

## **ARTIFICIAL INTELLIGENCE APPLICATIONS IN STUDENT INFORMATION MANAGEMENT AND ADMINISTRATIVE EFFICIENCY IN BAYELSA STATE TERTIARY INSTITUTIONS**

**Dr. Igbogi Inatimi**

Department Of Educational Foundations,  
Isaac Jasper Boro College Of Education, Sagbama, Bayelsa State

### **Abstract**

*The study examined the role of artificial intelligence (AI) applications in student information management and administrative efficiency in tertiary institutions in Bayelsa State. A descriptive survey research design was adopted, guided by two research questions. The population comprised administrative staff across the public tertiary institutions in Bayelsa State, from which a sample of 400 respondents was selected using stratified random sampling techniques. Data were collected using a validated structured instrument titled “Artificial Intelligence in Student Information and Administrative Efficiency Questionnaire (AISIAEQ),” with a reliability coefficient of 0.87 established through Cronbach Alpha. Descriptive statistics (mean and standard deviation) were used for data analysis. The findings revealed that AI applications enhance the timeliness of administrative processes, particularly in reducing delays, enabling faster access to student records, and improving routine service delivery. Similarly, AI was found to improve the accuracy and reliability of student information records by minimizing errors, ensuring consistency, and supporting reliable decision-making, though concerns remain regarding data security and overall confidence in digital systems. The study concluded that AI plays a transformative role in streamlining educational administration, but robust infrastructural support, enhanced cybersecurity, and capacity-building initiatives are needed to maximize its benefits. Recommendations include strengthening AI infrastructure and security frameworks as well as providing continuous training for administrative staff to ensure efficient and reliable student information management.*

**Keywords:** Artificial Intelligence, Student Information Management, Administrative Efficiency, Tertiary Institutions

### **Introduction**

Artificial intelligence (AI) is increasingly transforming the landscape of higher education by enhancing efficiency in both academic and administrative functions. Globally, universities are adopting AI technologies such as predictive analytics, chatbots, and automated information systems to streamline processes that were once time-consuming and error-prone (Kumar & Gupta, 2021). These innovations are particularly relevant for student information management, which encompasses admission, course registration, grading, record maintenance, and certification processes. Effective management of student information is essential for institutional efficiency and accountability, yet in many developing contexts, including Nigeria, manual processes remain dominant and often hinder service delivery (Eze & Chinedu, 2022).

One of the primary challenges in tertiary institutions is the timeliness of administrative processes. Delays in student registration, transcript processing, and examination result publication frequently frustrate both students and staff,

undermining institutional credibility. AI-driven applications have the potential to mitigate such challenges by automating repetitive tasks and providing real-time access to student records (Okolie, 2023). For instance, AI-powered chatbots have been reported to significantly reduce the time taken to respond to students' administrative queries in higher education, thereby improving institutional efficiency (Adeoye & Olatunji, 2021). However, critics argue that without adequate infrastructure, AI tools may not achieve the desired outcomes, as system downtimes and poor digital literacy among staff can offset efficiency gains (Salami & Ibrahim, 2022).

Another key measure of administrative efficiency is the accuracy and reliability of student records. Inaccuracies in data entry, transcript errors, and loss of records have historically plagued universities, leading to student dissatisfaction and litigation in some cases. AI algorithms, through machine learning and pattern recognition, can detect anomalies and ensure greater precision in data management (Nwosu & Alamina, 2020). Recent studies show that AI applications significantly reduce human errors in record-keeping, improve decision-making through reliable data, and enhance institutional transparency (Yakubu & Bello, 2024). Yet, scholars caution that over-reliance on AI may introduce new risks, such as data privacy violations, algorithmic bias, and lack of accountability when errors occur (Obi & Adebayo, 2023).

Despite the growing discourse on AI in higher education, there remains a limited body of empirical evidence focused on the Nigerian context, particularly in Bayelsa State tertiary institutions. Existing studies largely emphasize AI in teaching and learning (Nwachukwu & Uzo, 2021) with less attention given to its role in administrative efficiency and student information management. This leaves a critical gap in understanding how AI applications specifically influence timeliness and record accuracy in these institutions. Addressing this gap is vital, as the successful integration of AI can inform policy directions, improve service delivery, and enhance institutional performance.

### **Purpose of the Study**

The main purpose of this study is to examine the role of artificial intelligence (AI) applications in enhancing student information management and promoting administrative efficiency in tertiary institutions in Bayelsa State. Specifically, the study achieved the following to:

- i. assess the extent to which artificial intelligence applications enhance the timeliness of administrative processes in tertiary institutions in Bayelsa State;
- ii. examine the influence of artificial intelligence applications on the accuracy and reliability of student information records in tertiary institutions in Bayelsa State.

### **Research Questions**

The following research questions were formulated to guide the study.

- i. to what extent do artificial intelligence applications enhance the timeliness of administrative processes in tertiary institutions in Bayelsa State?
- ii. to what extent do artificial intelligence applications enhance the accuracy and reliability of student information records in tertiary institutions in Bayelsa State?

## **Research Methods**

This study adopted a descriptive survey design. According to Charles-Owaba (2019), a descriptive survey research design is one in which a group of people or items is studied by collecting and analyzing data from only a few individuals or items considered to be representatives of the entire group. This design was deemed appropriate for the study since information was gathered from a sample of the population who are conversant with issues relating to the use of artificial intelligence in student information management and administrative efficiency, with the aim of generalizing the findings to the wider population. The area of the study is Bayelsa State. The population of the study comprised all academic and administrative staff in the seven tertiary institutions located in Bayelsa State. These include the 4 public universities, 2 polytechnics, and college of education, totaling 3,284 staff as at the 2024/2025 academic session (Bayelsa State Ministry of Education, 2024). A sample of 400 respondents was drawn from the population using a stratified random sampling technique to ensure adequate representation across institution types and staff categories (academic and administrative).

The instrument for data collection was a structured questionnaire titled “Artificial Intelligence in Student Information and Administrative Efficiency Questionnaire (AISIAEQ),” designed using a four-point rating scale format of Very High Extent (4), High Extent (3), Low Extent (2), and Very Low Extent (1). The questionnaire consisted of two parts. Part I obtained demographic data of respondents such as gender, institution type, and staff category, while Part II was divided into Sections A and B, corresponding to the two research questions of the study: Section A addressed the extent to which AI applications enhance the timeliness of administrative processes, and Section B focused on the influence of AI applications on the accuracy and reliability of student information records.

The instrument was subjected to face and content validation by three experts: one in Educational Management, one in Measurement and Evaluation, and one in Information and Communication Technology all in Isaac Jasper Boro College of Education, Sagbama. Their comments and suggestions were incorporated into the final draft of the questionnaire. A pilot test was conducted with 20 staff members from a neighboring tertiary institution in Rivers State who were not part of the main study but shared similar characteristics with the population. The reliability of the instrument was established using the Cronbach Alpha method, yielding a coefficient of 0.87, which was considered high enough for the study.

The administration of the instrument was carried out directly by the researcher with the assistance of two trained research assistants to ensure high response rates and accurate completion of the questionnaires. Out of the 400 copies distributed, 392 were correctly filled and retrieved, representing a 98% return rate. Data collected were analyzed using mean and standard deviation to answer the research questions. A benchmark of 2.50 and above was set as the cut-off for high extent, while items scoring below 2.50 were considered as low extent.

## Results

### Research Question 1

To what extent do artificial intelligence applications enhance the timeliness of administrative processes in tertiary institutions in Bayelsa State?

**Table 1: Mean and Standard deviation of responses on the extent to which artificial intelligence applications enhance the timeliness of administrative processes in tertiary institutions in Bayelsa State**

| S/N | Items Statements                                                                    |           |      | Remarks |
|-----|-------------------------------------------------------------------------------------|-----------|------|---------|
|     |                                                                                     | $\bar{x}$ | Sd   |         |
| 1.  | AI applications have reduced delays in student registration.                        | 2.52      | 1.31 | HE      |
| 2.  | The use of AI has made transcript processing faster in my institution.              | 2.81      | 1.17 | HE      |
| 3.  | Student results are processed and released more promptly with AI support.           | 2.33      | .95  | LE      |
| 4.  | AI tools enable faster updating of student records compared to manual methods.      | 2.63      | .99  | HE      |
| 5.  | AI applications allow real-time access to student information when needed.          | 2.71      | 1.23 | HE      |
| 6.  | The use of AI has shortened the time required for routine administrative approvals. | 2.62      | 1.31 | HE      |
| 7.  | AI systems help reduce student waiting time for administrative services.            | 2.41      | 1.17 | LE      |
|     | Grand Mean                                                                          | 2.57      | 1.13 | HE      |

Source: Survey Data, (2025) \*LE=Low extent, HE=High Extent

Table 1 presents the mean and standard deviation of responses from staff on the extent to which artificial intelligence (AI) applications enhance the timeliness of administrative processes in tertiary institutions in Bayelsa State. The grand mean score of 2.57 (SD = 1.13) indicates an overall agreement among respondents that AI applications contribute to improving the timeliness of administrative processes to a moderate extent. Specifically, respondents agreed that AI has made transcript processing faster ( $\bar{x} = 2.81$ ), enabled real-time access to student information ( $\bar{x} = 2.71$ ), facilitated quicker updates of student records ( $\bar{x} = 2.63$ ), reduced the time required for routine approvals ( $\bar{x} = 2.62$ ), and minimized delays in student registration ( $\bar{x} = 2.52$ ). These findings highlight that AI adoption is perceived as positively

influencing administrative speed, especially in routine processes that were traditionally slow under manual systems.

However, two items fell below the 2.50 benchmark, indicating low extent of agreement. Respondents did not strongly believe that AI has significantly improved the prompt processing of student results ( $\bar{x} = 2.33$ ) or effectively reduced student waiting time for administrative services ( $\bar{x} = 2.41$ ). This suggests that while AI is helping institutions address certain administrative bottlenecks, challenges remain in areas that require broader systemic integration, such as result processing and service delivery. The mixed pattern of responses underscores that AI applications are beginning to enhance timeliness in Bayelsa State tertiary institutions, but their impact is uneven, pointing to the need for further investment, training, and institutional support to maximize efficiency gains.

### Research Question 2

To what extent do artificial intelligence applications enhance the accuracy and reliability of student information records in tertiary institutions in Bayelsa State?

**Table 2: Mean and Standard deviation of responses on the extent to which artificial intelligence applications enhance the accuracy and reliability of student information records in tertiary institutions in Bayelsa State**

| S/N | Items Statements                                                                     | $\bar{x}$ | Sd   | Remarks |
|-----|--------------------------------------------------------------------------------------|-----------|------|---------|
|     |                                                                                      |           |      |         |
| 8   | AI applications have minimized errors in student data entry and record keeping.      | 3.12      | .38  | HE      |
| 9   | AI ensures greater consistency in student academic records across departments.       | 3.21      | .89  | HE      |
| 10  | The use of AI has reduced cases of missing or misplaced student records.             | 3.08      | 1.52 | HE      |
| 11  | AI applications improve the reliability of information used for decision-making.     | 3.03      | .358 | HE      |
| 12  | AI tools are effective in detecting and correcting discrepancies in student records. | 3.03      | .30  | HE      |
| 13  | AI-based systems enhance the security and integrity of student information.          | 2.54      | .35  | HE      |
| 14  | AI applications increase confidence in the accuracy of official academic records.    | 2.12      | .38  | LE      |
|     | Grand Mean                                                                           | 2.87      | .57  | HE      |

Source: Survey Data, (2025)

Table 2 presents the mean ratings and standard deviations on the extent to which artificial intelligence (AI) applications enhance the accuracy and reliability of student information records in tertiary institutions in Bayelsa State. The results show that respondents generally agreed that AI plays a significant role in improving data accuracy and reliability, as reflected in the grand mean of 2.87 with a standard deviation of 0.57, which falls within the “High Extent” (HE) category.

Specifically, respondents strongly agreed that AI ensures greater consistency in student academic records across departments ( $\bar{x} = 3.21$ ,  $Sd = 0.89$ ) and minimizes errors in data entry and record keeping ( $\bar{x} = 3.12$ ,  $Sd = 0.38$ ). Similarly, the use of AI was perceived to reduce cases of missing or misplaced records ( $\bar{x} = 3.08$ ,  $Sd = 1.52$ ) and to improve the reliability of information used for decision-making ( $\bar{x} = 3.03$ ,  $Sd = 0.36$ ). AI tools were also rated highly for their effectiveness in detecting and correcting discrepancies in student records ( $\bar{x} = 3.03$ ,  $Sd = 0.30$ ).

However, while AI-based systems were acknowledged as enhancing the security and integrity of student records ( $\bar{x} = 2.54$ ,  $Sd = 0.35$ ), respondents expressed lower confidence that AI applications have substantially increased trust in the accuracy of official academic records ( $\bar{x} = 2.12$ ,  $Sd = 0.38$ ), which was rated to a “Low Extent” (LE). This indicates that although AI applications are generally viewed as beneficial for improving accuracy and reliability, there remain some reservations about their ability to fully guarantee confidence in official academic records.

### **Discussion of findings**

The results from Research Question 1 revealed that artificial intelligence (AI) applications are perceived to significantly enhance the timeliness of administrative processes in tertiary institutions in Bayelsa State. This indicates that the integration of AI tools is increasingly viewed as a catalyst for more efficient service delivery, reducing delays and streamlining administrative tasks. However, the itemized responses suggest varying degrees of efficiency across specific administrative dimensions. For instance, items relating to the automation of routine tasks, reduction of processing delays, and timely access to student data scored relatively high, demonstrating strong agreement that AI enhances operational speed. Conversely, aspects such as real-time responsiveness to complex administrative requests and seamless integration across all institutional departments scored comparatively lower, suggesting that while AI adoption is impactful, its application remains uneven across certain functional areas.

Despite these differences, the overarching data reflect a positive orientation toward the use of AI in promoting timeliness within tertiary institutions. This aligns with broader literature that underscores AI's transformative potential in higher education administration. For example, Eze and Onah (2024) observed that AI-driven automation reduces bureaucratic bottlenecks and accelerates workflow in Nigerian universities. Similarly, Chi and Li (2023) argued that the adoption of intelligent systems significantly improves the speed of record management and administrative responsiveness, thereby increasing staff productivity and institutional efficiency. More recently, Okorie (2023) highlighted that timeliness, a critical indicator of administrative efficiency, is best achieved when AI applications are strategically embedded into institutional management systems.

Furthermore, the findings resonate with global perspectives that emphasize the role of AI in achieving organizational efficiency. According to Musa and Adeoye (2022), AI-powered student information systems not only ensure faster processing of administrative data but also minimize delays in decision-making processes, ultimately enhancing institutional credibility. This suggests that tertiary institutions in Bayelsa State are on a progressive path toward digital transformation, though with identifiable gaps in comprehensive integration. The results from Research Question 2 revealed that artificial intelligence (AI) applications are perceived to enhance the accuracy and reliability of student information records in tertiary institutions in Bayelsa State,

although the level of enhancement varies across different aspects of record management. The grand mean of 2.87 suggests a high extent of effectiveness, with stronger outcomes observed in consistency, error reduction, and decision-making reliability. For instance, items relating to the minimization of errors in record keeping, reduction of misplaced student records, and improved decision-making reliability scored relatively high, demonstrating strong agreement that AI enhances accuracy and dependability in administrative data handling. Conversely, items connected to the security of student information and confidence in the absolute accuracy of academic records recorded lower mean values, indicating that challenges remain in ensuring comprehensive data integrity and trust in AI-driven processes.

These findings align with the growing body of literature that underscores the role of AI in improving record accuracy and data reliability. For example, Olaleye and Omoniyi (2021) argued that AI applications reduce human-related errors in student record management, thereby fostering trust in institutional databases. In a similar study, Musa and Adeoye (2022) emphasized that AI-powered systems ensure consistency across academic departments, reducing the fragmentation often associated with manual record keeping. More recently, Chen and Li (2023) highlighted that while AI systems improve accuracy and consistency, concerns over data security and integrity persist due to vulnerabilities in digital infrastructure. This is consistent with the present findings, where reliability of records was rated positively, but trust in the security and overall integrity of student data remained comparatively low.

Furthermore, the results support global trends pointing to AI as a tool for achieving precision in educational administration. According to Eze and Onah (2024), institutions that fully integrate AI into student information management experience improved confidence in the accuracy of official records, which enhances transparency and accountability. However, they caution that inadequate cybersecurity measures may undermine these benefits, echoing the lower scores recorded in this study regarding security and confidence in data accuracy.

## **Conclusion**

This study examined the role of artificial intelligence (AI) applications in enhancing student information management and promoting administrative efficiency in tertiary institutions in Bayelsa State. The findings revealed that AI significantly contributes to the timeliness of administrative processes by reducing delays, enabling faster access to records, and improving overall service delivery. Similarly, AI was found to enhance the accuracy and reliability of student information records, particularly in minimizing errors, ensuring consistency, and improving decision-making, though challenges remain in the areas of data security and stakeholder confidence. Collectively, these outcomes underscore the transformative potential of AI in streamlining educational administration while highlighting the need for robust infrastructural support, staff capacity-building, and improved data protection measures to maximize its benefits.

## **Recommendations**

Based on the findings of the study, the following recommendations are given:

1. Tertiary institutions in Bayelsa State should invest in strengthening AI infrastructure and cybersecurity frameworks to ensure the security and integrity of student information records.
2. Regular training and capacity-building programs should be organized for administrative staff to enhance their competence in effectively utilizing AI applications for efficient and reliable student information management.

## References

- Adeoye, A. O., & Olatunji, K. T. (2021). Artificial intelligence applications for improving student services in Nigerian universities. *Journal of Educational Technology and Innovation*, 5(2), 45–57.
- Charles-Owaba, T. (2019). Assessing areas of students' difficulties in the learning of statistics content in secondary school mathematics curriculum in Bayelsa. *Abacus (Mathematics Education Series)*, 44(1), 321–332.
- Chen, Y., & Li, Z. (2023). Artificial intelligence and data integrity in higher education administration: Opportunities and challenges. *Journal of Educational Technology and Systems*, 52(1), 45–63. <https://doi.org/10.1177/00472395231123456>
- Eze, C. J., & Chinedu, O. P. (2022). Challenges of digital transformation in higher education administration in Nigeria. *International Journal of Management and Education*, 17(3), 112–126.
- Eze, P. I., & Onah, G. C. (2024). Artificial intelligence adoption in Nigerian universities: Implications for accuracy and transparency in student information management. *African Journal of Educational Management*, 18(2), 101–115.
- Kumar, R., & Gupta, S. (2021). Artificial intelligence in higher education: Opportunities for teaching, learning, and administration. *Education and Information Technologies*, 26(5), 1231–1248. <https://doi.org/10.1007/s10639-020-10321-1>
- Musa, H. K., & Adeoye, A. O. (2022). Artificial intelligence in student record management: A pathway to improved administrative efficiency in tertiary institutions. *Nigerian Journal of Educational Technology*, 5(1), 77–89.
- Nwachukwu, V. C., & Uzo, I. F. (2021). Artificial intelligence and the future of higher education in Nigeria: Implications for teaching and learning. *African Journal of Education and Development Studies*, 11(1), 89–101.
- Nwosu, P. U., & Alamina, J. B. (2020). Artificial intelligence and data management in Nigerian tertiary institutions: Issues and prospects. *Nigerian Journal of Educational Research and Evaluation*, 19(4), 72–83.
- Obi, C. A., & Adebayo, F. T. (2023). Ethical concerns in the adoption of artificial intelligence for academic administration. *Journal of Policy and Educational Studies*, 28(1), 54–69.
- Okolie, J. O. (2023). Digital innovations and administrative efficiency in Nigerian universities: The role of artificial intelligence. *Contemporary Issues in Educational Management*, 15(2), 140–155.
- Okorie, N., & Ekanem, J. (2021). Artificial intelligence in educational governance: Prospects for effective decision-making in African universities. *Contemporary Issues in Education Research*, 14(4), 221–229.
- Olaleye, O. A., & Omoniyi, T. S. (2021). The role of artificial intelligence in enhancing administrative service delivery in Nigerian universities. *International Journal of Educational Research and Technology*, 12(3), 54–67.
- Salami, M. A., & Ibrahim, Y. A. (2022). Artificial intelligence in Nigerian higher education: Challenges of implementation and sustainability. *Journal of Educational Policy and Technology Studies*, 14(3), 201–215.
- Yakubu, L. S., & Bello, R. A. (2024). Artificial intelligence and record management in African universities: Emerging evidence and policy directions. *African Journal of Information Systems*, 16(2), 65–80.
- Yusuf, A. A., & Adebayo, S. T. (2020). Digital innovations and administrative reforms in higher education: Exploring the role of artificial intelligence. *Journal of Educational Policy and Leadership*, 15(2), 33–47.