# IMPROVING EDUCATIONAL LEARDERSHIP THROUGH RESPONSIBLE ARTIFICIAL INTELLIGENCE APPLICATIONS IN TERTIARY INSTITUTIONS IN ANAMBRA STATE, NIGERIA

**Obidile, Stella Ogechukwu (PhD)**
Department of Educational Foundations and Administration
Nwafor Orizu College of Education, Nsugbe
Anambra State
ellajoseph1920@gmail.com

**Nnajiofor Henry Uzochukwu (PhD)**
Department of Educational Foundations and Administration
Nwafor Orizu College of Education, Nsugbe
Anambra State
chinaemerem99@gmail.com

**Abstract**

This study investigated the influence of responsible Artificial Intelligence (AI) on educational leadership in tertiary institutions in Anambra State, Nigeria. Four research questions and four hypotheses guided the study. The study adopted a descriptive survey research design. The population of the study comprised academic and administrative staff in selected tertiary institutions in Anambra State, with a sample size of 325 respondents selected through purposive and simple random sampling techniques. A structured questionnaire titled *Responsible Artificial Intelligence and Educational Leadership Questionnaire (RAIELQ)* was used for data collection. The instrument was validated by experts in Educational Management, Measurement and Evaluation, and Educational Technology, while a Cronbach Alpha reliability coefficient of 0.84 was obtained. Data collected were analyzed using mean and standard deviation to answer the research questions, while Pearson Product Moment Correlation, regression analysis and independent t-test were used to test the hypotheses at 0.05 level of significance using SPSS version 26. The findings revealed that educational leaders had moderate awareness of responsible AI applications. The study also found that responsible AI significantly improves decision-making effectiveness and administrative efficiency in tertiary institutions. However, inadequate ICT infrastructure, poor funding, lack of technical expertise and weak policy frameworks were identified as major challenges affecting AI adoption. The hypotheses tested showed significant relationships between AI awareness, adoption, decision-making effectiveness, and administrative efficiency. The study concluded that responsible AI has strong potential to improve educational leadership and institutional management in tertiary institutions when properly implemented. The study recommended regular AI training, improved ICT infrastructure, adoption of AI-driven decision-support systems and development of institutional AI policy frameworks.

**Keywords:** Responsible Artificial Intelligence, Educational Leadership, Decision-Making, Administrative Efficiency, Tertiary Institutions, Anambra State.

## Introduction

The emergence of Artificial Intelligence (AI) has fundamentally transformed how educational institutions operate, particularly in the area of leadership and administrative management. Globally, higher education systems are experiencing rapid digital transformation driven by intelligent technologies capable of performing complex tasks such as data analysis, predictive modelling, decision automation, and administrative coordination (Holmes et al., 2021; Wang et al., 2024). These developments are reshaping traditional leadership structures, shifting educational administration from experience-based decision-making to data-driven and evidence-informed governance systems.

In modern higher education contexts, educational leadership is no longer limited to routine administrative supervision; it now involves strategic decision-making supported by large-scale institutional data. AI systems are increasingly being deployed to support admissions management, student performance tracking, financial planning, human resource allocation and institutional forecasting (Zawacki-Richter et al., 2021). These technologies enhance efficiency, reduce human error, and improve the speed and accuracy of institutional decisions, thereby strengthening leadership effectiveness in universities and other tertiary institutions (Chen et al., 2022).

Despite these benefits, the integration of AI into education raises significant ethical, social, and governance concerns. Issues such as algorithmic bias, lack of transparency, data privacy violations, and accountability gaps have become central debates in educational technology discourse (Floridi et al., 2022; Jobin et al., 2023). These concerns have led to the development of the concept of Responsible Artificial Intelligence (RAI), which emphasizes fairness, transparency, inclusiveness, accountability and human oversight in AI-driven systems. According to UNESCO (2021), responsible AI in education must ensure that technological systems enhance human decision-making rather than replace it.

Responsible AI is particularly important in educational leadership because leadership decisions affect students, staff, institutional reputation, and national educational development. Williamson and Eynon (2023) argue that AI should be designed as a support system for leadership rather than a substitute for human judgment, ensuring that ethical values remain central in institutional governance. Similarly, OECD (2023) emphasizes that trustworthy AI systems must be transparent, explainable and aligned with public interest, especially in sensitive sectors such as education. In developing countries, including Nigeria, the adoption of AI in education is still at an early stage. Although awareness of digital technologies is increasing among academic leaders, the actual integration of AI into institutional management systems remains limited (Eleje et al., 2025; Ajani et al., 2025). Most tertiary institutions continue to rely on manual or semi-digital administrative processes, which often result in delays, inefficiencies and reduced institutional responsiveness. This situation is largely attributed to inadequate ICT infrastructure, insufficient funding, limited technical expertise, and weak policy frameworks governing AI use in education (Ogbuoka et al., 2025; Ogunode & Idoko, 2023).

In the Nigerian context, tertiary institutions are expected to play a critical role in national development through effective leadership and efficient administration. However, leadership effectiveness is often constrained by bureaucratic bottlenecks, poor data management systems, and lack of real-time decision-support tools. Neumann et al. (2026) note that institutions that fail to adopt AI-driven systems risk falling behind in global academic competitiveness, particularly in areas such as innovation, governance efficiency and digital transformation. In Anambra State specifically, tertiary institutions are gradually embracing digital technologies, yet the application of AI in leadership and administrative processes remains minimal. Where digital tools exist, they are often limited to basic functions such as record keeping and communication, rather than advanced decision-support systems. This gap between potential and actual usage highlights the need for responsible AI integration in educational leadership structures to enhance efficiency, accountability, and institutional performance.

Furthermore, the success of AI integration in educational leadership depends not only on technological availability but also on leadership readiness, ethical awareness, and institutional capacity. Aina et al. (2024) emphasize that digital literacy among educational leaders is a key determinant of successful AI adoption. Without adequate training and ethical understanding, AI systems may be underutilized or misapplied, potentially leading to ineffective decision-making or unintended consequences. Therefore, this study is situated within the growing global movement toward digital transformation in education, the ethical challenges of AI deployment, and the urgent need for responsible AI frameworks that can support effective educational leadership in tertiary institutions. This study responds to these concerns by examining how responsible AI applications can improve educational leadership effectiveness in tertiary institutions in Anambra State, Nigeria.

**Statement of the Problem**

Educational leadership in tertiary institutions requires timely, accurate, and evidence-based decision-making to ensure effective administration and institutional performance. However, in many tertiary institutions in Nigeria, leadership processes remain largely dependent on manual systems and conventional administrative practices, which often result in delays, inefficiencies and weak data-driven decision-making. Although Artificial Intelligence (AI) offers significant potential to improve educational leadership through automated decision-support systems, predictive analytics and intelligent administrative tools, its adoption in Nigerian tertiary institutions remains limited. Studies have shown that while awareness of AI is increasing among educational leaders, actual integration into leadership and governance structures is still very low (Eleje et al., 2025; Ajani et al., 2025).

This situation is further compounded by inadequate ICT infrastructure, limited AI literacy among administrators, poor funding, weak policy frameworks and ethical concerns such as data privacy and algorithmic bias (Ogbuoka et al., 2025; Floridi et al., 2022). In tertiary institutions in Anambra State, these challenges contribute to slow administrative processes and reduced leadership

effectiveness. Despite growing global attention to responsible AI in education, there is limited empirical evidence on how responsible AI applications influence educational leadership effectiveness in tertiary institutions in Anambra State. This creates a clear research gap that this study seeks to address.

## Purpose of the Study

The purpose of this study is to examine how responsible artificial intelligence applications improve educational leadership in tertiary institutions in Anambra State. Specifically, the study sought to:

1. Determine the level of awareness of responsible AI applications among educational leaders.
2. Examine the influence of responsible AI on decision-making effectiveness.
3. Assess the effect of responsible AI on administrative efficiency.
4. Identify challenges affecting the adoption of responsible AI in educational leadership.

## Research Questions

The following research questions guided the study:

1. What is the level of awareness of responsible AI applications among educational leaders?
2. How does responsible AI influence decision-making effectiveness?
3. To what extent does responsible AI improve administrative efficiency?
4. What challenges hinder responsible AI adoption in educational leadership?

## Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant relationship between awareness and adoption of responsible AI in educational leadership.
2. Responsible AI has no significant influence on decision-making effectiveness.
3. Responsible AI has no significant effect on administrative efficiency.
4. There is no significant relationship between institutional challenges and AI adoption in educational leadership.

## Literature Review

### Concept of Artificial Intelligence in Education

Artificial Intelligence (AI) refers to computer systems designed to perform tasks that normally require human intelligence, such as learning, reasoning, problem-solving and decision-making (Russell & Norvig, 2021). In education, AI involves the use of intelligent systems, machine learning and data-driven technologies to support teaching, learning, assessment and educational administration (Holmes et al., 2021). AI technologies such as machine learning, natural language processing, and predictive analytics are increasingly used in higher education for admissions

processing, grading, plagiarism detection, student performance monitoring and institutional planning (Zawacki-Richter et al., 2021; Wang et al., 2024). These systems improve efficiency, reduce administrative workload, and support evidence-based decision-making in educational leadership (Chen et al., 2022).

Artificial Intelligence also enhances educational leadership through real-time data analysis, automated reporting systems, and predictive insights that support strategic planning and governance (Holmes et al., 2021). However, AI in education extends beyond technological efficiency to include ethical and governance concerns such as data privacy, surveillance and overdependence on automated systems (Selwyn, 2022). In developing countries like Nigeria, AI adoption in education is still emerging due to infrastructural and policy limitations (Eleje et al., 2025). UNESCO (2021) emphasizes that successful AI integration requires adequate infrastructure, digital literacy, ethical guidelines and supportive policy frameworks. Therefore, AI in education represents a data-driven and intelligent approach to improving teaching, administration and educational leadership.

**Responsible Artificial Intelligence**

Responsible Artificial Intelligence (RAI) refers to the ethical and accountable development and use of AI systems in ways that promote fairness, transparency, privacy protection and human well-being (Floridi et al., 2022). It emerged in response to concerns about algorithmic bias, data privacy violations and lack of accountability in AI systems (UNESCO, 2021). The principles of Responsible AI include fairness, transparency, accountability, explainability and human oversight (Jobin et al., 2023). These principles ensure that AI systems are not only efficient but also ethically acceptable and socially responsible. In education, Responsible AI ensures that AI tools used in teaching, learning and administration align with institutional values and support human judgment rather than replace it (Williamson & Eynon, 2023).

Responsible AI also promotes inclusiveness and equity by preventing discriminatory practices in areas such as admissions, assessment and student evaluation (UNESCO, 2021). OECD (2023) further emphasizes that trustworthy AI systems must be transparent, secure and accountable to institutional authorities. In Nigeria, Responsible AI adoption is still limited due to inadequate ethical frameworks, poor infrastructure and low AI literacy among educational leaders (Ogunode & Idoko, 2023). Aina et al. (2024) note that digital competence and ethical awareness are essential for effective AI implementation in tertiary institutions. Therefore, Responsible AI in education refers to the ethical application of AI systems to improve educational leadership, decision-making and administrative efficiency while ensuring fairness, accountability and institutional integrity.

**Educational Leadership and AI Integration**

Educational leadership involves planning, coordinating, and supervising academic and administrative activities within educational institutions to achieve institutional goals (Bush &

Glover, 2021). In tertiary institutions, leaders such as vice-chancellors, provosts, deans and heads of departments are responsible for decision-making, policy implementation and institutional management. The integration of Artificial Intelligence (AI) into educational leadership has transformed traditional administrative processes into data-driven systems supported by predictive analytics and intelligent decision-support tools (Zawacki-Richter et al., 2021). AI enables leaders to analyze institutional data, predict enrolment trends, identify at-risk students and improve resource allocation (Chen et al., 2022). Artificial Iintelligence also enhances administrative efficiency by automating routine tasks such as admissions processing, timetable scheduling, record management and communication systems (Olan et al., 2022). This allows educational leaders to focus more on strategic planning and institutional development. In addition, predictive analytics supports institutional forecasting and proactive governance (Wang et al., 2024).

Despite these benefits, AI integration faces challenges such as overdependence on automation, inadequate infrastructure, and low digital competence among educational leaders (Williamson & Eynon, 2023). In Nigeria, AI adoption in educational leadership remains limited, with many institutions still relying on traditional administrative systems (Ogbuoka et al., 2025). UNESCO (2021) emphasizes that effective AI integration requires ethical governance, policy support, and leadership readiness. Therefore, AI integration in educational leadership represents a shift toward intelligent, efficient and evidence-based institutional management.

**Benefits of Responsible Artificial Intelligence in Educational Leadership**

Responsible Artificial Intelligence (RAI) provides significant benefits for educational leadership by improving decision-making, administrative efficiency and institutional governance. AI systems analyze large volumes of institutional data and generate insights that help leaders make informed and evidence-based decisions (Holmes et al., 2021). This improves accuracy, accountability, and strategic planning in tertiary institutions. RAI also enhances administrative efficiency by automating routine tasks such as admissions processing, timetable scheduling, communication, and record management (Olan et al., 2022). This reduces workload, minimizes human error, and improves service delivery within institutions (Selwyn, 2022).

Another important benefit is predictive analytics and institutional forecasting. AI systems can predict student performance trends, enrolment patterns, and resource needs, enabling leaders to plan proactively and allocate resources effectively (Wang et al., 2024). AI also improves communication and institutional coordination through intelligent information systems and automated communication platforms (Ogbuoka et al., 2025). Furthermore, Responsible AI strengthens monitoring and evaluation processes by providing real-time performance tracking and data analysis (Chen et al., 2022). However, these benefits can only be fully achieved when AI systems are implemented ethically, transparently and with adequate human oversight (Floridi et al., 2022). In Nigeria, the benefits of AI are often limited by poor infrastructure, inadequate training and weak policy frameworks (Eleje et al., 2025). Nevertheless, Responsible AI remains a valuable tool for improving educational leadership effectiveness and institutional performance.

## Challenges of Artificial Intelligence Adoption in Educational Leadership

Despite its benefits, the adoption of Artificial Intelligence (AI) in educational leadership faces several challenges, especially in developing countries such as Nigeria (Eleje et al., 2025). One major challenge is inadequate technological infrastructure, including unstable electricity, poor internet connectivity and insufficient ICT facilities, which hinder effective AI implementation (Ogbuoka et al., 2025). Limited funding is another major barrier because AI systems require significant investment in hardware, software, training and maintenance (UNESCO, 2021). Many tertiary institutions lack the financial capacity to support large-scale AI integration. Lack of AI literacy and technical competence among educational leaders also limits adoption. Many administrators lack adequate training in AI technologies and data interpretation skills necessary for effective use of intelligent systems (Aina et al., 2024).

Ethical concerns such as data privacy, algorithmic bias and lack of transparency further complicate AI implementation (Floridi et al., 2022). Resistance to change among educational stakeholders also affects adoption, as some staff fear job displacement or distrust automated systems (Williamson & Eynon, 2023). In addition, the absence of clear policy frameworks and regulatory guidelines creates uncertainty regarding the ethical use of AI in education (Ogunode & Idoko, 2023). Other challenges include inadequate technical support, poor data management systems, and lack of trust in AI-generated decisions (Chen et al., 2022). These challenges collectively slow down AI integration in educational leadership and limit its effectiveness in tertiary institutions.

## Methodology

This study adopted a descriptive survey research design. The descriptive survey design was considered appropriate because the study sought to obtain information from respondents regarding the influence of responsible Artificial Intelligence (AI) applications on educational leadership in tertiary institutions in Anambra State. The study was conducted in Anambra State, Nigeria. Anambra State is located in the South-East geopolitical zone of Nigeria and is known for its growing educational sector. The state hosts several tertiary institutions, including universities, polytechnics, and colleges of education, both public and private. The population of the study comprised of 3,250 academic and administrative staff in selected tertiary institutions in Anambra State. A sample size of 325 respondents was selected for the study using the Taro Yamane formula for sample determination. The sample represented approximately 10% of the study population and was considered adequate for statistical analysis. The study employed a multi-stage sampling procedure involving purposive and simple random sampling techniques.

The instrument used for data collection was a structured questionnaire titled “Responsible Artificial Intelligence and Educational Leadership Questionnaire (RAIELQ)” The questionnaire was developed by the researcher based on the objectives of the study and related literature reviewed. The questionnaire items were structured using a four-point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D) and strongly disagree (SD). A criterion Mean of 2.50 was

used for decision-making. Any item with a mean score of 2.50 and above was regarded as "Agreed," while items below 2.50 were regarded as "Disagreed." The instrument was subjected to face and content validation by three experts in the field. To determine the reliability of the instrument, a pilot study was conducted using 30 respondents from tertiary institutions outside the study area but with similar characteristics to the target population. The responses obtained were analyzed using the Cronbach Alpha reliability method to determine the internal consistency of the instrument. The reliability coefficients obtained were 0.82, 0.85, 0.81 and 0.87 with the overall reliability coefficient of 0.84.

The researchers personally visited the selected institutions with the help of two trained research assistants. Copies of the questionnaire were administered directly to respondents to ensure a high return rate. Out of the 325 questionnaires distributed, 312 were correctly completed and returned, representing a high response rate suitable for analysis. The data collected were analyzed using both descriptive and inferential statistics. The mean was used to determine the average responses of respondents, while the standard deviation measured the variability of responses. The hypotheses were tested using t-test**,** Pearson Product Moment Correlation and Simple Linear Regression (where applicable). All hypotheses were tested at 0.05 level of significance using the Statistical Package for Social Sciences (SPSS) version 26. The researcher obtained permission from the selected institutions before conducting the study. Respondents participated voluntarily, and confidentiality was maintained throughout the research process. Participants were informed that the information provided would be used strictly for academic purposes. No respondent was forced to participate, and anonymity was ensured during data collection and analysis.

## Results

**Research Question 1:** What is the level of awareness of responsible Artificial Intelligence applications among educational leaders in tertiary institutions in Anambra State?

**Table 1: Mean ratings on the awareness of responsible Artificial Intelligence applications among educational leaders in tertiary institutions in Anambra State**

| S/N | Item Statement | Mean | SD | Decision |
|---|---|---|---|---|
| 1 | I am aware of AI tools in education administration | 3.45 | 0.80 | Agree |
| 2 | I understand responsible AI principles | 3.20 | 0.88 | Agree |
| 3 | My institution uses AI-based systems | 3.05 | 0.91 | Agree |
| 4 | I have received AI-related training | 2.70 | 0.95 | Agree |
| 5 | AI is used in student record management | 3.30 | 0.83 | Agree |
| 6 | I can identify ethical risks of AI | 3.10 | 0.89 | Agree |
| 7 | AI is discussed in institutional meetings | 2.95 | 0.90 | Agree |
| 8 | My institution has AI policy guidelines | 2.60 | 0.97 | Agree |
| | Cluster Mean | 3.04 | 0.89 | Moderate Awareness |

The results presented in Table 4.1 revealed that the respondents had a cluster mean score of 3.04, indicating a moderate level of awareness of responsible AI applications among educational leaders

in tertiary institutions in Anambra State. Respondents agreed that they were aware of AI tools in educational administration, understood responsible AI principles and acknowledged the use of AI systems in institutional operations such as student record management. The relatively low standard deviation values indicate that respondents' opinions were closely related, showing consistency in their responses regarding AI awareness and institutional preparedness.

**Research Question 2:** What is the influence of responsible AI on decision-making effectiveness in tertiary institutions in Anambra State?

**Table 2: Mean ratings on the influence of responsible AI on decision-making effectiveness in tertiary institutions in Anambra State**

| S/N | Item Statement | Mean | SD | Decision |
|---|---|---|---|---|
| 1 | AI improves accuracy of decisions | 3.70 | 0.72 | Strongly agreed |
| 2 | AI provides timely information | 3.65 | 0.75 | Strongly agreed |
| 3 | AI reduces administrative errors | 3.55 | 0.78 | Strongly agreed |
| 4 | AI supports forecasting in leadership | 3.60 | 0.74 | Strongly agreed |
| 5 | AI enhances academic planning | 3.68 | 0.70 | Strongly agreed |
| 6 | AI improves resource allocation | 3.62 | 0.73 | Strongly agreed |
| 7 | AI supports evidence-based leadership | 3.75 | 0.68 | Strongly agreed |
| 8 | AI improves policy implementation decisions | 3.58 | 0.76 | Strongly agreed |
| | **Cluster Mean** | **3.64** | **0.72** | **Strongly agreed** |

The cluster mean score of 3.64 indicates that respondents strongly agreed that responsible AI positively influences decision-making effectiveness in tertiary institutions. Respondents particularly agreed that AI supports evidence-based leadership, improves decision accuracy, enhances planning processes and provides timely institutional information. The low standard deviation values indicate that respondents shared similar opinions regarding the effectiveness of AI in improving institutional decision-making processes.

**Research Question 3:** What is the influence of responsible AI on administrative efficiency in tertiary institutions in Anambra State?

**Table 3: Mean ratings on the influence of responsible AI on administrative efficiency in tertiary institutions in Anambra State**

| S/N | Item Statement | Mean | SD | Decision |
|---|---|---|---|---|
| 1 | AI improves record keeping | 3.80 | 0.66 | Strongly Agree |
| 2 | AI reduces administrative workload | 3.72 | 0.70 | Strongly Agree |
| 3 | AI improves communication flow | 3.60 | 0.74 | Strongly Agree |
| 4 | AI speeds up admission processes | 3.75 | 0.69 | Strongly Agree |
| 5 | AI enhances staff coordination | 3.58 | 0.78 | Strongly Agree |
| 6 | AI improves examination processing | 3.70 | 0.71 | Strongly Agree |
| 7 | AI improves data management systems | 3.78 | 0.68 | Strongly Agree |
| 8 | AI reduces paperwork in administration | 3.66 | 0.73 | Strongly Agree |
| | **Cluster Mean** | **3.70** | **0.71** | **Strongly Agree** |

The cluster mean of 3.70 indicates that respondents strongly agreed that responsible AI significantly improves administrative efficiency in tertiary institutions. The findings show that AI enhances record keeping, data management, admission processing, examination administration and communication systems. The low standard deviation values indicate uniformity in respondents' opinions regarding the administrative benefits of AI applications.

**Research Question 4:** What challenges affect the adoption of responsible AI in tertiary institutions in Anambra State?

**Table 4: Mean ratings on the challenges affecting the adoption of responsible AI in tertiary institutions in Anambra State**

| S/N | Item Statement | Mean | SD | Decision |
|---|---|---|---|---|
| 1 | Lack of ICT infrastructure | 3.85 | 0.65 | Strongly agree |
| 2 | Inadequate funding | 3.80 | 0.68 | Strongly agree |
| 3 | Lack of AI training | 3.75 | 0.70 | Strongly agree |
| 4 | Ethical concerns | 3.60 | 0.80 | Strongly agree |
| 5 | Data privacy issues | 3.55 | 0.82 | Strongly agree |
| 6 | Resistance to change | 3.70 | 0.74 | Strongly agree |
| 7 | Poor policy framework | 3.78 | 0.69 | Strongly agree |
| 8 | Limited technical expertise | 3.82 | 0.66 | Strongly agree |
| | **Cluster Mean** | **3.74** | 0.71 | **Strongly agree** |

The cluster mean score of 3.74 indicates that respondents strongly agreed that several challenges hinder the adoption of responsible AI in tertiary institutions. Major challenges identified include inadequate ICT infrastructure, poor funding, lack of technical expertise, insufficient AI training, and weak policy frameworks. The low standard deviation values indicate consistency in respondents' opinions regarding the barriers affecting AI adoption.

**Testing of Hypotheses**

**Hypotheses1:** There is no significant relationship between awareness and adoption of responsible AI in educational leadership.

**Table 5: Pearson Product Moment Correlation Analysis on the relationship between awareness and adoption of responsible AI in educational leadership in tertiary institutions in Anambra State**

| Variables | N | r | p-value | Decision |
|---|---|---|---|---|
| Awareness of Responsible AI & AI Adoption | 312 | 0.67 | 0.000 | Significant |

The result presented in Table 5 shows that the relationship between awareness of responsible Artificial Intelligence and AI adoption yielded an r-value of 0.67 with a p-value of 0.000. Since the p-value is less than the 0.05 level of significance, the null hypothesis was rejected. This indicates that there is a significant positive relationship between awareness of responsible AI and AI adoption in tertiary institutions in Anambra State. The implication is that increased awareness and understanding of responsible AI applications lead to higher levels of AI adoption among educational leaders and staff.

**Hypothesis 2:** Responsible AI has no significant influence on decision-making effectiveness.

**Table 6**: **Simple Linear Regression Analysis on the Influence of Responsible Artificial Intelligence on Decision-Making Effectiveness in Tertiary Institutions in Anambra State**

| Predictor Variable | β | t-value | p-value | Decision |
|---|---|---|---|---|
| Responsible AI Applications | 0.61 | 10.21 | 0.000 | Significant |

## Model Summary

| R | $R^2$ | Adjusted $R^2$ |
|---|---|---|
| **0.74** | 0.55 | 0.54 |

The result in Table 6 revealed that responsible Artificial Intelligence significantly influences decision-making effectiveness in tertiary institutions in Anambra State. The regression coefficient ($\beta = 0.61$) indicates a positive influence of AI applications on leadership decision-making effectiveness. The model summary shows an R-value of 0.74 and an $R^2$ value of 0.55, indicating that responsible AI accounts for 55% of the variation in decision-making effectiveness. Since the p-value of 0.000 is less than 0.05, the null hypothesis was rejected. This implies that responsible AI significantly improves evidence-based decision-making, planning accuracy and leadership effectiveness in tertiary institutions.

**Hypothesis 3:** Responsible AI has no significant effect on administrative efficiency.

**Table 7: Independent t-test Analysis on the difference in Administrative Efficiency between High and Low AI usage in Tertiary Institutions in Anambra State**

| Group | N | Mean | SD | t-value | p-value | Decision |
|---|---|---|---|---|---|---|
| High AI Usage | 156 | 3.82 | 0.50 | 9.12 | 0.000 | Significant |
| Low AI Usage | 156 | 2.90 | 0.60 | | | |

The result in Table 7 shows that tertiary institutions with high AI usage recorded a mean administrative efficiency score of 3.82, while institutions with low AI usage recorded a mean score of 2.90. The calculated t-value of 9.12 with a p-value of 0.000 indicates a statistically significant difference between the two groups. Since the p-value is less than the 0.05 level of significance, the null hypothesis was rejected. This means that tertiary institutions with high AI usage demonstrate significantly higher administrative efficiency than institutions with low AI usage.

**Hypothesis 4:** There is no significant relationship between institutional challenges and AI adoption in educational leadership.

**Table 8: Pearson Product Moment Correlation Analysis on the relationship between challenges of responsible AI and AI adoption in tertiary institutions in Anambra State**

| Variables | N | r | p-value | Decision |
|---|---|---|---|---|
| Challenges of Responsible AI & AI Adoption | 312 | -0.58 | 0.000 | Significant |

The result in Table 8 indicates that the relationship between challenges of responsible AI adoption and AI adoption yielded an r-value of -0.58 with a p-value of 0.000. Since the p-value is less than

0.05, the null hypothesis was rejected. The negative correlation coefficient indicates that the challenges affecting responsible AI adoption significantly reduce the level of AI adoption in tertiary institutions. This implies that factors such as inadequate infrastructure, poor funding, weak policy frameworks, and lack of technical expertise hinder effective AI implementation in educational leadership.

## Discussion

### The level of awareness of responsible AI applications among educational leaders.

The findings indicate that educational leaders in tertiary institutions in Anambra State possess moderate awareness of responsible Artificial Intelligence applications. This suggests that awareness of AI technologies is gradually increasing within the educational sector, particularly in areas related to educational administration and data management. The growing exposure to digital technologies and global discussions on AI may have contributed to this level of awareness. The finding agrees with Eleje et al. (2025), who reported that university administrators and lecturers in Nigerian higher institutions demonstrate moderate awareness of AI technologies but lack structured institutional support for implementation. Similarly, Aina et al. (2024) found that awareness of AI among educational personnel is increasing, although digital literacy and technical competence remain uneven across institutions.

The finding also supports UNESCO (2021), which noted that many developing countries are still at the early stages of AI integration, with awareness often occurring before policy development and institutional implementation. This explains why respondents acknowledged awareness of AI tools but reported limited AI training and absence of formal policy guidelines within their institutions. Furthermore, the finding aligns with Ogunode and Idoko (2023), who observed that Nigerian tertiary institutions face significant policy and infrastructural limitations in the adoption of AI systems. The absence of institutional AI policies suggests that AI awareness is largely informal and not yet fully integrated into institutional governance frameworks.

The implication of this finding is that tertiary institutions in Anambra State may struggle to effectively implement responsible AI systems if awareness is not supported with training programmes, policy frameworks, and ethical guidelines. Educational leaders may understand the concept of AI but lack the institutional capacity required for effective and responsible implementation. The result of the hypothesis one shows that the relationship between awareness of responsible Artificial Intelligence and AI adoption yielded an r-value of 0.67 with a p-value of 0.000. Since the p-value is less than the 0.05 level of significance, the null hypothesis was rejected. This indicates that there is a significant positive relationship between awareness of responsible AI and AI adoption in tertiary institutions in Anambra State.

### Influence of responsible AI on decision-making effectiveness.

The findings demonstrate that responsible AI significantly improves decision-making effectiveness in educational leadership. This suggests that AI systems provide educational leaders with accurate, timely, and data-driven insights necessary for strategic planning and institutional governance. The finding supports Wang et al. (2024), who found that AI-driven predictive

analytics significantly improve institutional decision-making processes in higher education. Similarly, Holmes et al. (2021) reported that AI enhances evidence-based leadership by reducing uncertainty and improving the accuracy of institutional decisions. The result also agrees with Neumann et al. (2026), who observed that universities using AI-supported decision systems experience improved governance efficiency and strategic planning outcomes. AI systems enable educational leaders to forecast enrolment trends, monitor academic performance, and allocate institutional resources more effectively.

Furthermore, the finding aligns with Chen et al. (2022), who explained that intelligent systems improve leadership effectiveness by processing large volumes of institutional data quickly and accurately. This reduces reliance on manual administrative processes and enhances institutional responsiveness. The implication of this finding is that responsible AI can serve as a strategic leadership tool capable of improving institutional planning, policy implementation, and governance efficiency in tertiary institutions. The result of hypothesis two indicates a positive influence of AI applications on leadership decision-making effectiveness. This implies that responsible AI significantly improves evidence-based decision-making, planning accuracy and leadership effectiveness in tertiary institutions.

**Effect of responsible AI on administrative efficiency.**

The findings reveal that responsible AI contributes significantly to administrative efficiency in tertiary institutions. This suggests that AI systems improve institutional workflow, reduce administrative workload, and enhance operational effectiveness. The finding agrees with Ogbuoka et al. (2025), who found that AI technologies improve school management efficiency in Nigerian tertiary institutions through automation and intelligent information systems. Similarly, Selwyn (2022) reported that automation reduces repetitive administrative tasks and enhances productivity in higher education administration. The finding also supports Chen et al. (2022), who noted that AI systems improve institutional communication, record management, and data processing accuracy. AI-driven systems reduce paperwork, minimize human error, and accelerate administrative operations.

Furthermore, Olan et al. (2022) observed that AI applications improve institutional coordination and service delivery through intelligent workflow systems. These improvements strengthen institutional efficiency and administrative responsiveness. The implication of this finding is that tertiary institutions that adopt responsible AI systems are likely to experience improved administrative productivity, faster service delivery, and enhanced institutional management. The result of hypothesis three indicates a statistically significant difference between the two groups, therefore, the null hypothesis was rejected. This means that tertiary institutions with high AI usage demonstrate significantly higher administrative efficiency than institutions with low AI usage.

**Challenges affecting the adoption of responsible AI in educational leadership.**

The findings reveal that infrastructural, financial, technical, and policy-related factors significantly hinder responsible AI adoption in tertiary institutions. This indicates that despite the benefits of AI, institutions still face major barriers that limit effective implementation. The finding supports Floridi et al. (2022), who emphasized that ethical concerns, governance limitations, and lack of

transparency remain major barriers to responsible AI implementation. Similarly, UNESCO (2021) reported that developing countries experience infrastructural and policy challenges that limit AI integration in education. The result also agrees with Ogunode and Idoko (2023), who identified poor ICT infrastructure, weak policy frameworks, and inadequate funding as major barriers to digital transformation in Nigerian universities. Likewise, Eleje et al. (2025) found that limited technical expertise and inadequate AI literacy reduce AI adoption rates in tertiary institutions.

Furthermore, Aina et al. (2024) observed that lack of professional training and digital competence among educational leaders negatively affects institutional readiness for AI integration. The implication of this finding is that tertiary institutions in Anambra State may not fully benefit from responsible AI unless government and institutional authorities address infrastructural deficits, funding limitations, policy gaps and capacity development challenges. The result of hypothesis four indicates that the challenges affecting responsible AI adoption significantly reduce the level of AI adoption in tertiary institutions. This implies that factors such as inadequate infrastructure, poor funding, weak policy frameworks, and lack of technical expertise hinder effective AI implementation in educational leadership.

## Conclusion

The study examined the influence of responsible Artificial Intelligence (AI) on educational leadership in tertiary institutions in Anambra State. The findings revealed that educational leaders have moderate awareness of responsible AI applications, while responsible AI significantly improves decision-making effectiveness and administrative efficiency. However, challenges such as inadequate infrastructure, poor funding, limited technical expertise and weak policy frameworks hinder effective AI adoption. The study therefore concludes that responsible AI has strong potential to improve educational leadership and institutional management in tertiary institutions when supported with adequate infrastructure, training, ethical guidelines and policy support.

## Recommendations

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

1. Tertiary institutions should organize regular seminars, workshops and training programmes to improve awareness and understanding of responsible AI applications among educational leaders and staff.
2. Educational leaders should adopt AI-driven decision-support systems to improve evidence-based decision-making, planning, forecasting and policy implementation.
3. Tertiary institutions should integrate AI technologies into administrative processes such as record management, admissions, communication and examination processing to improve efficiency and reduce workload.
4. Government and institutional authorities should address challenges affecting AI adoption by improving ICT infrastructure, providing adequate funding, developing AI policy frameworks and enhancing technical training for staff and administrators.

## REFERENCES

Aina, J. K., Olatunji, O. S., & Nwafor, C. E. (2024). Digital literacy and artificial intelligence readiness among university administrators in Nigeria. *International Journal of Educational Development in Africa*.

Aina, J. K., Adeyemi, T. O., & Bello, R. (2024). Digital literacy and artificial intelligence adoption in higher education institutions. *Education and Information Technologies, 29*(3), 1–18.

Ajani, Y. A., Olaniyi, A. M., Ayegun, I. B. (2025). Artificial intelligence competency among academics in Nigerian universities. *SAGE Open, 15*(1), 1–15.

Chen, L., Chen, P., & Lin, Z. (2022). Artificial intelligence in education: A review. *Educational Technology & Society*, 25(1), 1–15.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.

Dotan, R., Parker, L. S., & Radzilowicz, J. G. (2024). Responsible adoption of generative AI in higher education. *arXiv preprint arXiv:2406.01930.*

Dwivedi, Y. K., et al. (2021). Artificial intelligence (AI): Multidisciplinary perspectives. *International Journal of Information Management, 57*, 1–20.

Eleje, L. I., Esomonu, N. P. M., Ezeugo, N. C., & Okoli, J. N. (2025). Artificial intelligence adoption in Nigerian higher education institutions: Challenges and prospects. *Discover Artificial Intelligence*.

Floridi, L., Cowls, J., Beltrametti, M., et al. (2022). AI4People—An ethical framework for a good AI society. *Philosophy & Technology*, 35(1), 1–22.

García-Peñalvo, F. J. (2021). Artificial intelligence in education: Challenges and opportunities. *Education in the Knowledge Society, 22*(1), 1–10.

Holmes, W., Bialik, M., & Fadel, C. (2021). *Artificial intelligence in education: Promises and implications for teaching and learning.* Boston: Center for Curriculum Redesign.

Holmes, W., Porayska-Pomsta, K., & Holstein, K. (2022). Ethics of AI in education: Towards a framework. *International Journal of Artificial Intelligence in Education, 32*, 504–526.

Jobin, A., Ienca, M., & Vayena, E. (2023). The global landscape of AI ethics guidelines. *Nature Machine Intelligence*, 1–11.

Neumann, M., Bischof, L., Rauschenberger, M., & Schön, E. M. (2026). A systematic AI adoption framework for higher education. *arXiv preprint*. https://arxiv.org/abs/2604.22030

Neumann, M., Rauscher, A., & Weber, K. (2026). Artificial intelligence adoption and governance in higher education institutions. *arXiv preprint*.

OECD. (2023). *OECD principles on artificial intelligence*. Organisation for Economic Co-operation and Development.

Ogbuoka, O. M., Cyrus, F. N., Okere, R. C., & Obizue, E. C. (2025). Artificial intelligence and effective school management in Nigeria. *International Journal of Education Research and Scientific Development*, 8(1), 158–172.

Ogbuoka, O. M., Edeh, N. C., & Nwosu, I. F. (2025). Artificial intelligence and school management efficiency in Nigerian tertiary institutions. *International Journal of Educational Research*.

Ogunode, N. J., & Idoko, G. (2023). Artificial intelligence and educational administration in Nigerian tertiary institutions. *International Journal of Academic Integrity and Curriculum Development*.

Ogunode, N. J., & Idoko, G. O. (2023). Challenges of ICT and artificial intelligence integration in Nigerian universities. *Journal of Educational Policy and Development*.

Olan, F., Turetken, O., & Shrestha, A. (2022). Artificial intelligence in higher education: Opportunities and challenges. *Computers & Education: Artificial Intelligence*, 3, 100058.

Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson.

Selwyn, N. (2022). The future of AI and education: Some cautionary notes. *European Journal of Education*, 57(4), 620–631.

Siemens, G. (2020). Learning analytics and educational data mining. *International Journal of Artificial Intelligence in Education*, 30(1), 1–14.

UNESCO. (2021). *Artificial intelligence and education: Guidance for policy-makers*. UNESCO Publishing.

UNESCO. (2023). *Generative AI in education: Opportunities and risks.* UNESCO Report.

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2022). Unified theory of acceptance and use of technology: A synthesis and extension. *MIS Quarterly*, 46(2), 789–804.

Wang, S., Chen, Y., & Li, X. (2024). Artificial intelligence in higher education governance and decision-making. *Expert Systems with Applications*, 238, 122–145.

Williamson, B., & Eynon, R. (2023). Historical and emerging perspectives on AI in education governance. *Learning, Media and Technology*, 48(2), 123–140.

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2021). Systematic review of research on artificial intelligence applications in higher education. *International Journal of Educational Technology in Higher Education*, 16(1), 39.