization in my research projects	2.92	1.19	AG	2.69	1.11	AG	3.29	0.99	AG

10	AI-Predictive Analytics tools improve the accuracy of data classification in my research.	2.92	1.04	AG	2.77	0.93	AG	3.35	0.79	AG
11	The application of AI-Predictive Analytics enhances the efficiency of data retrieval during my research .	3.24	0.83	AG	3.15	1.14	AG	3.29	0.77	AG
12	AI-Predictive Analytics helps in maintaining consistency in data organization throughout my research process.	1.76	0.88	DA	1.85	0.90	DA	1.82	1.01	DA
13	The use of AI-Predictive Analytics reduces the time spent on data cleaning and preparation for analysis.	1.92	1.00	DA	1.69	1.11	DA	1.71	0.85	DA
14	AI-Predictive Analytics provides useful insights for structuring my research data effectively	3.08	1.15	AG	2.77	1.24	AG	3.18	0.95	AG
Grand Mean		2.67	1.00	AG	2.55	1.07	AG	2.78	0.95	AG

The grand mean scores in Table 2 suggest that overall, students at all three universities (RSU, IAUE, UP) generally agree (AG) that AI-Predictive Analytics is effective in enhancing data organization for academic research. Students across all universities recognize the benefits of AI-Predictive Analytics in organizing large datasets, simplifying data categorization, improving accuracy, and enhancing the efficiency of data retrieval. However, there are concerns about maintaining consistency in data organization and reducing time spent on data cleaning and preparation. The overall positive agreement indicates that students find AI-Predictive Analytics to be a valuable tool in organizing data for academic research, though there are areas where its effectiveness could be improved to meet their expectations fully.

Hypotheses

Hypothesis 1: There is no significant difference in respondents' mean scores of state-owned universities and the federal university on data collection using AI-Predictive Analytics in enhancing Academic Research among Postgraduate Educational Management Students in Universities in Rivers State.

Table 3: ANOVA on data collection using AI-Predictive Analytics in enhancing Academic Research

Source of Variation	SS (Sum of Squares)	df (Degrees of Freedom)	MS (Mean Square)	F	P-value
Between Groups	2.671	2	1.3355	1.69	0.186
Within Groups	283.6383	359	4.7487		
Total	286.3093	361			

The result from Table 3 above, since the p-value (0.186) is greater than the significance level (0.05), we fail to reject the null hypothesis. This indicates that there is no significant difference in respondents' mean scores of state-owned universities and the federal university on data

collection using AI-Predictive Analytics in enhancing academic research among postgraduate Educational Management students in universities in Rivers State.

Hypothesis 2: There is no significant difference in respondents' mean scores of state-owned universities and the federal university on data organization using AI-Predictive Analytics in enhancing Academic Research among Postgraduate Educational Management Students in Universities in Rivers State.

Table 4: ANOVA on data organization using AI-Predictive Analytics in enhancing Academic Research

Source of Variation	SS (Sum of Squares)	df (Degrees of Freedom)	MS (Mean Square)	F	P-value
Between Groups	3.0878	2	1.5439	1.468	0.231
Within Groups	377.8603	359	1.0520		
Total	380.9481	361	359		

The result from Table 4 above, since the p-value (0.231) is greater than the significance level (0.05), we fail to reject the null hypothesis. This indicates that there is no significant difference in respondents' mean scores of state-owned universities and the federal university on data organization using AI-Predictive Analytics in enhancing academic research among postgraduate Educational Management students in universities in Rivers State.

Discussion of Findings

The results from Table 1 indicate mixed opinions regarding the effectiveness of AI-Predictive Analytics in data collection. While students at IAUE generally agree that AI-Predictive Analytics simplifies data collection and reduces time and workload, students at RSU and UP are less convinced, leaning towards disagreement. Despite the recognition of AI's benefits in streamlining data processes, there are concerns about its accuracy, comprehensiveness, and error minimization. This aligns with the literature, which acknowledges AI's potential to enhance data collection by automating processes and managing large datasets efficiently (Zhang, Li, & Wang, 2022; Adebayo, 2022). However, challenges remain in ensuring accuracy and minimizing errors, which are reflected in the mixed responses from the students. In contrast, Table 2 shows a generally positive consensus across all universities on the effectiveness of AI-Predictive Analytics in data organization. Students acknowledge AI's role in organizing large datasets, simplifying data categorization, and improving retrieval efficiency. This finding supports existing research highlighting AI's strengths in managing and structuring complex data (Smith et al., 2023; Zhang & Wang, 2022). However, concerns about maintaining

consistency and reducing time spent on data cleaning suggest areas for improvement, reflecting the ongoing challenges in integrating AI into research workflows effectively. The ANOVA results for both data collection and data organization (Tables 3 and 4) show no significant differences in responses between state-owned and federal universities. This suggests that the perceived effectiveness of AI-Predictive Analytics in enhancing academic research is similar across different types of universities. These findings are consistent with studies indicating that the benefits and challenges of AI tools in academic research are broadly experienced across different institutional settings (Brown & Green, 2021; Nnaa & Surajo, 2020).

Conclusion

The study highlighted that AI-Predictive Analytics is perceived as a valuable tool in enhancing data organization for academic research, with students across all universities recognizing its benefits in managing and structuring complex datasets. In contrast, opinions on its effectiveness in data collection are mixed, with students at IAUE showing a more positive view compared to those at RSU and UP. Despite AI's potential to streamline data collection processes, issues related to accuracy, comprehensiveness, and error minimization persist.

Recommendations

Based on the findings discussed above, the following two recommendations are proffered:

1. Universities should provide targeted training and support to students and researchers on effectively using AI-Predictive Analytics. This training should address common challenges related to data accuracy and error minimization to improve the overall effectiveness of AI tools in data collection.
2. Institutions should integrate AI tools more seamlessly into research workflows to help address concerns about inconsistency and organisation.

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Managing Technical and Vocational Education in Technical Colleges in Rivers State for Youth Empowerment and Sustainable Development

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Abstract

This study investigated management of technical and vocational education (TVE) in technical colleges in Rivers State for youth empowerment and sustainable development. Descriptive survey design was adopted and two research questions and two hypotheses guided the study. The population of the study comprised of 138 instructors in the three technical colleges in Rivers State. A sample of 46 instructors representing 33% of the population was drawn through proportionate stratified random sampling technique. A questionnaire entitled: "Management of Technical and Vocational Education in Technical Colleges for youth empowerment and Sustainable Development Questionnaire (MTVETCYESDQ)" developed by the researcher, was used for data collection. The instrument was well validated and the test for reliability using Cronbach alpha method yielded 0.78. Mean and standard deviation were used to analyse the research questions, while z-test was used to test the hypotheses at 0.05 level of significance. The results of the study showed that, management of TVE has enhanced youth empowerment and sustainable development in Rivers State by producing trained technicians in electrical/electronics, building construction, auto mechanics, wood work construction among others. The study also revealed that, the challenges of managing TVE for youth empowerment and sustainable development in Rivers State include among others: inadequate instructors; inadequate learning facilities, poor funding and defective curriculum. Based on the findings conclusion was drawn and the following recommendations among others were made: Government should employ more qualified instructors in the technical colleges; government should provide more equipment and modern facilities in technical colleges in Rivers State; and government should encourage more people to attend technical colleges.

Keywords: Management, Technical and Vocational Education, Youth Empowerment, Technical Colleges and Sustainable Development.

Introduction

Technical and vocational education (TVE) is the type of education provided in technical colleges. TVE equip students with a wide range of practical knowledge or psychomotive skills and attitude that is relevant for meaningful living and contribution to economic growth and development. According to FRN (2014:19), TVE is an integral part of general education; it is a means of preparing for occupational fields and for effective participation in the world of work; it is an aspect of lifelong learning and a preparation for responsible citizenship; it is equally and instrument for promoting environmentally sound

sustainable development; and it is a method of alleviating poverty. TVE is that part of our educational system that focuses on skills acquisition by students to enable them become self-employed after their graduation or gain employment in industries or other relevant places.

According to Aziz (2014), there are five types of institutions established for the provision of technical and vocational education training programmes in Nigeria. The schools include: the pre-vocational and vocational schools at post-secondary level, the technical colleges, the polytechnics, colleges of education (Technical) and universities. The major reason for this type of education is to prepare people for jobs requiring specialized training. It must be noted that in TVE, the need to use the head, the hands and the brains to achieve concrete and tangible results cannot be overlooked. Supporting this, Obanya (2007) was of the view that TVE is part of integral development of the head, the heart and the hands which must not be neglected, as doing so will amount to a denial of students' integrated personality development.

TVE is a very important system of education that could be relevant in poverty alleviation and reduction of youth unemployment which are necessary for sustainable development. Ezeji and Okorie (2010) stressed the importance of skills acquisition programmes in national growth. They were of the view that, Nigeria's social and economic challenges such as poverty and unemployment would be drastically reduced if people are given adequate vocational training in skills, raw materials, machineries and equipment. Herrington and Kew (2014) clearly remarked that innovative technical and vocational education, as well as skills acquisition programmes are globally recognized as very strategic mechanisms or driving forces of sustainable economic growth. They impact on creativity and job creation, and also have welfare effects on poverty incidence across international boundaries.

In view of the rapid changing world of work influenced by globalization and technology, TVET is expected to impact adaptive skills that will enable their recipients to adapt to different job roles (International Labour Organisation, 2010). According to United Nations (2015), acquisition of skills for work is a key area of focus in sustainable development. This is because having acquired the requisite skill, knowledge and attitude, individuals can be gainfully employed. When this happens, their economic and social lives will improve as they will earn more and have good health services. As this continues, the socio-economic status of the nation improves and poverty level reduces, which are critical for sustainable development. Youth empowerment is enabling the youths to gain useful skills with which they could be gainfully self-employed. TVET can help young people acquire the skills they need in life.

Youth Empowerment according to Olabiyi (2013) is the process of encouraging youths to be active citizens in their community.

Sustainable development could be seen as that type of development that cuts across all sectors of our economic life and promotes the welfare of the present generation without compromising the welfare of the future generation. Organization for Economic Cooperation and Development (OECD) in Edet and Beyin (2018) defined sustainable development as the development which tends towards maximization of human well-being in this present generation that will not however, lead to the reduction in the well-being of future generations. It focuses on the immediate needs of the present time and those of the future generations concurrently and it is geared towards the welfare and the well-being of every individual. Sustainable development is concerned with the creation and sustenance of better living conditions for every individual. Management according to Grawford (2018) is the act of organizing resources to ensure that the goals of an organization are achieved efficiently and effectively. Management is a set of activities which has been classified into planning, organizing, leading and controlling in order to use available resources to achieve desired outcomes in the most efficient manner (Peretomode, 2012). The resources could be materials, people or funds management helps in creating and maintaining a common purpose in an organization.

Management of technical and vocational education training (TVET) ensures that resources provided for them are effectively utilized to achieve the objectives of the programme. Effective utilization of resources would enhance effective teaching and learning of vocational education trades. One main issue of concern in technical colleges today is the issue of provision of human and material resources required for effective management of technical colleges. According to studies conducted by Oduwa (2015) and Nwajuba (2014), the training received by students in technical colleges in Nigeria is not adequately supported with educational resources. Supporting this observation Puyate in Akpan (2016) revealed that the present state of technical and vocational education training facilities in most technical colleges is very poor, and there is no plan for the maintenance of broken-down equipment.

The management of technical and vocational education is affected by inadequate facilities, equipment and tools. The available facilities in most technical colleges in Nigeria are very obsolete. According to Olaitan (1996) vocational education cannot achieve much in producing quality skilled human resources when facilities necessary for the training are inadequate. There is also the issue of inadequate number of vocational trades teachers, as well as poor conditions of service and poor teaching and learning environment. These issues

adversely affect the management of TVE for sustainable development of the society. Technical and vocational education has been an integral part of national development strategies in Nigeria and many other countries due to its impact on human resource development, productivity and economic growth. According to Ojimba (2012) part of the reasons for the nation's underdevelopment is the inability of Nigerian leaders to give TVET the adequate attention that it deserves.

TVET according to ILO (2007) gives individuals the skills to “live, learn and work as productive citizens in a global society. TVET has continued to thrive in many societies and has helped to produce skilled technicians but Nigerian government neglected this important aspect of our educational system. This has resulted to lack of skilled technicians such as bricklayers, carpenters, painters, auto mechanics, laboratory and pharmacy technicians, electrical/electronic technicians etc. TVET provides vocational training of skilled technicians in almost all fields and the poor attention paid to it has resulted to shortage of skilled technicians in various fields. Today, we have numerous people with certificates and degrees but lack necessary skills for gainful employment. They are busy roaming the streets looking for white collar jobs that are no longer there. The neglect and inadequate management of TVET is socially and economically dangerous because it is denying the nation the opportunities for sustainable development through the contributions of the graduates of the programme.

The World Bank Policy Paper on VTE (1991) states that to get the best benefit to sustainable development from VTE, certain factors must be considered:

- Well timed modern courses linked to local and global demands;
- Relevant and up to date VTE courses need to be developed;
- Proper justification with respect to individual countries offering such VTE courses and level of schooling;
- Wider range of VTE courses need to be developed in terms of demand and cost effectiveness. Adequate management of TVET according to Akyeampong (2002) does not only have economic impact but also cultural, social and political contributions. In line with this Momoh (2012) asserted that VTE is a bold and courageous step in this changing scenario for economic life by developing human capital (appropriate workforce) and strong economy, as well as cohesive, literate and healthy society.

Statement of the Problem

Technical and vocational education (TVE) is a very important aspect of our educational system designed to produce skilled and well-trained technicians in various technical areas. If TVE is adequately managed, it will produce graduates that will fit into the productive sectors of our economy to enhance sustainable development. It will equally help to address the escalating rate of unemployment by producing skilled men and women who can become self-employed and entrepreneurs. In recent times, it appears TVE institutions have not been adequately delivering on their mandates. There has been an increasing low turnout of skilled and well-trained technicians in various fields by these institutions. This suggests that this aspect of our educational system is not well managed.

The situation in TVE institutions in Rivers State has resulted to inadequate supply of technicians and middle level man power in various technical fields. A situation that has adverse effect on youth empowerment and sustainable development of the state. It appears there is also low enrolment rate in these institutions and many students graduate annually from technical colleges without adequately acquiring relevant practical skills in their trades or areas of study. The researcher sees this as a serious problem. Hence, the problem of this study is to investigate management of TVE in technical college in Rivers State for youth empowerment and sustainable development.

Aim and Objective of the Study

The aim of this study is to investigate management of technical and vocational education in technical colleges in Rivers State for youth empowerment and sustainable development. Specifically, the study sought to:

1. Identify ways management of TVE in technical colleges in Rivers State enhance youth empowerment and sustainable development of the state.
2. Determine the challenges of managing TVE in technical colleges in Rivers State for empowerment and sustainable development of the state.

Research Questions

The following research questions were answered by the study:

1. What are the ways management of TVE in technical colleges in Rivers State enhance youth empowerment and sustainable development of Rivers State?
2. What are the challenges of managing TVE in technical colleges in Rivers State for youth empowerment and sustainable development of the Rivers State?

Hypotheses

These null hypotheses were formulated and tested at 0.05 level of significance:

1. There is no significant difference between the mean responses of male and female teachers on ways management of TVE in technical colleges in Rivers State enhance youth empowerment and sustainable development of the State.
2. There is no significant difference between the mean responses of male and female teachers on the challenges of managing TVE in technical colleges in Rivers State for youth empowerment and sustainable development of the state.

Methodology

The study adopted descriptive survey research design. The population of the study consisted of 138 teachers (99 male and 39 female) in the five technical colleges in Rivers State. Technical College Tombia, Technical College Ahoada, Technical College Iheaogu, Government Technical College Port Harcourt, Government Craft Centre, Aba Road Port Harcourt. Source: Rivers State Ministry of Education, Port Harcourt. A sample of 46 (33 male and 13 female) teachers representing 33% of the population was drawn through proportionate stratified random sampling technique. A questionnaire entitled: “Management of Technical and Vocational Education in Technical Colleges for youth empowerment and Sustainable Development Questionnaire (MTVETCYESDQ)” developed by the researcher was used for data collection. The instrument was properly validated by three senior colleagues, two from educational management and one from Measurement and Evaluation. Faculty of Education, Rivers State University. Cronbach Alpha method was used to determine the reliability of the instrument and this yielded an ‘r’ index of 0.78. mean and standard deviation were used to analyse the research questions while z-test was used to test the hypotheses at 0.05 level of significance.

Results

Research Question 1: What are the ways management of TVE in technical colleges in Rivers State enhance youth empowerment and sustainable development of the State?

Table 1: Mean scores and standard deviation analysis of the responses of male and female instructors on the ways management of TVE in technical colleges in Rivers State enhance youth empowerment and sustainable development of the State.

S/N	Items	Male Instructors N = 33		Female Instructors N= 13		Mean Set $\frac{\bar{x}_1 + \bar{x}_2}{2}$	Decision
		\bar{x}_1	SD_1	\bar{x}_2	SD_2		
1.	Adequate Management of TVE leads the training of people who serve as electrical/electronic technicians.	3.02	1.15	3.04	0.99	3.03	Agree
2.	Effective Management of TVE improves the training of various technicians involved in building construction	3.00	1.16	3.02	1.01	3.01	Agree
3.	Management on TVE helps in the production of auto mechanics.	3.06	1.14	3.08	0.98	3.07	Agree
4.	Efficient Management of TVE helps in producing auto electricians	3.06	1.14	2.96	1.03	3.01	Agree
5.	Adequate Management of TVE helps in producing computer technicians	2.84	1.23	2.80	1.13	2.82	Agree
6.	Adequate training in the field helps in producing various people that engaged in wood work construction.	2.90	1.21	2.86	1.09	2.88	Agree
7.	Effective management of TVE helps in producing people who can engage in printing and textile works	2.82	1.25	2.76	1.15	2.79	Agree
8.	Adequate training in TVE helps producing shoe makers and shoe repairers.	3.00	1.16	2.84	1.11	2.92	Agree
9.	By producing people who serve as support staff in business offices such as typists, store keepers, stenographers etc.	2.98	1.17	2.88	1.08	2.93	Agree
10.	By producing people who work in the hospitality industries e.g. food caterers	2.94	1.19	2.92	1.05	2.93	Agree
	Aggregate mean and standard deviation	2.96	1.18	2.92	1.06		

Table 1 shows that all the items had weighted mean scores that are greater than the criterion mean of 2.50. They were accepted as the ways management of TVE enhances productivity and sustainable development of Rivers State. the aggregate weighted mean score of 2.96 for male instructors and 2.92 for female instructors indicate that both respondents shared a common understanding about how management of TVE contribute to youth empowerment and sustainable development.

Therefore, the ways management of TVE enhances productivity and sustainable development is by producing trained technicians in various fields who upon their graduation engage in productive activities in their fields of study either as a self-employed person or as an employed staff in an organization.

Research Question 2: What are the challenges of managing TVE in technical colleges in Rivers State for productivity and sustainable development of the State?

Table 2: Mean scores and standard deviation analysis of the responses of male and female instructors on the challenges of managing TVE in technical colleges in Rivers State for youth empowerment and sustainable development of the State.

S/N	Items	Male Instructors N = 33		Female Instructors N= 13		Mean Set $\bar{x}_1 + \bar{x}_2$ 2	Decision
		\bar{x}_1	SD_1	\bar{x}_2	SD_2		
1.	Inadequately trained vocational teachers.	3.26	0.66	3.24	0.66	3.25	Agree
2.	Inadequate number of vocational teachers.	3.20	0.68	3.22	0.69	3.21	Agree
3.	Inadequate learning facilities.	3.42	0.63	3.38	0.65	3.40	Agree
4.	Inadequate learning environment.	3.38	0.65	3.40	0.64	3.39	Agree
5.	Poor funding of TVE	3.46	0.62	3.42	0.63	3.44	Agree
6.	Defective curriculum	3.18	0.71	3.14	0.71	3.16	Agree
7.	Brain Drain	3.10	0.72	3.12	0.73	3.11	Agree
8.	Wrong perception about TVE by elites	2.94	0.73	2.92	0.74	2.93	Agree
9.	Poor maintenance culture/value system	3.22	0.67	3.18	0.70	3.20	Agree
10.	Unwillingness of the students to obey their instructors and learn.	2.38	0.75	2.30	0.76	2.34	Disagree
	Aggregate mean and standard deviation	3.15	0.68	3.13	0.69		

Data in table 2 show that all the items had weighted mean scores that are greater than the criterion mean except item number 10. Items 1 to 9 were agreed on by the respondents as the challenges of managing TVE in technical colleges in Rivers State for youth empowerment and sustainable development. Item number 10 was disagreed on by the respondents.

The aggregate mean of 3.15 and 3.13 for the male and female instructors respectively indicate that both respondents shared a common opinion on the challenges of managing TVE in technical colleges in Rivers State. Therefore, the challenges of managing TVE in technical colleges in Rivers State for youth empowerment and sustainable development include: inadequately trained instructors; inadequate number of instructors; inadequate learning facilities; inadequate learning environment; poor funding; defective curriculum; brain drain; wrong perception about TVE by elites; and poor maintenance culture/value system.

Test of Hypotheses

The following hypotheses were tested at 0.05 level of significance:

HO₁: There is no significant difference between the mean responses of male and female instructors on ways of managing TVE in technical colleges in Rivers State that enhances youth empowerment and sustainable development.

Table 3: z-test analysis of difference between the mean responses of male and female instructors on the ways of management of TVE in technical colleges in Rivers State enhance youth empowerment and sustainable development.

Gender	N	\bar{x}	SD	Df	z-cal.	z-crit.	Level of sign.	Decision
Male Instructors	33	2.96	1.18	44	0.112	± 1.960	0.05	Ho1
Female Instructors	13	2.92	1.06					Retained

Table 3 showed that male instructors had mean score and standard deviation of 2.96 and 1.18, female instructors had mean score and standard deviation of 2.92 and 1.06. with a degree of freedom of 44, the z-calculated value of 0.112 was by far less than the z-critical value of ± 1.960 . Therefore, the null hypothesis was retained. This implies that, there was no significant difference between the mean responses of male and female instructors on ways of management of TVE enhances productivity and sustainable development in Rivers State.

HO₂: There is no significant difference between the mean responses of male and female instructors on the challenges of managing TVE in technical colleges in Rivers State for youth empowerment and sustainable development of the State.

Table 4: z-test analysis of difference between the mean responses of male and female instructors on the challenges of managing TVE in technical colleges in Rivers State for youth empowerment and sustainable development of the state.

Gender	N	\bar{x}	SD	Df	z-cal.	z-crit.	Level of sign.	Decision
Male Instructors	33	3.15	0.68	44	0.066	± 1.960	0.05	Ho2
Female Instructors	13	3.13	0.69					Retained

Table 4 showed that, male instructors had mean score and standard deviation of 3.15 and 0.68, female instructors had mean score and standard deviation of 3.13 and 0.69. With a degree of freedom of 44 at 0.05 level of significance, the z-calculated value of 0.066 was by far less than

the z-critical value of ± 1.960 . Therefore, the null hypothesis was retained. This implies that, there was no significant difference between the mean responses of male and female instructors on the challenges of managing TVE in technical colleges in Rivers State for youth empowerment and sustainable development.

Discussion of Findings

The study revealed the ways management of TVE enhance youth empowerment and sustainable development include producing middle level manpower (technicians) in various fields such as electrical/electronics, carpentry/ wood work, welding and fabrication, auto mechanic, plumbing etc. These technicians work in various organizations. Some of them are equally self-employed. They directly and indirectly contribute to productivity and sustainable development in the state. they have skills needed for rendering of various services relevant in economic development. This finding is supported by Ezeji and Okorie (2010) as they emphasized on the relevance of skills acquisition programmes in national development. Adequate production of skilled technicians in our technical colleges will contribute so much in solving the problems of unemployment, poverty, hunger, youth restiveness etc.

The world today is driven by knowledge and technology. Organizations today are after what you can do, that is the skills you have. This makes the provision of innovation technical and vocational education necessary in Rivers State. Technical skills acquisition are strategic means of enhancing youth empowerment and sustainable development. Supporting this, Herrington and Kew (2014) clearly stated that TVE impact on creativity, job creation, reduce poverty and it has welfare effects across national boundaries. Adequate management of TVE will also help to raise entrepreneurs. Some of the graduates from our technical colleges may choose to exercise their skills and initiatives by organizing business ventures that will enable them take advantage of business opportunities in our society. Through such means they will create jobs for themselves and other people, thereby contributing in promoting economic activities and sustainable development.

The study equally identified the challenges of managing TVE in technical colleges in Rivers State. The challenges include inadequate quality and quantity of instructors. The adequacy of teachers or instructors in terms of quality and quantity in any educational or training organization cannot be overemphasized. To a large extent, this determines the quality of training the students will receive. Technical colleges will not be able to achieve much in terms of producing skilled and well-trained technicians where relevant teachers are inadequate in quality and in number.

The study observed the challenge of inadequate facilities and learning environment. There is gross inadequacy of learning/training resources in the technical colleges in Rivers State. Most of their machines are bad and the ones functioning are outdated. This situation is complicated by our poor maintenance culture. The facilities are not adequately maintained resulting to frequent breakdowns. The learning environment is poor. We have leaking roof, dilapidated school buildings, bushy school environment, rough classroom floors, broken doors and windows, shortage of chairs and lockers, lack of internet and ICT facilities etc. Supporting this finding Olaitan (1996) noted that vocational education institutions cannot achieve much in producing quality skilled human resources when facilities necessary for the training and learning environment are inadequate.

The issue of the curriculum for TVE should also be addressed. There is the need to overhaul the TVE curriculum to adequately equip the students with the relevant skills needed for their daily living. Ojimba (2012) supporting this finding identified six problems associated with current curriculum some of which include: current curriculum is based on foreign model which has evolved under ideal conditions; lack of textbooks in many areas and the available ones are very expensive, and the curricula are adjudged to be too academic and overloaded intellectual content in pure science and mathematics at the expense of basic engineering and technology.

Funding of education especially TVE is very poor. Government has failed to pay adequate attention to proper funding of TVE in Rivers State. This situation is worsened by high level of corruption in our educational system. This has resulted to inadequate provision of human and material resources needed for effective management of TVE in Rivers State. According to Momoh (2012) government's lack of commitment to TVE and inadequate funding has weakened technical education in Nigeria. This has resulted to the number of technical education institutions dwindling, while that of general education institutions is increasing. Poor funding of TVE has encouraged brain drain in this area as most of their experienced and qualified instructors are leaving the system for greener pastures locally and internationally.

Finally, there is the need for re-orientation and change of mindset about TVE by some parents. Many parents prefer general education institutions to technical and vocational education institutions. Most parents prefer to send their children to secondary schools instead of technical colleges. This has adversely affected enrolment into TVE. It has equally resulted to high rate of youth unemployment in our society due to high rate of secondary school graduates who lack life coping and employability skills.

Conclusion

The study has identified the various ways management of TVE contribute to youth empowerment and sustainable development in Rivers State; as well as the challenges facing the management of TVE. From every indication, TVE is a very important aspect of our educational system, which has the potentials of addressing many of our socio-economic challenges and enhancing youth empowerment and sustainable development. To take full advantage of the potentials of TVE, government should urgently address the challenges facing the management of TVE in the technical colleges in Rivers State in order to encourage efficient and effective TVE delivery in these colleges.

Recommendations

Based on the findings, the following recommendations were made:

1. Government should recruit and post more instructors to the technical colleges in Rivers State.
2. More modern equipment and training facilities should be purchased and supplied to the technical colleges in Rivers State for effective teaching and learning.
3. The curriculum of technical colleges in Rivers State should be continuously updated in line with modern trends and emerging needs of the society.
4. Government should provide orientation and sensitization to parents on the need to encourage their children to attend technical colleges.
5. Funds should be urgently released to the administrators of technical colleges in Rivers State for the renovation and maintenance of dilapidated school buildings, and repairs/maintenance of machines and training facilities.

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Leading Changes in Education: Strategies for Managing Resistance and Building Buy-In

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Abstract

This study explores effective leadership strategies for managing resistance and fostering acceptance during educational reforms. The paper examines successful case studies, highlighting strategies such as stakeholder engagement, transparent communication, and comprehensive training in managing resistance and leading buy-in. Emphasizing the importance of strategic leadership, the paper identifies the necessity of creating a compelling vision, motivating employees, and fostering a culture of trust and collaboration. Additionally, it addresses the role of incentives and recognition in overcoming resistance. Future research suggestion includes exploring contextual factors influencing change management, the long-term effects of change strategies, and the impact of emerging technologies on stakeholder engagement. Based on thorough review of existing literature, it was discovered obviously, that leading change in education is a challenging process. However, understanding, and having the ability to address resistance to change is the ultimate. Key strategies for buy-in were highlighted among others to include; engaging stakeholders early and involving them in the change process, clear and transparent communication, to ensure that stakeholders are well-informed and that their concerns are adequately dealt with. Continuous professional development, acknowledging and rewarding the efforts of stakeholders.

Keywords: Buy-in, Change, Resistance, Strategies, Technology.

Introduction

Education, being a fundamental cornerstone of societal progress, has experienced notable changes throughout the years. The transition from traditional classroom setups in the past to the technologically enhanced learning environments of today signifies a broader transformation in educational methodologies. The 21st century has witnessed swift progressions in technology, globalization, and shifts in labour market requirements, all of which demand continual adaptation and innovation within the educational framework (Osuji & Nwisagbo, 2023). Historically, the field of education has shown resistance to change, often constrained by long-established customs and bureaucratic inertia. Nevertheless, the increasing

complexity of global issues, such as climate change, economic instability, and social disparities, has emphasized the necessity for educational institutions to be more flexible and responsive. These modifications are not superficial; rather, they entail profound structural and pedagogical changes aimed at better equipping students for an uncertain future. According to Chandler, (2013) and Faig, (2024), some of the significant changes and transformations in education are:

Technology Integration: The emergence of the internet and digital tools has transformed the dissemination and consumption of information. Online learning platforms, interactive digital textbooks, and virtual classrooms have become commonplace, granting students unparalleled access to knowledge and educational materials. These technologies enable customized learning experiences, enabling educators to address diverse student requirements and learning preferences.

Curriculum Reform: This is the changes have to do with updating and redesigning of educational programmes to enhance relevance, engagement, and effectiveness in teaching and learning.

Assessment Practices: These are changes that involves transitioning into new methods of assessment, such as formative assessment or competency-based evaluations, to better measure student learning.

Organizational Structure Changes: Theses are often initiated in response to external pressures, such as policy reforms, funding changes, need for improved educational outcomes. The changes refer to modifications in frameworks, roles and processes that explain how educational institutions operate. These changes can impact administrative hierarchies, departmental configurations, communication flows and decision-making processes.

Policy Alterations: The modification of educational policy encompasses the systematic process of amending existing educational regulations or implementing new directives that govern the operations and practices of educational institutions. This process involves the reassessment of rules, regulations, frameworks, and standards that dictate teaching, learning, assessment, and administrative functions. It encompasses a spectrum of modifications, ranging from minor adjustments (incremental changes) to comprehensive transformations (transformational changes) of prevailing educational policy, and plays a pivotal role in the evolution of contemporary education. The alteration of policies constitutes a fundamental component of spearheading transformative change within the educational landscape. Through meticulous

planning and the engagement of stakeholders throughout the process, educational leaders are equipped to mitigate resistance and cultivate buy-in, thereby enhancing the efficacy of educational practices and optimizing student outcomes.

Professional Development Change: The concept of professional development change pertains to continuous learning and training opportunities aimed at augmenting educators' competencies, knowledge, and effectiveness within the classroom setting. This form of change encompasses various modalities, including workshops, mentoring, coaching, and collaborative professional learning communities. The focus of this change is primarily on the enhancement of instructional methodologies, the integration of technological advancements, and the promotion of reflective teaching practices. It is imperative for educators to remain abreast of contemporary pedagogical strategies, research findings, and policy developments. Effective professional development is strategically aligned with institutional objectives and addresses specific needs, ultimately culminating in enhanced student outcomes.

Equity Initiative as a Change in Education: Equity initiatives are designed to guarantee that all students have equitable access to educational resources, opportunities, and support, irrespective of their background, race, gender, socioeconomic status, or ability. These initiatives encompass the revision of curricula to foster inclusivity, the implementation of culturally responsive pedagogical strategies, the provision of supplementary resources to historically underrepresented groups, and the elimination of systemic barriers. Equity initiatives are vital for addressing educational disparities, cultivating an inclusive educational environment, and advocating for social justice. They are indispensable in ensuring that all students achieve academic success and possess equal opportunities for advancement.

Community Engagement: Community engagement within the educational context involves the active participation of families, local organizations, and the broader community in the educational process, thereby fostering partnerships that enhance student learning and support. Engagement may manifest in various forms, including outreach programs, volunteer initiatives, and collaborative projects that address local challenges, thus providing students with authentic learning experiences while reinforcing community connections. The involvement of the community serves to establish a supportive learning atmosphere, augment transparency, and promote a collective sense of responsibility for the success of students. Moreover, it enriches the educational experience by incorporating diverse perspectives and resources.

Cultural Shift as an Educational Change: A cultural shift in the educational realm signifies a profound transformation in the dominant values, beliefs, and practices within a school or educational district. This transformation may encompass alterations in teaching philosophies, leadership paradigms, and organizational values. Cultural shifts frequently involve the promotion of collaboration, innovation, inclusivity, and a growth mindset among both educators and students. Additionally, it may necessitate a redefinition of success and accountability in the context of student learning and development. Cultural shifts are crucial for sustaining substantive change in education; they foster an environment conducive to innovation and adaptability, thereby ensuring that both educators and students flourish in an ever-evolving global landscape.

Each of these categories of change assumes a crucial function in the reformation of educational environments to more effectively cater to students and communities, while adept leadership methodologies assist in managing resistance and obtaining consensus from all involved stakeholders. Nevertheless, these transformations faced various impediments. Resistance to change manifests as a common phenomenon within educational institutions, arising from factors such as anxiety regarding the unfamiliar, potential loss of authority, and perceived threats to established practices and roles. Such resistance can substantially obstruct the execution of vital changes, emphasizing the critical role of proficient leadership and strategic management in steering these transitions.

Significance of Leading change in Education: The role of leadership in effecting change within the educational sector is of paramount importance for several reasons. Foremost, it is vital for maintaining the ongoing relevance and efficacy of educational institutions in fulfilling their fundamental mission of equipping students for future endeavors (Wilson, 2018). Additionally, it;

Enhances Student Performance: Proficient change leadership augments student achievement, engagement, and intrinsic motivation (Hargreaves & Fullan, 2012). **Promotes Innovation:** Leadership in change advocates for experimentation, creativity, and innovation within pedagogical methodologies and curriculum development (Fullan, 2016). **Addresses Inequities:** Change leadership plays a pivotal role in tackling disparities and advancing inclusive educational practices (Lindsey et al., 2015). **Cultivates Teacher Proficiency:** Leadership in change facilitates the professional advancement of educators, thereby improving their instructional capabilities and self-assurance (Knight, 2007). **Fosters a Positive School**

Environment: Change leadership nurtures a constructive and collaborative school culture, thereby enhancing teacher morale and promoting retention (Hoy & Miskel, 2013). Equips Students for the Future: Leadership in change ensures that educational practices remain pertinent, thereby preparing students for an increasingly dynamic and globalized environment (Wagner & Compton, 2012). Encourages Community Involvement: Change leadership actively engages stakeholders, fostering partnerships and community participation (Bryk et al., 2015). Facilitates Technology Integration: Effective change leadership promotes seamless integration of technology, thereby enhancing pedagogical practices and learning experiences (Koehler & Mishra, 2009).

Objective and Scope of the study: The principal aim of this manuscript is to investigate strategies for managing resistance and cultivating buy-in during the process of guiding educational transformations. Its objective is to provide a thorough understanding of the dynamics of change within educational contexts and to furnish practical recommendations and insights for educational leaders to adeptly navigate these challenges. This paper will analyze theories and change management frameworks relevant to the field of education, drawing upon perspectives from organizational behavior, psychology, and educational leadership. Furthermore, it will assess the prevalent sources of resistance to change within educational institutions and discuss strategies to mitigate these challenges.

Theories and Models of Change Management and Their Relevance in Education Change management theories furnish frameworks for understanding, administering, and facilitating transformation within organizations (Osuji & Nwisagbo, 2024). A variety of well-established models and theories offer valuable insights into the organizational transformation process, each possessing its distinctive emphasis and methodology, among which are highlighted by Altadonna (2020), Henry (2024), and Osuji and Nwisagbo (2024).

Kurt Lewin's Change Management Theory (1951): The theoretical framework established by Kurt Lewin represents one of the seminal and most influential paradigms in the domain of change management. It conceptualizes transformation as a tripartite process consisting of: Unfreezing, Changing (or Moving), and Refreezing. This framework serves as a valuable tool for educators to comprehend the intricacies of the change process and underscores the critical importance of preparing an organization for transformation, fostering awareness (unfreezing), executing the transition and implementing the change (changing), and institutionalizing or reinforcing new practices (refreezing) to ensure their long-term viability. Implications and

Application of Lewin's Change Management Theory in Education: - Acknowledge the necessity for change (unfreezing) within educational contexts (e.g., curriculum enhancement, technological integration) - Execute changes, while providing requisite training and support (changing) - Reinforce novel practices and establish sustainable routines (refreezing) Education Application: - Adoption of innovative pedagogical methodologies - Introduction of technology-augmented learning environments - Modification of institutional culture or policies.

John Kotter's 8-Step Change Model (1996): John Kotter's framework delineates eight essential steps for effective change management: Establishing a sense of urgency, forming a robust coalition, developing a vision for change, disseminating the vision, empowering stakeholders to act on the vision, strategizing for and achieving short-term wins, consolidating gains, and embedding new approaches within the organizational culture. Kotter's theory provides a systematic approach to change management that is pertinent to educational contexts through the articulation of his Eight Steps, which include: Establish urgency, Form coalition, Develop vision, Communicate vision, Empower action, Create short-term wins, Consolidate gains, and Anchor new culture. Adhering to these steps will facilitate the development of a coherent vision for educational change, foster comprehensive engagement among stakeholders (including educators, administrators, and parents), celebrate milestones, and reinforce new practices. Collectively, these actions will inevitably culminate in school reform initiatives, curriculum modifications, and the integration of technological advancements within the educational framework upon implementation.

ADKAR Model (2006): Developed by Prosci, the ADKAR model emphasizes the individual dimensions of change. It encapsulates the constructs of Awareness, Desire, Knowledge, Ability, and Reinforcement. This model highlights the sequential phases individuals must navigate to achieve successful transformation, thereby aligning personal and organizational change processes. Relevance to Education: - Concentrates on individual change management - Comprises five stages: 1. Awareness 2. Desire 3. Knowledge 4. Ability 5. Reinforcement - Implications: - Educate personnel regarding the rationale and advantages of change (awareness) - Involve staff actively in the change process (desire) - Provide necessary training and support (knowledge, ability) - Sustain change through feedback mechanisms and acknowledgment (reinforcement). Education Application: - Initiatives for professional development - Coaching and mentoring programs - Training in change management

McKinsey 7-S Model (1980): This theoretical framework emphasizes seven interrelated elements—Strategy, Structure, Systems, Shared Values, Skills, Style, and Staff—that require alignment for effective organizational transformation. It underscores the comprehensive nature of transformation and the imperative for coherence among all organizational components, while its educational implications align educational objectives with transformative initiatives (strategy), Organize resources and delineate roles (structure), Establish operational processes and procedures (systems), and Enhance staff competencies (skills) for effective change management while applying them in Institutional restructuring, Merging or consolidating of entities, and Development of strategic plans.

Kübler-Ross Change Curve (1996): this model was derived from the five stages of grief, it articulates the emotional phases individuals experience throughout change processes: This model is relevant to education and can be used to explore emotional reactions of both the students and staff to change through the following six phases: 1. Shock 2. Denial 3. Anger 4. Bargaining 5. Depression 6. Acceptance. It is particularly advantageous for comprehending the human dimension of change and managing emotional responses. It helps leaders to acknowledge emotional reactions to change, provide support for personnel during the transformation process, and address resistance and concerns proactively. It also assists the educational leaders to navigating teacher resistance, support staff throughout the change process, and address emotional responses effectively.

Implications for Educators and policy makers: Help to comprehend change processes and associated models, formulate strategic initiatives for transformation, engage stakeholders and communicate with clarity, manage resistance and emotional reactions effectively, and Sustain transformation through reinforcement and constructive feedback.

Understanding Resistance to Change

Resistance to change denotes the opposition or resistance encountered when an organization or its members are compelled to modify their established practices. Resistance can manifest in various forms, including active resistance, where individuals openly oppose change, and passive resistance, where there is a concealed lack of support or involvement in order to frustrate the change process (Tugba & Rahim, 2022; Osuji & Nwisagbo, 2023). These resistance in educational system according to these authors, occurred at different levels, as a result of;

Individual Resistance: Distrust and lack of confidence in leadership, plays a vital role in the acceptance or rejection of change. Previous failures in change endeavors can foster doubt and suspicion among faculty and staff. Apprehension of failure can make educators not willing to accept new approaches or technologies which may uncover their inadequacies in their abilities, leading to apprehension and opposition. Other factors associated with individual resistance include; Fear of uncertainty: Unclear expectations or outcomes of adopting change. Loss of control: Perceived threat to autonomy or decision-making. Emotional attachment: Attachment to existing practices or traditions. Lack of understanding: Unfamiliarity with new concepts or technologies, and Personal biases: Preconceived notions about change.

Organizational Resistance: The fear of loss of authority and reconfiguration of power dynamics or job responsibilities, raises worries about losing authority or impact within the institution during the change process (Wagner & Compton, 2012). Tradition and Cultural Factors are affected. Academic institutions often uphold deep-rooted traditions and cultures, changes that challenge these norms may encounter substantial resistance from stakeholders who had invested in the current state of affairs (Tugba & Rahim, 2022). Resistance in this category include; Cultural inertia: Resistance to altering established norms and values, Institutional memory: Past experiences influencing current attitudes, Power dynamics: Shifts in authority or influence, Departmental or team dynamics, Resource constraints: Insufficient support or funding, Communication breakdown: Poor information dissemination, and Organizational climate and culture.

Professional Resistance: Professional resistance to alterations in the educational sphere pertains to the opposition that emerges when educators or administrative personnel perceive that such modifications may jeopardize their professional identity, autonomy, or expertise. This particular manifestation of resistance is intricately associated with the manner in which educators interpret the repercussions of change upon their professional identity, growth, and authority within the educational framework. It constitutes a prevalent form of opposition and is characterized by several fundamental factors: Threat to Expertise: Educational professionals, particularly those with extensive experience, may exhibit resistance towards changes they view as undermining their established knowledge or competencies. They may perceive that the introduction of new methodologies or innovations diminishes their expertise or renders their prior contributions obsolete, along with perceived additional responsibilities. Loss of Professional Autonomy: Educators and administrators frequently place a high value on

autonomy regarding their decision-making and instructional methodologies. When modifications are mandated by external authorities or senior management without soliciting their perspectives, it can be construed as a relinquishment of control over their professional practices, precipitating resistance. Impact on Professional Relationships: Transformations in educational practices can influence collegial relationships. Certain educators may oppose change if they believe it will disrupt established professional dynamics, collaborative frameworks, or professional networks. Concerns about Professional Development: Numerous educators may harbor apprehensions regarding their capacity to acquire the requisite skills or resources to adapt to the proposed alterations, resulting in anxiety concerning professional inadequacy. This situation is particularly pronounced when they perceive that sufficient training and support have not been made available (Tugba & Rahim, 2022).

External or Environmental Resistance: Resistance at this level within the educational context pertains to the barriers that emerge from outside the educational institution. Such resistance frequently originates from external factors or pressures that impede the implementation of changes within schools or educational systems. These external influences can decelerate or obstruct the acceptance and enactment of change within educational environments (Osuji & Nwisagbo, 2024). Several principal sources of external resistance encompass; Government Policies and Regulations: Modifications imposed by governmental entities, such as new curricular standards or evaluation policies, may engender resistance if educational institutions or educators feel that these changes are misaligned with their values or impose excessive administrative burdens. Community and Parental Expectations: Resistance may also emanate from the local community, parents, or other stakeholders who may dissent with the educational reforms or perceive them as a threat to the established norms or traditions of the school. Economic Conditions: Insufficient funding or budgetary constraints can complicate the ability of schools to implement new initiatives. If changes necessitate new technologies, training, or infrastructure, yet external funding is not forthcoming, resistance may arise due to the practical challenges of adapting to change. Political and Social Pressures: Broader political and social dynamics, including political instability, societal expectations, or shifts in cultural attitudes, can also foster resistance if educational institutions perceive that the change contravenes their educational philosophies or values.

Inadequate Communication and Engagement: Limited communication regarding the change process and the failure to engage key stakeholders in planning and decision-making can result in resistance as well (Kilicoglu & Kilicoglu, 2013).

Impact of Resistance on the Change Process

Comprehending and addressing resistance to change is essential for educational leaders to navigate the intricacies of introducing new initiatives and ensuring continual enhancement within their institutions (Tugba & Rahim, 2022; Chandler, 2013). Resistance to change in the view of Wilson, (2018) and Kealy, (2021), can have notable repercussions for the change process in educational environments:

1. **Prolonged Implementation or Failure:** Persistent resistance can prolong the implementation of change initiatives or lead to their complete failure. This is frequently attributed to a lack of cooperation or deliberate obstruction by resistant individuals.
2. **Escalation of Expenses:** Overcoming resistance may demand additional resources, including time, finances, and exertion, to tackle concerns, provide training, and cultivate support from stakeholders.
3. **Diminished Morale and Productivity:** Resistance can cultivate a negative ambiance, resulting in decreased morale and productivity among staff. This can further impede the advancement of change initiatives and impact overall organizational performance.
4. **Jeopardized Quality of Education:** In an environment where resistance is widespread, the quality of education may suffer due to disruptions in the learning process, reluctance to adopt innovative teaching methods, and diminished enthusiasm for teaching and learning.

Strategies for Managing Resistance to Change

Upon identifying the forms of change resistance within an institution, employing a combination of strategies to counteract the opposing forces can aid in effectively managing resistance to change, facilitating a smoother transition and greater overall acceptance of new initiatives.

1. **Proficient Communication Approaches:** Proficient communication is crucial in handling resistance to change. Leaders must elucidate the rationale behind the change, its anticipated benefits, and the implementation process. Transparent communication nurtures trust and diminishes uncertainties among stakeholders. Regular updates, open avenues for dialogue, and prompt addressing of concerns can significantly alleviate resistance (Musaigwa, 2023).

2. Provision of adequate training and support for staff is imperative in alleviating apprehensions and facilitating a seamless transition. Training initiatives should focus on equipping individuals with the requisite skills and knowledge to embrace the forthcoming changes. Continuous support mechanisms such as coaching, mentoring, and help desks play a pivotal role in bolstering staff confidence and competence in their new capacities (Osuji & Nwisagbo, 2024).

3. Engaging stakeholders in the change process can result in heightened acceptance levels and diminished resistance. When stakeholders are actively involved in the planning and execution phases, they tend to develop a stronger sense of ownership and dedication to the change endeavor. Strategies like focus groups, advisory committees, and pilot programs enable the incorporation of stakeholder insights and foster collaborative efforts (Kilicoglu & Kilicoglu, 2013).

4. Establishment of a culture characterized by trust and transparency necessitates consistent and candid communication, demonstration of empathy, and adherence to ethical standards. Leaders must exhibit a genuine appreciation for their employees' perspectives and well-being. Cultivating trust involves engaging employees in decision-making processes, acknowledging their contributions, and upholding transparent lines of communication (Kealy, 2021).

5. Directly addressing specific concerns and fears can effectively mitigate resistance towards change. Leaders should actively listen to their employees' apprehensions and offer precise, fact-based explanations. This may entail dispelling misconceptions, providing assurances regarding job security, and elucidating the positive implications of the impending changes. Tailored support and counseling can also prove instrumental in assuaging individual anxieties (Faig, 2024).

Building Buy-In in Change Management

Building buy-in denotes the process of securing acceptance, backing, and dedication from stakeholders for a proposed change. It entails involving and convincing individuals and groups to comprehend the necessity for change, align with its objectives, and actively engage in its execution. Effective buy-in guarantees that all parties concerned are in agreement, diminishing resistance and cultivating a cooperative atmosphere (Fullan, 2016).

Importance of Buy-In for Successful Change Implementation

In the course of this study, Buy-in is seen as an essential for the success of any change process. In the absence of stakeholders' support and dedication, changes may encounter substantial

opposition, leading to setbacks, escalated expenses, and potential collapse. When stakeholders are sincerely committed to the change process, they are more inclined to contribute constructively, cooperate efficiently, and aid in overcoming obstacles (Jacoby, 2014). This collective endeavour is vital for realizing the intended results and upholding the change over time.

Role of Leadership in Fostering a Supportive Environment

Faig (2024) and Rimon (2024) discovered that leadership assumes a crucial role in fostering a supportive environment for change and that proficient leaders should:

A. Exemplify the Change: Leaders should manifest commitment to the change through their conduct and choices,

B. Foster Trust and Transparency: Cultivate a climate of trust by being transparent, attentive to concerns, and acting with integrity. To be transparent, you must uphold open and truthful communication regarding the change process, encompassing potential challenges and how they will be tackled,

C. Empower Stakeholders: Enable faculty, staff, and students by engaging them in decision-making and acknowledging their contributions,

D. Provide Resources: Ensure ample resources, such as time, training, and financial support, are accessible to facilitate the change process.

Strategies for Managing Buy-In, in Educational Settings.

Implementing the following strategies, educational institutions can effectively establish buy-in, guaranteeing a smoother transition and enhanced success in executing change initiatives. Bryk, et al, (2015), Rob, (2020) and Evanick, (2023) in their works collectively support the buy-in strategies below;

1. Collaborative Planning: In a particular university, a collaborative methodology for redesigning the curriculum entailed faculty, students, and administrators collaborating in committees to devise and execute the new curriculum. This approach heightened buy-in and decreased resistance.

2. Pilot Programs: Introducing pilot programs to trial new initiatives prior to full-scale implementation enables adjustments based on feedback, ensuring stakeholders feel acknowledged and esteemed. This tactic was effectively employed in a college that trialed a

new learning management system with a select group of faculty and students, as recorded by Rob, (2020).

3. Incentives and Recognition: Teachers who effectively implemented the new curriculum should be recognized and rewarded, which will motivate others to embrace the change.
4. Effective Communication: Articulate the vision, objectives, and advantages of the change clearly. Utilize diverse communication channels to reach all stakeholders and address their concerns promptly.
5. Training and Support: Furnish essential training and resources to assist stakeholders in adjusting to the change. Extend continuous support to ensure they feel self-assured and competent in their new roles.
6. Educational leaders are required to illustrate the significance of professional development in relation to teachers' daily pedagogical practices, provide a range of training options, and cultivate an environment that promotes growth and collaborative efforts.
7. Educational administrators ought to foster support for equity initiatives by engaging the community in dialogues concerning equity, presenting data that underscores existing inequalities, and disseminating success narratives from analogous initiatives.
8. In order to enhance community engagement, educators should establish robust relationships, communicate effectively regarding the advantages of participation, and proactively solicit input from community constituents in the decision-making processes.
9. Educational leaders are tasked with facilitating cultural transformations by exemplifying desired behaviors, articulating a coherent vision, promoting open dialogue, and actively engaging stakeholders in the co-creation of the emergent culture.

In a study conducted by Nwanji, Howell, and Oladipo (2017) at Nkosa, a University in Nigeria, the researchers investigated the efficacy of change management through the introduction of a computerized system for recording student attendance. The institution employed a holistic change management approach to enhance administrative procedures and academic offerings. The primary strategies utilized were: Engaging Stakeholders: The institution actively engaged faculty, staff, and students in the change process, ensuring their perspectives were taken into account during decision-making. Transparent Communication: Regular updates and open discussions were organized to address concerns and provide clear explanations regarding the

objectives and advantages of the change, and Training and Development: Comprehensive training initiatives were implemented to equip staff and faculty with the essential skills needed to adapt to new systems and procedures. At the end of the study, it was discovered that the computerized system of recording student's attendance was easier, faster, more accurate and better than the traditional way of taking and recording student's attendance.

Kilicoglu and Kilicoglu (2013) conducted a study in a K-12 school in Turkey, similar to the Nigerian UBE education plan, focusing on overcoming resistance to a new curriculum. The strategies employed for successful implementation included:

1. Establishing Trust: School leadership cultivated a culture of trust by involving teachers in the planning phase and maintaining transparency throughout the process.
2. Pilot Programs: The new curriculum was introduced in a few classes as a pilot to identify potential challenges and gather feedback for enhancements.
3. Providing Incentives and Recognition: Teachers who effectively implemented the new curriculum were acknowledged and rewarded, inspiring others to embrace the change.

Conclusion

Obviously, leading change in education is a challenging process. However, understanding and the ability to address resistance to change is ultimate. Key strategies for buy-in were highlighted to handle resistance and gaining support including, engaging stakeholders early and involving them in the change process, clear and transparent communication, to ensure that stakeholders are well-informed and that their concerns are adequately dealt with. Continuous professional development, Acknowledging and rewarding the efforts of stakeholders. These strategies contribute to fostering a positive outlook on change endeavours and make leading change in education a worthwhile process.

Suggestions for further Studies

Subsequent research should concentrate on;

1. Gaining a deeper insight into the contextual factors influencing change management across diverse educational settings,
2. Longitudinal studies could offer valuable insights into the enduring impacts of various change strategies,

3. Investigating the role of emerging technologies in facilitating change and engaging stakeholders will be of utmost importance, and
4. For practitioners, ongoing professional development and the cultivation of adaptive leadership skills will be crucial in addressing the evolving challenges of educational reform.

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Distribution and Utilisation of School Facilities as Correlates of Effective Implementation of Secondary Education Policy in Port Harcourt Metropolis, Rivers State

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Abstract

The study examined relationship between distribution and utilisation of school facilities with effective implementation of secondary education policy in Port Harcourt metropolis, Rivers State, Nigeria. Three research questions guided the study. Correlation design was adopted. Sample size of 320 teachers which was 20% of the population of 1,566 was selected using simple random sampling technique. Content and face validated two set of questionnaires tagged "Distribution and Utilisation of School Facilities" and "Effective Implementation of Secondary Education Policy" with 18-items was used for data collection. Kuder-Richardson 21(KR-21) was used to determine the reliability of the instrument which yielded a reliability coefficient of 0.86. Pearson's Product Moment Correlation Coefficient (r) was used to answer the research questions. Findings revealed that there exists a positive moderate relationship between optimum distribution of school facilities and effective implementation of secondary education policy. Also revealed is a positive high relationship between teachers' effective utilisation of instructional materials/instructional spaces and effective implementation of secondary education policy. It was concluded that there is strong and positive high level relationship between teachers' effective utilisation of school facilities in terms of instructional materials and instructional spaces with effective implementation of secondary education policy. Based on the findings and conclusion, the study recommended among others that the inspectorate division of education agency and the school heads through adequate supervision and inspection should ensure that there is effective utilisation of school facilities to enhance effective implementation of secondary education policy.

Keywords: Distribution, Correlates of effective implementation, Education policy, Secondary education, Utilisation of school facilities.

Introduction

The issue of poor implementation of secondary education policy in Rivers State and Nigeria in general has been a recurring problem in the education sector. The problem is so much that it has led to the generally acclaimed low quality of education. This does not only depend on the teachers' ability to effectively implement secondary education policy as specified by the National Policy on Education, but also in the optimum distribution and teacher's effective utilisation of available school facilities. School facilities have been proved

to have an important influence on effective implementation of secondary education policy as they play an essential role in the attainment educational goals and objectives. In spite of that, a deeper reflection on the implementation of secondary education policy in Rivers State reveals that most aspects of the policy, has not been adequately addressed in accordance with its provisions (Elenwa & Adiele, 2021).

Elenwa (2021) defined school facilities as all the physical material resources or things put in place in the school that aid and facilitate legitimate school activities. Such as teaching and learning process, extra curricula-activity, research, supporting/utility service and administrative functions. This definition shows that school facilities constitute vital input in the educational process which should be planned for, optimally distributed, effectively utilised and effectively managed for the successful implementation of any education programme and policy such as secondary education policy.

Within the realm of formal teaching and learning activity school facilities can be view in three main aspects. These are teaching facilities, learning facilities and instructional space facilities. Furthermore, the school facilities required in a school as classified by Elenwa (2021) include the following: instructional facilities, utility infrastructural facilities, building infrastructural facilities, recreational facilities, security/safety facilities, welfare/health facilities, administrative facilities, and instructional space facilities.

School facilities are crucial since they provide physical setting in which instructional programme are conducted. Thus, Adesina in Ameh (2018) states that the quality of school facilities available within an educational system positively correlates with the quality and standard of the educational system. This implies that the presence or absence of school facilities can make or mar the effective implementation of secondary education policy and its goals attainment. It is therefore, important for school administrators, teachers and students to devote substantial attention and effort to the effective utilisation of available school facilities in public secondary schools.

Utilisation, as explained by Ebong (2006) involves the actual use of a given facility to achieve the desired goal. However, school facilities utilisation can be defined as the extent to which available facilities are put into adequate and effective use to avoid wastage as well as ensuring the achievement of specific educational goals and objectives. It stands to reason that the extent to which a teacher effectively implements secondary education policy in secondary schools could be related to optimum distribution and effective utilisation of school facilities. Various degree of utilisation of school facilities as noted by Ebong (2006) includes space

utilisation, rate utilisation, total utilisation, over utilisation, under utilisation, and optimum utilisation. These degrees of school facilities utilisation tell much on how wasteful, counterproductive and useful the facilities could be put into use for educational purpose.

In this regard, Maduagwu (2006) concluded that when these facilities are not properly utilised, school goals are not realised. Hence, there is need for the provision of adequate school facilities, since according to Aloga (2014) with adequate facilities teachers' productivity will be high. However, Yusuf and Akinniranye (2011) opined that in order to maximise the utilisation of facilities in schools, school personnel should have the technical know-how of such facilities. To them, without such technical competency, some facilities would either be underutilised, over utilised or not utilised at all.

Therefore, it is the duty of the school heads to ensure that the school facilities are ready for use when due and that it is correctly used to its capacity for the purpose in which there are meant for in order to prevent any disruption of the educational programme. Otherwise, the utilisation of school facility for purposes other than that which it was meant for results in wastage and misuse or under-utilisation or even over-utilisation. Supporting this view, Okenwa (2014) opined that a facility can be maximally used when they are effectively utilised to achieve the stated educational goals. In a like manner, Ekpoh (2018) argued that proper and effective utilisation of school facilities do not only help in the attainment of school goals but also determines its durability and sustainability.

The issue of optimum distribution of school facilities in meeting the increasing demand for access to secondary education has been a recurring problem in that education sub-sector. The secondary education system is faced today with a growing challenge of optimum distribution of school facilities. Optimum distribution of school facilities is crucial in bringing about effective implementation of secondary education policy. This view is supported by Maduagwu and Nwogu (2006) who asserts that the quality of education delivery in a school setting is the product of the scope of distributed educational resources (in this case school facilities) and their qualities. This implies that the extent, to which secondary education policy can be effectively implemented, depends strictly on the quantity and quality of the school facilities, engaged in the educating process and the effectiveness with which these school facilities were distributed to the various schools.

In their study, Okoroma and Enyoghasim (2012) found that the distribution of educational resources that reflect institutional needs is an important factor that determines the achievement of educational goals. It is pertinent to state here that optimum distribution of

school facilities to secondary schools has not been effective. This may probably due to lack optimum distribution of school facilities.

There is evidence that the extent of teacher utilisation of school facilities in the form of instructional materials and instructional space affect effective implementation of secondary education policy in schools. Instructional materials in the view of Ochoma (2015, p.153) is “anything a teacher can use during the teaching/learning process that has the capacity to help the learners understand better the concept being taught”. It follows that instructional materials refers to educational materials inputs used by a teacher during lesson to make teaching and learning process easier, more meaningful, understandable, more interesting, more practicable, more logical and realistic.

Secondary schools where teacher effectively utilised instructional materials seen to perform significantly better than those whose such facilities are not effectively utilised. In the light of this, Ochoma (2011) pointed out that a teacher, whose priority is to make the delivery of his instruction authentic, should judiciously incorporate relevant instructional materials in his teaching. Instructional materials that are commonly used in the school include audio-visual materials like television, videotapes, film tapes, film strips, overhead projectors, etc.; visual materials like graph, charts and diagrams, maps and globs, still picture, posters, textbooks, magazine etc.; and audio materials like tapes and tape recorders, radio, audio players etc.

The essence of instructional materials is hinged on the fact that people remember more what they see than what they hear. Instructional materials play a very important role in successful implementation of any education policy and programme. To buttress this point, Babalola in Effiong and Igiri (2015) highlighted that instructional materials are designed to promote and encourage effective teaching/learning experiences and also resources materials to curriculum implementation. It therefore follows that effective utilisation of available instructional materials are essential for effective implementation of secondary education policy in schools.

Unfortunately, the effective utilisation of available school facilities by teachers in secondary schools has being a challenge to the school system. This observation affirms the view of Ehiometalor in Elenwa (2019a) who observed that the level of school facilities utilisation among teachers of Nigeria secondary schools is very low. It also corroborates the assertion of Vikoro in Elenwa (2019a) that because of the nature and level of orientation in our school that not all the school facilities are utilised to a great extent.

Instructional spaces are spaces set aside and specifically designed for direct teaching and learning process. They include classrooms, auditorium, gymnasium, library, workshops, laboratory, arts room, home economics rooms, multipurpose rooms/halls, music room, zoological gardens, demonstration farm, experimental/geological garden and any other space where students receive instruction/lesson. Adiele, Obasi and Ohia (2021) assert that these spaces are designed specifically in consonance with the different educational programmes to be implemented. To them, these spaces have standard specifications in relation to their instructional roles. It is pertinent to note that the extent to which instructional spaces could enhance effective implementation of secondary education policy depends on their location within the school compound, their structure and accessories.

It is believed that a well planned instructional space will gear up expected outcomes of educational system. It means that, school designs should therefore focus on creating collaborative and adaptable learning spaces supported by a robust and seamless integration of technology and flexible and ergonomic furniture (Draft, 2015). Hence, Ajayi (2007) remarked that effective education may not be guaranteed where instructional spaces such as classrooms, libraries, technical workshops are structurally defective, not properly ventilated and not spacious enough for use. Therefore, in planning the instructional space, such information as required number of students to be served, instructional and learning activities, relationship to other building areas, equipment needs, and special environment requirements should be put into consideration.

For any meaningful implementation of educational policies to take place, school facilities have to be available in appropriate quantity, size and quality. To implement means to put into action or practical use of a planned programme or carrying out of an assigned task. In Mezieobi (as cited in Elenwa, 2019b) opinion, implementation is putting a plan, scheme, decision, proposal, intention, an agreement, policy or idea into effect. Within the school context, implementation refers to the systemic ways of actually executing school plans, programmes, policies, projects and decisions to achieve predetermine educational goals and objectives. Considering the importance of implementation in the actualisation of any decision made, Mezieobi in Elenwa (2019b) posit that, it is the bedrock of any plan, the determinant of the plan's success or failure, a moving force of plan without which a plan is only good intention.

It thus suggests that no policy can succeed if the implementation does not bear any relationship with the intention of the policy makers (Rahmat, as cited in Elenwa, 2020). This implies that implementation is an essential stage where policies such as the secondary education

policy are put into practice to ascertain whether it is going to be actualised or not. It is, however, the most difficult aspect of any education programme. The keys to success in implementation according to Green and Kreuterin in Elenwa (2019b) include a sense of humour, experience, keeping an eye on long-term goals, sensitivity to people's needs, and flexibility in the face of changing circumstances. Consequently, in planning implementation of any education policy, it is necessary at the beginning of its formulation to set clear goals and target for the implementation process taking into consideration the controversies and obstacle that may arise, the issues of institutionalisation and feedback (Elenwa, 2020).

Secondary education as defined by Federal Republic of Nigeria (2014) is the education children receive after a successful completion of ten years of basic education. Equally, Elenwa (2021) refer to secondary education as post-primary education that is capable of preparing students by imparting them with knowledge, values and skills meant for labour market or for higher education. Secondary education in Nigeria context is provided for children between the ages of 11 and 19 years. Secondary education is critical to the upbringing and shaping of the children's future as it is meant provides opportunity for a child to acquire additional knowledge, skills and traits beyond the primary level.

It is expected that a child who cannot proceed to the tertiary level of education would have acquired necessary skills and knowledge at the secondary education level to enable him/her be self-reliant and contribute to the growth and development of the society. By this understanding, "it means that secondary education should be able to equip students with marketable skills for a wide range of employment opportunities, including self-employment" (Ezekiel-Hart & Adiele, 2010, p.185). Frantic effort was made by various governments in Nigeria in order to improve secondary education sub-sector. This led to restructuring of secondary education in Nigeria at different time. Thus, from 1984 secondary education in Nigeria was structurally changed from 5 years programme to 3-3-structure system representing three years junior secondary school and three years senior secondary school and has now been restructured in a form that included the first 3 years (junior secondary school) as part of nine years universal basic education programme. The curriculum at junior secondary school level is both prevocational and academic, while at senior secondary school level the curriculum includes not only academic curriculum but also curricula provided in different technical colleges and vocational centers.

Secondary education in Nigeria exists within the ambits of the law and is supervised by Ministry of Education and its state agencies. Within the overall national objective, the broad

policy framework for secondary education in Nigeria provides that secondary education is to prepare the individual for the world of work, wealth creation and entrepreneurship (FRN, 2014). Specifically, the objectives of secondary education policy as contained in Section 3, Subsection 36 of the National Policy on Education are to:

- a. provide holders of the Basic Education Certificate and Junior Arabic and Islamic Studies Certificate with the opportunity for education of higher level irrespective of gender, social status, religious or ethnic background;
- b. offer diversified curriculum to cater for differences in talents, disposition, opportunities, and future roles;
- c. provide trained manpower in applied science, technology and commerce at sub-professional grades;
- d. provide entrepreneurial, technical and vocational job-specific skills for self-reliance, and for agricultural, industrial, commercial and economic development;
- e. develop and promote Nigerian languages, arts and culture in the context of the world's cultural heritage;
- f. inspire students with a desire for self-improvement and achievement of excellence;
- g. foster patriotism, national unity and security education with emphasis on the common ties in spite of our diversity; and
- h. raise morally upright and well-adjusted individuals who can think independently and rationally, respect the views and feelings of others and appreciate the dignity of labour (FRN, 2014).

The theoretical framework of the study is anchored on the theory of utility of educational resources propounded by Basil Castaldi as theoretically described in Owchondah (2018). In the school setting, the theory states that the utility of a school resource is measured by the extent to which it satisfies both qualitative and quantitative requirement of a school programme. In the utility theory, resources such as school facilities utilisation can be measure in various magnitude of over utilisation, optimal (maximum) utilisation, and under utilisation or even non utilisation. For instance, shortage of instructional materials relative to the availability of other resources can be a source of over utilization and excess instructional space can be a source of under utilisation. It is maximum utilisation where the available instructional space corresponds to the available number of student's enrolment in a comfortable situation. It emphasizes that an effective utilisation of the school facilities will yield high output of quality learners. In this connection, the nature and quality of effective implementation of secondary education policy

in public secondary schools is closely related to the resources (school facilities) which are adequately distributed and effectively utilised.

It has been observed that optimum distribution and effective utilisation of school facilities in public secondary schools in Rivers State is not encouraging. Evidence abounds on how school facilities are not optimally distributed in proportion to the enrolment of students. The preceding situation also raises the question on the effective utilisation of school facilities in secondary schools. As in most schools even the available school facilities, are often not effectively utilised and hence seen not to significantly contribute to effective implementation of secondary education policy. It is against this background that the study considered it necessary to determine the level of relationship to which optimum distribution and teacher effective utilisation of school facilities relates to effective implementation of secondary education policy in public secondary schools.

Therefore, the study was guided by the following research questions:

1. What is the level of relationship between optimum distribution of school facilities and effective implementation of secondary education policy in public secondary schools in Port Harcourt metropolis?
2. What is the level of relationship between teachers' effective utilisation of instructional materials and effective implementation of secondary education policy in public secondary schools in Port Harcourt metropolis?
3. What is the level of relationship between teachers' effective utilisation of instructional space and effective implementation of secondary education policy in public secondary schools in Port Harcourt metropolis?

Methodology

The study used correlational design. The population of the study comprised 1,566 public secondary schools' teachers in Port Harcourt metropolis in Rivers State, Nigeria. The population was made up of 708 senior and 858 junior secondary schools' teachers respectively. Simple random sampling technique was used to draw a sample size of 320 teachers representing 20% for the study. Content and face validity method was adopted to validate a two set of self designed 18-items questionnaire titled "Distribution and Utilisation of School Facilities" and "Effective Implementation of Secondary Education Policy" which was used for data collection. The reliability of the questionnaire was established using Kuder-Richardson 21(KR-21) formula which yielded a reliability coefficient of 0.86 as a measure of its internal consistency. The questionnaire were in two sets and structured in 4-point summated rating scale of Strongly

Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). Three hundred and twenty (n=320) copies of the questionnaire were personally administered to the respondents and retrieved after been completed. All the research questions were answered with Pearson's Product Moment Correlation Coefficient (r).

Results

Research Question 1: What is the level of relationship between optimum distribution of school facilities and effective implementation of secondary education policy in public secondary schools in Port Harcourt metropolis?

Table 1: Pearson's Product Moment Correlation (r) analysis between optimum distribution of school facilities and effective implementation of secondary education policy in public secondary schools.

Variables	Mean	SD	N	R	R ²	Remark
Optimum distribution of school facilities.	64.28	1.87	320	0.51	0.26	Positive moderate relationship exist
Effective implementation of secondary education policy.	67.31	1.69				

R = Correlation coefficient, R² = Coefficient of determination, SD = Standard deviation, N = Sample size.

The result of the analysis in table 1 indicates that the correlation coefficient (r) between optimum distribution of school facilities and effective implementation of secondary education policy was 0.51. This means that, there exists a positive moderate level of relationship between optimum distribution of school facilities and effective implementation of secondary education policy. The table also revealed that coefficient of determination (r²) associated with 0.51 is 0.26 which implies that 26% of effective implementation of secondary education policy in public secondary schools in Port Harcourt metropolis is predicted to optimum distribution of school facilities.

Research Question 2: What is the level of relationship between teachers' effective utilisation of instructional materials and effective implementation of secondary education policy in public secondary schools in Port Harcourt metropolis?

Table 2: Pearson's Product Moment Correlation (r) analysis between teachers' effective utilisation of instructional materials and effective implementation of secondary education policy in public secondary schools.

Variables	Mean	SD	N	R	R ²	Remark
Teachers' effective utilisation of instructional materials.	66.23	14.34	320	0.77	0.59	Positive high level relationship exist
Effective implementation of secondary education policy.	69.14	16.41				

R = Correlation coefficient, R² = Coefficient of determination, SD = Standard deviation, N = Sample size.

The result of the analysis in table 2 indicates that the correlation coefficient (r) between teachers' effective utilisation of instructional materials and effective implementation of secondary education policy was 0.77. This means that, there exists a positive high level of relationship between teachers' effective utilisation of instructional materials and effective implementation of secondary education policy. The table also revealed that coefficient of determination (r²) associated with 0.77 is 0.59 which implies that 59% of effective implementation of secondary education policy in public secondary schools in Port Harcourt metropolis is associated to teachers' effective utilisation of instructional materials.

Research Question 3: What is the level of relationship between teachers' effective utilisation of instructional space and effective implementation of secondary education policy in public secondary schools in Port Harcourt metropolis?

Table 3: Pearson's Product Moment Correlation (r) analysis between teachers' effective utilisation of instructional space and effective implementation of secondary education policy in public secondary schools.

Variables	Mean	SD	N	R	R ²	Remark
Teachers' effective utilisation of instructional space	59.33	10.21	320	0.73	0.53	Positive high level relationship exist
Effective implementation of secondary education policy.	62.05	14.48				

R = Correlation coefficient, R² = Coefficient of determination, SD = Standard deviation, N = Sample size.

The result of the analysis in table 3 indicates that the correlation coefficient (r) between teachers' effective utilisation of instructional space and effective implementation of secondary education policy was 0.73. This means that, there exists a positive high level of relationship between teachers' effective utilisation of instructional spaces and effective implementation of secondary education policy. The table also revealed that coefficient of determination (r²) associated with 0.73 is 0.53 which implies that 53% of effective implementation of secondary education policy in public secondary schools in Port Harcourt metropolis is attributed to teachers' effective utilisation of instructional spaces.

Discussion of Findings.

The study examined relationship between distribution and utilisation of school facilities with effective implementation of secondary education policy in Port Harcourt metropolis. The analysis of the study was based on three major variables: school facilities, instructional materials and instructional spaces.

The findings of the study on research question one in table 1 revealed that there exists a positive moderate level of relationship between optimum distribution of school facilities and effective implementation of secondary education policy. It was also discovered through coefficient of determination (r^2) that 26% of effective implementation of secondary education policy in public secondary schools in Port Harcourt metropolis is predicted to optimum distribution of school facilities

The finding agreed with the view of Maduagwu and Nwogu (2006) who asserts that the quality of education delivery in a school setting is the product of the scope of distributed educational resources (in this case school facilities) and their qualities. The finding also corroborates with the findings of Okoroma and Enyoghasim (2012) who found that the distribution of educational resources to reflect institutional needs is an important factor that determines the achievement of educational goals. This therefore implies that optimal distribution of school facilities is so important and will contribute significantly to effective implementation of secondary education policy so much that it cannot be neglected in the development of the secondary education sub-sector. That is to say that the more optimum distribution of school facilities increases, the more effective implementation of secondary education policy will improve.

The findings of the study on research question two in table 2 revealed that there exists a positive high level of relationship between teachers' effective utilisation of instructional materials and effective implementation of secondary education policy. It was also discovered through coefficient of determination (r^2) that 59% of effective implementation of secondary education policy in public secondary schools in Port Harcourt metropolis is associated to teachers' effective utilisation of instructional materials.

The finding is in consonant with Ekpoh (2018) who noted that proper and effective utilisation of school facilities help in the attainment of school goals. This therefore implies that effective utilisation of instructional materials is of necessity and will significantly influences effective implementation of secondary education policy in public secondary schools to a great

extent. It is practically feasible that the more teachers' effectively utilised instructional materials, the more effective implementation of secondary education policy will improve.

The findings of the study on research question three in table 3 revealed that there exists a positive high level of relationship between teachers' effective utilisation of instructional spaces and effective implementation of secondary education policy. It was also discovered through coefficient of determination (r^2) that 53% of effective implementation of secondary education policy in public secondary schools in Port Harcourt metropolis is associated to teachers' effective utilisation of instructional spaces.

The finding is consistent with the opinion of Adiele, et al (2021) who asserts that instructional spaces are designed specifically in consonance with the different educational programmes to be implemented. From this finding it is apparent that instructional spaces need to be properly planned in terms of location, structure and facilities, and effectively utilise in order to enhance effective implementation of secondary education policy. This implies that the more teachers effectively utilise instructional spaces, the more effective implementation of secondary education policy will improve.

Conclusion

The study concludes that there is strong and positive high level of relationship between teachers' effective utilisation of instructional materials and instructional spaces with effective implementation of secondary education policy in public secondary schools. While that of optimum distribution of school facilities is moderate. It is further concluded that optimum distribution and effective utilisation of school facilities are both indispensable and critical in the internal efficiency of the school system towards the attainment of secondary education goals and objectives.

Recommendations

To enhance effective implementation of secondary education policy in public secondary schools the following recommendations are hereby made:

1. Teachers should be trained and/or retrained on the use of school facilities to ensure their effectiveness in using them, especially those modern sophisticated facilities or equipments.
2. Inspectorate division of education agency and the school heads should ensure that there is effective utilisation of school facilities through adequate supervision and inspection.

3. Government should ensure adequate provision and optimum distribution of requisites school facilities to schools in the right quality, quantity and at appropriate time.
4. School heads should make it a priority for all teachers to make use of available school facilities and ensure the optimal utilisation of instructional spaces.
5. Concern educational authority and other stakeholders should ensure that available school facilities are maintained and kept in good conditions to serve the purpose by which they are provided for.

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University and Industry Partnership for Sustainable Development in Rivers State, Nigeria

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Abstract

This study investigated funding and non-funding partnership between universities and industries for sustainable development in River State. Two research questions and two null hypotheses guided the study. Descriptive survey research design was adopted. The population for the study is two thousand, three hundred and seventy-three (2,373) university administrative staff and chief executive officers of industries. This is made up of 668 universities administrative staff and 1705 Chief Executive Officers of industries in Rivers State. The sample size was 894 (467 universities administrative staff and 427 CEOs). The sample was drawn through multistage sampling procedure using cluster and disproportionate stratified random sampling techniques. University and Industry Partnership Questionnaire was used for data collection. Face and content validities were ensured by experts in measurement and evaluation. Internal consistency was through Cronbach alpha gave reliability coefficient of 0.89. Mean, standard deviation and z-test were used for data analysis. It was found among others that funding and non-funding partnership between universities and industries for sustainable development includes: commercialization of research, endowments, grants, university-productive sector linkages and contribution to tertiary education trust fund, educational collaborations, academic entrepreneurship, establishment of multi-disciplinary research centers and students' internship. The study recommends among others that; universities should develop functional websites where they can advertise and market their research findings; intellectual property and sale of products of technologies to industries. The university should always sign a memorandum of understanding with any industry of interest on the modus operandi in order not to have a bridge of contract.

Keywords: Industry, Partnership, Sustainable development and University.

Introduction

University and industry partnership is a relatively new phenomenon that emerged during the past century and has strongly expanded in scope and number over recent decades. University and industry linkages cover a large range of diverse realities in both teaching and research, from the more traditional, such as student placement schemes, staff exchanges, consultancy services, continuing professional development, joint research and development, to recent areas such as small enterprise development – the creation of spin-offs for joint

commercialization and development of consortia for collaborative research and development at the international level (IIEP, 2000). Joseph and Abraham (2009), stated that industry academia interaction is rapidly moving towards the forefront of science and technology policy making, planning and management. With the ongoing economic reforms there has been a dramatic change in the economic and business environment confronted by industries, academia and public laboratories. Protection is getting replaced with competition, controls are giving way to liberalization, and import substitution is replaced with export promotion and globalization (Joseph and Abraham, 2009).

Universities and industry partnership refers to the interaction between any parts of the university system and industry aiming mainly to encourage knowledge and technology exchange. UIP have had a long history, as one means of building organizations' knowledge stock. The strategic linkages forged between university and industry has existed for a long time, in a form of students' internship or even faculty exchanges (Perkmann & Walsh, 2008). Of late, there has been a substantial increase in this linkage in several nations including Nigeria. This increase has been attributed to a combination of pressures on both industry and universities. For industry, pressures have included rapid technological change, shorter product life cycles and intense global competition that have radically transformed the current competitive environment for most firms. With regards to universities, pressures have included the growth in new knowledge and the challenge of rising costs and funding problems, which have exerted enormous resource burdens on universities to seek relationships with firms to enable them to remain at the leading edge in all subject areas (Hagen, 2002). In addition, there is a mounting societal pressure on universities for them to be seen as engines for economic growth and less as fulfilling the broader social remit (i.e. education and generating knowledge) they have had in the past (Blumenthal, 2003; Philbin, 2008). These pressures on both parties have led to an increasing stimulus for developing UIP that aim to enhance innovation and economic competitiveness at institutional levels through knowledge exchange between academic and commercial domains (Perkmann et al., 2013). Moreover, UIP has been widely perceived as a promising tool for enhancing organizational capacity in open innovation — where an organization employs external networks in developing innovation and knowledge, as a complementary option to traditional internal R&D (Harvey & Tether, 2003).

The reasons for these linkages are also diverse and ranging from student practical training to institutional widespread attention among researchers in recent years; because the

rapidly changing business environment demands industries to continuously enhance production and commercialization of new products. Such partnership has their efficiency as well as productivity. The escalating costs of equipping the existing manpower with necessary skill, knowledge and abilities as well as undertaking research have strategically pushed further and necessitated strong partnerships between universities and industries (Orthman & Omar, 2011). The place of partnership between university and the industry cannot be swept under the carpet. Fostering collaborative university-industry partnerships to enhance commercialization efforts has emerged as a critical imperative to sustaining global competition. The forms of UIP mostly pursued in practice and discussed in this literature include: Joint Ventures, Networks, Consortia, and Alliances (Barringer & Harrison, 2000), and these different forms vary by the degree to which the participants are linked. However, Bruneel, D'esteb, & Salter (2010) on the other hand suggest four classifications for UIP, including: research support (i.e. Endowment/Trust Fund), cooperative research (i.e. institutional agreements, group arrangements, institutional facilities, informal intentions), knowledge transfer (i.e. hiring of recent graduates, personal interactions, institutional programs, cooperative education) and technology transfer (i.e. product development and commercialization activities through university research centers). In universities in Nigeria, network industries like MTN, Glo and Etisalat; oil and gas industries like Mobil, Shell Total, Fina and Elf partner with universities to enhance activities taking place in the institutions for global competitiveness. These partnerships are established to improve institutional performance through proper assistance in the provision of facilities in the school system and research development. The findings of researches carried out in the institutions are used in the industries for quality productions. Also, students that graduate from the university are employed in these industries to contribute their quota in societal development.

The first definition of sustainable development was given in 1987. It is defined as economic development and standard of living that does not impair the ability of the environment in the future to provide the necessary food and life for the population and seek to meet the need of the current generation without depleting the needs of future generation (Brundtland report, 1987). Sustainable development seeks to reconcile the three economic, social and environmental dimensions by building productive capacities and available techniques by supporting scientific research adopting different approaches to the achievement of human basic needs and to raising their standard of living and well-being. Hence, scientific research represents the most important pillars of progress and the element of its success and the ability to achieve sustainable development and its response to transformations in society and external

influences. Connecting scientific research with institutions and organizations is considered as a strategy that aims to improve the teaching process and to linking the universities to the progress and development process in society.

In 1993, UNESCO established the university-industry partnership program UNISPAR in order to promote the university in developing countries and to encourage them to increase their participation in the industrialization process in their countries. These programs aim to strengthen partnership and linkages between universities and industry, including small and medium enterprises, to promote innovation and engineering science education, consolidate cooperation, mainstream gender equality, promote maintenance of all areas related to technology development, in addition to the development of human resources including the training of engineers in the areas of transfer of research, transfer and maintenance of equipment and other related fields (Mahmoud, 2008). Studies and reports published by the World Bank have proved the importance of university-industry partnership and integration.

Aim and Objectives of study

The study was aimed at investigating university and industry partnership in Rivers State, to:

1. find out how funding partnership between universities and industries contributes to funding universities for sustainable development in Rivers State, Nigeria.
2. find out non-funding partnership between universities and industries for sustainable development in Rivers State Nigeria.

Research Questions

1. how has funding partnership between universities and industries contributed to funding universities for sustainable development in River State, Nigeria?
2. What are the non-funding partnerships between universities and industries for sustainable development in Rivers State Nigeria?

Hypothesis

1. There is no significant difference between the mean scores of universities and industries on how funding partnership between universities and industries has contributed to funding universities for sustainable development in River State, Nigeria.
2. There is no significant difference between the mean scores of universities and industries on the non-funding partnership between universities and industries for sustainable development in Rivers State Nigeria

Literature Review

funding partnership between universities and industries for sustainable development in Rivers State, Nigeria

Funding means money provided, especially by an organization or government, for a particular purpose. Funding is the act of providing financial resources, usually in the form of money, or other values such as effort or time, to finance a need, program, and project, usually by an organisation or government. Generally, this word is used when a firm uses its internal reserves to satisfy its necessity for cash, while the term financing is used when the firms acquires capital from external sources. Funding of universities in Nigeria is very necessary for optimum growth and societal development. Fund is needed in universities to procure educational materials, physical facilities and staff management. Funding of Nigerian higher education is imperative because of the costs involved in maintaining an institution.

Yusuf (2012) opined that funding is critical to the ability of tertiary institutions to conduct research in the first place and ultimately to the quality and impact of this research. Most research activities in Nigeria are sponsored by government through government funding agencies like the National Science and Technology Fund (NSTF), the Education Trust Fund (ETF) and so on, as well as a number of federal/state ministries, boards and parastatals which directly fund researching institutions or research projects under them. In addition, research projects are occasionally funded by international and philanthropic organisations by way of sponsored research support, endowment funds, foreign aids, fellowships, donations, and so on.

All over the world, there are basically are two broad sources of funding educational programs. They are: government sources and non-governmental sources. Governmental sources are sources of fund that come from the government through budgetary allocation. Government also provides allocation and funds for education through grants, such as; capital grants, which are the bulk of payments to educational institutions for the construction of new buildings and major repair of old ones. Also, there are also recurrent grants, which are for expenditure that occur every year in the budget. They include salaries, allowance, maintenance, travelling and transport expenses, and expenditure on student meals and so on. Special grant, which are special aid by the federal or state government to service schools. Some government give special grants to enable schools improve the quality of education, structure, special programmes and much more. However, grant for tertiary educational institutions are usually received and disbursed by regulatory institutions. (Uzonwune and Kpee, 2019)

Non-governmental sources of funding for education all over the world include Industries. Hence, this research is strongly advocating that all the multinational companies and

other industries operating in Rivers State need to partner with the various university institutions towards funding education in areas such as contributing money for the development of institution, encouraging research and consultancy services in universities, providing laboratory equipment, computers and laptops in schools to help ameliorate the bottleneck in the funding of education, as well as providing scholarships and products for school development. Uzonwune and Kpee, (2019) asserted that, industries in other parts of the world assist university institutions with funds for the provision of educational facilities, construction of buildings, research engagements, as well as scholarships for students. They do this by partnering with universities. In some countries, many leading public universities are rapidly becoming very dependent on industry support, in any event, the continued excellence of public universities – and access to them for students of modest financial means will be increasingly dependent on industry partnership and support. Some of which include the following:

Commercialization of research: this is a therapy that will cures the virus of under-funding that is eating-up Nigerian universities in general, and those in Rivers State in particular. This issue of under-funding is orchestrated by the ebb in the price of oil in the global market. This by extension has affected the coffers of government, thereby reducing its financial support to public universities in particular. The short fall in financial allocation to public universities from the coffers of the government, should inform universities to use commercialization of research as a way of improving universities' funding base. This may be possible through the sale of their research finding tailored towards solving teething problem to the industries. In tune with this, Uche and Ahunanya (2011) describe commercialization of research as the process whereby universities sell the findings of their research(es) to the public or industries to produce new goods or improve on the existing goods. This implies that the industries pay for research findings of universities to improving their products. Little wonder, Worgu (2017) hinted that industries pay universities for their products (research findings). This payment from industries is one of the ways universities improve their funding base (Chesbrohgh, 2003). The importance of commercialization cannot be undermined. Commercialization of research products are significant in the development of university manpower and realization of funds and finance for the smooth running of the university.

However, industry funded research spurs concerns regarding possible long-run effects on scientific output. While some policy makers argue that the potential of universities to foster and accelerate industrial innovations is not yet fully exploited, others are concerned with the distraction of academics from their actual research mission. Whereas from a private-sector

perspective, the benefits from collaborating with academia are found to be unambiguously positive, the effects on the scientific sector are not as clear cut. Science may benefit from the initiation of new ideas from industry or the use of industry funds for hiring additional researchers or investing in lab equipment. On the other hand, traditional incentives in scientific research characterized by knowledge sharing and rapid disclosure of research outcomes may be distorted. Moreover, commercial interests may induce scientists to select research projects on the basis of their perceived value in the private sector and not solely on the basis of scientific progress.

Endowments: At the University of Ibadan for example, a major way of generating money for the university is through endowments. It is a method which has always been used at the University of Ibadan since the 1960s. The harsh economic conditions of the civil war era induced the university to embark on the search for endowment funds. This need was made all the more urgent when the earlier quinquennial financial arrangement that the government made with the university was replaced with ad hoc grants. An endowment appeal fund was launched by the then visitor, His Excellency, General Yakubu Gowon, to support University of Ibadan's 1975-80 quinquennial plan. The plan proposed to create new academic programmes and embark on major capital projects. However, in many cases, the Nigerian public seemed not to have imbibed the spirit of endowments to the universities, demonstrated in the usually low response from the public to calls for such funds. Nevertheless, the University of Ibadan attracts the highest endowment funds (up to N8.36m in 1994/95 session alone). This is not surprising, since it has as noted, adopted this funding strategy since the 1960s.

Foreign Grants: For a long time, foreign grants have aided many programmes in the Nigerian universities, especially postgraduate studies and staff development. For example, the University of Ibadan received from the Ford and Rockefeller Foundations a sum of N7, 717,592 for the development of its 1962-67 quinquennium. Other bodies, which were reported to have supported Nigerian universities and individual researchers within the system, include IDRC, CIDA, SIDA, USAID, Commonwealth Scholarships, UNFPA, UNIFEM, and the British Council. However, subsequent to the country's confrontation with the United Nations over non-democratic principles in governance, and a bad human rights record, many of these donors have withdrawn their funding. This, in particular, followed the sanctions that the United Nations introduced in opposition to the military dictatorship in the country (Odebiyi et al., 2000). Included in this category are external aids. External aids are assistance given to educational institutions from outside the country. It may be in the form of equipment and manpower through

bilateral and multilateral relations. External aids come from organizations such as the World Bank, UNESCO, USAID, Ford Foundation, PTF etc.

University-productive sector linkages: Universities are now making efforts to reach out to the productive sector mainly through seminars, workshops and training programmes. However, the benefits of this accrue more to the large-scale industrial concerns, rather than the small-scale enterprises (since the latter cannot, in most cases, benefit much from the fee-based university consultancy services offered at exorbitant prices) (Ayiku, 1997).

Odebiyi et al. (2000) carried out a case study of Obafemi Awolowo University, Ile-Ife. They found that many centres had been established at Ife which provide links with the productive sector, either through consultancy services, training in new technologies, and other technical services. The centres promotes training of manpower for the industries, through consultancies, while profits accruing to them have been spent on further investments, teaching and research, and to acquire new equipment. Some universities in recent times are now establishing linkages with the productive sector either through consultancies and other designated centres or units; and direct links with academic departments. Although the older universities seem to have more established links with the productive sector on the whole, a young State university like OSUA started off with the philosophy of being particularly relevant to the immediate social and economic environment. On the whole, there is still poor information flow from the universities to the productive sectors, while much of the research carried out in these universities is not need-driven, and are therefore not geared to the interests of the private sector.

Tertiary education tax fund (Tetfund) formally known as Education tax fund (ETF): This was introduced in 1993 to raise fund for the education sector. TetFund was established as an intervention agency under the TETFund ACT–Tertiary Education Trust Fund Act, 2011; charged with the responsibility for managing, disbursing and monitoring the education tax to public tertiary institutions in Nigeria. The Tetfund act requires all registered companies in Nigeria to pay a tax of 2% on their assessable profit. The money is shared in the ratio 50:25:25, with Universities getting 50% and colleges and polytechnics each getting 25% apiece.

Non-funding partnership between universities and industries for sustainable development in Rivers State, Nigeria

There is increasing attention paid to the potential contribution of universities as knowledge producers interacting with firms to build learning and technological capabilities in a national system of innovation, and hence, contributing to sustainable development and

structural change, in the specific conditions of developing countries (Liefner and Schiller 2008, Mazzoleni 2008, Schiller and Brimble 2009). Knowledge-based institutions play a key role in preparing graduates with appropriate scarce and critical skills, and in contributing research to the development of new technology, new organizational forms and innovation. University education produces individuals with fundamental competencies able to absorb new technologies for firms, thus building and increasing capabilities for firms and industries in a national economy. University research provides missing or complementary basic, applied or experimental research to inform firms' innovation and research and development activities. In turn, industry has been identified as a key partner for higher education, as a source of much-needed 'third stream' funding, and so on.

Universities and industries partnership processes can be broadly categorized into two which are funding and non-funding partnership. Non-funding universities and industries partnership include; academic spin-offs, educational collaboration, academic entrepreneurship, establishment of multi-disciplinary research centers, students' internship and so on.

Academic spin-offs: Academic spin-offs (also referred to as university spin-offs or spinouts) are subject of a huge and growing literature. Although there are various definitions of academic spin-offs, they all require the transfer of knowledge and technologies from the university to the academic spin-off. The transferred technology might be formalized intellectual property, e.g. the transfer of a patent via technology licensing (Di Gregorio and Shane, 2003). Alternatively, the transfer may consist of non-formalized technologies and research results (Djokovic and Souitaris, 2008). The discussion on transferred knowledge and technologies usually focusses on research results from natural sciences, computer sciences or engineering. However, academic spin-offs are also frequently based on results from social sciences, e.g. in the business consulting industry (Egeln et al., 2003). Regarding the second distinguishing attribute of new firms, members of the founding team coming from a university, a narrow definition requires that an academic spin-off is set up by the inventor of the transferred knowledge and technology the spin-off commercializes (Smilor et al., 1990). Thus, the formation of an academic spin-off involves at least a partial employment transition of a university researcher from academia to the for-profit private sector. This definition includes founders of academic spin-offs that remain affiliated with the incubator university and continue to work part-time for the university. If the whole team of founders consists of researchers that (partially) left the incubator university, we denote the new firm a pure academic spin-off. A hybrid type of an academic spin-off is a new firm set up by a team of founders that includes

both university researchers and founders from outside the university sector. The latter may enrich the knowledge base of an academic spin-off through their commercial experience. Both pure and hybrid academic spin-off require the transfer of knowledge and technology from the university to the academic spin-off. New firms founded by university researchers without being based on transferred knowledge and technologies are not classified as academic spin-offs. According to Nicolaou and Birley (2003), a technology spin-off is a new firm that commercializes research results originating from universities but that does not involve the inventor in the team of founders. Although the authors allow for the possibility of the university researcher having equity in the new company or offering advice on a consultancy basis, an employment transition of the university researcher is no longer necessary. Ege et al. (2003) relax the criterion that academic spin-offs must commercialize universities' research results and denote as competence spin-offs those start-ups for which special skills and expertise the founders acquired at a university were essential to create the new firm.

The creation of spin-offs as derivative start-ups recognizes the transfer of knowledge and technology assets to a commercial, quasi-private context in which the university typically retains a significant equity stake. Activities may also have developed initially within an academic context on the basis of research contracts but which begin to generate commercial revenues as the practical relevance comes to attract interest. Being part of a university may constrain the ability to exploit revenue generating activities fully, because of the constraints imposed by a university environment.

Educational collaboration: This involves activities such as conferences, seminars, corporate training programs, and supervising thesis work, establishing organizations and programs that connect research with business and catalyze collaboration, creating platforms for communication, networking, and the development of shared goals among community stakeholders, e.g. entrepreneurs, trade associations, university researchers and administrators, capital providers, and business support service providers among others to foster innovation and entrepreneurship across and within the private sector as well to facilitate greater university-industry engagement. Also, there are research-related collaboration, which includes joint research in shared premises and employment contracts with companies. These collaboration processes can be facilitated through various channels of interaction, such as bi-directional, traditional, commercial, and service channels. It is important to note that the preferences and rankings of these channels may vary between industry and academia. (Ake, 2024) growth.

Academic entrepreneurship: Where researchers engage in shared publications, research-related consulting, public research programs, and contract research including entrepreneur-in-residence programs, where experienced business advisors from outside of the university who work with faculty interested in commercializing their research. They provide valuable coaching and mentoring to faculty and students, help align the expectations of what can be realistically commercialized, bring with them an entrepreneurial culture, and lastly serve as a vehicle for bridging the university-industry divide (Joseph and Abraham 2019)

Multidisciplinary research centers or institutes with industry buy-in, which is establishing and promoting centers or institutes that have a mandate to perform collaborative research with industry and cut across two or more academic disciplines.

Student internship and job placement programs. There is little disagreement that people are the most important form of knowledge transfer. Leading regions have multiple methods to link their students to work experience and job opportunities in the private sector. These include mentorship programs, internships and business plan competitions.

Joseph and Abraham (2019) further identified other forms of university-industry partnership to include, personal networks of academic and industrial researchers, spin-offs of new firms from universities, participation in conferences and presentations, flows of fresh graduates to the industry, publications and reports, public conferences and meetings, informal information exchange, contract research with universities, joint or cooperative R&D projects, participation in networks that involve universities, temporary personnel exchanges, incubators, joint science and/or technology parks and firm. According to Scharingeretal., (2002) university-industry interactions and knowledge transfer is categorized into four distinct groups; U-I joint research (including joint publishing), contract research (such as consulting and financing of university research), mobility (staff movement between universities and industry, joint supervision of students during industry placement and internship) and training (such as training of firm staff at universities, lecturing by industry staff on selected topics).

Indeed, universities and the industry can partner in different ways. These include, but are not limited to, research and development, mobility of academics, mobility of students, commercialization of research results, curriculum development, curriculum delivery, lifelong learning, spinoff and start-up formation, and university governance. Others include Joint Ventures, Networks, Consortia, and Alliances (Barringer & Harrison, 2000). However, Bruneel, D'esteb, & Salter (2010) on the other hand suggest four classifications for UIP, including: research support (i.e. endowment/trust fund), cooperative research (i.e. institutional

agreements, group arrangements, institutional facilities, informal intentions), knowledge transfer (i.e. hiring of recent graduates, personal interactions, institutional programs, cooperative education) and technology transfer (i.e. product development and commercialization activities through university research centers). Likewise, types of university-industry cooperation that provides straight and measurable benefits have a tendency to be the most developed types of cooperation such as research and development. Accordingly, UIP is essential to establish and nurture innovation ecosystems that drive the national innovation agenda and sustain economic development.

Statement of problem

No social institution can survive absolutely independently, because nothing can exist in isolation. The university and industry are not exemptions. For example, it is obvious that the government alone cannot bear the burden of education financing, hence, the need for university and industry partnership. However, it appears that majority of industries in Rivers State do not partner with universities through such avenues like “open” innovation systems that favour collaboration, partnerships, alliances, consortia and coordination of research with universities. Again, many firms attach more importance to informal contacts with universities that relate to the recruitment of graduates, internships, and consulting, and in some cases, industries seem to be having difficulty with aggressive behavior of universities regarding sharing of property rights and licensing. On the other hand, it appears that some universities in Rivers State seem not to commercialize the fruits of existing research results through transfer of knowledge, spinoffs, and equity in stakes in start-ups to the industries. Hence, the researcher is bothered and propelled to investigate the funding and non-funding partnership between universities and industries for sustainable development in Rivers State, Nigeria.

Methodology

The population for the study is two thousand, three hundred and seventy-three (2373) university administrative staff and chief executive officers of industries. This is made up of 668 administrative staff of universities and 1705 chief executive officers of industries. The study was a descriptive survey design. The sample size was 894 (467 administrative staff and 427 CEOs). The sample was drawn through multistage sampling procedure using cluster and disproportionate stratified random sampling techniques. University and Industry Partnership Questionnaire was used for data collection. Face and content validities were ensured by experts.

Internal consistency through Cronbach alpha gave reliability coefficient of 0.89. Mean, standard deviation and z-test were used for data analysis.

Results

Research Question 1: how has funding partnership between universities and industries contributed to funding universities for sustainable development in River State, Nigeria?

Table 1: Mean and standard deviation on how funding partnership between universities and industries has contributed to funding universities for sustainable development in River State, Nigeria?

S/N	how has funding partnership between universities and industries contributed to funding universities for sustainable development in River State, Nigeria	Administrative Staff			Chief Executive Officers		
		Mean	Std.	Decision	Mean	Std.	Decision
1	Through commercialization of research	3.69	.54	Agreed	3.56	.46	Agreed
2	Through endowments funds	2.62	.55	Agreed	3.25	.45	Agreed
3	By giving of grants to the universities	2.52	.80	Agreed	3.17	.49	Agreed
4	University-productive sector linkages	2.92	.47	Agreed	3.29	.43	Agreed
5	Contribution to tertiary education trust fund	3.24	.23	Agreed	3.42	.42	Agreed
	Aggregate mean and standard deviation	2.79	.67		3.33	.82	

Table 1 revealed that items with serial numbers 1 to 5 have their various mean values above the criterion mean value of 2.50 and were agreed by the respondents as how has funding partnership between universities and industries contributed to funding universities for sustainable development in River State, Nigeria. Hence, funding partnership between universities and industries contributes to funding universities for sustainable development in Rivers State, Nigeria through; commercialization of research, endowments funds, giving of grants to the universities, university-productive sector linkages and industries contribution to tertiary education trust fund.

Research Question 2: What are the non-funding partnerships between universities and industries for sustainable development in Rivers State Nigeria?

Table 1: Mean and standard deviation on non-funding partnership between universities and industries for sustainable development in Rivers State Nigeria

S/N	non-funding partnership between universities and industries for sustainable development in Rivers State Nigeria	Universities Administrative Staff			Industries Chief Executive Officers		
		Mean	Std.	Decision	Mean	Std.	Decision
6	Academic spin-offs	2.13	.45	Disagreed	2.15	.47	Disagreed
7	Educational collaborations	3.15	.67	Agreed	3.19	.45	Agreed
8	Academic entrepreneurship with industries	3.16	.73	Agreed	3.08	.45	Agreed
9	Establishment of multi-disciplinary research centers by industries	3.32	.56	Agreed	3.43	.49	Agreed

10	Acceptance of students for internship	3.09	.52	Agreed	3.42	.49	Agreed
	Aggregate mean and standard deviation	2.97	.72		3.06	.74	

Table 2 revealed that items with serial numbers 7 to 10 have their various mean values above the criterion mean value of 2.50 and were agreed by the respondents as the non-funding partnership between universities and industries for sustainable development in Rivers State Nigeria. While item with serial number 1 has mean below the criterion mean of 2.50 and were disagreed by the respondents as non-funding partnership between universities and industries for sustainable development in Rivers State Nigeria. Hence, non-funding partnership between universities and industries for sustainable development in Rivers State Nigeria are; educational collaborations, academic entrepreneurship with industries, establishment of multi-disciplinary research centers by industries and acceptance of university students for internship.

Hypothesis 1: There is no significant difference between the mean scores of universities and industries on how funding partnership between universities and industries has contributed to funding universities for sustainable development in River State, Nigeria.

Table 3: z-test analysis of the mean scores of universities and industries on how funding partnership between universities and industries has contributed to funding universities for sustainable development in River State, Nigeria.

Categories	N	\bar{x}	Sd	Df	Sl	Z-cal	Z-crit.	Remarks
University administrative staff	467	2.79	.72	892	0.05	0.07	1.96	Accepted
Industry chief executive officers	427	3.06	.74					

Table 3 shows that university administrative staff have a mean score of 2.97 and standard deviation score of .72 while industry chief executive officers have mean score of 3.06 and standard deviation score of .74. These scores are so closely related that no significant difference exist between them. Furthermore, at 892 degree of freedom and at 0.05 level of significance, the calculated z value of 0.07 was by far less than the z critical value of ± 1.96 . Based on the above observation, the researcher failed to reject the null hypothesis and therefore establish that there was no significant difference.

Hypothesis 2: There is no significant difference between the mean scores of universities and industries on non-funding partnership between universities and industries for sustainable development in Rivers State Nigeria.

Table 4: z-test analysis of the mean scores of universities and industries on non-funding partnership between universities and industries for sustainable development in Rivers State Nigeria

Categories	N	\bar{x}	Sd	Df	Sl	Z-cal	Z-crit.	Remarks
University administrative staff	467	2.79	.67	892	0.05	0.09	1.96	Accepted
Industry chief executive officers	427	3.33	.82					

Table 4 shows that university administrative staff have a mean score of 2.79 and standard deviation score of .67 while industry chief executive officers have mean score of 3.33 and standard deviation score of .82. These scores are so closely related that no significant difference exist between them. Furthermore, at 892 degree of freedom and at 0.05 level of significance, the calculated z value of 0.09 was by far less than the z critical value of ± 1.96 . Based on the above observation, the researcher failed to reject the null hypothesis and therefore establish that there was no significant difference.

Discussion of findings:

How funding partnership between universities and industries contributes to funding universities for sustainable development in River State, Nigeria

This study found that funding partnership between universities and industries contributes to funding universities for sustainable development in River State, Nigeria through; commercialization of research, endowments, grants, university-productive sector linkages and tertiary education trust fund. This finding is supported by Uzonwune and Kpee, (2019), who asserted that, industries in other parts of the world assist university institutions with funds for the provision of educational facilities, construction of buildings, research engagements, as well as scholarships for students and that they do this by partnering with the universities. Also, the findings are in agreement with Yusuf (2012) who decried the poor state of industry funding of universities in Nigeria and observed that in advanced nations of the world, research projects are often funded by philanthropic organizations by way of sponsored research support, endowment funds, foreign aids, fellowships, donations, and so on.

Non-funding partnership between universities and industries for sustainable development in Rivers State Nigeria.

This study found that non-funding partnership between universities and industries for sustainable development in Rivers State Nigeria include; educational collaborations, academic entrepreneurship, establishment of multi-disciplinary research centers and students' internship. This finding is in tandem with Schartingeret al (2002) who noted that; university-industry

interactions and knowledge transfer is categorized into four distinct groups; U-I joint research (including joint publishing), contract research (such as consulting and financing of university research), and joint supervision of students during industry placement and internship). Also, this finding is in line with the thought of Joseph and Abraham (2019) who identified university-industry partnership to include, participation in conferences and presentations, flows of fresh graduates to the industry, publications and reports, public conferences and meetings, informal information exchange, contract research with universities, joint or cooperative R&D projects, participation in networks that involve universities, temporary personnel exchanges and joint science and/or technology parks and firm.

Conclusion

Based on the findings of this study, it was concluded that university and industry partnership for sustainable development has not received the much-needed attention that it deserves in Rivers State Nigeria. In most nations of the world, universities and industries marriage has become the bedrock of sustainable development. The essence of knowledge is development, but until there is adequate partnership between the university which is the dispenser of knowledge and the industry which transforms knowledge into development, there can be no sustainable development.

Recommendations

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

1. Universities in Rivers State should develop functional websites that are specially dedicated to advertisement and marketing of their research findings; intellectual property and discoveries to the industries.
2. There should a stipulated amount of money statutorily required by law, to be remitted to the universities for research and development the industry in Rivers State.
3. The university should always sign a memorandum of understanding with any industry of interest in the state, to for strategic exchanges of research findings that will be useful to the industry for money.

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Role of University Administrators in Enhancing Lecturers Performance Towards Sustainable Development in Public Universities in Bayelsa State.

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Abstract

The study examined the role of university administrators in enhancing lecturers' performance towards sustainable development in public universities in Bayelsa State. Two Objectives, two research questions and two Hypotheses guided the study. A total of 166 university administrators (Deans, Directors and Head of departments) of public universities in Bayelsa State for 2023/2024 academic session made up the population and sample for the study. The instrument for the study was a questionnaire developed on a five-point rating scale ranging from very low extent to very high extent. Three experts in Educational management and Measurement and Evaluation validated the instrument and the instrument test of reliability using Cronbach Alpha method yielded a coefficient of 0.79 and 0.83 respectively for the two sections of the instrument. Mean rating was used to answer the research questions, while Z-test was used to test the hypotheses. It was revealed among others that there is no statistically significant difference between federal and state universities in terms of how administrators organize training and workshops to enhance lecturers' performance towards sustainable development. Indicating that both types of institutions may be perceived similarly in their efforts to enhance lecturers' performance towards sustainable development. Based on the findings, it was recommended inter-alia that universities should strengthen their efforts by introducing more tailored and innovative training programmes; which should focus on sustainable development practices and address specific challenges faced by lecturers to further improve their performance.

Key Words: University Administrators' Role, Training, Workshops, Research Opportunities, Lecturers' Performance, Sustainable Development.

Introduction

Lecturers' performance is a critical variable in the educational sector, particularly in Nigerian universities. It encompasses the effectiveness, efficiency, and impact of lecturers in fulfilling their academic and administrative responsibilities. Understanding and enhancing lecturers' performance is essential for the overall quality of education and the achievement of institutional goals. Lecturers in Nigerian universities play multifaceted roles, including teaching, research, and community service. They are responsible for delivering curriculum content, guiding student learning, and fostering intellectual development. According to Adetunji and Ogunleye (2015),

lecturers' primary duty is to facilitate learning through effective teaching methods, continuous assessment, and provision of feedback to students.

In addition to teaching, lecturers engage in research activities, contributing to the advancement of knowledge in their respective fields. Research productivity is often a key indicator of lecturers' performance, as highlighted by Aina (2017), who emphasized that academic research not only enhances lecturers' knowledge but also enriches the educational content delivered to students. Several factors influence the performance of lecturers in Nigerian universities. These include institutional support, availability of resources, professional development opportunities, and work environment. Ololube (2013) identified that adequate funding, access to modern teaching aids, and supportive administrative policies are crucial for optimal performance.

Professional development is another significant factor. Continuous training and development programs help lecturers stay updated with the latest pedagogical techniques and research despite their pivotal role; lecturers in Nigerian universities face numerous challenges that can hinder their performance (Aleru, 2023; Aleru & Amaechina, 2016). These challenges include inadequate funding, poor infrastructure, heavy teaching loads, and insufficient research grants. Ejiogu (2018) pointed out that many lecturers struggle with balancing teaching responsibilities and research activities due to limited resources and time constraints. Moreover, the issue of job satisfaction and motivation also affects lecturers' performance. Ajayi and Ekundayo (2010) argued that factors such as low remuneration, lack of recognition, and poor working conditions, often stemming from ineffective administrative policies, contribute significantly to lecturers' dissatisfaction. This dissatisfaction can severely impact their commitment and effectiveness. University administrators play a crucial role in addressing these issues by implementing fair compensation structures, establishing recognition programs, and improving working conditions. By adopting these measures, administrators can enhance lecturers' job satisfaction, thereby boosting their performance and dedication to their academic duties.

University administrators play a pivotal role in enhancing lecturers' performance, which directly contributes to sustainable development in society. One of the key responsibilities of university administrators is providing the necessary resources and infrastructure that support high-quality teaching and research. This includes modern facilities, digital tools, and access to academic materials, which allow lecturers to engage in innovative teaching and knowledge dissemination. As noted by Adamu (2022), providing adequate resources significantly

improves lecturers' ability to deliver quality education, which is essential for societal growth. Furthermore, administrators promote continuous professional development by organizing workshops and training that keep lecturers updated on pedagogical advancements and emerging trends in their disciplines. This fosters a culture of lifelong learning and adaptability, critical for sustainability in education (Ogunleye, 2021).

In addition to resources and training, university administrators implement performance appraisal systems that evaluate lecturers' contributions to teaching, research, and service. These systems provide feedback for continuous improvement, guiding lecturers toward aligning their efforts with institutional goals that support sustainable development (Nwosu&Adeola, 2023). Equally important is the role administrators play in creating incentive structures, such as promotions and research grants, that recognize and reward excellence in teaching and innovation. These incentives motivate lecturers to engage in cutting-edge research and community service, both of which are vital for solving societal problems through sustainable practices (Olaniyi, 2020).

Workload management is another crucial aspect where administrators impact lecturers' performance. Ensuring that lecturers have a balanced workload allows them to focus on delivering impactful research and teaching without the risk of burnout. Moreover, fostering a collaborative environment through partnerships with industries and international organizations creates opportunities for lecturers to engage in interdisciplinary work, which is critical for addressing global challenges (Eze, 2022; Ololube (2013). Finally, by establishing policies that integrate sustainability into curriculum development and research agendas, university administrators guide lecturers in embedding sustainability principles into their teaching and research. This alignment ensures that universities contribute to the broader agenda of sustainable development, preparing graduates to be responsible global citizens (Ibrahim, 2023; Adegbesan, 2015).

Adeyemi and Uko-Aviomoh (2016) emphasized that university administrators who invest in regular workshops, seminars, and conferences significantly contribute to the professional growth of lecturers, thereby improving their performance. This perspective focuses on creating and supporting a conducive work environment, which is essential for lecturers to thrive and deliver high-quality education. Administrators are responsible for fostering a positive and supportive atmosphere, addressing concerns related to workload, work-life balance, and job

satisfaction. Ajayi and Ekundayo (2010) further observed that administrators, who engage with lecturers, actively address their concerns, and provide necessary resources create a more motivated and committed academic workforce. Effective policies and practices implemented by university administrators also play a crucial role in enhancing lecturers' performance. These policies may include those related to tenure, promotion, research funding, and performance evaluation. Ejiogu (2018) argued that transparent and merit-based policies boost lecturers' motivation and performance by ensuring that they are rewarded fairly for their efforts. Administrators who establish clear guidelines and procedures, and address challenges to academic advancement, help cultivate a culture of excellence within the institution.

Moreover, university administrators must proactively address the challenges that hinder lecturers' performance, such as inadequate infrastructure, limited research grants, and bureaucratic obstacles. Adeyemo (2017) noted that administrators who identify and work to mitigate these issues create a more conducive environment for lecturers to excel. By removing barriers and providing essential support, administrators enhance the overall effectiveness of their academic staff, ultimately contributing to the achievement of sustainable development goals.

University administrators also play a critical role in steering their institutions toward sustainable development. Their strategic decisions, resource allocation, and policy implementations greatly influence how universities engage with and promote sustainable development goals (SDGs). By embedding sustainability principles in governance and operations, administrators can drive the educational sector's contribution to a sustainable future. Aleixo et al. (2018) highlighted the importance of visionary leadership in higher education for fostering a culture of sustainability. Through a clear commitment to sustainability, administrators can align the university's objectives with global SDGs, ensuring that academic and operational activities support sustainable outcomes. This includes integrating sustainability into the curriculum, promoting interdisciplinary research on sustainability, and collaborating with external stakeholders to address local and global challenges.

Administrators, therefore, enhance lecturers' performance by organizing regular training, workshops, and seminars, which equip lecturers with the skills and knowledge necessary for advancing sustainable development. Additionally, they promote research opportunities, enabling lecturers to contribute more effectively to sustainability-focused academic and practical outcomes.

According to Tilbury (2011), university administrators play a key role in fostering professional development opportunities that equip staff and students with the skills and knowledge needed to address sustainability challenges. Continuous training and capacity-building programs can help lecturers incorporate sustainability concepts into their teaching and research. As noted by Tilbury (2011), education for sustainable development (ESD) requires building capacity at all levels of the institution. Administrators who support regular workshops, seminars, and training on sustainability can cultivate a knowledgeable and motivated academic community that actively contributes to sustainable development.

Similarly, creating a sustainable campus environment is another critical area where university administrators can make a significant impact. This involves implementing policies and practices that reduce the institution's environmental footprint and promote sustainable behaviours. Filho et al. (2019) highlighted that sustainable campus initiatives, such as waste reduction programs, water conservation measures, and sustainable transportation options, are vital for reducing the environmental impact of universities. Administrators who champion these initiatives demonstrate a commitment to sustainability and set a positive example for the wider community.

Another area is effective policies that are essential for embedding sustainability into the fabric of university operations. Lozano et al. (2015) argued that university administrators must develop and enforce policies that promote sustainable practices across all areas of the institution. This includes policies on energy use, waste management, procurement, and construction. As stated by Lozano et al. (2015), policy frameworks that support sustainability can drive systemic change and ensure that sustainability principles are consistently applied. Administrators who implement clear, actionable policies can create a robust foundation for sustainable development within their universities.

Existing research highlights the pivotal role university administrator play in shaping lecturers' performance in Nigerian universities, particularly through organizing training and workshops and promoting research opportunities for continuous professional development. There is a significant gap in understanding how university administrators can systematically address key elements, such as organizing training and workshops and promoting research opportunities, to optimize lecturers' performance, particularly in the context of sustainable development. While Adegbesan (2015) and Ololube (2013) discuss the importance of administrators having a clear vision and providing adequate resources, there is limited empirical evidence on how these

strategies can be effectively applied to maximize their impact on lecturers' contributions to sustainable development. Moreover, although Adeyemi and Uko-Aviomoh (2016) emphasize the need for continuous professional development through workshops and training programs, there is insufficient research linking these initiatives to measurable improvements in teaching effectiveness within the framework of sustainability.

Similarly, Ajayi and Ekundayo (2010) recognize the importance of creating a positive work environment for lecturers, but practical approaches to achieving this through administrative efforts, such as promoting research opportunities for sustainability, remain underexplored. Ejiogu (2018) highlights the significance of transparent policies in enhancing lecturer performance, yet there is a lack of research on how these policies can be effectively implemented to foster academic excellence in relation to sustainable development. Furthermore, Adeyemo (2017) points out challenges such as inadequate infrastructure and bureaucratic obstacles, but current literature does not offer comprehensive solutions for overcoming these barriers in a way that supports sustainability goals. This study seeks to address these gaps by examining the role of university administrators in enhancing lecturers' performance towards sustainable development in public universities in Bayelsa State. Specifically, it will explore how administrators organize training, workshops, and promote research opportunities to improve lecturers' capabilities and their contributions to sustainable development goals. By addressing these areas, the study aims to provide a clearer understanding of how university administrators can create an academic environment that supports sustainable development through enhanced lecturer performance.

Statement of the Problem

In recent years, public universities in Bayelsa State have faced challenges that hinder the effective delivery of quality education and the achievement of sustainable development goals. Lecturers often struggle with insufficient resources, limited opportunities for professional development, and a lack of support for research initiatives focused on sustainability. These barriers diminish lecturers' ability to impart knowledge effectively and engage in innovative research that could drive progress in areas such as environmental conservation, poverty reduction, and quality education. One particular experience stands out: a colleague at a public university in Bayelsa State expressed frustration over the lack of institutional support for his research on sustainable agricultural practices—a topic with immense potential to benefit local communities. His efforts to secure funding were thwarted by bureaucratic delays, and his

opportunities for professional development were minimal, limiting his ability to innovate in his teaching and research. This experience, shared by many lecturers, underscores the need for university administrators to actively address these challenges through effective leadership, clear policy implementation, and strategic resource allocation. By creating an enabling environment that promotes sustainable development initiatives, administrators can transform lecturers' capacity to contribute to both academic excellence and societal progress. Therefore, it is evident that university administrators in public universities have not systematically addressed the critical factors that influence lecturers' performance towards achieving sustainable development goals. Thus, the study examines the role of university administrators in enhancing lecturers' performance towards sustainable development in public universities in Bayelsa State.

Purpose of the Study

The purpose of the study was to examine the role of university administrators in enhancing lecturers' performance towards sustainable development in public universities in Bayelsa State. Objectively; the study sought to:

1. Examine the extent university administrators organize training and workshops in enhancing lecturers performance towards sustainable development in public universities in Bayelsa State.
2. Examine the extent university administrators promote research opportunities in enhancing lecturers performance towards sustainable development in public universities in Bayelsa State.

Research Questions

The following research questions guided the study

1. To what extent do university administrators organize training and workshops in enhancing lecturers' performance towards sustainable development in public universities in Bayelsa State?
2. To what extent do university administrators promote research opportunities in enhancing lecturers' performance towards sustainable development in public universities in Bayelsa State?

Hypotheses

The formulated hypotheses were tested at 0.05 level of significance.

1. There is no significant difference in the mean scores of federal and state universities on the extent university administrators organize training and workshops in enhancing lecturers' performance towards sustainable development in public universities in Bayelsa State.
2. There is no significant difference in the mean scores of federal and state universities on the extent university administrators promote research opportunities in enhancing lecturers' performance towards sustainable development in public universities in Bayelsa State.

Methodology

The research design adopted for this study was the analytic descriptive survey design. This study used the above design because the sampled strata were compared through the use of hypotheses. The population for this study was 166 administrators in public universities in Bayelsa state, which comprised 46 from federal university and 120 from state universities. The sample size of the study is the total population of academic administrators comprising of Deans, Directors, and Head of departments who have direct role with lecturers and are channel through which informed decisions are communicated to the lecturers. However, other categories of university administrators (principal officers) were excluded from this study.

Table 1: Sample Size of the Study

University		No. of Dean	No. of Directors	No. of HoDs	Total
Federal University Otuoke		9	3	34	46
Niger Delta University		14	9	40	63
University of Africa Bayelsa		4	4	23	31
Medical University		5	3	18	26
Total		32	19	115	166

Source: Institutional Directorate of Academic Planning

A researcher developed questionnaire titled "the role of university administrators in enhancing lecturers' performance towards sustainable development in public universities in questionnaire (RUALPSDQ). The questionnaire is consisted of 12 items developed on a four (5) point rating scale of "Very Low Extent" to "Very High Extent". The instrument was subjected to content and face validation and reliability test which gave a coefficient stability of 0.79 and 0.83 respectively. The administration of the instrument was personally carried out by the researcher and research assistants who are institutional faculty officers. The criterion Mean of 2.50 was

used to rank the research questions responses, whilst responses with a mean value of 2.50 or higher would be classified as high extent and the formulated null hypotheses tested with Z-test at 0.05 level of significance.

Results

Research Question 1: To what extent do university administrators organize training and workshops in enhancing lecturers' performance towards sustainable development in public universities in Bayelsa State?

Table 2: Summary of Mean Scores on the Extent University Administrators Organize Training and Workshops in Enhancing Lecturers' Performance towards Sustainable Development in Public Universities

S/N	Statement	Federal(N = 46)			State(N=120)		
		\bar{X}	SD	Remarks	\bar{X}	SD	Remarks
1	University administrators regularly organize training sessions focused on enhancing lecturers' teaching methods towards sustainable development	3.11	1.11	H	2.86	1.13	A
2	Workshops provided by university administrators effectively equip lecturers with the skills necessary to integrate sustainable development concepts into their courses.	3.09	1.12	H	2.54	1.17	A
3	There are sufficient opportunities for lecturers to participate in training programs related to sustainable development, organized by the university administration.	2.76	0.96	H	2.6	0.93	H
4	University administrators ensure that the training and workshops offered align with global sustainable development goals (SDGs) to enhance lecturers' performance.	3.14	0.7	H	3	0.91	H
5	The workshops organized by university administrators provide practical strategies for lecturers to address sustainability challenges in their academic fields	2.5	0.8	H	2.52	0.62	H

6	University-sponsored training programmes have significantly improved lecturers' awareness and understanding of sustainable development issues.	2.67	0.7	H	2.67	0.7	H
Grand Mean		2.87	0.89	H	2.69	0.91	H

Table 2 above for research question 1, shows that respondents' remarks indicate "H" (high extent), suggesting that, in general, respondents agree with the statements, though the extent of agreement varies across items and between federal and state universities. The analysis indicates that lecturers in both federal (2.87 and 0.89) and state universities (2.69 and 0.91) generally perceive organising training and workshops in enhancing lecturers' performance to a high extent. However, there are differences in the degree of agreement, with federal university lecturers showing slightly higher mean scores on several items. The standard deviation values suggest moderate variability in responses, indicating a diversity of opinions among lecturers.

Research Question 2: To what extent do university administrators promote research opportunities in enhancing lecturers' performance towards sustainable development in public universities in Bayelsa State?

Table 3: Summary Of Mean Scores On The Extent University Administrators Promote Research Opportunities In Enhancing Lecturers' Performance Towards Sustainable Development In Public Universities

S/N	Statements	Federal(N=46)			State universities (N=120)		
		\bar{X}	SD	Remark	\bar{X}	SD	Remark
7	University administrators actively encourage lecturers to engage in sustainability-related research projects.	3.14	0.96	H	3.09	0.89	H
8	Adequate funding is provided by university administrators to support research focused on sustainable development.	3.09	1.12	H	2.54	1.12	H
9	University administrators create opportunities for interdisciplinary research collaborations aimed at addressing sustainable development challenges.	2.76	0.96	H	2.6	0.93	H
10	The university offers regular grants and research incentives	2.12	0.7	L	2.34	0.91	L

	that promote innovation and sustainability-focused research.							
11	University administrators provide necessary infrastructure (e.g., laboratories, research facilities) that supports lecturers' research on sustainability.	2.5	0.8	H	2.52	0.62	H	
12	There is institutional support from university administrators for lecturers seeking external grants for research on sustainable development topics.	2.32	0.75	H	2.45	0.7	H	
	Grand Mean	2.65	0.87	H	2.59	0.86	H	

Table 3 above for research question 2, shows that in most cases, respondents' remarks indicate "H" (high extent), suggesting that respondents generally agree with the statements. For item 10, the remark "L" (disagree) indicates that respondents do not agree that university offers regular grants and research incentives that promote innovation and sustainability-focused research. The analysis indicates that both federal (2.65 and 0.87) and state universities (2.59 and 0.86) respondents generally to a high extent that university extent university administrators promote research opportunities in enhancing lecturers' performance towards sustainable development in public universities. The standard deviation values suggest moderate variability in responses, indicating a diversity of opinions among administrators.

Hypotheses

H₀₁: There is no significant difference in the mean scores of federal and state universities on the extent university administrators organize training and workshops in enhancing lecturers' performance towards sustainable development in public universities in Bayelsa State.

Table 4: Z-Test On The Mean Scores Of Federal And State Universities On The Extent University Administrators Organize Training And Workshops In Enhancing Lecturers' Performance Towards Sustainable Development In Public Universities In Bayelsa State

Respondents	\bar{X}	SD	N	DF	Z-cal	Z-	Decision
Federal University	2.87	0.89	46	164	0.38	1.96	Not Significant
State Universities	2.69	0.91	120				

Table 4 presents the results of a Z-test comparing the mean scores of federal and state universities regarding the extent to which university administrators organize training and workshops to enhance lecturers' performance towards sustainable development in public universities in Bayelsa State. The mean score (\bar{X}) for respondents from federal universities is 2.87, with a standard deviation (SD) of 0.89 and a sample size (N) of 46. For state universities, the mean score is 2.69, with a standard deviation of 0.91 and a sample size of 120. The degree of freedom (DF) is 164. The calculated Z-value (Z-cal) is 0.38, which is less than the critical Z-value (Z-critical) of 1.96 at a 0.05 significance level. Since the Z-calculated value falls below the critical value, the decision is that the result is not significant. This implies that there is no statistically significant difference between federal and state universities in terms of how administrators organize training and workshops to enhance lecturers' performance towards sustainable development. Both types of institutions appear to have similar levels of administrative efforts in organizing these developmental activities for lecturers.

H₀₂: There is no significant difference in the mean scores of federal and state universities on the extent university administrators promote research opportunities in enhancing lecturers' performance towards sustainable development in public universities in Bayelsa State.

Table 5: Z-Test on The Mean Scores Of Federal And State Universities On The Extent University Administrators Promote Research Opportunities In Enhancing Lecturers' Performance Towards Sustainable Development In Public Universities In Bayelsa State.

Respondents	\bar{X}	SD	N	DF	Z-cal	Z-	Decision
Federal University	2.65	0.87	46	146	0.60	1.96	Not Significant
State Universities	2.59	0.86	120				

In analyzing the data presented in Table 5, we see the calculated mean scores (\bar{X}) for federal universities at 2.65 and for state universities at 2.59. The standard deviations (SD) indicate a slight variability in responses, with federal universities having an SD of 0.87 and state universities an SD of 0.86. The sample sizes (N) are 46 for federal universities and 120 for state universities, resulting in a total of 146 respondents. The degrees of freedom (DF) are consistent with this total. The calculated Z-value (Z-cal) is 0.60, which is compared against the critical Z-value of 1.96 at a significance level of 0.05. Since the Z-cal value (0.60) is less than the critical value (1.96), the decision is to not reject the null hypothesis. This outcome suggests that there is no statistically significant difference between the perceptions of university administrators' promotion of research opportunities in federal and state universities, indicating that both types

of institutions may be perceived similarly in their efforts to enhance lecturers' performance towards sustainable development. This finding could imply that despite differences in governance and funding, both federal and state universities in Bayelsa State are equally committed or lack commitment to fostering research opportunities that support sustainable development.

Discussion of Findings

The findings from Table 2 suggest that lecturers from both federal (mean = 2.87, SD = 0.89) and state universities (mean = 2.69, SD = 0.91) generally perceive the organization of training and workshops positively. However, the Z-calculated value (0.60) being less than the critical value (1.96) indicates that there is no statistically significant difference in perceptions regarding the organization of training and workshops in these institutions. This implies that both federal and state universities are similarly effective in promoting these professional development activities, supporting the conclusion that their administrative efforts towards enhancing lecturers' performance for sustainable development are comparable.

While Adegbesan (2015) emphasizes the importance of professional development in educational management and its positive impact on performance, the lack of a significant difference in perceptions between federal and state universities aligns with these findings. Similarly, Adeyemi and Uko-Aviomoh (2016) highlight the role of well-organized training programs in fostering professional growth, which appears to be consistently valued across both types of institutions. Ajayi and Ekundayo (2010) discuss how development initiatives influence job satisfaction and performance, reinforcing the idea that training and workshops in both federal and state universities contribute similarly to these outcomes. The moderate variability in responses (SD values) indicates that while lecturers generally agree on the positive influence of these activities, individual experiences may vary.

Regarding resource allocation (Table 3), lecturers from federal (mean = 2.65, SD = 0.87) and state universities (mean = 2.59, SD = 0.86) also share similar perceptions, with no significant difference between the two groups. The Z-calculated value below the critical value suggests that both institutions have similar resource allocation strategies aimed at enhancing lecturers' performance towards sustainable development. Despite Adeyemo's (2017) identification of barriers to effective teaching and research, including inadequate resource allocation, both federal and state universities appear to face comparable challenges in providing adequate

research grants and resources. This reflects similar perceptions across the institutions, as noted by Aina (2017), who stresses the critical role of resources in improving academic output. Moreover, the alignment of perceptions in federal and state universities supports Trencher et al. (2014), who discuss the co-creation of sustainability practices in higher education.

In conclusion, the findings suggested that both federal and state universities in Bayelsa State demonstrate similar commitments—or lack thereof—to organizing developmental activities and promoting research opportunities aimed at sustainable development, despite differences in governance and funding structures.

Conclusion

The study concluded that both federal and state universities in Bayelsa State demonstrate comparable levels of commitment or lack thereof towards fostering sustainable development through the promotion of research opportunities and the organization of professional development activities for lecturers.

Recommendations

Based on the findings of the study and conclusion made, the following recommendations were put forward by the researcher that:

1. Universities strengthen their efforts by introducing more tailored and innovative training programs. These programs should focus on sustainable development practices and address specific challenges faced by lecturers to further improve their performance.
2. Universities should actively seek to enhance access to research grants and resources. University administrators should implement strategies to address gaps in research funding, ensuring that lecturers are adequately supported in contributing to sustainable development through impactful research.

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Virtual Learning Environment: Redefining Higher Educational Delivery for Efficiency and Accessibility

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Abstract

The pivotal role of virtual learning environments in enhancing efficiency and accessibility within educational systems is phenomenal. By leveraging digital platforms, virtual learning environments facilitate flexible, personalized learning experiences that transcend traditional classroom constraints. This paper examines the concept of virtual learning environments, types of virtual learning environments, educational delivery, the importance of educational delivery, the redefinition of educational delivery through virtual learning environments, and the role of educators in utilizing virtual learning environments in educational delivery. Virtual learning environments significantly enhance student engagement, learning flexibility, and access to diverse educational resources. Virtual platforms provide opportunities for interactive and collaborative learning, promoting better student outcomes. While virtual learning environments offer immense potential for improving educational delivery, their success depends on the availability of reliable technological infrastructure, effective educator training, and the development of engaging learning materials. Addressing these challenges is crucial for maximizing the benefits of virtual learning environments. It was recommended among others that educational institutions should prioritize investments in robust digital infrastructure and cutting-edge technology to support virtual learning environments.

Keywords: Virtual Learning, Environment, Educational Delivery, Efficiency, Accessibility

Introduction

In the realm of contemporary education, Virtual Learning Environments (VLEs) stand at the forefront of transformative innovations, fundamentally reshaping how knowledge is imparted and acquired in higher education. VLEs encompass a broad spectrum of digital platforms and tools that revolutionize traditional educational paradigms by offering dynamic, interactive, and flexible learning experiences online (Boelens, Voet & De Wever 2017)). These platforms enable students and educators to interact in virtual spaces, eliminating geographical barriers and ensuring that education is accessible to a broader audience, particularly in times of crisis such as the COVID-19 pandemic (Dhawan, 2020). At their core, VLEs are sophisticated systems designed to facilitate the creation, management, and delivery of educational content over the internet. They integrate various technologies such as learning management systems

(LMS), multimedia resources, virtual classrooms, and collaborative tools, providing educators and learners with unprecedented opportunities for engagement and interaction (Bond, Marin, Dolch, Bedenlier & Zawacki-Richter 2020).

The evolution of VLEs has been driven by the imperative to enhance educational efficiency and accessibility. Efficiency is realized through streamlined administrative processes, automated grading systems, and the seamless integration of multimedia content, which collectively optimize teaching workflows and reduce logistical overheads (Means, Bakia & Murphy 2020). For example, many modern VLEs allow for the use of AI-driven tools that personalize learning experiences, track student progress in real-time, and automate administrative tasks, further freeing up educators to focus on instructional quality. Furthermore, VLEs transcend geographical boundaries, offering learners the flexibility to participate in courses from anywhere with internet connectivity. This accessibility is particularly transformative for non-traditional students, adult learners, and those with physical disabilities who may face barriers in accessing traditional educational settings.

Additionally, the rise of VLEs has had a significant impact on redefining educational delivery to meet the evolving needs of learners and educators in the digital age. Educational delivery, at its core, involves the dissemination of knowledge and skills through various instructional methods. It is the mechanism by which educational goals are achieved, incorporating different strategies to cater to diverse learning needs. According to Garrison and Vaughan (2013), educational delivery can be classified into several types: traditional delivery, blended learning, online learning, and hybrid learning. Each of these models represents a spectrum of face-to-face and digital integration that allows institutions to customize their delivery to suit the needs of learners.

As technology continues to advance and educational needs evolve, the methods of delivering education will continue to adapt, offering new opportunities and challenges. The rise of digital technologies such as artificial intelligence, augmented reality, and data analytics has revolutionized educational delivery, making it more accessible, adaptable, and efficient (Rapanta Botturi, Goodyear, Guardia & Koole 2020). For instance, the proliferation of VLEs has enabled educators to create more engaging and personalized learning experiences, where students can learn at their own pace and receive immediate feedback on their performance (Bond et al., 2020). Redefining educational delivery to enhance both efficiency and

accessibility is crucial, involving the leveraging of new technologies, adopting innovative teaching strategies, and rethinking traditional models of education. VLEs offer innovative solutions to improve efficiency and accessibility in educational delivery. They integrate various elements such as course materials, communication tools, assessment methods, and tracking systems, creating a comprehensive digital learning space. By leveraging VLEs, educational institutions can address diverse learning needs, enhance engagement, and promote inclusive education. Furthermore, these environments allow for the implementation of adaptive learning technologies that tailor educational content to the specific needs of each student, ensuring that no learner is left behind, regardless of their learning style or pace.

Concept of Virtual Learning Environment

One of the pivotal innovations in this era is the virtual learning environment, a dynamic platform that facilitates the delivery and management of educational content and interactions online. Virtual learning environments have become integral to modern education systems, enabling institutions to extend their reach, enhance student engagement, and optimize administrative processes. A virtual learning environment can be defined as a web-based platform designed to provide educators, students, and administrative personnel with a cohesive framework for delivering, managing, and interacting with educational content (Dillenbourg, Schneider, & Synteta, 2020). Becta (2020) considers it as a system that creates an environment designed to facilitate teachers in the management of educational courses for their students, particularly by helping teachers and learners with course administration. It typically includes functions for content delivery, student tracking, and collaboration. Cavus (2021) views virtual learning environments as a set of teaching and learning tools designed to enhance a student's learning experience by including computers and the internet in the learning process. It can provide various resources like course materials, assignments, and examinations, as well as communication tools.

According to Dillenbourg et al. (2020), a virtual learning environment integrates a range of tools and functionalities, including course content management, communication tools, assessment modules, and collaborative learning features, to create an immersive and interactive educational experience. These platforms are designed to support synchronous and asynchronous learning activities, catering to diverse educational needs and preferences. The significance of virtual learning environments in contemporary education cannot be overstated. They offer numerous benefits, such as flexibility in learning schedules, accessibility to a vast

array of resources, and the ability to track and analyze student progress in real-time (Salinas, 2021). As institutions worldwide continue to embrace digital transformation, the implementation of virtual learning environments is poised to play a critical role in shaping the future of education, making it more inclusive, efficient, and adaptable to the evolving demands of the 21st-century learner (Cavus, 2021).

Types of Virtual Learning Environments

Virtual learning environments come in various forms, each tailored to specific educational needs and contexts. Identifying the different types of virtual learning environments can help educators and institutions to choose the most suitable platform to enhance teaching and learning experiences. Siemens (2013). identify some common types of virtual learning environments.

1. Learning Management Systems: Learning Management Systems (LMS) are the most widely used type of VLE. They are comprehensive platforms designed to facilitate the delivery, management, and tracking of educational content. They serve as the backbone of modern educational technology, providing educators and learners with a structured and efficient environment for teaching and learning. They provide a centralized platform for delivering and managing educational content, tracking student progress, and facilitating communication between instructors and learners. Examples of popular LMS platforms include Moodle, Blackboard, and Canvas.

2. Course Management Systems: Course Management Systems (CMS) are specialized platforms designed to facilitate the delivery and management of course content in educational settings. While they share some similarities with Learning Management Systems (LMS), CMS typically focus more on the organization and dissemination of course materials rather than broader administrative functions. They provide tools for creating and organizing course materials, but may lack some of the broader features of an LMS, such as advanced analytics and extensive communication tools. Course Management Systems (CMS) play a crucial role in modern education by providing features such as content organization, syllabus management, assignment distribution, gradebook management, and basic communication tools, CMS platforms enhance the teaching and learning experience.

3. Personal Learning Environments: Personal Learning Environments (PLE) represents a learner-centered approach to education, emphasizing the individual's control over their own

learning process. Unlike traditional educational systems, which are often structured and institutionally controlled, PLEs enable learners to integrate a variety of tools, resources, and services tailored to their personal learning goals and preferences. It prioritizes learner autonomy, customization, and continuous learning. By integrating diverse tools and resources, PLEs support personalized and engaging learning experiences that cater to individual needs and preferences.

4. Massive Open Online Courses: Massive open online courses (MOOCs) are online courses designed for large-scale participation and open access via the internet. They are intended to provide educational opportunities to a wide audience, regardless of geographical location, background, or prior qualifications. MOOCs cover a diverse range of subjects and are typically offered by universities, colleges, and organizations. They provide access to course materials, lectures, and forums, often at no cost. Platforms like Coursera, edX, and Udacity offer MOOCs on a wide range of subjects, making education accessible to a global audience.

5. Virtual Classrooms: A virtual classroom is an online learning environment that enables real-time interaction between instructors and students. Virtual classrooms are integral components of modern e-learning systems, providing tools and features that enhance engagement, collaboration, and accessibility. They offer real-time interaction between instructors and students through video conferencing, live chats, and collaborative tools. Platforms like Zoom, Google Classroom, and Microsoft Teams are commonly used for virtual classroom settings.

6. Collaborative Learning Environments: Collaborative learning environments (CLEs) are educational settings, both physical and digital, where students work together to achieve common academic goals. By promoting active participation and mutual support, CLEs aim to deepen understanding and develop essential skills such as communication, problem-solving, and teamwork. They provide tools for group projects, discussions, and peer feedback. Examples include Google Workspace for Education and Microsoft Office 365 Education.

Educational Delivery

Educational delivery is the systematic approach to planning, implementing, and evaluating the instructional methods and technologies used to provide education to learners. It includes traditional face-to-face instruction, online and blended learning, experiential learning, and other innovative teaching practices that enhance student engagement and achievement (Garrison & Vaughan 2020). Educational delivery in a traditional classroom setting involves face-to-face

interaction between teachers and students. This method includes lectures, discussions, hands-on activities, and assessments conducted within a physical classroom environment.

According to Salas (2020) in recent years, educational delivery has undergone significant transformations due to advancements in technology, shifts in educational paradigms, and the growing need for flexible and inclusive learning environments ranging from traditional classroom instruction to innovative digital platforms. Educational delivery is critical in shaping the learning experience and achieving educational objectives. By understanding and implementing diverse instructional strategies, educators can create dynamic and inclusive learning environments that cater to the needs of all students.

Importance of Educational Delivery

Educational delivery is central to the learning process, shaping how content is conveyed and how students engage with and absorb information. Effective educational delivery methods are critical for achieving educational goals and fostering an environment where all learners can thrive. The importance of educational delivery can be highlighted through several key aspects as discussed by Tomlinson (2014):

1. Enhances student engagement

Effective educational delivery methods significantly enhance student engagement by making learning interactive and stimulating. Engaged students are more likely to participate actively, retain information, and develop a deeper understanding of the subject matter. Interactive elements such as discussions, multimedia presentations, and collaborative activities can make lessons more dynamic and interesting.

2. Promotes accessibility and inclusivity

Educational delivery methods that leverage technology, such as online learning platforms, can significantly increase accessibility for students with varying needs and circumstances. This includes learners who are geographically isolated, those with disabilities, and adult learners balancing education with other responsibilities. For instance, online and blended learning models allow students to access materials and participate in classes from anywhere, making education more inclusive and flexible.

3. Facilitates personalized learning

Personalized learning is enhanced by effective educational delivery methods that cater to individual learning styles and needs. Adaptive learning technologies and differentiated instruction strategies allow educators to tailor content and approaches to each student's

strengths and areas for improvement. This individualized attention helps students progress at their own pace and fosters better learning outcomes.

4. Improves efficiency in teaching and learning

Efficient educational delivery methods streamline administrative tasks and optimize teaching processes. Efficient delivery systems also enable faster feedback and more effective communication between educators and students.

5. Supports lifelong learning

Educational delivery methods that incorporate flexible and innovative approaches support lifelong learning by allowing individuals to continue their education throughout their lives. Online courses, professional development programs, and self-paced learning modules offer opportunities for ongoing skill development and knowledge acquisition, which are essential in a rapidly changing world.

Redefine Educational Delivery through Virtual Learning Environments

Redefining educational delivery through virtual learning environments involves leveraging digital tools and strategies to enhance the effectiveness, efficiency, and accessibility of education. By integrating VLEs, educational institutions can transform traditional learning paradigms and create more dynamic, flexible, and inclusive learning experiences. Through virtual learning environment, educational delivery can be redefined in the following ways:

- **Centralized and Streamlined Course Management**

Centralized and streamlined course management refers to the consolidation and organization of all course-related activities, materials, and communications into a single, cohesive platform. This approach simplifies the administrative processes for educators and enhances the learning experience for students. Lee & Lee (2021) note that a centralized and streamlined course management involves a:

Unified platform: A centralized course management system (often part of a Virtual Learning Environment or Learning Management System) provides a single access point for all course-related activities. This includes posting and accessing syllabi, lecture notes, reading materials, assignments, and grades.

Resource organization: All educational resources are organized in a structured manner, making it easy for students to find and utilize materials. This can include categorizing resources by week, topic, or module.

Consistent communication: Centralized platforms offer various communication tools such as discussion boards, announcements, and messaging systems, ensuring consistent and clear communication between educators and students.

Assignment management: The system allows educators to create, distribute, collect, and grade assignments all in one place. This helps in keeping track of submissions and providing timely feedback.

Assessment and grading: Centralized systems streamline the process of creating and administering quizzes, tests, and exams. Automated grading features can provide immediate feedback to students, while grade books help educators manage and track student performance.

- **Automation of Administrative Tasks**

Automation within VLEs can handle routine administrative tasks such as grading, attendance tracking, and assignment submissions. Automated grading systems provide immediate feedback to students, enhancing their learning process by allowing them to quickly understand and correct mistakes. This reduces the administrative burden on educators and allows them to focus more on teaching and personalized student support. Watt, McKillop & Nunn (2020) acknowledge that automation of administrative tasks involves:

Automated grading: One of the most significant benefits of VLEs is the ability to automate grading for quizzes, tests, and assignments. Automated grading systems provide immediate feedback to students, helping them understand their mistakes and learn from them promptly. This also saves educators considerable time, allowing them to focus on more complex assessments and personalized feedback.

Attendance tracking: VLEs can automatically track student attendance and participation in online activities such as lectures, discussions, and assignments. This automation ensures accurate record-keeping and reduces the time educators spend on manually tracking attendance.

Assignment submission and management: Automated systems streamline the submission and management of assignments. Students can submit their work online, and educators can easily organize, review, and grade submissions. These systems often include plagiarism detection tools, which help maintain academic integrity.

Communication and notifications: VLEs can automate communication tasks, such as sending reminders for upcoming deadlines, announcements, and feedback. Automated notifications ensure that students stay informed and engaged without requiring constant manual effort from educators.

Course scheduling and management: Automation tools within VLEs assist in scheduling classes, exams, and other activities. They can manage course calendars, synchronize with institutional schedules, and adjust for changes automatically, ensuring that all stakeholders are kept up-to-date.

Reporting and analytics: VLEs can generate detailed reports on student performance, engagement, and progress automatically. These analytics provide educators with insights into student learning patterns, helping them identify areas where students may need additional support (Siemens & Long, 2011).

- **Personalized Learning Experiences**

VLEs offer personalized learning paths through adaptive learning technologies that adjust content and assessments based on individual student performance. This personalization ensures that each student receives instruction tailored to their unique needs, promoting better engagement and understanding. Analytics within VLEs can track student progress and identify areas where additional support is needed, enabling educators to provide targeted interventions. Johnson Adams, Estrada & Freeman, 2022) emphasize the prominent aspects of personalized learning experiences through:

Adaptive learning technologies: These technologies use algorithms to adjust the difficulty and type of content presented to students based on their performance. For instance, if a student struggles with a particular concept, the system can provide additional resources and practice opportunities until the student achieves mastery.

Customizable learning paths: VLEs can offer customizable learning paths that allow students to choose the sequence in which they engage with the course material. This flexibility accommodates different learning styles and paces, enabling students to focus on areas where they need the most improvement.

Individual learning plans: Educators can create individual learning plans for students based on their strengths, weaknesses, interests, and goals. These plans can be regularly updated and adjusted as students progress through the course, ensuring that each student's learning experience is tailored to their needs.

Data-driven insights: VLEs collect and analyze data on student performance, engagement, and progress. Educators can use these insights to identify learning patterns, track student development, and provide targeted support and interventions.

- **Enhanced Communication and Collaboration**

Effective communication and collaboration are vital for successful learning. VLEs facilitate this through tools like discussion forums, instant messaging, video conferencing, and collaborative document editing. These tools enable real-time and asynchronous interactions, supporting diverse learning styles and schedules. Enhanced communication tools also foster a sense of community and peer-to-peer learning, which can improve overall student engagement and success. Garrison, Anderson & Archer (2010) describe the following aspects of enhanced communication and collaboration.

Discussion forums and boards: VLEs often include discussion forums where students can post questions, share insights, and engage in academic conversations. These forums foster peer-to-peer interaction and allow students to benefit from diverse perspectives. Educators can also use these forums to facilitate discussions, clarify concepts, and encourage critical thinking (Garrison et al., 2010).

Instant messaging and chat: Real-time messaging tools within VLEs enable quick and effective communication between students and educators. Instant messaging allows for immediate feedback and support, helping to resolve issues and answer questions promptly. Group chat features can also support collaborative projects and team discussions.

Video conferencing: Video conferencing tools integrated into VLEs enable live virtual classes, meetings, and office hours. This synchronous communication allows students and educators to interact face-to-face despite geographical distances, fostering a more personal and interactive learning experience. Video conferencing can also be used for group projects, presentations, and collaborative workshops.

Collaborative document editing: VLEs often include tools for collaborative document editing, such as shared Google Docs or integrated word processors. These tools allow multiple users to work on the same document simultaneously, facilitating group work and collaborative learning. Students can co-create content, provide feedback, and make revisions in real time (McLaughlin & Gonzales, 2014).

Shared calendars and scheduling: Shared calendars within VLEs help coordinate schedules for group activities, deadlines, and meetings. This feature ensures that all members of a group or class are aware of important dates and can plan their activities accordingly. It also reduces scheduling conflicts and improves overall organization (Baker, 2013).

- **Data-Driven Decision Making**

Data-driven decision making (DDDM) in education involves using data to guide and enhance decision-making processes related to teaching, learning, and institutional management. In the context of Virtual Learning Environments (VLEs), DDDM leverages data collected from various interactions and activities to improve educational outcomes, streamline administrative processes, and support strategic planning. Mandinach & Gummer (2013) explore how data-driven decision-making functions in VLEs:

Data collection: VLEs gather extensive data on student interactions, performance, and engagement. This data can include participation rates, quiz scores, assignment submissions, forum activity, and attendance records. The breadth of data collected provides a comprehensive view of both individual student progress and overall class dynamics.

Analytics tools: Advanced analytics tools within VLEs process and analyze the collected data to generate actionable insights. These tools can identify patterns, trends, and anomalies in student performance and engagement, providing educators with valuable information to guide their instructional strategies (Ferguson, 2012).

Performance dashboards: Dashboards in VLEs display real-time data and key performance indicators (KPIs) in an accessible format. Educators and administrators can use these dashboards to monitor student progress, track attendance, and assess the effectiveness of instructional materials and methods.

Predictive analytics: Predictive analytics use historical data to forecast future trends and outcomes. In education, this can involve predicting student performance, identifying at-risk students, and assessing the potential impact of different instructional strategies. These forecasts help educators intervene proactively and tailor their approaches to meet student needs (Long & Siemens, 2011).

- **Diverse and Inclusive Assessment Methods**

Diverse and inclusive assessment methods in Virtual Learning Environments (VLEs) aim to accommodate the varied needs, backgrounds, and learning styles of all students. These methods ensure that assessments are fair, equitable, and capable of providing an accurate measure of student learning and progress. VLEs provide various assessment methods that cater to different learning styles and preferences. Online quizzes, interactive assignments, peer assessments, and project-based evaluations offer multiple ways for students to demonstrate their understanding and skills. Inclusive assessment practices ensure that all students have the opportunity to

succeed, regardless of their preferred learning style or abilities. Topping (2018) note that VLEs functions in the following aspects of diverse and inclusive assessment

Multiple assessment formats: VLEs can support various assessment formats, including quizzes, written assignments, projects, presentations, and discussions. This diversity allows students to demonstrate their knowledge and skills in different ways, catering to different strengths and learning styles (Bennett, Kane & Bridgeman 2019).

Formative and summative assessments: Formative assessments are conducted during the learning process to provide ongoing feedback and guide instruction, while summative assessments evaluate student learning at the end of an instructional period. Both types are essential for a comprehensive assessment strategy, helping to monitor progress and measure overall achievement (Black & Wiliam, 2010).

Inclusive assessment design: Inclusive assessments consider the diverse needs of students, including those with disabilities or language barriers. This involves providing accommodations such as extended time, alternative formats, and assistive technologies to ensure that all students can participate fully and fairly in assessments (Sewell, Fox & Enge 2019).

Authentic assessments: Authentic assessments require students to apply their knowledge and skills to real-world scenarios. This type of assessment is meaningful and relevant to students' lives and future careers, promoting deeper learning and engagement.

Redefining educational delivery through VLEs involves embracing digital tools and strategies to enhance the effectiveness, efficiency, and accessibility of education. By centralizing course management, automating administrative tasks, offering personalized learning experiences, facilitating communication and collaboration, leveraging data for decision-making, and providing flexible and inclusive learning opportunities, VLEs can transform traditional education paradigms. This transformation not only improves educational outcomes but also ensures that education is inclusive, equitable, and accessible to all learners.

Role of Educators in utilizing VLEs in Educational Delivery

Virtual Learning Environments (VLEs) are transforming educational delivery by providing innovative tools and resources for teaching and learning. The role of educators in effectively utilizing VLEs is critical to enhancing educational outcomes. Educators must integrate these technologies into their teaching practices and adapt their roles to meet the demands of a digital learning environment. Educators act as facilitators of online learning by guiding students through digital content and activities. They create and curate instructional materials that are

engaging and accessible, ensuring that learning objectives are met. This involves designing online courses, developing multimedia content, and setting up interactive elements such as quizzes and discussion forums (Anderson, 2008).

In VLEs, educators provide continuous support to students through various communication tools. They offer timely feedback on assignments, answer questions through instant messaging or discussion boards, and hold virtual office hours using video conferencing tools. This ongoing support is essential for maintaining student engagement and addressing any learning challenges promptly (Hrastinski, 2008). Educators use the analytics and tracking features of VLEs to monitor student progress. They can track attendance, participation, and performance data to identify students who may be struggling or excelling. This data-driven approach allows educators to tailor their instruction and provide targeted interventions to support student success (Siemens & Long, 2011). VLEs offer various tools for collaboration, such as group workspaces, shared documents, and collaborative projects. Educators play a vital role in encouraging and facilitating these collaborative activities. By designing group assignments and moderating online discussions, educators help students develop teamwork and communication skills (Garrison & Akyol, 2015).

Effective use of VLEs requires integrating technology with sound pedagogical practices. Educators must select appropriate technological tools that align with their instructional goals and enhance the learning experience. This involves understanding the capabilities of the VLE and how it can be used to support different teaching strategies, such as flipped classrooms, blended learning, and project-based learning (Kirkwood & Price, 2014).

Theoretical Framework

Theory of digital learning efficiency developed by Mitchell and Carter (2024) postulates that the integration of virtual learning environments within higher education drastically enhances the efficiency of educational delivery. This increased efficiency stems from the automation of administrative processes, optimization of instructional design, and streamlining of resource management, allowing for smoother operations and better allocation of institutional resources. The digital learning efficiency theory recognizes the power of virtual learning environments to replace traditional manual processes with automated systems. These systems take on routine tasks such as grading, assignment tracking, attendance, and content delivery. By reducing the administrative load on educators, virtual learning environments free up time for more interactive and personalized student engagement. As institutions scale up

their digital infrastructure, tasks that once required significant manpower and time—such as course registrations, feedback dissemination, or grading—are now completed in a fraction of the time. This not only enhances the speed and responsiveness of the education system but also cuts down operational costs.

Mitchell and Carter argue that virtual learning environments allow for the complete restructuring of educational workflows by digitally centralizing educational resources and enabling automation across the board. Efficiency is not only realized in how learning is delivered but also in how it is designed and evaluated. The landscape of educational administration, illustrating how efficiency can lead to improved student outcomes, cost reductions, and higher institutional effectiveness.

The core of this theory emphasizes how digital tools, when used effectively, can enhance both the delivery and reception of education by optimizing resource use and improving learning outcomes. In the context of a virtual learning environment, Mitchell and Carter's theory suggests that proper implementation of digital learning technologies can improve student engagement, access to materials, and the flexibility of learning schedules, thus fostering a more efficient educational experience. For higher education, this means shifting from traditional classroom models to a more dynamic, technology-driven approach, which allows students to learn at their own pace, irrespective of geographical barriers. The theory advocates for leveraging tools that promote real-time collaboration, personalized learning paths, and data analytics for tracking student progress, all of which are central to creating an effective (TTRO, 2024)

By integrating these principles into virtual learning environment, institutions can enhance both the quality and reach of their programs. The implications are particularly significant for developing countries, such as Nigeria, where improving access to higher education is a priority. Virtual environments, guided by the principles of digital learning efficiency, help address challenges of overcrowded classrooms, limited resources, and geographical constraints, making education more accessible to a larger audience. These concepts align with existing digital learning models, such as the SAMR and TPACK frameworks, which emphasize the need for thoughtful technology integration to transform educational delivery and outcomes effectively (Edvocate, 2024). By ensuring that digital tools are not merely a substitute for traditional methods but are used to innovate and enhance educational experiences, Mitchell and Carter's

theory advocates for a redefined approach to learning that prioritizes efficiency and accessibility in the virtual space.

Conclusion and Recommendations

As educational institutions strive to meet the diverse needs of their student populations, VLEs provide a flexible and scalable solution that supports various learning styles and paces. This shift towards digital learning platforms not only facilitates continuous learning but also addresses barriers related to geography, physical disabilities, and time constraints, thereby promoting inclusivity and equity in education. They enable educators to deliver content in innovative ways, engage students more effectively, and track progress with precision. The integration of VLEs into educational delivery systems has the potential to revolutionize how knowledge is imparted and absorbed, leading to improved learning outcomes and enhanced student experiences. Hence it was recommended that:

1. Educational institutions should prioritize investments in robust digital infrastructure and cutting-edge technology to support VLEs. This includes high-speed internet access, reliable hardware, and secures software platforms.
2. Continuous professional development is essential for educators to effectively utilize VLEs. Training programs should focus on integrating technology with pedagogy, developing digital literacy, and using data analytics to inform instructional strategies.
3. To maximize the potential of VLEs, educators should employ interactive and collaborative teaching methods. Incorporating multimedia elements, virtual labs, and group projects can enhance student engagement.
4. Institutions must implement robust data protection policies and educate students and staff about best practices for online safety. Regular audits and updates to security protocols can help mitigate risks and maintain trust.

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Artificial Intelligence Tools and Educational Management for Sustainable Development in Public Rivers State Owned Universities

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Abstract

The study examined the relationship between artificial intelligence tools and Educational Management for Sustainable Development in Rivers State Owned Universities. The study adopted a correlational research design. To direct the investigation, two research questions and two hypotheses were formulated to guide the study. The population of the study comprised all 384 level 400 students of Department of Educational Management, Rivers state university and Ignatius Ajuru University of Education. The sample size of 370 students were selected for the study through random sampling techniques. The Researchers developed instruments titled " Artificial Intelligence Questionnaires and Sustainable Development Questionnaires were used to gather data for the study. The reliability coefficient of the study was calculated using crombach's alpha reliability coefficient statistics and the overall reliability coefficient of 0.83 and 0.75 were obtained respectively. Data collected were analysed using pearsons' Product Moment Correlation (PPMC) Statistics. The result obtained showed that artificial intelligence relates with educational Management for sustainable development in Rivers state owned universities. The Researchers recommended that artificial intelligence should be considered as a tool for effective management for sustainable development.

Keywords: Artificial intelligence, Tools, Educational Management, Sustainable and development.

Introduction

In recent years, the meteoric rise of artificial intelligence (AI) has shockwaves through society on economic, political, social environmental, and cultural levels. Seemingly poised to become as ubiquitous as email, this rapidly evolving technology is transforming. many sectors and aspects of daily life including management of educational system. Bernard (2017), Educational management is a field which is concerned with the operation of educational institutions. According to Brown, Johnson, and white (2019) educational management is the process of planning, organizing, directing, and coordinating activities in a school system by Effectively utilizing human and material resources in order to achieve the school objectives.

Educational Management is the process of planning, organizing and directing activities in a school and effectively utilizing human and material resources in order to accomplish the school's objectives and it is one of the most gratifying career choices that can enable managers to work with a team to create curriculum, resources, technologies which will affect students at all levels of education and across the globe.

Williams (2018). Educational Management helps managers of education to develop education policy, conduct research and evaluate the development of education system so as to enrich and enhance education at all levels, therefore education plays a major role in the successful running of educational institutions and it is a crucial factor in determining the success of educational institutions, as it will help Managers be committed to addressing systematic inequalities and ensuring that all students have access to high quality education. They must also be eager to engage in critical self-reflection and work to develop inclusive and culturally sensitive learning environments. The educational Managers possess certain traits, personalities, behaviors, patterns, values and styles of leadership in the school system. Such as instructional leadership, participatory leadership, transformational leadership, servant leadership, ethical leadership, distributive leadership, and digital leadership.

Okoroma (2019) stated that educational Management encompasses several key elements, including decision making, planning, coordination, motivation, creating a shared vision, building relationships, as technologies continue to evolve, there is a growing interest in the use of artificial intelligence in education setting, which is, if further inculcated into educational leadership, has the potentiality to improve leadership, learning outcomes, and sustainable development. Artificial intelligence is a rapidly developing technological machine that can completely transform global sustainability initiative as a result of its capability to perform tasks that typically require human intelligence. It plays a crucial role in educational Management by streamlining administrative duties such as scheduling, record keeping, predictive analytics, grading, and also in teaching and learning by means of identifying areas for development and offering individualized support to instructors and students, which by extension will lead to sustainable development (Obadimeji and Oredein, 2020).

The first attempt to create machines that could think and learn like human beings were made in 1950s which is when artificial intelligence was first studied in line with rule-based systems, neural networks, machine learning and deep learning are few of the stages that artificial intelligence research has gone through. Russell and Norvig (2021) stated that recent advances in artificial intelligence have been fueled by the availability of large datasets, improved

computing, power, and sophisticated algorithms. Artificial intelligence can be classified into two main types. Narrow or weak artificial intelligence and general or strong artificial intelligence. Narrow or weak artificial intelligence is designed to perform specific tasks such as playing chess or detecting fraud and it operates within a limited domain. General or strong artificial intelligence on the other hand, is designed to perform any intellectual task that a human being can do, and it is not limited to a specific domain.

Ugwu and Ogunremi (2019) stated that sustainable development is a progressive growth in all aspects of nations building. It is a positive growth of people economically, politically, culturally technologically, educationally, socially interwoven and intermingled to form a whole. On this note, sustainable development relates to the principles of meeting human development goals while at the same time sustaining the ability of natural systems to provide benefits without sacrificing environmental, social, and cultural values and norms. Sustainable development can be seen as the experience of growth and change in both tangible and intangible aspects of social and cultural life including industrialization, material advancement, modernization, and increased opportunity for social members and better standard of living. Nwonkwo (2023) stated that Sustainable development connotes national development and it is an ongoing dynamic process by which individuals identifies themselves as a community and are collectively empowered to bringing about positive change in the three Sustainable development components, which are environment, society, and economy. He further added that it is the realization of human rights especially economic, cultural, and social which is aimed at ending poverty, inequality, suffering, and injustice. On the whole therefore, Sustainable national development can be viewed as a dynamic and progressive process that brings about positive change and advancement in all aspects of social, cultural, political, and economic life which enhances productivity. Ijah (2018), identify various tools of artificial intelligence that can assist educational management for Sustainable development like machine learning, predictive analytics, knowledge representation, and record keeping. Record keeping is a vital responsibility of the education managers because it is a core duty of education managers to update records and information in their day to day activities of the school system through artificial intelligence tools. Koko (2018) stated that School managers rely on record keeping to make effective decision about immediate issues and more comprehensive School policies that without school records there can be no accountability, effective job performance, attainment of educational goals and objectives, the quality of teachers' job performance, tasks accomplishment, measurable outcomes depend heavily on the school records. The education

manager who dwell on the traditional way of recording, makes job performance inefficient. Therefore, the acquisition of knowledge of artificial intelligence assists education managers to carrying out their functions in terms of filling, recording, and storing information for effective and efficient documentation of school records.

Machine learning as one of the indices of artificial intelligence that makes predictions about future outcomes using historical data combined with statistical modeling, and data mining techniques. According to Zulkifli (2023) machine learning is a subset of artificial intelligence that uses statistical techniques and data to extract algorithms and models for learning. He further stated that machine learning can access future outcomes based on historical data and ongoing trends that focuses on data science and how units within organization can collaborate to drive profitability. In this regard, the educational Managers can collaborate with experts in other disciplines such as computer engineering, sciences, and environmental science to foster sustainable development. machine learning predicts the outcome of behaviour of students in order to take better decisions for students' future academic achievement. Machine learning helps to calculate each student score for effective recording and documentation. Machine learning according to Milligans, (2023), is the use of mathematical and statistical techniques, including artificial intelligence to predict the value of teachers, students and others for effective assessment and appraisal. and helps to improve teachers and students' behaviours, retentions, lifetime values, and satisfaction based on their class interactions, preference, and feedback. Therefore, machine learning correlates with artificial intelligence because both are computer programme machine that have the capacity to use statistical analysis to identify patterns, behaviours and forecast future events for the attainment of educational sustainable development.

Machine learning is an application of artificial intelligence that enables systems to learn and improve from experience without being explicitly programmed that can access data and use it to learn for themselves. According to Sarvendra and Vijay (2023), machine learning is a tool that can change the experience educational managers, teachers, and students. It optimizes and personalizes the learning experience for students and helps educational administrators and teachers to grade students' continuous assessments and examinations accurately. Lee and Kin (2023) stated that artificial intelligence transforms education management by enabling individualized learning, intelligent, tutoring, data- driven, decision making, automation, stimulation, and ethical issues. In order hand, machine learning in education helps in the

analysis of students' performance, and determine the student's strength and weakness. Nwile and Edo, (2023) Stated that artificial intelligence and machine learning offers schools a bright future in school management software. On this note, artificial intelligence systems will become more accessible and sophisticated with each technological advance leading to personalized learning, predictive insight, and efficient and effective Administrative processes. Rashmi (2023), machine learning is used to automate grading, assignment, tests, and students' assessments. This will reduce education managers and teacher's workload and can personalized attention to larger student population, thereby improving learning outcomes and students expressing understanding through data visualization, and dynamic storytelling.

Knowledge representation is a field in artificial intelligence that allows Artificial intelligence programmes to answer questions intelligently. It refers to presenting educational information in a systematic way that computer system can understand and use it to generate and solve education problems. Alexander (2024) stated that knowledge representation is concerned with how knowledge can be presented symbolically and manipulated in an automated way by reasoning programmes. On this note knowledge representation provides a framework for representing, organizing, and manipulating knowledge that can be used to solve complex problems, make decisions, and learn from data and a fundamental concept in artificial intelligence that involves creating models and structures that will facilitate and promote management and learning activities. Loannis and Jim (2018) stated that knowledge representation is one of the most transformative components of artificial intelligence that help demonstrate human-like intelligence in machine learning. In the same vein, Rajeswari (2022) asserted that knowledge representation is a process used in education that generate deep learning, metacognition, and also help educational management to reason about how to capture and encode knowledge in a format that can be easily processed and utilized by students.

Statement of the Problem

Educational management is an issue for sustainable development especially in Rivers state owned universities as it plays a major role in the successful running of educational institutions. Educational management encompasses procedures used in managing educational institutions such as Tertiary, secondary, and primary institutions towards achieving stipulated goals and objectives. Despite the importance of educational Management, the aims of sustainable development have not been fully realized. The Researchers wonder what could be the reasons behind this lack of actualization of the objectives of sustainable development. Could it be lack of knowledge about sustainable development? Could lack of professional development

contribute to this poor education management? Again the Researchers have noted that not much efforts seems to have been made towards finding out whether the application of machine learning and knowledge representation could be responsible for the shortfall and if these indices are properly investigated can improve and enhance sustainable development in educational management.

Purpose of the Study

The purpose of the study was to examine the tools of artificial intelligence and educational management for sustainable development in Rivers state owned universities. The specific objectives are to:

1. examine the relationship between machine learning and educational management for sustainable development in Rivers State Owned Universities.
2. examine the relationship between knowledge representation and educational management for sustainable development in Rivers state owned universities.

Research Questions

The following research questions guided the study.

1. What is the relationship between machine learning and educational management for sustainable development in Rivers State owned universities?
2. What is the relationship between knowledge representation and educational management for sustainable development in Rivers state owned universities?

Hypotheses

The following null hypotheses were formulated to guide the study at 0.05 level of significance

1. There is no significant relationship between machine learning and educational management for sustainable development in Rivers state owned universities.
2. There is no significant relationship between knowledge representation and educational management for sustainable development in Rivers state owned universities.

Methodology

The study examined the relationship between artificial intelligence tools and educational management in Rivers state owned universities.

The study adopted correlational research design. To direct the investigation two research questions and two hypotheses were formulated to guide the study. The population of the study comprised all 184 students in department of educational Management, Rivers State University

and 200 students in department of educational Management, Ignatius Ajuru University of education, totalling 384 level 400 Students 2022/2023 academic session. The sample size of 370 which comprised 180 students in department of educational Management, Rivers state university and 190 students in department of educational Management, Ignatius Ajuru University of education. The proportionate sampling method and simple random sampling method were deployed. The Researchers employed questionnaires to elicit response from the students titled " Artificial Intelligence Tools Questionnaires (AITQ) and Sustainable development Questionnaire (SDQ) were used to gather data for the study. The reliability coefficient of the study was calculated using crombach's alpha reliability coefficient statistics of 0.83 and 0.75 were obtained respectively with the overall reliability index of 0.79. Data collected were analyzed using pearsons' product moment correlation (PPMC) statistics.

Results and Discussions

The following results were obtained from the study.

Research Question 1

What is the relationship between machine learning and educational management for sustainable development in Rivers state owned universities?

Table 1: Relationship between machine learning and educational management for sustainable development in Rivers state owned universities.

Variables.	ΣX	ΣX^2	Σxy	$r - \text{cal}$	$r - \text{crit}$	remarks
	ΣY	ΣY^2				
Machine learning	3817	62733	233167	0.77	0.139	strongly positive relation
Educational Mgt. for Sustainable development	14664	880440				

The result presented in table 1 shows that the correlation coefficient (r) is 0.77. this indicates that strong positive relationship exists between machine learning and educational management for sustainable development in Rivers state owned universities.

Research Questions 2

What is the relationship between knowledge representation and educational management for sustainable development in Rivers state owned universities?

Table 2 Relationship between knowledge representation and educational management for sustainable development in Rivers state owned universities.

Variables.	ΣX	ΣX^2	Σxy	r – cal	r – crit	remarks
	ΣY	ΣY^2				
Knowledge Rep.	4391	79196	261946	0.52	0.139	strongly positive relation
Educational Mgt. for Sustainable development	14664	880440				

The result presented in table 2, shows that the correlation coefficient (r) is 0.52. this indicates that strong positive relationship exists between knowledge representation and educational management for sustainable development in Rivers state owned universities.

Table 3: correlation analysis of the relationship between machine learning and educational management for sustainable development in Rivers state owned universities

Variables.	ΣX	ΣX^2	Σxy	r – cal	r – crit	remarks
	ΣY	ΣY^2				
Machine learning	3817	62733	233167	0.77	0.139	strongly positive relation
Educational Mgt. for Sustainable development	14664	880440				

N=370* significant $p < 0.5$; df368; critical r- value=0.139.

The result presented in 3, shows that calculated r-value of 0.77 is greater than the critical r-value of 0.139 at 368 degree of freedom and 0.05 alpha levels. Therefore, the null hypothesis which stated that there is no significant relationship between machine learning and educational management for sustainable development in Rivers state owned universities was rejected. Hence, there is a significant relationship between machine learning and educational management for sustainable development in Rivers state owned universities.

Table 4: Correlation of the relationship between knowledge representation and educational management for sustainable development in Rivers state owned universities

Variables.	ΣX	ΣX^2	Σxy	r – cal	r – crit	remarks
	ΣY	ΣY^2				
Knowledge Rep.	3817	62733	233164	0.52	0.139	strongly positive relation
Educational Mgt. for Sustainable development	14664	880440				

N=370* significant $p < 0.5$; df 368; critical r- value=0.139

The result presented in table 4, shows that calculated r-value of 0.52 is greater than the critical r-value of 0.139 at 368 degree of freedom and 0.05 alpha levels. Therefore, the null hypothesis which stated that there is no significant relationship between knowledge representation and educational management for sustainable development in Rivers state owned universities was rejected. Hence, there is a significant relationship between knowledge representation and educational management for sustainable development in Rivers state owned universities.

Discussion of Findings

The result presented in table 1, shows that a strong positive relationship exists between machine learning and educational management for sustainable development in Rivers state owned universities. The corresponding hypothesis in table 3 also shows that there is a significant relationship between machine learning and educational management for sustainable development in Rivers state owned universities. This is in agreement with the earlier study of Zulkifli (2023) who stated that the purpose of machine learning in educational Management is to predict the outcome of student's behaviour in order to take positive decisions for students future academic achievements and to calculate each student scores for effective recording, storing, and documentation.

In the same vein, Rashmi (2023) found out that machine learning helps to automate grading, texts, and students assignments and this makes it possible to bring experts from various disciplines such as computer science, engineering, business studies, and environmental studies to collaborate on artificial intelligence driven sustainable development programmes that will help to equip educators and students with the needed skills and knowledge to work with data including how to calculate, analyze, and visualize data in order to drive information for sustainable development helps educational Management to reason about how to capture and encode knowledge in a format that can be easily passed on students and utilized for students' academic achievements.

The result presented in table 2, shows that a strong positive relationship exists between knowledge representation and educational management for sustainable development in Rivers state owned universities. The corresponding hypothesis in table 4 also shows that there is a significant relationship between knowledge representation and educational management for sustainable development in Rivers state owned universities. This is in agreement with the study of Alexander (2023) who found out that knowledge representation helps educational Managers to symbolically manipulate artificial intelligence in order to personalize learning experience for students' academic achievement. In the same vein, Rajaswari (2022) found out that knowledge

representation helps educational Managers to reason about how to capture and encode knowledge in a format that will be easily processed and utilized for students' academic success.

Conclusion

Based on the findings of this study, the researchers concluded that there is a significant relationship between artificial intelligence and educational management. This is so, because it was revealed that artificial intelligence will assist educational managers through machine learning and knowledge representation for sustainable development in Rivers state owned universities.

Recommendations

Based on the findings of this study, the following recommendations were made by the researchers

1. Educational Management should use artificial intelligence tools to enhance Sustainable development in Rivers state owned universities
2. Government should provide enough artificial intelligence tools for state owned universities so as to enable educational Management to improve on their duties or functions in terms of analyzing and visualizing of data in order to drive Sustainable development.
3. Government should organize workshops and seminars for educational management on how to use machine learning and knowledge representation to capture and encode knowledge for Sustainable development.

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Influence of School-Community Relationships on Sustainable School Administration in Public Senior Secondary Schools in Abua/Odual Local Government Area, Rivers State

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Abstract

The study examined influence of school-community relationships on sustainable school administration in Public Senior Secondary Schools in Abua/Odual LGA, Rivers State. Three research questions and three hypotheses guided the study. The study adopted descriptive survey design. The total population was 2793 respondents consisting of 2,760 Parent Teachers Association (PTA) members and 33 principals from 11 public senior secondary schools in Abua/Odual Local Government Area of Rivers State. A sample size of 350 respondents comprising of 317 Parent Teachers Association and 33 principals was derived through Taro Yamane's formula and simple random sampling technique. The instrument was a self-developed questionnaire titled: Influence of School Community Relationships on Sustainable School Administration Questionnaire" which was face and content validated by experts in Measurement and Evaluation and Department of Educational Management, all in Rivers State University. Cronbach Alpha statistics was used for the reliability of the instrument which yielded reliability indexes of 0.72, 0.80 and 0.85 respectively. Mean and standard deviation were used to answer the research questions while z-test was used in testing the formulated null hypotheses at 0.05 level of significance. Findings of the study revealed that to a very high extent school modern, school alienative and cooperative relationships influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State. Based on the findings, it was recommended among others that School principals should create a more robust relationship with the community and the community should in return reciprocate in enhancing the relations.

Keywords: School-community Relationships, Modern Relationship, Alienative Relationship, Cooperative Relationship and Sustainable School Administration.

Introduction

The relationship between the school and the community is crucial in achieving a long-term success in the education sector. This relationship aids to provide support, increase partnership, improve communication, stimulate cordial relationship that helps to arrest most of the shortfalls that contribute to educational gaps. The relationship becomes a propeller because the school and the community are two inseparable entities with a symbiotic relationship

(Duru-Uremadu, 2017). School-community relationship helps both to build and maintain developmental strides centered on the core values of school. However, school community relations can only be achieved based on the level of cordial relationship that is in existence. Gital (2009), uphold that cordial relationship between the school and the community is a pre-requisite for achieving a meaningful educational objective in the community and the nation at large. The community will not ordinarily come to assist the school in one form or the other, if the school administrator does not maintain a friendly and respectful relationship with the community (Nath & Ememe, 2012). Principals as the leaders of the school has the responsibility to encourage the school personnel to be open to the host community and encourage their involvement in school activities (Mbua, 2003). Good relationships and regular interaction between the school leadership and the community are fundamental in guaranteeing an environment that is enabling for staff and learners (Ngwa, 2023). The manner to which school administrators interact with host communities can significantly whittle or accelerate sustainable school administration. In essence, school community relation has great potentials for removing mistrust and distance between people and schools by nurturing transparency of information and a culture of mutual respect and by jointly pursuing improvement of school by sharing vision, process, and results (Amopho, 2020). The term sustainable school administration is the management of schools in a manner that enhances its long-term viability, growth and stability. To promote and enhance good relationship between the school and the community, the principal must develop approaches that put into cognizance the long-term effect of harnessing quality education through community involvement. These approaches help schools to develop effective school community relations through resource mobilization, collaboration, participation, provision of support and mutual benefits. Which may be significant to create a supportive and dynamic atmosphere that enhances the quality of educational delivery that are in tandem with the wider sustainability objectives. School-community relationship is the way and manners schools and their host communities communicate with one another in order to get along with things. This relationship is indispensable for building, creating collaborating, supporting and promoting cordial relationship in the business of school. Although, engaging in collaborative and supportive relationship, Duru-Uremadu (2016) specified the following as the core rationale behind the act as to, (a) educate and mold the habits, interest, attitudes and feelings of a child, (b) transmit the social norms, culture, values and tradition from one generation to another so as to prevent cultural extinction, (c) prepare an individual for survival and functionality in the society by providing and equipping an individual with knowledge, skills, competencies and

capabilities and (d) champion social and technological change when necessary. However, this mission appears to be farfetched in Abua/Odual LGA, Rivers State, due to the fact that, most of the secondary schools' principals appears to be confronted with issues that appear not suitable for effective educational delivery. The issues range from infrastructural deficiencies, administrative instability, security issues, inadequate educational resources, teacher's shortage, social economic challenges to many others. Thereby tends to truncate the effectiveness of the school. Obi (2004) claimed that some community members go as far as encroaching or trespassing on the school land as well as imposing hostile laws that affects the its climate. In most, cases school facilities are vandalized. Making the situation more detrimental to the child development, and depict that such community members are showing indifference to their children's educational development (Okongu, 2002).

The study of Agi and Adiele (2009), outlined three types of school-community relationships to be; model, alienative and cooperative. The model school-community relationship is the type in which either the school or the community benefits from each other, whereby the party receiving support has nothing to offer in return. In this case, donor-recipient relations occur in which one party donates and the other receives without giving anything in return (Ibiam, 2015). The alienative school-community relationship is built on the ground that community has little or nothing to offer the school, however, it depends on government to provide education for her people. By this, the school restricts its activities to its traditional role of teaching and learning, which might be detrimental to the improvement of instructional provisions. As a result of this, the school and the community tend to overlook whatever assistance that can be rendered to each other (Duru-Uremadu, 2017). Consequent upon this Hascher and Hagenauer (2010) disclosed that this, action can directly lead students to emotionally withdrawal from school which is often accompanied by a physical withdrawal, both of which contribute to academic failure.

Whereas, the cooperative relations according to, Ibiam (2011) is based on the premises that a link exists between the school and the community and both parties have something to offer and benefit from each other. Generally, community has major concern and interest in what schools do and how they do it (Sadker, 2008). In cooperative relations, the community helps to strengthens school administration through resource sharing, constructive collaboration, provision of effective mechanisms and active participation in school related matters, with enthusiasm at addressing community and educational needs. However, Okosun, *et al* (2023) posited that rural communities may find it difficult to cooperate and maintain positive relationships with their schools, arising from high cost of living, high unemployment rates, to

low morale which may be possess detrimental effect on community involvement. Further stating that some of the rural residents cannot afford to offer their kids with educational resources at home and these kids at school face considerable obstacles due to poverty; as a result, most parents have poor morale and unfavourable views about helping out with education.

Statement of the Problem

Despite the acknowledged importance of school-community relationships in Nigeria, public secondary schools in in Abua/Odual L.G.A of Rivers State is increasingly facing challenges in fostering and sustaining effective relationship with their communities. The problem is compounded by factors such as decreasing parental involvement, community indifference towards school activities and limited collaboration between school administrators and community leaders. This phenomenon seems to have resulted inadequate resource mobilization, overstretched school facilities and a general decline in the quality of education leading to low school performance. This ugly scenario appears to have contributed to a rigorous course of achieving effective and functional educational. Based on this backdrop, the study examined the influence school-community relationships on sustainable school administration in public senior secondary schools Abua/Odual Local Government Area of Rivers State.

Aim and Objectives of the Study

The study examined the influence of school-community relationships on sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State. Specifically, the study sought to;

1. Ascertain the extent to which school model relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.
2. Examine the extent to which school alienative relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.
3. identify the extent to which school cooperative relationship influences sustainable school administration in public senior secondary schools in in Abua/Odual Local Government Area of Rivers State.

Research Questions

The following research questions guided the study:

1. To what extent does school model relationship influence sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State?
2. To what extent does school alienative relationship influence sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State?
3. To what extent does school cooperative relationship influence sustainable school administration of public senior secondary schools in Abua/Odual Local Government Area of Rivers State?

Hypothesis

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant difference between the mean ratings of PTA and principals on the extent to which school modern relationship influence sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.
2. There is no significant difference between the mean ratings of PTA and principals on the extent to which school alienative relationship influence sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.
3. There is no significant difference between the mean ratings of PTA and principals on the extent to which school cooperative relationship influence sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.

Methodology

The study adopted a descriptive survey design. The population of the study comprised 2,793 consisting of 2,760 Parent Teachers Association (PTA) members and 33 principals (including vice principal administration and academics) from 11 public senior secondary schools in Abua/Odual Local Government Area of Rivers State. A sample size of 350 respondents comprising of 317 Parent Teachers Association (PTA) and 33 principals was derived through Taro Yamane's formula and simple random sampling technique. The instrument for data collection was a self-structured questionnaire titled: "Influence of School-Community Relationships for Sustainable School Administration Questionnaire (ISCRSSAQ)" with 16 questionnaire items based on the research questions. The instrument was structured in line with the modified rating scale of Very High Extent (VHE)= 4points, High Extent (HE)=3 Points, Low Extent (LE)= 2 Points and Very Low Extent

(VLE)= 1 point respectively. The face and content validity were test run by experts in Measurement and Evaluation and the Department of Educational Management all in Rivers State University. Cronbach Alpha statistics was used to test the internal consistency of the instrument which yielded reliability indexes of 0.72, 0.80 and 0.85 respectively. The researchers and two trained research assistants distributed the copies of 350 questionnaires and retrieved within the period of one week. Mean and standard deviation were used to answer the research questions with a criterion mean of 2.50. Items between 3.00 and above were considered Very High Extent, 2.50 – 2.99 were considered High Extent, 1.50 – 2.49 were regarded as Low Extent while 0.50 – 1.49 were Very Low Extent. The null hypotheses were tested using z-test at 0.05 level of significance. Analyzed data therefore with calculated z-value greater than the z-critical value of ± 1.96 was rejected and below was accepted.

Results

Research Question 1: To what extent does school modern relationship influence sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State?

Table 1: Mean Ratings of P.T.A and Principals on the Extent School Model Relationship Influences Sustainable School Administration in Public Senior Secondary Schools in Abua/Odual Local Government Area of Rivers State.

S/N	Item	P.T.A			Principals		
		N=317			N=33		
		\bar{X} 1SD		Decision	\bar{X} 2SD		Decision
1	Developing a culture of mutual respect helps to foster healthy relationship	3.23	0.69	VHE	3.01	0.59	VHE
2	Allowing community members to have voice in parents' teacher's association forum increases their level of participation	2.85	0.65	HE	2.95	0.58	HE
3	Establishing channels that accelerates transparent communication increases access to community engagement	2.77	0.60	HE	2.94	0.62	HE

4	Developing a culture for enhancing teachers professional development helps teachers develop proficient skills	3.19	0.69	VHE	3.30	0.76	VHE
5	Foster avenues for problem solving increases the sense of resources sharing	3.00	0.60	VHE	3.11	0.65	VHE
Grand Mean/SD		3.01	0.65		3.06	0.64	

The result on Table 1 revealed that questionnaire items 1, 4 and 5 which had mean scores of 3.23, 3.19 and 3.00 with corresponding standard deviation 0.69, 0.69 and 0.60 for P.T.A and 3.01, 3.30 and 3.11 with corresponding standard deviation 0.59, 0.76 and 0.65 for principals were rated very high extent, while items 2 and 3 which had mean scores of 2.85 and 2.77 with corresponding standard deviation 0.65 and 0.60 for P.T.A and 2.95 and 2.94 with corresponding standard deviation 0.58 and 0.62 for principals were rated high extent. With grand mean scores of 3.01 and 3.06 which are above the criterion mean, this infers that to a very high extent school model relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.

Research Question 2: To what extent does school alienative relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State?

Table 2: Mean Ratings of P.T.A and Principals on the Extent School Alienative Relationship Influences Sustainable School Administration in Public Senior Secondary Schools in Abua/Odual Local Government Area of Rivers State.

		P.T.A			Principals		
		N=317			N=33		
S/N	Item	\bar{X}_1	SD	Decision	\bar{X}_2	SD	Decision
6	Lack of participation by parents in meeting the diverse needs of learners increases negative perception.	2.77	0.50	HE	2.90	0.72	HE

7	Inability to provide avenue for people to express their worries increases alienation.	2.69	0.52	HE	2.65	0.51	HE
8	Decreases parental involvement in decision-making processes affects the operations of the school.	3.13	0.77	VHE	3.09	0.76	HE
9	Difficulty in addressing issues during participation decreases support from parents	3.09	0.53	VHE	3.04	0.62	VHE
10	Not managing existing historical conflict reduces collaboration among parents	3.20	0.79	VHE	3.05	0.73	VHE
11	Alienation in school brings about resource constraint.	2.73	0.63	HE	2.96	0.69	HE
Grand Mean/SD		2.94	0.62		2.95	0.67	

The result on Table 2 revealed that questionnaire items 6, 7 and 11 which had mean scores of 2.77, 2.69 and 2.73 with corresponding standard deviation 0.50, 0.52 and 0.63 for P.T.A and 2.90, 2.65 and 2.96 with corresponding standard deviation 0.72, 0.51 and 0.69 for principals were rated high extent, while items 8, 9 and 10 which had mean scores of 3.13, 3.09 and 3.20 with corresponding standard deviation 0.77, 0.53 and 0.79 for P.T.A and 3.09, 3.04 and 3.05 with corresponding standard deviation 0.76, 0.62 and 0.73 for principals were rated very high extent. With grand mean scores of 2.94 and 2.95 which are above the criterion mean, implies that to a high extent school alienative relationship sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.

Research Question 3: To what extent does school cooperative relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State?

Table 3: Mean Ratings of P.T.A and Principals on the Extent School Cooperative Relationship Influences Sustainable School Administration IN Public Senior Secondary Schools in Abua/Odual Local Government Area of Rivers State.

S/N	Item	P.T.A	Principals	Decision
		N=317	N=33	

		$\bar{X1}$	SD	Decision	$\bar{X2}$	SD	
12	Promoting viable parent/teacher's association helps to increase student academic achievement	3.69	0.54	VHE	3.77	0.59	VHE
13	Community members making use of school buildings pave ways for school to receive from community	3.37	0.65	VHE	3.29	0.68	VHE
14	Developing collaborative ventures between school and community helps to mitigate future impeding obstacles	3.45	0.96	VHE	3.20	0.80	VHE
15	Integrating community-based values in schools increases participation	3.55	0.55	VHE	3.60	0.57	VHE
16	Developing school-community based connect programme helps to enhance community participation	3.56	0.56	VHE	3.59	0.53	VHE
Grand Mean/SD		3.52	0.65		3.49	0.63	

Data on Table 3 revealed that all questionnaire items 12, 13, 14, 15 and 16 which had mean scores of 3.69, 3.37, 3.45, 3.55 and 3.56 with corresponding standard deviation 0.54, 0.65, 0.96, 0.55 and 0.56 for P.T.A and 3.77, 3.29, 3.20, 3.60 and 3.59 with corresponding standard deviation 0.59, 0.68, 0.80, 0.57 and 0.53 for principals were rated very high extent. With grand mean scores of 3.52 and 3.49 which are above the criterion mean, infers that to a very high extent school cooperative relationship influence sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.

Hypotheses

Ho₁ There is no significant difference between the mean ratings of PTA and principals on the extent to which school modern relationship influence sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.

Table 4: z-test Analysis of Difference in the Mean Ratings of P.T.A and Principals on the Extent School Modern Relationship Influences Sustainable School Administration in Public Senior Secondary Schools in Abua/Odual Local Government Area of Rivers State.

Respondents	N	\bar{X}	SD	Df	SL	z-cal.	z-crit.	Decision
P.T.A	317	3.01	0.65					
				348	0.05	-0.42	± 1.96	Failed to Reject
								No Significant Difference
Principals	33	3.06	0.64					

Data on Table 4 above revealed z-test analysis of difference between the mean ratings of PTA and principals on the extent to which school modern relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State. At 0.05 level of significance and 348 degree of freedom, the z-calculated value of -0.42 was less than the z-critical value of ± 1.96 ; therefore, the null hypothesis was accepted which states that there is no significant difference between the mean ratings of PTA and principals on the extent to which school modern relationship influence sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.

H₀₂ There is no significant difference between the mean ratings of PTA and principals on the extent to which school alienative relationship influence sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.

Table 5: z-test Analysis of Difference in the Mean Ratings of P.T.A and Principals on the Extent School Alienative Relationship Influence Sustainable School Administration of Public Senior Secondary Schools in Abua/Odual Local Government Area of Rivers State.

Respondents	N	\bar{x}	SD	Df	SL	z-cal.	z-crit.	Decision
P.T.A	317	2.94	0.62					
				348	0.05	-0.08	± 1.96	Failed to Reject
								No Significant Difference
Principals	33	2.95	0.67					

Data on Table 5 above revealed z-test analysis of difference between the mean ratings of PTA and principals on the extent to which school alienative relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State. At 0.05 level of significance and 348 degree of freedom, the z-calculated value of -0.08 was less than the z-critical value of ± 1.96 ; therefore, the null hypothesis was accepted which states that there is no significant difference between the mean ratings of PTA and principals on the extent to which school alienative relationship influence sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.

H₀₃ There is no significant difference between the mean ratings of PTA and principals on the extent to which school cooperative relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.

Table 6: z-test Analysis of Difference in the Mean Ratings of P.T.A and Principals on the Extent School Cooperative Relationship Influences Sustainable School Administration in Public Senior Secondary Schools in Abua/Odual Local Government Area of Rivers State.

Respondents	N	\bar{x}	SD	Df	SL	z-cal.	z-crit.	Decision
P.T.A	317	3.52	0.65					

		348	0.05	0.25	± 1.96	Failed to Reject	
						No Difference	Significant
Principals	33	3.49	0.63				

Data on Table 6 above revealed z-test analysis of difference between the mean ratings of PTA and principals on the extent to which school cooperative relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State. At 0.05 level of significance and 348 degree of freedom, the z-calculated value of 0.25 was less than the z-critical value of ± 1.96 ; therefore, the null hypothesis was accepted which states that there is no significant difference between the mean ratings of PTA and principals on the extent to which school cooperative relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State.

Discussion of Findings

Findings on research question 1 on Table 1 revealed that to a very high extent school modern relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State with grand mean scores of 3.01 and 3.06. Hypothesis 1 on Table 4 revealed that there was no significant difference in the mean ratings of PTA and principals on the extent school modern relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State with z-calculated value of -0.42 which was less than the z-critical value of ± 1.96 . This finding is in agreement with Nath and Ememe (2012) who claimed that community will not ordinarily come to assist the school in one form or the other, if the school administrator does not maintain a friendly and respectful relationship with the community.

Findings on research question 2 on Table 2 showed that to a high extent school alienative relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State with grand mean scores of 2.94 and 2.95. Again, information on hypothesis 2 on Table 5 revealed that there was no significant difference in the mean ratings of PTA and principals on the extent school alternative

relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State with z-calculated value of -0.08 which was less than the z-critical value of ± 1.96 . This finding corroborates with Hascher and Hagenauer (2010) who disclosed that this, action can directly lead students to emotionally withdrawal from school which is often accompanied by a physical withdrawal, both of which contribute to academic failure.

Findings on research question 3 on Table 3 showed that to a very high extent school cooperative relationship influences sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State with grand mean scores of 3.52 and 3.49. Again, information on hypothesis 3 on Table 6 revealed that there was no significant difference in the mean ratings of PTA and principals on the extent school cooperative relationship influence sustainable school administration in public senior secondary schools in Abua/Odual Local Government Area of Rivers State with z-calculated value of 0.25 which was less than the z-critical value of ± 1.96 . This finding is in tandem with Okosun, *et al.* (2023) who asserted that rural communities may find it difficult to cooperate and maintain positive relationships with their schools due to issues such as high living expenses, high unemployment rates, and low morale that have a detrimental effect on community involvement in the construction of educational facilities

Conclusion

The study shows that school-community relationship with respect to model, alienative and cooperative relationships influences sustainable school administration to a very high extent. This implies that, school-community relationships will increase school and community participation, which is advantageous at promoting supportive school environment.

Recommendations

Based on the findings, the following recommendations were made;

1. School principals should create a more robust relationship with the community, and the community should as well reciprocate in reviving the relationship.
2. School principals should initiate favourable actions that are expedient at stimulating cordial relationship among host community elites. This can be done by creating avenues where they can be given a proper recognition.

3. School principals should always see the need to convey their needs to the host communities during participation and the host communities should not relent to share new ideologies to the school should there be changes.

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