



Enhancing Administrative Efficiency Through Data Analytics, Digital Communication, and Automation in Tertiary Institutions in Anambra and Imo States

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Submitted : 2025-10-01 ; Accepted : 2025-10-12 ; Published : 2025-10-15

Keywords:

data analytics, digital communication, automation, administrative efficiency, tertiary institutions.

Abstrak : In the era of digital transformation, technological innovations are increasingly redefining administrative processes within tertiary institutions. This study adopted a descriptive survey design to investigate how data analytics, digital communication, and automation enhance administrative efficiency in public tertiary institutions across Anambra and Imo States, Nigeria. The population included students, lecturers, and administrative staff from selected institutions, with a sample of 2,000 respondents chosen through stratified random sampling. Data were collected using a validated questionnaire. The questionnaire consisted of three clusters aligned with the research objectives and was structured on a 4-point Likert scale. Expert validation and a pilot test confirmed the instrument's validity and reliability, yielding Cronbach's Alpha values of 0.81, 0.84, and 0.89 for the three clusters. Data collection was facilitated by trained assistants, and analysis was conducted using SPSS version 27. Descriptive statistics addressed the research questions, while ANOVA tested the hypotheses. This methodology provided a robust foundation for assessing the role of technological transformation in institutional administration. Data-driven decisions were strongly supported (Mean = 3.51), with Imo (3.56) slightly ahead of Anambra (3.49), though Anambra excelled in problem-solving using analytics (3.30 vs. 2.52). However, both states lacked dedicated analytics software (Anambra: 1.63; Imo: 2.39). Digital tools were widely used (Mean = 3.10), improving collaboration (3.07) and meeting productivity (3.00), yet failed to significantly reduce communication delays (1.78). Automation showed the highest benefits, reducing workload (3.36), improving accuracy (3.45), and enhancing speed (3.42), though transparency remained low (Anambra: 2.00; Imo: 1.30). Hypothesis testing showed no significant difference in analytics impact ($p = .058$), but digital tools ($p = .000$) and automation ($p = .000$) significantly influenced efficiency. These findings highlight the need for better infrastructure and training, especially in analytics and transparency tools, to sustain efficiency gains. The study concludes that technological integration significantly enhances administrative performance but highlights the need for targeted investments in analytics systems and staff training.

INTRODUCTION

In today's fast-evolving academic environment, tertiary institutions face mounting pressure to manage large volumes of administrative tasks more efficiently. Rising student enrolment, complex regulatory demands, and growing expectations from stakeholders often expose gaps in outdated administrative processes. Issues such as long queues, missing records, slow communication, and poor data management continue to affect service delivery (Anaekwe et al, 2025). To meet these challenges, institutions have begun embracing digital technologies—particularly data analytics, digital communication, and automation—as tools to streamline operations and improve overall administrative efficiency. Administrative Efficiency refers to how well an institution manages its internal operations, resources, and services to meet organizational goals with minimal waste, delay, or redundancy. In tertiary institutions, this means ensuring that processes such as admissions, student services, academic records, and staff coordination run smoothly and effectively. When administrative functions operate efficiently, students receive timely support, staff experience reduced workload stress, and institutional performance improves (Ositadinma & Victor, 2025; Peeters & Campos, 2023). Achieving this level of efficiency requires not just better management, but the adoption of tools and practices that enhance oversight and responsiveness. One such essential tool that supports administrative efficiency is data analytics.

Data Analytics provides a foundation for administrative efficiency through evidence-based decision-making. It involves gathering, organizing, and interpreting institutional data to uncover patterns, assess performance, and predict trends. For example, analyzing student enrolment or drop-out data allows administrators to adjust admission strategies or provide timely interventions. Similarly, financial and staffing data inform resource allocation and policy planning. With clear insights, leaders can make smarter choices that reduce errors and optimize outcomes (Nyangowa et al, 2014; Chinedu et al, 2025). However, insights from data analytics are only effective when shared and acted upon quickly. This brings in the need for effective digital communication systems to support real-time collaboration. Digital Communication bridges the gap between information and action. It refers to the use of technology-based channels—such as email, SMS, mobile apps, video conferencing, and online portals—to share information rapidly and reliably (Okeke, 2024). In tertiary institutions, digital communication enables smooth interaction among administrators, staff, and students. With faster message delivery and easier access to information, decisions based on analytics are shared promptly, reducing delays and confusion. This enhances teamwork and stakeholder engagement. However, as communication becomes more streamlined, institutions also benefit from reducing repetitive administrative workload. This leads to the integration of automation into routine tasks.

Automation transforms administrative efficiency by using software and digital systems to handle repetitive, time-consuming operations with minimal human intervention. Tasks like admissions processing, course registration, transcript issuance, and payroll management can be completed more quickly and accurately through automation. It reduces human error, ensures consistency, and frees up staff to focus on strategic planning and student support (Akaegbobi & Nkamnebe, 2023). Data generated from automated systems also feeds into analytics tools, while

automated notifications enhance digital communication channels. Together, these digital strategies form a unified approach that strengthens administrative efficiency, creating a smarter, faster, and more accountable system in tertiary education.

Data analytics helps institutions make smarter decisions using real-time, reliable information. With access to a wealth of data on students, staff, finances, and academic activities, institutions can track patterns and generate insights that support better planning and service delivery. For example, analyzing student data helps detect academic struggles early, allowing timely interventions to improve retention and performance (Ihemeje et al, 2024). Administrators can also monitor resource usage and align decisions with available budgets. Dashboards and visual reports offer snapshots of performance indicators, making it easier to respond quickly to issues or adjust strategies where necessary (Ezeudu & Fadeyi, 2024). Beyond decision-making, data analytics supports greater transparency. When processes are backed with facts, institutions create an environment where accountability thrives. Key stakeholders—students, staff, regulators, and partners—can easily understand how decisions were reached. In countries like Nigeria, institutions that rely on data-driven insights have improved how they manage resources and allocate staff responsibilities (Anukaenyi et al, 2023).

Digital communication is another key driver of efficiency. Relying solely on printed memos, physical meetings, or verbal instructions often slows things down and leads to miscommunication. Today, tools like emails, SMS alerts, instant messaging platforms, and online portals make it easier to share information quickly and clearly. Students get immediate updates about exams, course registration, or fee payments. Staff collaborate across departments without needing to meet physically. These improvements reduce waiting time, ease administrative burdens, and boost staff morale (Nwakoby & Iloka, 2025). Digital platforms also improve access. Those in remote areas or with busy schedules can stay informed and engaged without needing to be on campus. During the COVID-19 pandemic, institutions that had already embraced digital communication found it easier to maintain contact with students and staff, holding virtual meetings and offering remote services (Anukaenyi et al, 2023). This flexibility continues to be valuable in today's hybrid work and learning environments.

Automation helps eliminate delays in repetitive and rule-based tasks. Functions like admissions processing, payroll, timetable creation, or result computation can be handled more swiftly using specialized software. These systems reduce human error, maintain consistent records, and free up staff to focus on more strategic responsibilities (Aavakare & Nikou, 2020). For instance, once a student uploads the required documents, an automated system can instantly verify the application, check eligibility, and send a notification about admission status—all without human involvement. Automation also improves accuracy. Mistakes in manual entries or delayed processing often create bottlenecks in student records and staff payments. With automated systems, these risks are reduced. Reports generated from automated workflows also provide administrators with accurate data for budgeting, performance reviews, and compliance tracking. In some institutions, tools like robotic process automation (RPA) help detect anomalies in real-

time, allowing administrators to act quickly and resolve issues before they escalate (Nyagowa et al, 2014).

When these tools—data analytics, digital communication, and automation—work together, institutions benefit from a more connected and responsive administrative environment. The motivation for this study stems from the growing administrative challenges faced in tertiary institutions across Anambra and Imo States, where inefficient processes hinder academic service delivery. Despite the global shift toward digital transformation, many institutions in these states still lack integrated systems that support data-driven decision-making, fast communication, and task automation (Mordi et al, 2023). Previous studies focused mainly on e-learning, neglecting core administrative structures (Anukaenyi et al, 2023). This study addresses that gap by exploring how digital tools can improve efficiency, transparency, and responsiveness in administration, offering practical solutions for institutional reform in a region struggling with systemic inefficiencies.

Statement of the Problem

Administrative inefficiencies continue to pose significant challenges in tertiary institutions across Anambra and Imo States. Despite technological advancements, many institutions still depend on manual or semi-digital processes for critical functions such as student registration, record keeping, result computation, and internal communication. These outdated systems often result in prolonged service delivery, loss of vital data, low staff productivity, and student dissatisfaction. A report from the Joint Admissions and Matriculation Board (JAMB) revealed that over 35% of students in public tertiary institutions in Nigeria faced delays in admissions and transcript processing due to poor administrative coordination (JAMB, 2022). In Anambra and Imo States, several institutions lack integrated data systems, leading to fragmented decision-making and duplication of tasks. The absence of data analytics tools prevents administrators from identifying patterns that could inform efficient policy and planning. Furthermore, communication between departments remains weak in many institutions, with staff relying heavily on paper memos or verbal directives, increasing the risk of errors and misinformation. During the COVID-19 pandemic, many institutions in these states struggled to maintain operational continuity due to their limited use of digital tools.

While automation and digital communication have improved operations in some sectors, their adoption in tertiary education within Anambra and Imo remains low and inconsistent. The persistent administrative delays, resource wastage, and weak accountability systems underscore the urgent need for a shift toward data-driven, digitally integrated management. This study is therefore necessary to explore how the strategic use of data analytics, digital communication, and automation can significantly enhance administrative efficiency in tertiary institutions across the two states. Findings from the study will provide evidence-based recommendations for institutional leaders and policymakers to adopt sustainable digital reforms that promote transparency, responsiveness, and performance in tertiary education administration.

Objectives

1. Analyze the impact of data analytics on administrative decision-making process in tertiary institutions in Anambra and Imo states
2. Assess the role of digital communication and collaboration tools in administrative efficiency in tertiary institutions in Anambra and Imo states.
3. Explore the benefits of automation in administrative tasks in tertiary institutions in Anambra and Imo states.

Research Questions

1. What is the impact of data analytics on the administrative decision-making process in tertiary institutions in Anambra and Imo states?
2. How do digital communication and collaboration tools affect administrative efficiency in tertiary institutions in Anambra and Imo states?
3. What are the benefits of automation in administrative tasks in tertiary institutions in Anambra and Imo states?

Hypotheses

1. There is no significant impact of data analytics on the administrative decision-making process in tertiary institutions in Anambra and Imo states.
2. Digital communication and collaboration tools do not significantly influence administrative efficiency in tertiary institutions in Anambra and Imo states.
3. Automation does not have significant benefits for administrative tasks in tertiary institutions in Anambra and Imo states.

METHODOLOGY

This study employed a descriptive survey design to investigate how technological transformation—specifically data analytics, digital communication, and automation—enhanced administrative efficiency in public tertiary institutions in Anambra and Imo States. The study was conducted in Anambra and Imo States, both located in Southeastern Nigeria. These states were chosen due to their relatively high concentration of public tertiary institutions and diverse administrative structures. In Anambra State, the institutions covered included Nnamdi Azikiwe University (UNIZIK), Awka; Chukwuemeka Odumegwu Ojukwu University (COOU), Uli; Federal Polytechnic, Oko; Nwafor Orizu College of Education, Nsugbe; and Anambra State Polytechnic, Mgbakwu. In Imo State, the institutions comprised the Federal University of Technology (FUTO), Owerri; Imo State University (IMSU), Owerri; Alvan Ikoku Federal College of Education, Owerri; Federal Polytechnic, Nekede; Imo State Polytechnic, Umuagwo; and Eastern Palm University, Ogboko.

The population of the study consisted of students, lecturers, and administrative staff members from these institutions. A multistage sampling technique was used to draw a total sample of 2,000 respondents. This sample included 1,000 students, 500 academic staff, and 500

administrative staff members. A stratified random sampling method was adopted to ensure adequate representation from the different categories of respondents across institutions and states. The instrument for data collection was a structured questionnaire. The questionnaire was designed by the researchers and structured using a 4-point Likert scale, ranging from Strongly Agree to Strongly Disagree. It comprised three clusters: impact of data analytics on administrative decision-making; the role of digital communication and collaboration tools in administrative efficiency; and the benefits of automation in administrative tasks. To ensure the validity of the instrument, the draft questionnaire was reviewed by three experts—two in educational measurement and evaluation and one in information and communication technology (ICT) in education. Their comments and suggestions helped refine the instrument for clarity, relevance, and alignment with the study’s objectives.

The reliability of the instrument was established through a pilot study involving 50 respondents from institutions not included in the main study. The internal consistency of the instrument was tested using Cronbach’s Alpha. The overall reliability coefficient was 0.86, indicating strong internal consistency. Specifically, the cluster on data analytics recorded a reliability coefficient of 0.81; the cluster on digital communication and collaboration tools recorded 0.84; and the automation cluster yielded a high reliability of 0.89. These figures exceeded the generally accepted threshold of 0.70, affirming the reliability of the instrument. Data collection was carried out by four trained postgraduate research assistants and two academic staff members from each institution. The assistants were thoroughly briefed on the purpose of the study and the procedures for administering the instruments to ensure consistency, accuracy, and ethical compliance. Questionnaires were administered in person and retrieved on the spot to maximize response rates and data completeness. The data collected were organized and coded using Microsoft Excel version 2016 and analyzed using the Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics such as mean and standard deviation were used to answer the research questions, while inferential statistics, specifically Analysis of Variance (ANOVA), were employed to test the hypotheses at a 0.05 level of significance.

RESULT AND DISCUSSION

Result

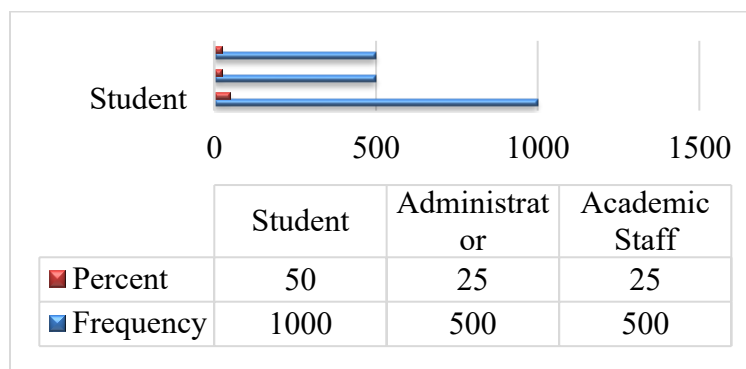


Figure 1. Distribution of Respondents by Designation

Figure 1 presents the designation of respondents in the study. The majority were students, accounting for 1,000 individuals (50.0%), indicating half of the total population. Administrators made up 500 respondents (25.0%), while academic staff also contributed 500 (25.0%). The cumulative percentage shows that students and administrators together comprised 75.0% of the sample, while the inclusion of academic staff brought the total to 100.0%. This distribution suggests that the views of students dominate the data, although institutional perspectives from both administrative and academic personnel are also equally represented in the remaining half.

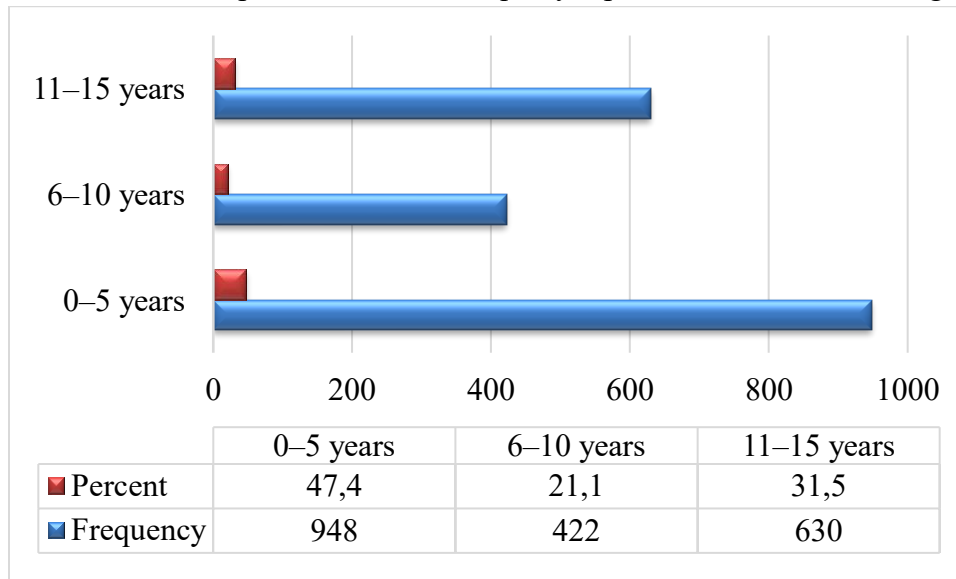


Figure 2. Distribution of Respondents by Years of Work/Study in the Institution

Figure 2 shows the distribution of respondents based on their years of work or study in the institution. The largest group had 0–5 years of experience, comprising 948 respondents (47.4%), suggesting a significant proportion are relatively new to the institution. Those with 6–10 years numbered 422 (21.1%), while 630 respondents (31.5%) had 11–15 years of experience. The cumulative percentage indicates that 68.5% of respondents had 10 years or less, while only 31.5% had more extended experience. This distribution implies a youthful or recently recruited/student-dominated population, with a substantial yet smaller experienced group.

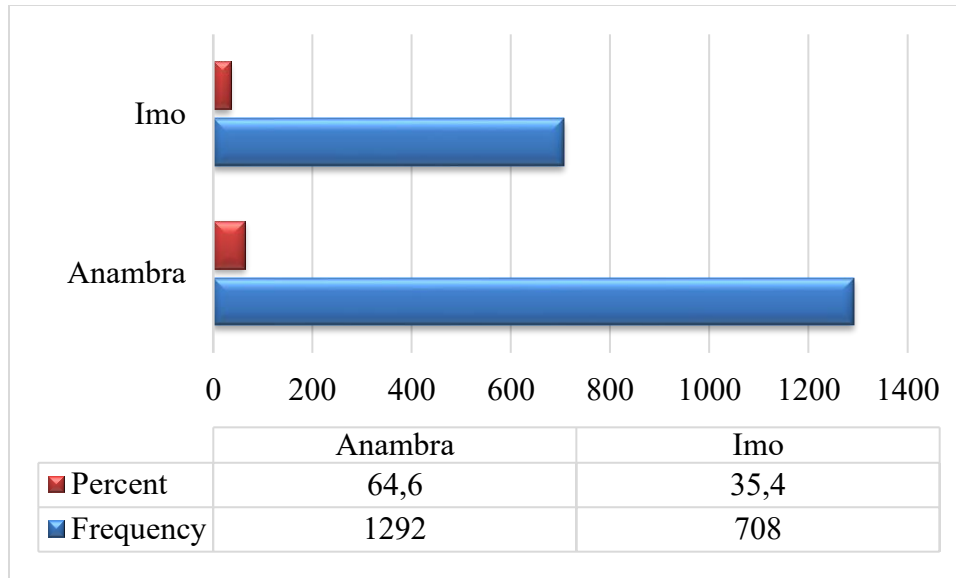


Figure 3. Distribution of Respondents by State

Figure 3 illustrates the state-wise distribution of respondents. A majority of the respondents, 1,292 (64.6%), are from Anambra State, while 708 (35.4%) are from Imo State. This indicates a higher level of participation or representation from Anambra compared to Imo. The cumulative percentage shows that all participants came from these two states, with Anambra contributing nearly two-thirds of the total sample. This distribution suggests that the study may have greater contextual relevance or institutional presence in Anambra State, although Imo State's representation still provides a meaningful comparative perspective.

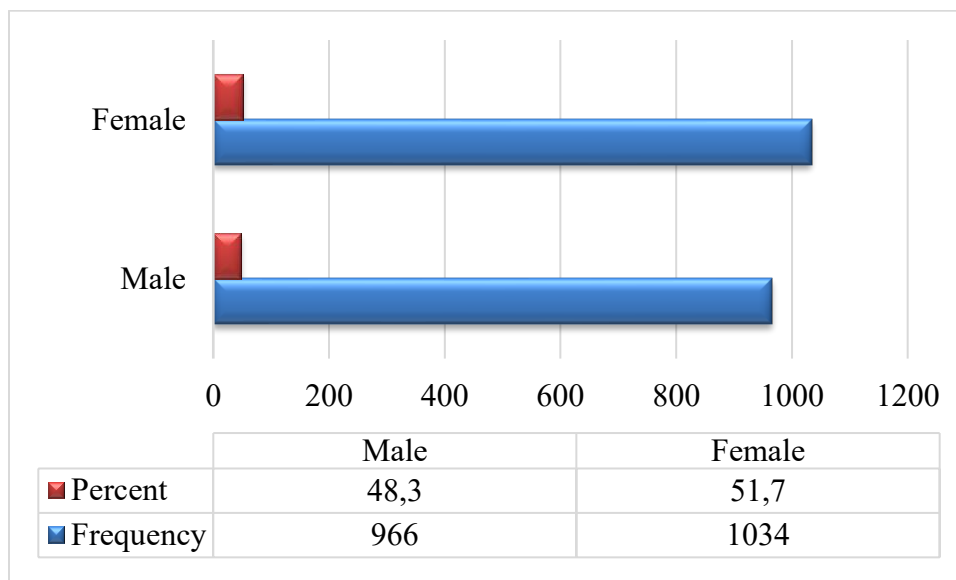


Figure 4. Distribution of Respondents by Gender

Figure 4 presents the gender distribution of the respondents. Female respondents constitute the majority with 1,034 individuals (51.7%), while male respondents make up 966 (48.3%). The cumulative percentage indicates that the entire sample is evenly distributed across both genders, with a slight female predominance. This balanced representation enhances the credibility of any gender-based analysis in the study, suggesting inclusivity and reducing the risk of gender bias in the findings. The near parity between male and female participants ensures that the perspectives captured are reflective of both gender experiences within the institution.

Research Question 1: What is the impact of data analytics on the administrative decision-making process in tertiary institutions in Anambra and Imo states?

Table 1.
Descriptive Statistics on the Impact of Data Analytics on Administrative Decision-Making in Tertiary Institutions in Anambra and Imo States

State		My institution uses analytics strategic planning	Data-driven insights for considered administrative decisions	Use of data analytics are improved in problem-solving management	Staff has trained interpret apply in analytics tools.	There is a dedicated system/software for analyzing institutional data.
Anambra	Mean	2.10	3.49	3.30	3.05	1.63
	N	1292	1292	1292	1292	1292
	Std. Deviation	1.328	.695	.732	.806	1.123
	Variance	1.763	.482	.536	.650	1.262
	Kurtosis	-1.536	-.298	-.978	-1.457	.063
	Skewness	.543	-1.000	-.538	-.084	1.357
Imo	Mean	1.64	3.56	2.52	3.17	2.39
	N	708	708	708	708	708
	Std. Deviation	1.230	.650	1.213	.817	1.094
	Variance	1.512	.422	1.472	.667	1.197
	Kurtosis	-.032	.231	-1.553	-1.430	-1.433
	Skewness	1.403	-1.195	-.189	-.321	-.217
Total	Mean	1.93	3.51	3.02	3.09	1.90
	N	2000	2000	2000	2000	2000
	Std. Deviation	1.312	.680	1.004	.812	1.170
	Variance	1.721	.462	1.008	.659	1.369
	Kurtosis	-1.232	-.131	-.471	-1.465	-1.190
	Skewness	.804	-1.067	-.783	-.166	.709

Table 1 presents respondents’ perceptions of the impact of data analytics on administrative decision-making across tertiary institutions in Anambra and Imo States. The highest-rated item overall is *"Data-driven insights are considered in administrative decisions"* with a mean score of (3.51), suggesting strong integration of analytics in decision-making. Imo State institutions slightly lead in this aspect with a mean of (3.56) compared to Anambra’s (3.49). Anambra, however, scores higher on *"Use of data analytics has improved problem-solving in management"* (3.30) than Imo (2.52). Both states show low means on *"Dedicated software for data analysis"* (Anambra: 1.63; Imo: 2.39), highlighting a key gap.

Research Question 2: How do digital communication and collaboration tools affect administrative efficiency in tertiary institutions in Anambra and Imo states?

Table 2.
Descriptive Statistics on the Effect of Digital Communication and Collaboration Tools on Administrative Efficiency in Tertiary Institutions in Anambra and Imo States

State		Digital tools (e.g., emails, chats, platforms like Zoom/MS Teams) are used for communication.	These tools reduce delays in administrativ e communication.	Collaboration among departments has improved due to digital platforms.	Digital communication tools are easy to access and use.	Management meetings are now more productive with the use of online platforms
Anambra	Mean	3.19	1.98	3.19	3.30	3.00
	N	1292	1292	1292	1292	1292
	Std. Deviation	.947	1.287	.842	1.003	.865
	Variance	.896	1.656	.710	1.005	.747
	Kurtosis	.142	-1.329	.795	.081	-.144
	Skewness	-1.040	.697	-1.064	-1.189	-.654
Imo	Mean	2.95	1.42	2.87	3.21	3.00
	N	708	708	708	708	708
	Std. Deviation	1.162	.961	.995	1.064	.933
	Variance	1.350	.923	.989	1.133	.870
	Kurtosis	-.950	2.060	-.347	-.212	-.463
	Skewness	-.742	1.944	-.804	-1.090	-.642
Total	Mean	3.10	1.78	3.07	3.27	3.00
	N	2000	2000	2000	2000	2000
	Std. Deviation	1.034	1.211	.912	1.025	.889
	Variance	1.069	1.467	.832	1.052	.790
	Kurtosis	-.286	-.737	.355	-.023	-.267

Skewness	-.954	1.034	-.993	-1.154	-.650
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Table 2 reveals how digital tools influence administrative efficiency. Overall, respondents agreed that *digital tools are widely used for communication* (Mean = 3.10), with Anambra (3.19) slightly ahead of Imo (2.95). *Digital platforms also enhanced collaboration among departments* (Mean = 3.07), particularly in Anambra (3.19). Both states reported *ease of access and use* (Anambra: 3.30; Imo: 3.21), showing general comfort with the tools. Notably, *digital tools reducing communication delays* scored lowest across both states (Anambra: 1.98; Imo: 1.42; Total: 1.78), suggesting inefficiencies still exist. However, *online platforms have made meetings more productive* (Mean = 3.00) in both states, indicating a shift in operational effectiveness.

Research Question 3: What are the benefits of automation in administrative tasks in tertiary institutions in Anambra and Imo states?

Table 3.
Descriptive Statistics on the Benefits of Automation in Administrative Tasks in Tertiary Institutions in Anambra and Imo States

State		Automation has reduced manual workload in my institution.	Administrative processes such as registration, payroll, and data entry are now automated.	Automation ensures accuracy and reduces human error.	The use of automation tools have improved the speed of administrative service delivery.	Automation has enhanced transparency and accountability in the system.
Anambra	Mean	3.42	3.42	3.54	3.47	2.00
	N	1292	1292	1292	1292	1292
	Std. Deviation	.814	.814	.788	.973	1.296
	Variance	.662	.662	.621	.946	1.679
	Kurtosis	1.466	1.466	2.808	1.284	-1.316
	Skewness	-1.424	-1.424	-1.831	-1.649	.704
Imo	Mean	3.26	3.18	3.30	3.35	1.30
	N	708	708	708	708	708
	Std. Deviation	1.030	1.007	1.039	1.166	.847
	Variance	1.062	1.013	1.080	1.359	.718
	Kurtosis	.282	.150	.389	.026	5.885
	Skewness	-1.255	-1.124	-1.330	-1.364	2.750
Total	Mean	3.36	3.33	3.45	3.42	1.75
	N	2000	2000	2000	2000	2000
	Std. Deviation	.899	.894	.892	1.046	1.205
	Variance	.809	.800	.795	1.095	1.453

Kurtosis	1.107	1.006	1.795	.785	-.472
Skewness	-1.407	-1.342	-1.662	-1.550	1.155

Table 3 reveals that automation is significantly benefiting administrative operations in tertiary institutions. Overall, respondents strongly agreed that automation reduces manual workload (Mean = 3.36), improves accuracy (3.45), and speeds up service delivery (3.42). Anambra scored slightly higher in these areas than Imo, with peak agreement on *accuracy and reduced human error* (Anambra: 3.54; Imo: 3.30). Automation of core processes like registration and payroll also received high ratings (Total Mean = 3.33). However, both states recorded very low means on *enhancing transparency and accountability* (Anambra: 2.00; Imo: 1.30), indicating that while efficiency gains are evident, transparency remains a major concern.

Hypothesis 1: There is no significant impact of data analytics on the administrative decision-making process in tertiary institutions in Anambra and Imo states.

Table 4.
Test of Hypothesis 1 – Impact of Data Analytics on Administrative Decision-Making in Tertiary Institutions

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	37.947 ^a	1	37.947	3.592	.058
Intercept	329454.099	1	329454.099	31189.128	.000
State	37.947	1	37.947	3.592	.058
Error	21105.088	1998	10.563		
Total	383567.000	2000			
Corrected Total	21143.036	1999			

Hypothesis 1 (Table 4) states that there is no significant impact of data analytics on the administrative decision-making process in tertiary institutions in Anambra and Imo states. The ANOVA results show that the effect of *State* on the *impact of data analytics* is not statistically significant, with an F-value of (3.592) and a p-value of (.058). Since the p-value is greater than the standard threshold of 0.05, we fail to reject the null hypothesis. This suggests that there is no statistically significant difference in the impact of data analytics on administrative decision-making between the two states.

Hypothesis 2: Digital communication and collaboration tools do not significantly influence administrative efficiency in tertiary institutions in Anambra and Imo states.

Table 5.
Test of Hypothesis 2 – Influence of Digital Communication and Collaboration Tools on Administrative Efficiency

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	663.969 ^a	1	663.969	45.825	.000
Intercept	361224.021	1	361224.021	24930.487	.000
State	663.969	1	663.969	45.825	.000
Error	28949.519	1998	14.489		
Total	434457.000	2000			
Corrected Total	29613.488	1999			

Hypothesis 2 (Table 5) proposes that digital communication and collaboration tools do not significantly influence administrative efficiency in tertiary institutions in Anambra and Imo states. The ANOVA results reveal a statistically significant effect of *State* on the *effectiveness of digital communication and collaboration tools*, with an F-value of (45.825) and a p-value of (.000). Since the p-value is less than 0.05, the null hypothesis is rejected. This indicates that digital tools significantly influence administrative efficiency, and the effect differs meaningfully between Anambra and Imo states. It suggests that the level of integration and effectiveness of these tools varies by state.

Hypothesis 3: Automation does not have significant benefits for administrative tasks in tertiary institutions in Anambra and Imo states.

Table 6.
Test of Hypothesis 3 – Benefits of Automation in Administrative Tasks in Tertiary Institutions

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	974.221 ^a	1	974.221	63.920	.000
Intercept	417907.181	1	417907.181	27419.569	.000
State	974.221	1	974.221	63.920	.000
Error	30451.921	1998	15.241		
Total	501260.000	2000			
Corrected Total	31426.142	1999			

Hypothesis 3 (Table 6) states that automation does not have significant benefits for administrative tasks in tertiary institutions in Anambra and Imo states. The ANOVA results show

a statistically significant effect of *State* on the *perceived benefits of automation*, with an F-value of (63.920) and a p-value of (.000). Since the p-value is less than 0.05, the null hypothesis is rejected. This indicates that automation significantly benefits administrative tasks and that the perceived benefits vary meaningfully between institutions in Anambra and Imo states. The result affirms that automation plays a critical role in enhancing administrative performance, though its impact differs by location.

Discussion

Research Question 1 was on the impact of data analytics on the administrative decision-making process in tertiary institutions in Anambra and Imo States. The findings reveal moderate integration of data analytics into administrative decision-making, with both Anambra and Imo institutions rating "data-driven insights in decisions" highly (Mean = 3.51). Imo scored slightly higher (3.56), suggesting a marginally stronger strategic alignment. This finding agreed with Ihemeje et al, (2024) who observed that universities in Imo state had more structured approaches to data governance. In contrast, Anambra institutions scored higher in problem-solving applications (3.30), supporting Akaegbobi and Nkamnebe (2023) who noted that institutions in Anambra often use ad-hoc data analysis for immediate solutions rather than strategic planning. Both states recorded low means regarding the use of dedicated analytics software (Anambra: 1.63; Imo: 2.39), a limitation also noted by Ezeudu and Fadeyi (2024) who emphasized infrastructural deficits in southeastern institutions. The hypothesis test result ($p = .058$) showed no statistically significant difference between the states, indicating that regional variations may be more perceptual than structural. In a related study, Mordi et al, (2023) concluded that analytics adoption in Nigerian tertiary institutions is more influenced by leadership commitment than geographical location.

Research Question 2 examined how do digital communication and collaboration tools affect administrative efficiency in tertiary institutions in Anambra and Imo States. The results show broad usage of digital communication tools, especially in Anambra (Mean = 3.19), which slightly outperformed Imo (2.95). This finding agreed with Anukaenyi et al, (2023) who highlighted Anambra's swift digital transition post-COVID-19. Similarly, Nwakoby and Iloka (2025) found that digital platforms have fostered more collaboration among departments, particularly in Anambra where this indicator scored 3.19. In contrast, both states recorded low effectiveness in reducing communication delays (Anambra: 1.98; Imo: 1.42). Peeters and Campos (2023) reported similar inefficiencies, attributing them to institutional bureaucracy and inadequate training. On the positive side, ease of access and use of digital tools scored well (Total Mean = 3.27), consistent with Aavakare and Nikou (2020) who found a growing level of digital literacy among university staff. The hypothesis test showed a significant difference ($p = .000$), confirming that state-based discrepancies exist. This supports Nyagowa et al, (2014) who emphasized the impact of localized ICT training programs and infrastructure on communication efficiency. In sum, while both states benefit from digital tools, implementation depth and training appear to vary.

Research Question 3 covered the benefits of automation in administrative tasks in tertiary institutions in Anambra and Imo States. Automation was generally rated highly across both states. Respondents acknowledged its effectiveness in reducing manual workload (Mean = 3.36), improving accuracy (3.45), and enhancing service speed (3.42). Anambra outperformed Imo slightly in each metric, which agrees with Okeke (2024) who found that Anambra institutions benefited more from automated processes due to stronger ICT integration policies. In a related study, Okeke and Anaekwe (2025) found that E-administration significantly reduced operational costs in institutions with higher administrative digitalization levels, especially in Anambra. However, both states showed weak performance in using automation to improve transparency (Anambra: 2.00; Imo: 1.30). This aligns with Okoye et al, (2023) who noted that without robust digital technology frameworks, automation alone does not ensure transparency. The hypothesis test revealed a statistically significant difference ($p = .000$), indicating varied implementation outcomes between the two states. This supports the argument by Webster and Gardner (2019) that institutional readiness, not just access to technology, influences the success of automation.

CONCLUSION

This study examined how data analytics, digital communication, and automation contribute to enhancing administrative efficiency in tertiary institutions in Anambra and Imo States. Findings revealed that while data-driven insights are moderately considered in decision-making, both states lack dedicated analytics systems, highlighting a critical infrastructural gap. Digital communication tools are widely used, particularly in Anambra, where departmental collaboration and meeting productivity have improved. However, both states reported limited effectiveness of these tools in reducing communication delays. Automation emerged as the most impactful factor, significantly improving workload reduction, accuracy, and speed of service delivery, with Anambra showing a slight edge. Nonetheless, both states scored poorly in leveraging automation for transparency and accountability, indicating the need for stronger governance frameworks. The statistical analyses further confirmed that while digital tools and automation significantly influence administrative outcomes, the impact of data analytics showed no significant difference between the states. This suggests a need for holistic strategies that emphasize infrastructure, staff training, and policy integration. In conclusion, enhancing administrative efficiency requires not only technological adoption but also institutional readiness and a culture that supports data-informed governance, seamless communication, and transparent, automated processes across tertiary institutions in both states.

ACKNOWLEDGEMENT

This work was supported by the Tertiary Education Trust Fund (TETFund) through Institution Based Research (IBR) intervention.

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