

ARTIFICIAL INTELLIGENCE AS DETERMINANT FOR BASIC SCHOOLS LOCATIONAL PLANNING IN THE NORTH-EAST, NIGERIA

Edoh Cletus¹, Musa Usman²

¹Department of Education Foundations, Faculty of Education, Modibbo Adama University, Yola, +2348066412064, +2349019657695¹,

²School of Continuing Education, Adamawa State Polytechnic, Yola, +2348035390088²
{edohcletus@mau.edu.ng¹, Musman902@hotmail.com²}

Abstract

This study examined artificial intelligence as determinant for basic school locational planning in the North-East, Nigeria. Specifically, three specific sub-variables, three research questions and three hypotheses guided the study. Correlational research design was adopted for this study. The population of this study is 36,802. This population consists of 2,423 principals, 34,379 teachers in 2423 Basic Schools in North-East, Nigeria. The sample of the study is 1,173 respondents (i.e., 484 principals and 688 teachers) in Basic Schools in North-East, Nigeria. Multi-stage sampling technique was adopted for this study. Two self-structured instruments developed by the researchers were used for data collection. The questionnaires were tagged “Artificial Intelligence Questionnaire (AIQ)” and “School Locational Planning Questionnaire (SLPQ)”. The instruments were scored on a five-point Likert type Scale. A reliability coefficient of 0.85 and 0.82 were obtained for “AIQ and SLPQ using Cronbach Alpha Method of internal consistency. Data collected for the study were analysed using descriptive statistics of Mean and Standard Deviation in answering the three research questions raised. While, Simple linear regression analysis was used in testing null hypothesis 1 and 2. Multiple regression analysis was used to test hypothesis 3. The results revealed that AI-driven human resource management system is a significant determinant for basic school locational planning in the North-East, Nigeria at $(F(1, 1172) = 8.416, p < .05)$. The findings revealed that Personalized learning system is a significant determinant for basic school locational planning in North-East, Nigeria $(F(1, 1172) = 9.327, p < .05)$. The regression model indicates that Artificial intelligence variables of AI-driven human resource management systems and personalized learning systems are significant determinants for basic school locational planning in North-East, Nigeria $F(2, 1172) = 8.945, p < .05$. The results led to the conclusion that AI-powered human resource management systems provided the most significant unique input in understanding the locational planning for basic schools in North-East Nigeria, particularly when accounting for the variance attributed to other factors in the model, in contrast to personalized learning systems, which offered a relatively lesser unique contribution. Based on the findings of the study, the following recommendations among others were made; Educational planners need to guarantee the complete application of AI algorithms, particularly in enhancing budget distribution through the examination of past financial data to forecast upcoming expenses. AI-powered tools should be employed to handle tasks like hiring teachers and conducting performance assessments. Educational planners should create an interactive learning environment that fosters deeper student engagement through AI-powered intelligent tutoring systems. This is due to the fact that intelligent tutoring systems powered by AI can suggest personalized study plans and offer immediate feedback for fundamental school location planning.

Keywords: Artificial Intelligence (AI), AI-driven Human Resource Management System, AI-powered Personalized Learning System, and, Basic School Locational Planning.

Introduction

Educational planning is essential as it ensures the success of the educational institutions. [11] noted that educational planning, in its broadest sense, is the application of logical and methodical analysis to the process of educational development in order to increase education's effectiveness and efficiency in meeting the needs and objectives of students and society at large. School Locational Planning (SLP) is a systematic and intentional process of designing, implementing, and evaluating educational programs, policies, and institutions. It involves planning, management, and monitoring and evaluation to achieve specific educational goals and objectives of basic schools. [20] submitted that school locational planning involves leading the school towards development through optimum

use of human and material resources, physical sources and principles necessary in achieving all the objectives of the school.

In other words, it can be said to be a continuous process that takes into account all aspects of the school (policies, material and human resources, activities, equipment, etc.) and integrates them into achieving educational goals. SLP encompasses various functions, including needs assessment, goal setting, resource allocation, curriculum development, teacher management, infrastructure management, and monitoring and evaluation. By performing these functions, locational planning ensures that educational programs are effective, efficient, and relevant to the needs of students and society. Education drives social, economic, political, religious, and technological development of nations. The actualization of the goals of basic school education warrants robust and efficient planning and management mechanisms [23]. [15], submitted that school locational planning form the foundation of successful schools, institutions, and organizations. This underscores its importance in achieving the objectives of education in Nigeria. As educational institutions face increasing demands for efficiency and quality, the role of AI and technology has become crucial.

According to Lion and Ekefre [19], the term artificial intelligence (AI) describes computer programs that are able to carry out sophisticated operations that were previously limited to human performance, such as problem-solving, thinking, and decision-making. Artificial intelligence (AI) is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings [4]. Artificial intelligence (AI) describes computer programs that are able to carry out sophisticated operations that were previously limited to human performance, such as problem-solving, thinking, and decision-making [28]. The adoption of AI in educational planning and administration is transforming how institutions manage processes, engage with stakeholders, and deliver educational content [3]. AI-driven tools streamline administrative tasks, automate routine operations, and provide data-driven insights that enhance decision-making and strategic planning [16].

Artificial Intelligence presents a promising solution to these challenges by automating administrative processes, optimizing resource management, and providing data-driven decision-making support. However, the integration of AI in Nigeria's secondary schools remains minimal, largely due to infrastructural deficits, inadequate AI literacy among educators, resistance to change, and ethical concerns such as data privacy and algorithmic bias [13; 7; 24]. The absence of a structured approach to AI adoption further exacerbates these challenges, leaving many schools reliant on outdated methods that fail to meet the demands of modern education. If these issues persist, Nigerian secondary schools may continue to lag in global educational advancements, reducing their capacity to equip students with the necessary skills to thrive in an increasingly digital world.

The growing complexity of basic schools in Nigeria necessitates the adoption of modern, data-driven solutions that can enhance efficiency, transparency, and productivity. AI offers unique capabilities that go beyond traditional administrative approaches by automating repetitive tasks, analyzing vast amounts of educational data, and providing actionable insights for school management [8]. Unlike conventional methods, AI-driven systems can track and predict student academic performance, helping educators identify learners who need additional support [2]. Additionally, AI enhances administrative efficiency by streamlining grading processes, automating attendance tracking, and optimizing timetable scheduling, thereby reducing the workload on teachers and allowing them to focus more on instructional activities. This study, therefore, sought to examine how

AI can be leveraged to optimize school locational planning in North-East, Nigeria by investigating how AI-powered tools such as; predictive AI-driven human resource management systems, personalized learning systems, AI-powered tutoring, and collaboration with human educators (automating administrative tasks). AI can be applied to basic school resource management. AI can analyze data on student needs, teacher qualifications, and school resources to optimize resource allocation. This can help schools ensure that resources are allocated effectively and equitably, and that all students have access to the resources they need.

AI-driven human resource management systems can analyze large datasets of employee performance, suggest personalized training programs, and enhance overall staff well-being [21]. Effective human resource management in basic schools is crucial for maintaining a productive learning environment. AI tools help automate tasks such as teacher recruitment, performance evaluations, and professional development programs. AI helps school administrators optimize budget allocation by analyzing historical financial data and predicting future expenditures. AI models can forecast budget needs based on student enrollment, infrastructure development, and operational expenses. AI can eliminate resource wastage and enhance financial management in educational institutions by providing real-time insights into expenditure patterns. Traditional scheduling methods often lead to inefficiencies in classroom and teacher allocations. AI-driven scheduling systems ensure that classrooms and teachers are assigned optimally, reducing conflicts and improving efficiency. [27] emphasize that AI can enhance time management in secondary schools by creating intelligent timetables that adjust dynamically to changes in teacher availability and student needs.

AI can be used to create personalized learning experiences for students, tailoring instruction to individual learning needs and paces. This can help improve student engagement and achievement, especially for students who are struggling [26]. Beyond administrative functions, AI contributes to personalized learning by adapting instructional content to meet the unique needs of students. AI-powered intelligent tutoring systems can provide real-time feedback, recommend customized study plans, and create an interactive learning environment that fosters deeper student engagement [22]. In many developed countries, the integration of AI in educational management has significantly improved institutional efficiency, ensuring data-driven decision-making and better student outcomes. Given Nigeria's expanding student population and the persistent challenges of teacher shortages and inefficient resource allocation, AI presents an opportunity to bridge these gaps, improve school governance, and enhance the overall quality of secondary education [13]. However, to fully harness AI's potential, it is imperative to address barriers such as limited infrastructure, lack of AI expertise among educators, and ethical concerns related to data security and bias. This underscores the need for well-defined policies and strategic initiatives to facilitate AI adoption in school locational planning in Nigeria's education sector, particularly in Basic Schools in North-East, Nigeria.

School location with its attendant features of instructional spaces planning, administrative places planning, circulation spaces planning, spaces for conveniences planning, accessories planning, the teachers as well as the students themselves are essential in the teaching-learning process. The extent to which student learning could be enhanced depends on their location in the locality, within the school compound, the structure of their classroom, availability of instructional facilities and accessories. It is believed that a well planned school will gear up expected outcomes of education that will facilitate good social, political and economic emancipation, effective teaching and learning process and academic performance of the students.

Emphasizing the importance of school location to school effectiveness started with Coleman's Report [29] in the United States. Since then, various researches have been conducted on school effectiveness. These researches, however, were centred on the developed countries. With the exception of few works [29; 23; 26; 15; 20; 11], no serious attempt has been made to study how artificial intelligence could be use for basic school locational planning in the North-East, Nigeria. It is on this basis that the researchers sought to unravel how artificial intelligence (AI-driven human resource management systems and personalized learning systems) determine basic school locational planning in North-East, Nigeria.

Statement of the Problem

In an ideal situation, effective school locational planning is crucial for improving educational quality, increasing efficiency, enhancing accountability, and supporting educational reform in basic schools in North-East, Nigeria. It optimizes the use of educational resources, reduces waste, and improves productivity [29]. School locational planning also promotes transparency, accountability, and responsiveness in educational institutions and systems. Furthermore, it facilitates the implementation of educational reforms, innovations, and policies. By adopting a systematic and intentional approach to school locational planning, educators, policymakers, and administrators can work together to create more effective, efficient, and equitable educational systems that benefit students, teachers, and society as a whole. AI can revolutionize basic school locational planning by optimizing resource allocation, anticipating future needs, and ensuring equitable access to education. AI algorithms can analyze data to predict student enrolment, identify areas with limited educational opportunities, and optimize transportation routes, ultimately leading to more efficient and effective school systems [26].

Artificial Intelligence (AI) has emerged as a transformative tool in educational planning and management, offering innovative solutions to enhance efficiency, optimize resources, and improve learning outcomes. As secondary schools in Nigeria face increasing demands for quality education and effective administration, AI-driven systems present opportunities for automating administrative tasks, personalizing learning experiences, and facilitating data-driven decision-making [25]. However, despite its potential, the integration of AI into Nigeria's basic school system (especially in areas of locational planning) remains limited due to challenges such as infrastructural deficits, data privacy concerns, algorithmic biases, and resistance to change among educators and administrators [29].

Consequent on the above, the importance of effective school locational planning North Eastern Nigeria continues to face significant inefficiencies in administration, resource allocation, student performance tracking, and decision-making processes [2]. Traditional management approaches often rely on manual record-keeping, inconsistent data monitoring, and slow response mechanisms, which hinder the smooth operation of schools. These inefficiencies could contribute to poor educational outcomes, limit teacher effectiveness, and weaken institutional performance, ultimately affecting students' learning experiences and future opportunities, especially in basic school locational planning [26]. To find answers to these unwelcomed development found in basic school locational planning in North-East, Nigeria, this study examined artificial intelligence as determinant for basic school locational planning in the North-East, Nigeria.

Purpose of the Study

This study examined artificial intelligence as determinant for basic school locational planning in the North-East, Nigeria. Specifically, the study sought to examine:

1. AI-driven human resource management systems as determinant for basic school locational planning in the North-East, Nigeria.
2. Personalized learning system as determinant for basic school locational planning in the North-East, Nigeria.
3. Artificial intelligence (AI-driven human resource management systems, personalized learning systems, AI-powered tutoring, and collaboration with human educators (automating administrative tasks) as determinants of basic school locational planning in North-East, Nigeria.

Research Questions

The following research questions were raised to guide the study:

1. What is the level of AI-driven human resource management systems for basic school locational planning in the North-East, Nigeria?
2. What is the level of Personalized learning for basic school locational planning in the North-East, Nigeria?
3. What is the level of basic schools locational planning in North-East, Nigeria?

Hypotheses

The following null hypotheses are formulated to guide the study and were tested at 0.05 level of significance:

- Ho₁:** AI-driven human resource management system is not a significant determinant for basic school locational planning in the North-East, Nigeria.
- Ho₂:** Personalized learning system is not a significant determinant for basic school locational planning in the North-East, Nigeria.
- Ho₃:** Artificial intelligence (AI-driven human resource management systems, personalized learning systems) are not significant determinants of basic school locational planning in Nigeria.

Methodology

Correlational research design was adopted for this study. The area of the study is North-East, Nigeria. North-East, Nigeria is made up of six states namely Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe. The population of this study is 36,802. This population consists of 2,423 principals, 34,379 teachers in 2423 Basic Schools in North-East, Nigeria. The sample of the study is 1,173 respondents (i.e., 484 principals and 688 teachers) in Basic Schools in North-East, Nigeria. The sample represents 20% of the entire population of principals (2,423) and 2% of the population of teachers (34,379), selected based on the recommendation of [14] that if the population of a study is between 10,000 and above, 2% should be used; between 5000 and 10,000, 5% should be used; between 2000 and 5000, 10% should be used; when the population is between 1000 and 2000, 20% should be used and if the population is between hundreds, 50% should be selected and when it is in tenths, the whole population may be used. Multi-stage sampling technique was adopted for this study. Two self-structured instruments developed by the researchers were used for data collection. The questionnaires were tagged “Artificial Intelligence Questionnaire (AIQ)” and “School Locational

Planning Questionnaire (SLPQ)”. The instruments were scored on a five-point Likert type Scale of Very High Level (VHL=5), High Level (HL=4), Moderate Level (ML=3), Low Level (LL=2), and Very Low Level (VLL=1). The instruments were subjected to face and content validity by three experts. For the reliability of the instruments, its consistency was tested using Cronbach Alpha Method of internal consistency, and a reliability coefficient of 0.85 and 0.82 were obtained for “AIQ and SLPQ. These reliability coefficients indicated that the instruments were good enough for the study. This is in line with [14] who revealed that the closer a reliability coefficient is to the value of 1.00, the more reliable is the instrument.

The direct delivery approach was used in administering the instruments. Data collected for this study were analysed using descriptive statistics of Mean and Standard Deviation in answering the three research questions raised. The decision rule for the research questions will be based on the real limit of numbers as shown below; 4.50 – 5.00 as Very High Level; 3.50 – 4.49 as High Level; 2.50 – 3.49 as Moderate Level; 1.50 – 2.49 as Low Level; and 0 – 1.49 as Very Low Level. While, Simple Linear and Multiple-Regression Analysis were used in testing null hypotheses at a 0.05 level of significance. Simple linear regression analysis was used in testing null hypothesis 1 and 2. Multiple regression analysis was used to test hypothesis 3. The choice of simple linear and multiple regression analysis is because the hypotheses are based on predictive modelling of two groups of respondents that responded to the items and, also the sample size is more than 30 respondents. The responses of the respondents were compared to see if a significant difference(s) exist between means of the two groups i.e, artificial intelligence as determinant of school locational planning in Basic Schools in North-East, Nigeria. The decision rule for the null hypotheses was that if $p \leq 0.05$ the hypothesis is rejected, but when $p \geq 0.05$, we do not reject the hypothesis.

2.1 Results

Three research questions were raised and answer using descriptive statistics of mean and standard deviation. Three hypotheses were also formulated and tested at 0.05 level of significance using Simple Linear Regression (for testing hypotheses 1 & 2) and Multiple Regression Analysis (for testing hypothesis 3).

2.1.1 Research Question One

What is the level of AI-driven human resource management systems for basic school locational planning in the North-East, Nigeria?

To answer this research question, responses on the level of AI-driven human resource management systems for basic school locational planning in the North-East, Nigeria were collected and analyzed as shown in Table 1.

Table 1 Mean and Standard Deviation of level of AI-driven human resource management systems for basic school locational planning in the North-East, Nigeria

S/N	Items	n=1173	Mean	S. D	Remark
1	AI-driven tools that automate tasks such as teacher recruitment	3.09	0.91	ML	
2	AI-driven tools that automate tasks such as performance evaluations	2.87	0.78	ML	
3	AI tools creating intelligent timetables that adjust dynamically to changes in teacher availability based on student needs	2.36	0.69	LL	
4	AI algorithm that optimizes budget allocation by analyzing historical financial data by predicting future expenditures	4.00	1.00	HL	
5	AI-driven scheduling systems ensure that classrooms are assigned to teachers optimally	2.39	0.86	LL	
Average Mean		2.94	0.85	ML	

The average mean and standard deviation of level of AI-driven human resource management systems for basic school locational planning in the North-East, Nigeria are shown in Table 1. In Basic Schools in North-East, Nigeria a moderate level of AI-driven human resource management systems for basic school locational planning in the North-East, Nigeria indicated by an average mean score of 2.94 and standard deviation value of 0.85. This implies that AI algorithm is used in optimizing budget allocation by analyzing historical financial data by predicting future expenditures, AI-driven tools automate tasks such as teacher recruitment and, AI-driven tools automate tasks such as performance evaluations to a moderate level.

2.1.2 Research Question Two

What is the level of Personalized learning for basic school locational planning in the North-East, Nigeria?

To answer this research question, responses on the level of personalized learning for basic school locational planning in the North-East, Nigeria were collected and analyzed as shown in Table 2.

Table 2 Mean and Standard Deviation of level of personalized learning for basic school locational planning in the North-East, Nigeria

S/N	Items	Mean	S. D	Remark
n=1173				
1	AI-powered intelligent tutoring systems can provide real-time feedback	3.73	0.85	HL
2	AI-powered intelligent tutoring systems can recommend customized study plans	3.80	0.87	HL
3	AI-powered intelligent tutoring systems can create an interactive learning environment that fosters deeper student engagement	4.52	1.14	VHL
4	Ensuring data-driven decision-making for better student outcomes	2.99	0.79	ML

5	AI-powered intelligent tutoring systems improve school governance	3.41	0.81	VHL
Average Mean		3.69	0.89	HL

The mean and standard deviation of the level of personalized learning for basic school locational planning in the North-East, Nigeria are shown in Table 2. A moderate level of level of personalized learning for basic school locational planning in the North-East, Nigeria is indicated by an average mean score of 3.69 and standard deviation value of 0.89. This implies that to a moderate level; AI-powered intelligent tutoring systems can create an interactive learning environment that fosters deeper student engagement, AI-powered intelligent tutoring systems can recommend customized study plans, and AI-powered intelligent tutoring systems can provide real-time feedback for basic school locational planning in the North-East, Nigeria.

2.1.3 Research Question Three

What is the level of basic schools locational planning in North-East, Nigeria?

To answer this research question, responses on the level of basic schools locational planning in North-East, Nigeria were collected and analyzed as shown in Table 3.

Table 3 Mean and Standard Deviation of the level of basic schools locational planning in North-East, Nigeria

S/N	Items	n=1173	Mean	S. D	Remark
1	Type of school being planned (e.g., primary, secondary, vocational)	4.55	1.19		VHL
2	Goal setting based on community's demographics (e.g., age, income, ethnicity)	4.00	1.00		VHL
3	Resource allocation based on accessibility of the site (e.g., road access, public transportation)	3.97	0.88		HL
4	Curriculum development that will adapt to future changes in the community	3.66	0.85		HL
5	Teacher management based on safety concerns related to the school's location (e.g., traffic, crime)	4.08	1.01		VHL
Average Mean		4.05	0.99		HL

Result of analysis in Table 3 shows the mean and standard deviation of level of basic schools locational planning in North-East, Nigeria. An average mean of 4.05 and standard deviation of 0.99 shows a high level of level of basic schools locational planning in North-East, Nigeria. This implies that; Type of school being planned (e.g., primary, secondary, vocational), Teacher management based on safety concerns related to the school's location (e.g., traffic, crime), and Goal setting based on community's demographics (e.g., age, income, ethnicity) is to a high level in terms of basic schools locational planning.

3 Hypotheses Testing

3.1 H₀₁: AI-driven human resource management system is not a significant determinant for basic school locational planning in the North-East, Nigeria.

Table 4a Result of Regression Analysis of AI-driven human resource management system as a significant determinant for basic school locational planning in the North-East, Nigeria.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.778	1	8.778	8.416	.009 ^b
	Residual	53.784	1171	1.043		
	Total	62.562	1172			

a. Dependent Variable: Basic School Locational Planning

b. Predictors: (Constant), AI-driven Human Resource Management System

Table 4a presents the results of a regression analysis examining AI-driven human resource management system as a significant determinant for basic school locational planning in the North-East, Nigeria. The table shows that the regression model is statistically significant at ($F(1, 1172) = 8.416$, $p < .05$), indicating that AI-driven human resource management system is a significant determinant for basic school locational planning in the North-East, Nigeria.

Table 4b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.537 ^a	.481	.485	.08469

a. Predictors: (Constant), AI-driven Human Resource Management System

Table 4b provides a summary of the regression model, showing that the model has a moderate effect size ($R = .537$), meaning that AI-driven human resource management system is a significant determinant for basic school locational planning in the North-East, Nigeria. The predictors in the model account for a significant proportion of the variance in basic school locational planning in the North-East, Nigeria ($R^2 = .481$). The adjusted R^2 value suggests that approximately 48.1% of the variance in basic school locational planning in the North-East, Nigeria can be explained by AI-driven human resource management system. The standard error of estimate is .08469, reflecting a moderate degree of variability.

Table 4c: Coefficients of Beta

Model		Unstandardized Coefficients β	Std. Error	Standardized Coefficients Beta (β)	t	Sig.
1	(Constant)	2.099	.558		3.132	.002
	AI-driven Human Resource Management System	.483	.118	.657	2.224	.009

a. Dependent Variable: Basic School Locational Planning

Table 4c displays the coefficients for the predictors in the regression model. The standardized coefficient (Beta) for AI-driven Human Resource Management System is .657, indicating a moderate positive relationship with Basic School Locational Planning. The t-value of 2.224 suggests that the relationship is statistically significant ($p = .009$). The Unstandardized Coefficient ($\beta = .483$) suggests that a one-unit increase in AI-driven human resource management system leads to a 0.483 improvement in basic school locational planning.

3.2 H₀₂: Personalized learning system is not a significant determinant for basic school locational planning in the North-East, Nigeria.

Table 5a: Results of Regression Analysis of personalized learning system as a significant determinant for basic school locational planning in the North-East, Nigeria

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.695	1	7.695	9.327	.006 ^b
	Residual	30.001	1171	0.825		
	Total	37.696	1172			

a. Dependent Variable: Basic School Locational Planning

b. Predictors: (Constant), Personalized Learning System

Table 5a illustrates the results of a regression analysis examining personalized learning system as a significant determinant for basic school locational planning in North-East, Nigeria. The table indicates that the regression model is statistically significant ($F(1, 1172) = 9.327, p < .05$), suggesting that personalized learning system is a significant determinant for basic school locational planning in North-East, Nigeria.

Table 5b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.528 ^a	.502	.504	.49480

a. Predictors: (Constant), Personalized Learning System

Table 5b provides a summary of the regression model, indicating that the model has a moderate effect size ($R = .528$), meaning that personalized learning system is a significant determinant for basic school locational planning in North-East, Nigeria. The predictors included in the model account for a considerable proportion of the variance in basic school locational planning in North-East, Nigeria ($R = .502$). The adjusted R value suggests that approximately 50.2% of the variance in basic school locational planning in North-East, Nigeria can be explained by personalized learning system. The standard error of estimate is .49480, reflecting a high degree of precision in the prediction.

Table 5c: Coefficients of Beta

Model	Unstandardized Coefficients β	Std. Error	Standardized Coefficients Beta(β)	T	Sig.
-------	--	------------	--	---	------

1	(Constant)	1.813	.731		2.511	.011
	Personalized Learning System	.661	.195	.568	3.078	.006

a. Dependent Variable: Basic School Locational Planning

In Table 5c, the coefficients for the predictors in the regression model are presented. The standardized coefficient (β) for personalized learning system is .568, indicating a moderate positive relationship with basic schools locational planning. The t-value of 3.078 suggests that the relationship is statistically significant ($p = .006$).

3.3 H₀₃: Artificial intelligence (AI-driven human resource management systems, personalized learning systems) are not significant determinants for basic school locational planning in North-East, Nigeria.

Table 6a: Results of Regression Analysis of Artificial intelligence (AI-driven human resource management systems, personalized learning systems) as significant determinants for basic school locational planning in North-East, Nigeria

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.999	2	8.999	8.945	.004 ^b
	Residual	35.775	1170	1.006		
	Total	44.774	1172			

a. Dependent Variable: Basic Schools Locational Planning

b. Predictors: (Constant), Artificial intelligence (AI-driven human resource management systems, personalized learning systems)

Table 6a shows the results of the regression analysis testing Artificial intelligence (AI-driven human resource management systems, personalized learning systems) as significant determinants for basic school locational planning in North-East, Nigeria. The regression model is statistically significant, $F(2, 1172) = 8.945$, $p < .05$, indicating that AI-driven human resource management systems and personalized learning systems are significant determinants for basic school locational planning in North-East, Nigeria.

Table 6b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.684 ^a	.426	.346	.80743

a. Predictors: (Constant), Artificial intelligence (AI-driven human resource management systems, personalized learning systems)

In Table 6b, the model summary shows that the correlation coefficient (R) between AI-driven human resource management systems and personalized learning systems as significant determinants for basic school locational planning in North-East, Nigeria is .684, indicating that AI-driven human resource management systems and personalized learning systems are significant determinants for basic school

locational planning in North-East, Nigeria. The coefficient of determination (R Square) is .426, indicating that 42.6% of the variance in basic school locational planning in North-East, Nigeria can be explained by AI-driven human resource management systems and personalized learning systems. The adjusted R Square is .346, suggesting that when considering the number of predictors in the model, the explanatory power decreases slightly. The standard error of estimate is .80743, reflecting a high degree of precision in the prediction.

Table 6c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		β	Std. Error	Beta (β)		
1	(Constant)	-.331	.695		-.343	.734
	AI-driven human resource management systems	-.217	.264	.428	.642	.520
	personalized learning systems	.193	.357	.353	.531	.579

a. Dependent Variable: Basic Schools Locational Planning

Table 6c displays the coefficients from a multiple regression analysis, revealing how each variable in the model contributes to predicting Basic Schools Locational Planning. The analysis shows that AI-driven human resource management systems have a beta value of 0.428, indicating that it explains 42.8% of the variance in Basic Schools Locational Planning, with a t-value of 0.642 and a p-value of .520. Similarly, personalized learning systems have a Beta (β) value of 0.353, explaining 35.3% of the variance in Basic Schools Locational Planning, with a t-value of 0.531 and a p-value of .579.

It can be concluded that AI-driven human resource management systems made the strongest unique contribution to explaining Basic Schools Locational Planning in North-East, Nigeria when controlling for the variance explained by all other variables in the model, as it has the largest beta coefficient of .428. In contrast, personalized learning systems makes a comparatively smaller unique contribution, with a beta value of .353.

Summary of Major Findings

Based on the analysis of data, it was revealed that:

1. AI-driven human resource management system is a significant determinant for basic school locational planning in the North-East, Nigeria at ($F(1, 1172) = 8.416, p < .05$).
2. Personalized learning system is a significant determinant for basic school locational planning in North-East, Nigeria ($F(1, 1172) = 9.327, p < .05$).
3. The regression model indicates that Artificial intelligence variables of AI-driven human resource management systems and personalized learning systems are significant determinants for basic school locational planning in North-East, Nigeria $F(2, 1172) = 8.945, p < .05$.

Discussion of Findings

The first finding of this study revealed that AI-driven human resource management system is a significant determinant for basic school locational planning in the North-East, Nigeria. Majorly, the finding revealed that AI algorithm is used in optimizing budget allocation by analyzing historical financial data by predicting future expenditures, AI-driven tools automate tasks such as teacher recruitment and, AI-driven tools automate tasks such as performance evaluations to a moderate level. This finding corroborate with that of [17] whose findings revealed that AI has the potential to significantly augment leadership decision-making including administrative as well as educational issues. AI's state-of-the art tools and techniques such as data analytics, predictive modelling, machine learning, and AI-driven learning management systems have the potential to drastically transform educational leadership. In corroboration to this finding, is the findings of [6] who revealed that among the most influential developments are the integration of artificial intelligence (AI) and the implementation of strategic human resource management (HRM) practices, these are now two central pillars for enhancing educational outcomes and leadership effectiveness [6]. [6] further revealed that, AI-driven human resource management systems have long been considered a cornerstone of effective school leadership, encompassing crucial functions such as recruitment and selection, performance appraisal, professional development, and staff motivation.

The second finding of this study revealed that personalized learning system is a significant determinant for basic school locational planning in North-East, Nigeria. Majorly, this study revealed that to a moderate level; AI-powered intelligent tutoring systems can create an interactive learning environment that fosters deeper student engagement, AI-powered intelligent tutoring systems can recommend customized study plans, and AI-powered intelligent tutoring systems can provide real-time feedback for basic school locational planning in the North-East, Nigeria. This finding aligns with that of [2] whose findings showed that students are aware and ready to adopt Artificial Intelligence-based tutoring systems for learning in senior secondary schools. Also, the result showed that across gender, class, and subject specializations (Arts, Commercial and Sciences), there was no significant differences between senior secondary students' level of awareness and readiness to adopt Artificial Intelligence-based Tutoring Systems for learning in schools. This finding corroborate with that of [1] who also reported students' positive attitudes towards the use of computers in learning. Given this, Intelligent Tutoring Systems (ITS) development is critical to educational sustainability, and also as a solution to digital inequality. The implication of this finding is that, the use of computer technologies is one strategy often utilized in education to improve achievement and motivation.

The third finding of this study revealed that Artificial intelligence variables of AI-driven human resource management systems and personalized learning systems are significant determinants for basic school locational planning in North-East, Nigeria. Majorly, the finding revealed that AI-driven human resource management systems made the strongest unique contribution to explaining Basic Schools Locational Planning in North-East, Nigeria when controlling for the variance explained by all other variables in the model, as it has the largest beta coefficient of .428. In contrast, personalized learning systems makes a comparatively smaller unique contribution, with a beta value of .353. The implication of this finding is that integration of AI into school locational planning introduces a range of capabilities that transform traditional teaching and learning paradigms. This finding corroborate with that of [10], whose findings revealed that AI systems, can be classified as either narrow or super intelligent, exhibit varying levels of cognitive capacity based on their type of intelligence in carrying out human resource management functions of; recruitment, training,

budgeting, resource allocation, record keeping, and examination administration. [10], further revealed that, embedded AI technologies, such as machine learning and natural language processing, offer significant benefits for educational settings by automating administrative tasks, analysing extensive datasets, and enabling adaptive learning. This finding aligns with that of [18] who elucidated that, AI encompasses three primary capabilities: data analysis and learning, human-like cognition, and emotion sensing. These technologies, categorized by their type of intelligence, system embedding, and functions, significantly impact educational activities. According to [18], analysing cognitive processes and personalizing learning experiences, AI enhances educational outcomes and makes the learning process more effective.

This finding aligns further with that of [9], whole findings revealed that in the educational context, AI proves to be a highly valuable tool for enhancing instructional strategies, customizing content delivery, and providing personalized feedback tailored to diverse student needs. Additionally, [9], revealed that intelligent agents such as AI-powered chatbots facilitate real-time interactions and support, thereby increasing student engagement and fostering greater autonomy in the learning process. The finding aligns with that of [12], whose findings revealed that machine learning algorithms empower schools to leverage AI's predictive modelling capabilities to forecast student performance, identify learners facing academic challenges, and implement targeted interventions designed to enhance student success. Conversely, [5] revealed that AI-assisted Big Data systems are revolutionizing educational research and decision-making processes by enabling the collection, management, and analysis of complex datasets beyond the capabilities of traditional data systems. This finding suggests that transformative capability equips educational leaders with practical knowledge about student learning behaviors, teaching effectiveness, and institutional performance, enabling data-driven modifications and enhancements in educational settings.

Conclusion

The results led to the conclusion that the complete adoption of AI-powered human resource management systems and Artificial Intelligence-Based Tutoring Systems (AI-ITS) in basic schools is anticipated, as it represents the future of education. The research found that those involved in educational planning are both cognizant of and prepared to implement AI-based tutoring systems for secondary education. Additionally, it was determined that AI-powered human resource management systems provided the most significant unique input in understanding the locational planning for basic schools in North-East Nigeria, particularly when accounting for the variance attributed to other factors in the model, in contrast to personalized learning systems, which offered a relatively lesser unique contribution.

Recommendations

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

1. Educational planners need to guarantee the complete application of AI algorithms, particularly in enhancing budget distribution through the examination of past financial data to forecast upcoming expenses. Additionally, AI-powered tools should be employed to handle tasks like hiring teachers and conducting performance assessments.
2. Educational planners should create an interactive learning environment that fosters deeper student engagement through AI-powered intelligent tutoring systems. This is due to the fact

that intelligent tutoring systems powered by AI can suggest personalized study plans and offer immediate feedback for fundamental school location planning.

3. Educational planners need to guarantee that the design, development, and complete execution of an AI-driven human resource management system and an Artificial Intelligence-based tutoring system for location planning in basic education are carried out, as both teachers and students are knowledgeable and prepared to embrace it.

References

- [1] Adekunle, S. E. (2016). Perception of Secondary Schools' Students on Computer Education in Federal Capital Territory (FCT-Abuja), Nigeria. *International Journal of Social, Behavioural, Educational, Economic, Business and Industrial Engineering*, 10(1), 2016.
- [2] Adelana, O. P., & Akinyemi, A. L. (2021). Artificial intelligence-based tutoring systems utilization for learning: a survey of senior secondary students' awareness and readiness in Ijebu-Ode, Ogun State. *UNIZIK Journal of Educational Research and Policy Studies (UNIJERPS)*, 9(1), 16–28.
- [3] Ajuwon, O. A., Animashaun, E. S. & Chiekezie, N. R. (2024). Integrating AI and technology in educational administration: Improving efficiency and educational quality. *Open Access Research Journal of Science and Technology*, 11(02), 116–127.
- [4] Akpan, E. And Essien, F. G. (2025). Artificial intelligence: a dependable tool for effective management of resources in secondary schools. *Shared Seasoned International Journal of Topical Issues*, 11(1), 119-130.
- [5] Ali, L. (2022). Transforming education: the role of AI in tailored learning and dynamic assessment. *International Journal of Advanced Engineering Technologies and Innovations*, 1(1), 285-300. <https://doi.org/10.765656/q3tzjq05>.
- [6] Anastasiou, S. (2025). Integrating human resource management and artificial intelligence in educational leadership: Pathways toward transformational change. *Academic Journal of Interdisciplinary Studies*, 14(3), 7-18.
- [7] Atobatele, F. A., Kpodo, P. C., & Eke, I. O. (2024). Strategies for enhancing international student retention: A critical literature review. *Open Access Research Journal of Science and Technology*, 10(2), 035-045.
- [8] Awofiranye, M. (2024). The challenges of using AI in education. Available from <https://www.afterschoolafrica.com/78994/the-challenges-of-using-ai-in-education/>
- [9] Bahroun, Z., Anane, C., Ahmed, V., & Zacca, A. (2023). Transforming education: A comprehensive review of generative artificial intelligence in educational settings through bibliometric and content analysis. *Sustainability*, 15(17), 12983. <https://doi.org/10.3390/su151712983>.
- [1] Bates, T., Cobo, C., Mariño, O., & Wheeler, S. (2020). Can artificial intelligence transform higher education? In (Vol. 17, pp. 1-12): Springer.
- [2] Chakma, D. (2019). Educational Planning: Nature and Characteristics and Principles of Educational Planning. Retrieved from <https://onlinenotebank.wordpress.com/2019/12/21/educational-planning-nature-and-characteristics-and-principles/>

- [3] Chen, F. (2022). Human-AI cooperation in education: human in loop and teaching as leadership. *Journal of Educational Technology and Innovation*, 2(1), 14-25. <https://doi.org/10.61414/jeti.v2i1.34>
- [4] Fullan, M., Azorín, C., Harris, A., & Jones, M. (2023). Artificial intelligence and school leadership: challenges, opportunities and implications. *School Leadership and Management*, 1(1), 56- 67.
- [5] Gall, M., Gall, J., & Borg, R. (2007). *Educational research an introduction* (8th ed.). New York, NY Pearson Education.
- [6] Gregory, D., & Jegede, D. (2021). Educational Planning in Nigeria: Problems and the Ways Forward. *Central Asian Journal of Literature, Philosophy and Culture*, 2(2), 41-48.
- [7] Hwang, G.-J., & Chen, C.-H. (2020). Artificial Intelligence in Education: A Review. *Educational Technology Research and Development*, 68(1), 61-96.
- [8] Igbokwe, I. C. (2024). Artificial Intelligence in Educational Leadership: Risks and Responsibilities. *European Journal of Arts, Humanities and Social Sciences*, 1(6), 3–10. [https://doi.org/10.59324/ejahss.2024.1\(6\).01](https://doi.org/10.59324/ejahss.2024.1(6).01)
- [9] Kaur, S., Tandon, N., & Matharou, G. S. (2020). Contemporary trends in education transformation using artificial intelligence. In *Transforming Management Using Artificial Intelligence Techniques* (pp. 89-103). CRC Press. <https://doi.org/10.1201/9781003032410-7>
- [10] Lion, C. J. and Ekefre, A. E. (2024). Risk Control and Management in Banking Sector: Investigating the Work of Artificial Intelligence in Mitigating Risks. *International Journal of Advancement in Education, Management, Science and Technology*, 7(1), 82-92.
- [11] Nanbak, J. A. (2020). An analysis of secondary education in Nigeria: A need for rethinking in a philosophical perspective. *BSUJEM*, 2(1), 12-22.
- [12] Niedbal R. & Pytel-Kopcznska, M. (2024). The Pro spect of AI Using in Shaping the Employees' Well-Being. Silesian University of Technology Publishing House. <https://managementpapers.pols>.
- [13] Olatunde-Aiyedun, T. G. (2024). Artificial intelligence (AI) in education: integration of AI into science education curriculum in Nigerian universities. *Int J Artif Intell Digit*, 1(1), 14-24.
- [14] Osiesi, M. P. (2023). Emerging Issues in Educational Planning and Management in Nigeria: Implications for Educational Evaluators. *International Journal of Academic and Applied Research (IJAAR)*, 7(2), 60-64.
- [15] Owoade, O., & Oladimeji, R. (2024). Empowering SMEs: Unveiling business analysis tactics in adapting to the digital era. *Journal of Scientific and Engineering Research*, 11(5), 113-123.
- [16] Pope, N. (2020). AI-Based Scheduling Systems: Enhancing Educational Efficiency. *Educational Technology Research and Development*, 68(2), 351-368. <https://doi.org/10.1007/s11423-019-09728-0>
- [17] Sanusi, I. T., Olaleye, S. A., Agbo, F. J., & Chiu, T. K. F. (2022). The role of learners' competencies in artificial intelligence education. *Computers & Education: Artificial Intelligence*, 3(1), 34-45.
- [18] Sarwar M. & Saima A. (2024). The Role of Artificial Intelligence in Shaping the Future of Education at Higher Secondary Level. *Journal of Education and Social Studies, Science Impact Publishers*, 5(1), 34-45.

- [19] Ufot, S. I. (2024). Artificial Intelligence and Digital Marketing: Assessing the AI Enhancing Tools for Effective Marketing in Akwa Ibom State. *Global Academic Journal of Library and Information Science (GAJLIS)*, 3(1), 87-95.
- [20] Ughenu, N. P. Ukandu, C. J., Okeke, U. N. Akpulue, C. E., & Uju, U. (2025). Leveraging Artificial Intelligence in Educational Planning and Management of Secondary Schools in Nigeria. *World Journal of Innovation and Modern Technology*, 9(4), 62-73.

AUNIC 2025