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International Journal of Educational Management, Rivers State University.

Artificial Intelligence and Quality Service Delivery in Rivers State Owned Universities for Sustainable National Development

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Abstract

The study investigated artificial intelligence and quality service delivery in Rivers State owned universities for sustainable national development. Three purposes of the study were formulated, three research questions and three hypotheses guided the study. The correlational survey design was adopted. The population of the study was 82 teaching staff of the two Rivers State owned universities who also served as the respondents. Census sampling was used. The Artificial Intelligence and Quality Service Delivery Questionnaire (AIQSDQ) was used as the instrument for data collection. The reliability coefficient of the instrument was 0.78, 0.81 and 0.79 respectively. Data obtained were analyzed using mean and standard deviation to answer research questions whiles the Z – ration was used to test hypotheses at 0.05 level of significance. All the items on the instrument were accepted, meaning there is a significant relationship between artificial intelligence and service delivery. Thus, the recommendation of inculcating artificial intelligence in service delivery related activities was solicited.

Keywords: Artificial intelligence, Service delivery, Rivers State Universities, Sustainable development, Educational management.

Introduction

Given the issues surrounding quality service delivery in Educational Management which is mixed with a feeling of perfections and imperfections on the side of educational managers, there is need to apply the services of Artificial Intelligence as a trending paradigm globally.

The phrase "Artificial Intelligence" is a combination of two words namely: "Artificial and Intelligence ". Artificial intelligence also known as (AI) in education refers to the integration and application of Artificial Intelligence technologies to enhance teaching and learning processes. This includes a wide range of technologies and approaches that use machine learning, natural language processing, data analysis, and other Artificial Intelligence techniques to create more personalized, efficient, and effective educational experiences (Nwankwo, 2007).

Artificial intelligence (AI) has increasingly become a transformative force across various sectors, including education. The integration of Artificial Intelligence in educational management holds the promise of significantly enhancing the quality of service delivery, which

is crucial for sustainable national development. Artificial Intelligence technologies can streamline administrative processes, personalize learning experiences, and provide data-driven insights for decision-making, thereby improving efficiency and outcomes in educational institutions. In other words, the term Artificial Intelligence is commonly used to describe a range of different technologies in use today which involves the theory and development of computer systems capable of performing tasks that historically required human intelligence, such as recognizing speech, making decisions, and identifying patterns (Nwankwo, 2007).

The above position of Nwankwo seems to have a corresponding view with that of Unachukwu and Ebenebe, (2001) see quality service delivery in educational management as the effective and efficient provision of educational services that meet or exceed the expectations of stakeholders, including students, parents and teachers. This ensures that, the delivery of services enhances the learning experience and outcomes for all students. This in the well-informed opinion of the authors could not have been easily achieved without the effective use and application of artificial intelligence.

Consequently, Sly and Wawiyil (2019) identified sustainable national development in education as the process of enhancing the educational system of a country in a way that meets current educational needs without compromising the ability of future generations to meet their own needs. This concept is grounded in the broader framework of sustainable development, which balances economic growth, social inclusion and environmental protection. This is to create an educational system that not only supports individual growth and societal progress but also contributes to the long-term sustainability of the nation as a whole. Impliedly, educational management as a field that is concerned with the operation of educational organizations in the state is mainly associated with the process of planning, organizing and directing activities in a school, effectively utilizing human and material resources in order to accomplish the school's objectives.

Artificial Intelligence is a trending phenomenon globally, as a result, most countries are keying into this global phenomenon because of the perception that, its application into any sector of development enhances the achievement of desired goals. The promptness of this study was necessitated by the perception of countries that are keying into the exploits of artificial intelligence in the sense that, if artificial intelligence is introduced into the educational sector, it will help enhance quality service delivery in the sector.

Conceptual framework for a study of this nature is crucial in both artificial intelligence (AI) and educational management for several reasons, especially when aiming for sustainable

national development. By providing a structured approach, a conceptual framework ensures that, AI and educational management efforts are coherent, effective, and aligned with the broader goals of sustainable national development.

Artificial Intelligence

Ahmed (2019), opined that, artificial intelligence (AI) refers to the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (acquiring information and rules for using it), reasoning (using rules to reach approximate or definite conclusions), and self-correction.

Importance of Artificial Intelligence.

Amhed, (2019) advanced the following importance of artificial intelligence,

1. Improved Decision-Making: artificial intelligence provides data-driven insights that enhance decision-making at all levels of educational management.
2. Resource Optimization: Artificial Intelligence helps in the efficient allocation and utilization of resources, reducing waste and improving outcomes.
3. Enhanced Learning Outcomes: By personalizing education, Artificial Intelligence helps improve student engagement, retention, and success rates.
4. Scalability: Artificial Intelligence solutions can scale to meet the needs of growing student populations and complex administrative demands.

Challenges of artificial intelligence

1. Implementation Costs: High initial costs and ongoing maintenance can be barriers for many educational institutions.

2. Data Privacy and Security: Ensuring the privacy and security of sensitive educational data is a critical concern.

3. Resistance to Change: Teachers, administrators, and students may resist adopting new Artificial Intelligence technologies due to fear of the unknown or disruption to established practices.

4. Ethical Considerations: The use of Artificial Intelligence raises ethical questions about bias, fairness, and accountability Amhed, (2019).

Sustainable Development

Luckin (2019) refers to Sustainable National Development as the development that meets the needs of the present without compromising the ability of future generations to meet their own needs, encompassing economic, social, and environmental sustainability.

Sustainable development can be defined as an approach to the economic development of a country without compromising the quality of the environment for future generations. Sustainable development is how we must live today if we want a better tomorrow, by meeting present needs without compromising the chances of future generations to meet their needs. The survival of our societies and our shared planet depends on a more sustainable world (Nwankwo, 2007)

Quality Service Delivery

According to Bialik, and Fadel, (2019) quality service delivery in the context of education refers to the provision of high-quality educational services that meet the needs and expectations of students, parents and society. Quality service delivery in educational management involves ensuring that educational institutions provide high-quality education and support services that meet the needs of students, teachers, and other stakeholders.

Quality service delivery refers to the provision of excellent services that meet or exceed customer expectations. It is a critical factor for the success of any business, including hospitality and tourism industries. The quality of service delivery depends on clean, clear processes that work smoothly and are under continuous review. It is important that all systems work perfectly together and processes flow, and this starts right at the beginning with the first contact from the customer (Unachukwu and Ebenebe 2001).

Curriculum Development

Designing and updating curricula to meet current educational standards and future workforce needs. Curriculum development is a planned, thoughtful and deliberate course of actions that ultimately enhance the quality and impact of the learning experience of students. It includes the development and organization of learning activities designed to meet intended learning outcomes. It also involves the thoughtful assessment of those learning outcomes. The ultimate goal of curriculum is to enhance the quality and impact of the teaching and learning experience. Whether designing a course or a program of studies, there are a number of things that must be considered to create meaningful learning experiences. Curriculum development moves beyond

a content-centered approach to one that considers the relationship between the course/program learning outcomes, assessment of those outcomes, and the activities and opportunities designed to facilitate student learning. Teacher professional development is any type of continuing education effort for educators.

Teacher Training and Professional Development

Teacher professional development is any type of continuing education effort for educators. It's one way teachers can improve their skills and, in turn, boost student outcomes. Learning can take place in formal or informal settings. Formal settings include conferences, courses, seminars, retreats and workshops. Informal opportunities for teacher professional development include independent research or investigation, peer learning initiatives or even just chatting with a colleague in the staff room. Professional development for teachers takes place on a number of different levels: district-wide, among teachers in a given school, or even on a classroom or individual basis (Alper, and Goggin, 2017).

Assessment and Evaluation

Regularly assessing educational programs and student performance to identify areas for improvement. Evaluation is a process of judging someone based on their importance, knowledge, and merit using rules and methods. Assessment is the recording and interpreting of various data to obtain an appropriate measure of skills, knowledge, and attitude to improve the individual's overall performance.10 Jun 2024 Assessment is feedback from the student to the instructor about the student's learning. Evaluation uses methods and measures to judge student learning and understanding of the material for purposes of grading and reporting. Evaluation is feedback from the instructor to the student about the student's learning (Baker, and Inventado, 2014).

Statement of the Problem

It is expected that the application of Artificial Intelligence in educational management practices has the potentials of enhancing quality service delivery in the education sector which is geared towards achieving sustainable national development. These expectations as opined by Holmes, W, Bialik, M, and Fadel, C. (2019) include: Curriculum Development which is the process of creating, designing and implementing a curriculum for educational programmes, courses and training sessions. Teachers Training and Professional Development, this refers to the process of equipping teachers with necessary skills, knowledge and competencies to effectively curriculum content and achieve learning objectives as well as student support services.

Assessment and Evaluation, these are crucial processes in education that helps measure students learning and programme effectiveness. It gives equal opportunities for all students, regardless of background or ability. Although, many disagree on whether these actually constitute artificial intelligence. Instead, some argue that much of the technology used in the real world today actually constitutes highly advanced machine learning that is simply a first step towards true artificial intelligence.

However, despite the perception of a perceived relationship between artificial intelligence and quality service delivery in the education sector in Rivers State owned universities, quality service delivery seems to be sighted at a distance from the school system as the quality of curriculum developed by teachers seems to be alien to the gap it is aimed to fill, teachers professional training and development programmes are not handing down what teachers are required to learn. Assessment and evaluation that is expected to measure students learning outcomes are also not measuring what it is supposed to measure. This brings us to curiosity as to why the gap between the variables and quality service delivery.

Purpose of the Study

The purpose of this study are as follows:

1. To examine the relationship between artificial intelligence and curriculum development in educational management departments in Rivers State owned universities for sustainable national development.
2. To examine the relationship between artificial intelligence and teachers training and professional development in educational management in Rivers State owned universities for sustainable national development.
3. To examine the relationship between artificial intelligence and assessment and evaluation in educational management in Rivers State owned universities for sustainable national development.

Research Questions:

1. What is the relationship between artificial intelligence and curriculum development in educational management in Rivers State owned universities for sustainable national development?
2. What is the relationship between artificial intelligence and teachers training and professional development in educational management in Rivers State owned universities for sustainable national development?

3. What is the relationship between artificial intelligence and assessment and evaluation in educational management in Rivers State owned universities for sustainable national development?

Hypotheses

1. There is no significant relationship between artificial intelligence and curriculum development in educational management in Rivers State owned universities for sustainable national development.
2. There is no significant relationship between artificial intelligence and teachers training and professional development in educational management in Rivers State owned universities for sustainable national development.
3. There is no significant relationship between artificial intelligence and assessment and evaluation in educational management in Rivers State owned universities for sustainable national development.

Methodology

The methodology outlines the research design, methods and procedures that were employed to investigate the relationship between artificial intelligence (AI) and quality service delivery in educational management for sustainable national development. It includes descriptions of the research design, population, sampling techniques, data collection methods, data analysis procedures and data collection method.

The most appropriate design that was used for this study was the correlational survey design. The choice of this design is premised on its basic features as it seeks to study the relationship that exists between two or more variables. Correlation is the degree, strength and direction of a linear relationship between variables (Hedge, N.D).

The population of this study was made up of the two Rivers State owned universities namely; Rivers State University (RSU) and Ignatius Ajuru University of Education (IAUOE). All the 82 academic staff members of the department of educational management in the two universities (43 from RSU and 39 from IAUOE) were used as the population of the study. (School records, 2024).

The census sampling was used to determine the sample of this study, therefore, 82 members of staff in the department of educational management of the two Rivers State Government owned Universities made the sample of the study. The instrument that was used for data collection was

the Artificial Intelligence and Quality Service Delivery Questionnaire (AIQSDQ). The researcher used the above-mentioned questionnaire for the collection of data from respondents. To ensure the validity of the study, copies of the instrument titled; Artificial Intelligence and Quality Service Delivery Questionnaire (AIQSDQ) were given to research experts in measurement and evaluation departments of the sampled universities for necessary corrections which was adhered to strictly.

To ascertain the reliability of the study, The Cronbach Alpha method was used, 20 respondents were selected from the population that were not part of the sample, the researcher administered the instrument on them and retrieved after their response. Data gotten from the respondents were analyzed using Cronbach Alpha statistics.

Data for this study were collected through the administration and collection of the instrument titled; Artificial Intelligence and Quality Service Delivery Questionnaire (AIQSDQ) by the researcher and two research assistants to the sampled population.

Data that were collected in the course of this study were analyzed with relevant statistical tools. The Pearson Product Moment Correlation Coefficient formula (r) was used to answer the research questions while the z-ratio was used to test the hypotheses at 0.05 level of significance.

Results

Research Question 1: What is the relationship between artificial intelligence and curriculum development in educational management in Rivers State owned Universities for sustainable national development?

S/N	ITEMS	Male		Female		
		X	SD	X	SD	DECISION
1	Artificial intelligence enhances faster development of curriculum	3.77	2.14	3.05	2.12	Agreed
2	Artificial intelligence aids the speedy inculcation of curriculum content	3.86	1.59	3.50	1.21	Agreed
3	Curriculum developed using artificial intelligence are richer in content than other curriculums developed without artificial intelligence	3.69	1.60	3.90	2.48	Agreed
4	Schools using the services of A.I in the development of curriculums are always ahead of schools developing curriculum without artificial intelligence	4.01	2.33	3.77	0.87	Agreed

Table 1 above revealed that, items on serial numbers 1, 2, 3 and 4, or all the items presented on table 1 above were agreed by the respondents. This implies that, artificial intelligence enhances the development of curriculum faster. Artificial intelligence also aids the speedy inculcation of curriculum content. Results from the findings further revealed that curriculum developed using the services of Artificial Intelligence are richer in content than others developed without artificial intelligence and finally, schools using artificial intelligence in the development of curriculum are always ahead of other schools without artificial intelligence.

Research Question 2: What is the relationship between artificial intelligence and teacher training and professional development in educational management in Rivers State owned Universities for sustainable development?

S/N	**ITEMS**	**Male**		**Female**		
		X	**SD**	**X**	**SD**	**DECISION**
5	Teachers training and professional development becomes more effective with artificial intelligence	3.32	1.33	3.05	1.05	Agreed
6.	Application of artificial intelligence in teacher training and professional development programmes enhances teachers quality	3.88		3.10	2.22	Agreed
7.	Artificial intelligence propelled teachers' development and enhances teachers professionalism	8.19	2.23	3,.32	0.99	Agreed
8.	Students in schools where teachers are trained with the application of artificial intelligence tends to perform better than students in schools where teachers are trained without the application of artificial intelligence	4.07	3.02	3.91	2.11	Agreed

Table 2 above shows that, items 5, 6, 7 and 8 were strongly agreed by the respondents on the grounds that, teachers training and professional development becomes more effective with the application of artificial intelligence in teachers training and professional development programmes enhances teacher's quality. The findings further reveals that, artificial intelligence propelled teachers development and enhances teachers professionalism and finally, students in schools where teachers are trained with the application of artificial intelligence tends to perform better than students in schools where teachers are trained without the application of artificial intelligence.

Result Question 3: What is the relationship between artificial intelligence and assessment and evaluation in educational management in Rivers State owned universities for sustainable national development?

S/N	ITEMS	Male		Female		
		X	SD	X	SD	DECISION
9	The application of artificial intelligence enhances accuracy in the evaluation process of school records	3.20	1.15	3.42	0.48	Agreed
10	The application of artificial intelligence brings about a perfect assessment process	3.83	0.99	3.54	3.65	Agreed
11	Teachers with the knowledge of artificial intelligence in assessment and evaluation stand out amongst their peers.	3.11	1.83	3.76	3.10	Agreed
12	The application of artificial intelligence skills in the process of assessment and evaluation reduces stress for teachers.	3.50	2.98	3.17	2.08	Agreed

Result from table 3 above presents the opinions of the respondents on items 9, 10, 11 and 12. The respondents agreed to all the items on table 3 above. In their collective view, the respondents agreed that, the application of artificial intelligence enhances accuracy in the evaluation process. The application of artificial intelligence brings about a perfect assessment process. Teachers with the knowledge of artificial intelligence in assessment and evaluation stand out amongst their peers and the application of artificial intelligence in assessment and evaluation reduces stress for teachers.

Hypothesis 1: There is no significant relationship between artificial intelligence and curriculum development in educational management in Rivers State owned universities for sustainable national development.

Table 4; Z-ratio test of the relationship between artificial intelligence and curriculum development in educational management at 0.05 level of significance.

Respondents	N	$\bar{x}$	SD	df	Z cal	Z crit	Decision
Male	31	15.2	6.68	80	1.82	1.96	Hypothesis Rejected
Female	51	17.23	66.8				

Results from table 4 revealed that, male teachers have mean and standard deviation scores of 15.23 and 6.68 while female teachers have mean and standard deviation scores of 17.23 and 6.68 respectively. With degree of freedom of 80, the calculated Z - ratio of 1.82 is less than the Z -critical value of 1.96, therefore the null hypothesis was rejected. This implies that there is significant relationship between artificial intelligence and curriculum development.

Hypothesis 2: There is no significant relationship between artificial intelligence and teachers training and professional development in educational management in Rivers State owned universities for sustainable national development.

Table 5: Z - ratio test of the relationship between artificial intelligence and teacher training and professional development in educational management in Rivers State owned universities for sustainable development.

Respondents	N	$\bar{x}$	SD	df	Z cal	Z Crit	Decision
Male Female	31 51	14.37 15.14	6.37 7.01	80	1.54	1.96	Hypothesis Rejected

Results from table 5 shows that male teachers have a mean and standard deviation scores of 14.37 and 6.37 while female teachers have a mean and standard deviation scores of 15.14 and 7.01 respectively. With degree of freedom of 80, the calculated Z - ratio of 1.54 is less than the Z - critical value of 1.96, therefore, the null hypothesis was rejected.

This means that, there is significant relationship between artificial intelligence and teacher training and professional development.

Hypothesis 3: There is no significant relationship between artificial intelligence and assessment and evaluation in educational management in Rivers State owned universities for sustainable national development.

Table 6: Z - ratio test of the relationship between artificial intelligence and assessment and evaluation in educational management in Rivers State owned universities for sustainable development.

Respondents	n	$\bar{x}$	SD	Df	Z cal	Z Crit	Decision

Male Female	31 51	13.64 13.82	9.31 5.18	80	1.04	1.96	Hypothesis Rejected

Results from table 6 shows that, there is significant relationship between artificial intelligence and assessment and evaluation. This is because the mean and standard deviation scores of male teachers are 13.64 and 9.31 while female teachers mean and standard deviation scores are 13.82 and 5.18 respectively. With a degree of freedom of 80, the calculated Z - ratio of 1.04 is less than the Z - critical value of 1.96, therefore, the null hypothesis was rejected.

Discussion of Findings

Major findings of the study shows that, artificial intelligence enhances curriculum development faster, artificial intelligence application aids speedy inculcation of curriculum content. Most curriculums developed with the application of artificial intelligence are richer in content than others developed without the use of artificial intelligence, as well as schools using the services of artificial intelligence in the development of curriculums are mostly ahead of schools developing curriculum without artificial intelligence.

Further findings from the study revealed that, teachers training and professional development becomes more effective with artificial intelligence, artificial intelligence propelled teacher development enhances teacher professionalism.

Application of artificial intelligence in teachers training and professional development programmes enhances teacher's quality and of course, students in the institutions where teachers are trained with the application of artificial intelligence tends to perform better than students who are in the institutions where teachers are not trained with the application of artificial intelligence.

Results from the findings of the study further revealed that, the application of artificial intelligence enhances accuracy in the evaluation process of school records, it also brings about a perfect evaluation process of students work. Teachers with the knowledge of artificial intelligence in assessment and evaluation stands out amongst their peers and finally, the application of artificial intelligence skills in the process of assessment and evaluation reduces stress.

Conclusion

The study concluded that, artificial intelligence application is key to quality service delivery in educational management and all other sectors of administration particularly in Rivers state owned universities system.

Recommendation

Based on the findings of the study, the researcher recommends thus-

i. Artificial intelligence application should be introduced during curriculum development process to achieve optimal productivity.

ii. Organisers of teacher training and professional development programmes should encourage the application of artificial intelligence at all times.

iii. Assessment and evaluation is very key to educational management service delivery, it is therefore recommended for all assessment and evaluation activities.

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