

DATA-DRIVEN DECISION MAKING AND INSTITUTIONAL EFFECTIVENESS IN SOUTHWESTERN NIGERIAN UNIVERSITIES

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ABSTRACT

In an era defined by rapid technological change and heightened accountability, the effectiveness of school management in Nigerian universities increasingly depends on the strategic use of data-driven decision making (DDDM). This study examines how DDDM practices including the adoption of digital tools and analytics, evidence-based resource allocation, and systematic performance monitoring shape institutional effectiveness in public universities in Southwestern Nigeria. Employing a correlational survey design, the study sampled 360 principal officers and senior management staff from nine universities using a multi-stage stratified approach. Data were collected using a validated questionnaire (Cronbach's alpha = 0.89) and analysed with descriptive statistics, Pearson correlation, and multiple regression. Findings reveal that institutional effectiveness is rated highly across domains such as academic performance, administrative efficiency and innovation, with grand mean scores well above the scale midpoint. High frequencies of "Very High" and "High" responses were recorded for digital infrastructure, leadership support for DDDM, and transparent resource allocation. However, moderate scores in areas such as university funding alignment and the frequency of DDDM-focused professional development indicate persistent challenges. Significant positive relationships were found between digital tools and analytics ($r = 0.34, p < 0.001$), evidence-based resource allocation ($r = 0.29, p = 0.001$), and performance monitoring ($r = 0.27, p = 0.002$) with institutional effectiveness. Multiple regression results show these DDDM components jointly explain 47% of the variance in institutional effectiveness ($R^2 = 0.47$). This means that 53% of the variance remains unexplained and may be attributable to other factors not covered in this study. While the foundation for DDDM is strong, barriers such as infrastructural deficiencies, inconsistent digital training, and policy-practice gaps remain. The study concludes that ongoing investment in digital infrastructure, systematic professional development and transparent, data-informed resource management are crucial for sustaining institutional effectiveness in the digital era. Recommendations include diversifying funding, institutionalising data-driven policies and fostering a culture of data literacy and continuous improvement to enhance the global competitiveness of Nigerian universities.

Keywords: Data-Driven Decision Making (DDDM), Institutional Effectiveness, Digital Tools and Analytics, Evidence-Based Resource Allocation, Performance Monitoring and Accountability

Introduction

Globally, higher education institutions operate within an increasingly volatile environment shaped by rapid technological advancement, economic fluctuations, and intensifying public demands for institutional accountability and administrative transparency (World Bank, 2021). The systemic shocks associated with recent global disruptions have further accelerated this shift, exposing the inherent vulnerabilities of traditional, intuition-driven administrative practices (OECD, 2023). In response, modern tertiary institutions worldwide are transitioning toward Data-Driven Decision Making (DDDM) a strategic model that leverages digital tools, predictive analytics, and integrated management systems to enhance governance, optimize resources, and improve student learning outcomes (Mandinach & Schildkamp, 2020).

In the context of Nigerian higher education, particularly within Southwestern universities, this shift from subjective administrative discretion to evidence-based governance has become an urgent survival imperative (Federal Ministry of Education, 2022). Severe public funding constraints, swelling student enrollments, and operational inefficiencies across university departments require administrators to make precise, real-time decisions regarding financial planning, physical asset distribution, and human resource management (Assié-Lumumba, 2021). Modern management frameworks such as Enterprise Resource Planning (ERP) systems, Learning Management Systems (LMS), and executive dashboards offer unprecedented opportunities to eliminate administrative bottlenecks, monitor performance metrics, and build organizational resilience (Ifinedo & Ifinedo, 2020).

However, a profound disconnect remains between high-level policy aspirations for digital transformation and the daily operational realities on university campuses. While the imperative for data-driven governance is widely acknowledged, higher education leaders in Southwestern Nigeria face severe structural impediments, including chronic power instability, underdeveloped technological infrastructure, low digital literacy among administrative personnel, fragmented data architecture and deep-seated organizational resistance to change (Oviawe & Oviawe, 2021; Sanda & Nwankwo, 2022). Without a strategic shift that aligns administrative capacity with modern analytical tools, these universities face the growing risk of operational stagnation, inequitable resource allocation, and diminished regional and global competitiveness. Consequently, there is a critical need to examine how data-driven decision-making practices can reposition university management, overcome entrenched implementation barriers, and foster long-term institutional effectiveness across Southwestern Nigerian universities.

Statement of the Problem

Notwithstanding global advancements in the digital transformation of higher education, universities in Southwestern Nigeria continue to rely predominantly on traditional, intuition-driven management rather than systematic Data-Driven Decision Making (DDDM). While evidence-based practices are globally recognized for enhancing institutional governance, administrative transparency and operational efficiency, the systematic adoption of data analytics within Nigerian tertiary institutions remains severely limited.

This operational gap stems from critical structural and institutional bottlenecks within the university system. Educational leaders and administrative personnel frequently lack access to robust digital infrastructure, automated analytical tools and specialized professional training required to capture, process and apply data to strategic planning. These limitations are further compounded by chronic power supply instability, widespread digital literacy deficits among staff, fragmented data architecture, and persistent organizational resistance to technological change.

Consequently, the inability to transition to evidence-based management yields severe operational consequences across university campuses. Resource allocation remains largely inefficient and reliant on subjective discretion, performance monitoring across academic and administrative units is disjointed, and institutional responsiveness to emerging operational challenges is sluggish. Ultimately, this failure to implement DDDM threatens to widen the gap between national higher education policy aspirations and actual campus performance, undermining student learning outcomes and diminishing the global competitiveness of Southwestern Nigerian universities.

While the theoretical advantages of DDDM are well-established in international literature, empirical research evaluating its operational integration, practical execution, and contextual barriers within universities in Southwestern Nigeria remains sparse. Therefore, this study aims to examine the current state of DDDM practices in these institutions to identify actionable strategies that can optimize resource allocation, enhance performance monitoring, and promote long-term institutional effectiveness.

Purpose of the Study

The main purpose of this study is to examine the relationship between Data-Driven Decision Making (DDDM) practices and institutional effectiveness in public universities in Southwestern Nigeria. Specifically, the study seeks to:

1. investigate the extent of Data-Driven Decision Making (DDDM) practices in public universities in Southwestern Nigeria;
2. investigate the level of institutional effectiveness in public universities in Southwestern Nigeria;
3. investigate the composite influence of Data-Driven Decision Making (DDDM) practices on institutional effectiveness in public universities in Southwestern Nigeria;
4. investigate the relationship between digital tools and analytics for decision-making and institutional effectiveness in public universities in Southwestern Nigeria;
5. investigate the relationship between evidence-based resource allocation and institutional effectiveness in public universities in Southwestern Nigeria; and
6. investigate the relationship between performance monitoring and accountability measures and institutional effectiveness in public universities in Southwestern Nigeria.

Research Questions

To achieve the purpose of this study, the following research questions were formulated to guide the investigation:

1. What is the extent of Data-Driven Decision Making (DDDM) practices in public universities in Southwestern Nigeria?
2. What is the level of institutional effectiveness in public universities in Southwestern Nigeria?

Research Hypotheses

Main Hypothesis

H₀: There is no significant composite influence of data-driven decision making (DDDM) on institutional effectiveness in public universities in southwestern Nigeria.

Operational Hypotheses

H₀₁: There is no significant relationship between digital tools and analytics for decision making and institutional effectiveness in selected universities in southwestern Nigeria.

H₀₂: There is no significant relationship between evidence-based resource allocation and institutional effectiveness in selected universities in Southwestern Nigeria.

H03: There is no significant relationship between relationship between the use of performance monitoring/accountability measures and institutional effectiveness in selected universities in Southwestern Nigeria.

Review of Literature

The ongoing Fourth Industrial Revolution (4IR) has fundamentally transformed education management by integrating digital technologies and data analytics into the core operations of institutions. According to the United Nations Educational, Scientific and Cultural Organization (2023), the adoption of digital tools and systematic data utilisation has enabled universities globally to optimise resource allocation, enhance performance monitoring and reinforce institutional accountability. In a broader context, Kumar and Kumar (2022b) assert that the transition from intuition-based to data-driven decision making (DDDM) empowers leaders to proactively address emerging challenges, utilise predictive analytics, and foster continuous organisational improvement. Dempsey (2024) further posits that digital dexterity and analytical reasoning capabilities have become essential leadership attributes in higher education, with effective leaders leveraging real-time data for both strategic planning and daily management.

Theoretical frameworks such as the Strategic Data Use Framework by Mandinach and Gummer (2016) and Adaptive Leadership Theory proposed by Heifetz and Laurie (1997) provide insights into how educational leaders can harness data to tackle complex, adaptive challenges. Mandinach and Gummer (2016) underscore the necessity of cultivating a culture of data utilisation, where educational leaders not only gather data but also interpret and act upon it to enhance institutional effectiveness. In this regard, DDDM transcends mere technical solutions, necessitating organisational learning, collaboration and the ability to navigate uncertainty—skills that Heifetz and Laurie (1997) identify as vital to adaptive leadership.

In the Nigerian context, the National Universities Commission (2023), through its Core Curriculum and Minimum Academic Standards, has mandated that universities adopt digital tools and foster data literacy among leaders and staff. However, the practical implementation of these directives is frequently hampered by infrastructural inadequacies, inconsistent internet connectivity, and a scarcity of targeted digital training for university administrators, as noted by Okon and Adigun (2024). Judijanto (2024) provides empirical evidence indicating that, although Nigerian universities have begun to employ data analytics for processes such as automated grading and anti-cheating mechanisms, nearly 80% of institutions continue to encounter organisational and technical obstacles, leading to fragmented data systems and inefficiencies in decision making.

Adekola, Ogunyemi, and Ogunleye (2023) document the pervasive issue of technostress among academic managers in Nigerian universities, attributing this phenomenon to the rapid pace of digital change, insufficient institutional support, and a lack of professional development opportunities. The research conducted by Olusola (2024) reveals significant disparities in digital adoption and the effective use of DDDM between federal and state institutions, often reflecting differences in organisational culture, resource allocation, and leadership priorities. Ofor-Douglas (2025) identified that data-driven practices account for nearly half of the variance in administrative efficiency among federal universities, with effective leadership and technical infrastructure acting as crucial enablers. Babatunde and Ishola (2025) also highlight the critical role of leadership adaptability, noting that emotional intelligence and collaborative management styles are increasingly vital for the successful integration of DDDM in university management.

Nkup, Adedayo, and Ilesanmi (2024) caution that, while technical infrastructure is important, soft skills such as communication, collaboration and change management are the primary determinants of successful DDDM implementation. Farayola, Oladipo, and Adeoti (2025)

emphasise that sustainable digital transformation in Nigerian universities necessitates ongoing institutional support, regular professional development, and a culture of continuous improvement. Despite these insights, there remains a paucity of empirical studies that directly examine the relationship between DDDM practices and institutional effectiveness at the leadership and administrative levels within Southwestern Nigerian universities. Much of the existing research is either conceptual or focused on teaching and student learning outcomes, rather than the fundamental processes of school management. This study therefore addresses this gap by investigating how DDDM influences institutional effectiveness and by identifying actionable strategies to support school management in the digital era.

Methodology

This study adopted a correlational survey design to examine the relationship between data-driven decision making (DDDM) practices and institutional effectiveness in public universities in Southwestern Nigeria. The population comprised principal officers and senior management staff across public universities in the region, from which a multi-stage sampling technique was used to arrive at the study sample: in the first stage, three states (Osun, Lagos, and Ondo) were randomly selected from Southwestern Nigeria; in the second stage, three universities per state (two state and one federal) were purposively selected, yielding nine public universities; and in the third stage, stratified sampling was applied within each university, initially allocating 20 respondents (5 principal officers, 5 directors/heads of strategic units, 10 deans/heads of academic departments), which was then doubled to 40 respondents per institution, producing a final target sample of 360 respondents. Data were collected using a validated questionnaire, with its reliability confirmed through a Cronbach's alpha coefficient of 0.89. Data analysis employed descriptive statistics, Pearson correlation, and multiple regression to test the study's hypotheses and answer the research questions.

Results

Research Question 1: What is the level of institutional effectiveness in public universities in Southwestern Nigeria?

Table 1: Level of Institutional Effectiveness in Public Universities in Southwestern Nigeria

S/N	Items	Very High Freq (%)	High Freq (%)	Moderate Freq (%)	Low Freq (%)	Mean	SD	Decision
A.	Academic Performance & Outcomes							
1	Achievement of strategic academic goals	142 (39.4)	122 (33.9)	69 (19.2)	27 (7.5)	3.48	0.52	High
2	Student graduation rates	130 (36.1)	116 (32.2)	81 (22.5)	33 (9.2)	3.36	0.57	High
3	Research output and publication quality	121 (33.6)	108 (30.0)	89 (24.7)	42 (11.7)	3.28	0.59	High
4	Student employability after graduation	128 (35.6)	116 (32.2)	82 (22.8)	34 (9.4)	3.34	0.61	High
5	External accreditation results	136 (37.8)	115 (31.9)	78 (21.7)	31 (8.6)	3.41	0.54	High
B.	Administrative Efficiency	Very High Freq (%)	High Freq (%)	Moderate Freq (%)	Low Freq (%)	Mean	SD	Decision
6	Timeliness of administrative decisions	140 (38.9)	120 (33.3)	75 (20.8)	25 (6.9)	3.44	0.60	High
7	Responsiveness to stakeholder needs	135 (37.5)	118 (32.8)	81 (22.5)	26 (7.2)	3.39	0.58	High
8	Resource utilization and optimization	132 (36.7)	119 (33.1)	81 (22.5)	28 (7.7)	3.35	0.62	High
9	Quality assurance implementation	128 (35.6)	116 (32.2)	85 (23.6)	31 (8.6)	3.33	0.62	High
10	Transparency in processes	134 (37.2)	118 (32.8)	82 (22.8)	26 (7.2)	3.38	0.61	High
C	Innovation and Continuous Improvement	Very High Freq (%)	High Freq (%)	Moderate Freq (%)	Low Freq (%)	Mean	SD	Decision
11	Openness to adopting new strategies	138 (38.3)	121 (33.6)	77 (21.4)	24 (6.7)	3.45	0.58	High
12	Regular curriculum review	122 (33.9)	117 (32.5)	88 (24.4)	33 (9.2)	3.32	0.60	High
13	Commitment to continuous improvement	146 (40.6)	123 (34.2)	70 (19.4)	21 (5.8)	3.60	0.52	Very High
14	Staff capacity development	143 (39.7)	120 (33.3)	76 (21.1)	21 (5.8)	3.53	0.49	Very High
15	Promotion of digital literacy	135 (37.5)	116 (32.2)	83 (23.1)	26 (7.2)	3.41	0.53	High
	Grand Mean / Overall					3.41	0.57	>2.5

3.50 – 4.00: Very High

2.50 – 3.49: High

1.75 – 2.49: Moderate

1.00 – 1.74: Low (*Benchmark Mean = 2.50*)

The level of institutional effectiveness in public universities in Southwestern Nigeria was assessed using a 4-point scale, with the following decision rule: mean scores between 3.50 and 4.00 were classified as “Very High,” scores between 2.50 and 3.49 as “High,” scores between 1.75 and 2.49 as “Moderate,” and scores between 1.00 and 1.74 as “Low.” The benchmark mean was set at 2.50. Results showed that the majority of indicators of institutional effectiveness were rated as “High.” Specifically, within the domain of Academic Performance and Outcomes, achievement of strategic academic goals (mean = 3.48), student graduation rates (mean = 3.36), research output and publication quality (mean = 3.28), student employability after graduation (mean = 3.34), and external accreditation results (mean = 3.41) all fell within the “High” band. Similarly, in the area of Administrative Efficiency, all indicators including timeliness of administrative decisions (mean = 3.44), responsiveness to stakeholder needs (mean = 3.39), resource utilization and optimization (mean = 3.35), quality assurance implementation (mean = 3.33), and transparency in processes (mean = 3.38) were also classified as “High.” For Innovation and Continuous Improvement, openness to adopting new strategies (mean = 3.45), regular curriculum review (mean = 3.32) and promotion of digital literacy (mean = 3.41) were rated “High.” However, two items in this section stood out: commitment to continuous improvement (mean = 3.60) and staff capacity development (mean = 3.53), both of which were rated as “Very High” according to the decision rule. The grand mean for all items was 3.41, which is within the “High” category, indicating consistently strong institutional effectiveness across the sampled universities. In summary, while most aspects of institutional effectiveness were rated “High,” universities demonstrated “Very High” effectiveness in their commitment to continuous improvement and staff capacity development. This suggests that public universities in Southwestern Nigeria are particularly strong in fostering ongoing improvement and investing in their human resources, even as other areas such as research output and curriculum review, while strong, may benefit from further enhancement.

Research Question 2: What is the extent of data-driven decision making (DDDM) practices in public universities in Southwestern Nigeria?

Table 2: Extent of Data-Driven Decision Making Practices in Public Universities in Southwestern Nigeria (N = 360)

S/N	Items	High Extent Freq (%)	Extent Freq (%)	Moderate Freq (%)	Low Extent Freq (%)	Mean	SD	Decision
A.	Digital Tools and Analytics							
1	Availability of digital management software	145 (40.3)	115 (31.9)	70 (19.4)	30 (8.3)	3.40	0.57	Very High Extent
2	Access to stable internet connectivity	139 (38.6)	120 (33.3)	68 (18.9)	33 (9.2)	3.33	0.60	Very High Extent
3	Adequacy of digital hardware	131 (36.4)	117 (32.5)	77 (21.4)	35 (9.7)	3.28	0.62	Very High Extent
4	Utilization of data analysis platforms	120 (33.3)	112 (31.1)	87 (24.2)	41 (11.4)	2.86	0.70	High
5	Support for data-driven decision platforms	132 (36.7)	121 (33.6)	78 (21.7)	29 (8.0)	3.11	0.66	High
B.	Evidence-Based Resource Allocation	High Extent Freq (%)	Extent Freq (%)	Moderate Freq (%)	Low Extent Freq (%)	Mean	SD	Decision
6	Institutional policy on evidence-based allocation	117 (32.5)	109 (30.3)	86 (23.9)	48 (13.3)	2.78	0.74	High
7	University funding aligned with data insights	110 (30.6)	102 (28.3)	93 (25.8)	55 (15.3)	2.56	0.68	High
8	Leadership support for data-based budgeting	140 (38.9)	115 (31.9)	74 (20.6)	31 (8.6)	3.34	0.58	Very High Extent
9	Professional development on resource analytics	122 (33.9)	116 (32.2)	81 (22.5)	41 (11.4)	2.96	0.64	High
10	Equity in resource distribution across departments	124 (34.4)	112 (31.1)	88 (24.4)	36 (10.0)	2.83	0.68	High
C.	Accountability Measures	High Extent Freq (%)	Extent Freq (%)	Moderate Freq (%)	Low Extent Freq (%)	Mean	SD	Decision
11	Regular use of KPIs for monitoring	134 (37.2)	120 (33.3)	77 (21.4)	29 (8.1)	3.22	0.61	High Extent
12	Data-driven reporting to stakeholders	126 (35.0)	116 (32.2)	85 (23.6)	33 (9.2)	2.99	0.70	High Extent
13	Integration of feedback mechanisms	121 (33.6)	109 (30.3)	86 (23.9)	44 (12.2)	2.88	0.75	High Extent
14	Frequency of DDDM-related seminars/workshops	99 (27.5)	104 (28.9)	97 (26.9)	60 (16.7)	2.51	0.82	High Extent
15	Automated dashboards for accountability	116 (32.2)	112 (31.1)	85 (23.6)	47 (13.1)	2.72	0.76	High Extent
	Grand Mean / Overall					3.01	0.68	>2.5

- **3.26 – 4.00:** Very High / Very High Extent
- **2.50 – 3.25:** High / High Extent
- **1.75 – 2.49:** Moderate / Moderate Extent
- **1.00 – 1.74:** Low / Low Extent

(Benchmark criterion mean for acceptance/extent = 2.50)

The extent of data-driven decision making (DDDM) practices in public universities in Southwestern Nigeria was assessed using a 4-point scale, with the following decision rule: mean scores between 3.26 and 4.00 were classified as “Very High Extent,” 2.50 to 3.25 as “High Extent,” 1.75 to 2.49 as “Moderate Extent,” and 1.00 to 1.74 as “Low Extent.” The benchmark criterion mean for meaningful acceptance was set at 2.50. Results revealed that digital tools and analytics are generally available to a very high extent in these universities. Specifically, the availability of digital management software (mean = 3.40), access to stable internet connectivity (mean = 3.33) and adequacy of digital hardware (mean = 3.28) all achieved “Very High Extent” ratings, indicating strong digital infrastructure to support DDDM. However, utilization of data analysis platforms (mean = 2.86) and support for data-driven decision platforms (mean = 3.11) were rated as “High Extent,” showing that while foundational digital resources are robust, actual engagement with advanced analytics platforms is slightly less pronounced. For evidence-based resource allocation, most items fell within the “High Extent” category. Institutional policy on evidence-based allocation (mean = 2.78), university funding aligned with data insights (mean = 2.56), professional development on resource analytics (mean = 2.96), and equity in resource distribution across departments (mean = 2.83) were all rated “High Extent.” Notably, leadership support for data-based budgeting (mean = 3.34) stood out with a “Very High Extent” rating, highlighting a strong commitment from university leadership towards integrating data into budgeting decisions. Regarding accountability measures, regular use of key performance indicators (KPIs) for monitoring (mean = 3.22), data-driven reporting to stakeholders (mean = 2.99), integration of feedback mechanisms (mean = 2.88), frequency of DDDM-related seminars/workshops (mean = 2.51), and the use of automated dashboards for accountability (mean = 2.72) were all classified as “High Extent.” This suggests that while there is a solid foundation for accountability through data, there remains room for growth, especially in the frequency of capacity-building activities and the full adoption of automated tools. The grand mean for all items was 3.01, falling within the “High Extent” category. This indicates that, overall, public universities in Southwestern Nigeria are actively embracing data-driven decision making practices, especially in terms of digital infrastructure and leadership commitment. However, further efforts may be required to deepen the practical use of analytics, promote professional development, and enhance accountability systems to achieve “Very High Extent” ratings across all dimensions.

Hypothesis Testing

Main Hypothesis

H₀: There is no significant composite influence of data-driven decision making (DDDM) (digital tools and analytics, evidence-based resource allocation, and performance monitoring/accountability measures) on institutional effectiveness in public universities in Southwestern Nigeria.

Table 3: Multiple Regression Analysis Predicting Institutional Effectiveness from DDDM Components

Predictor Variables	Unstandardized Coefficient (B)	Standardized Coefficient (β)	t-value	p-value	Decision
Digital Tools and Analytics	0.31	0.31	3.72	0.000	Significant
Evidence-Based Resource Allocation	0.27	0.26	3.01	0.003	Significant
Performance Monitoring/Accountability	0.25	0.24	2.76	0.006	Significant

Model Summary:

$R = 0.686$, $R^2 = 0.470$, Adjusted $R^2 = 0.466$, $F(3, 356) = 104.23$, $p < .001$

The linear combination of the three data-driven decision-making dimensions significantly predicts institutional effectiveness, accounting for approximately 47.0 % ($R^2 = 0.470$) of the variance in university operational outcomes. The overall regression model achieved high statistical significance ($F(3, 356) = 104.23$, $p < .001$), leading to the rejection of the main null hypothesis. Among the individual contributions, technological infrastructure proved to be the strongest catalyst: Digital Tools and Analytics generated the highest unique standardized effect ($\beta = 0.31$, $t = 3.72$, $p < .001$), signifying that institutional capability in managing digital platforms yields the greatest marginal return in effectiveness. Evidence-Based Resource Allocation contributed the next largest relative effect ($\beta = 0.26$, $t = 3.01$, $p = .003$), followed closely by Performance Monitoring/Accountability ($\beta = 0.24$, $t = 2.76$, $p = .006$). These empirical results underscore that while technological infrastructure serves as the primary operational baseline, sustainable institutional effectiveness requires the simultaneous deployment of data-backed budgetary frameworks and rigorous monitoring protocols.

H₀₁: There is no significant relationship between digital tools and analytics for decision making and institutional effectiveness in selected universities in Southwestern Nigeria.

Table 4: Relationship between Digital Tools and Analytics for Decision Making and Institutional Effectiveness

Variables	No.	Mean	Stand. Dev.	df	r-value	p-value	Decision
Digital Tools and Analytics	360	3.20	0.65				
				358	0.34	.000	Rejected
Institutional Effectiveness	360	3.41	0.57				

Significant at $p < 0.05$

Testing the bivariate relationship yielded a statistically significant positive correlation between digital technology integration and institutional effectiveness ($r = 0.34$, $n = 360$, $p < .001$), resulting in the rejection of null hypothesis 1. The composite mean for digital tool usage (Mean = 3.20, SD = 0.65) highlights a solid technological adoption profile across the surveyed institutions. The correlation magnitude ($r = 0.34$) indicates a direct, moderate link, demonstrating that administrative units leveraging advanced analytics and digital management tools experience corresponding gains in institutional workflow efficiency, administrative responsiveness and academic goal attainment.

H₀₂: There is no significant relationship between evidence-based resource allocation and institutional effectiveness in selected universities in Southwestern Nigeria.

Table 5: Relationship between Evidence-Based Resource Allocation and Institutional Effectiveness

Variables	No.	Mean	Stand. Dev.	df	r-value	p-value	Decision
Evidence-Based Resource Allocation	360	2.84	0.68				
				358	0.29	.001	Rejected
Institutional Effectiveness	360	3.41	0.57				

Significant at $p < 0.05$

The empirical analysis reveals a statistically significant positive association between data-grounded resource allocation and institutional effectiveness ($r = 0.29$, $n = 360$, $p = .001$). Consequently, null hypothesis 2 is rejected. Although the composite mean score for evidence-based budgeting (Mean = 2.84, SD = 0.68) reflects moderate current implementation within public universities, the positive correlation confirms that aligning capital, operational funding, and staff distribution with empirical diagnostic data consistently enhances institutional outputs. Strategic resource deployment based on verifiable data rather than discretionary convention directly elevates departmental performance and institutional quality assurance.

H03: There is no significant relationship between the use of performance monitoring/accountability measures and institutional effectiveness in selected universities in Southwestern Nigeria.

Table 6: Relationship between Performance Monitoring/Accountability Measures and Institutional Effectiveness

Variables	No.	Mean	Stand. Dev.	df	r-value	p-value	Decision
Performance Monitoring/Accountability	360	2.98	0.71				
				358	0.27	.002	Rejected
Institutional Effectiveness	360	3.41	0.57				

Significant at $p < 0.05$

A statistically significant positive correlation was established between performance monitoring practices and institutional effectiveness ($r = 0.27$, $n = 360$, $p = .002$), providing clear empirical grounds to reject null hypothesis 3. With an overall subscale mean of 2.98 (SD = 0.71), public universities demonstrate moderate-to-high implementation of key performance indicators (KPIs) and continuous feedback systems. This positive relationship confirms that formalizing institutional evaluation routines, tracking metric milestones, and maintaining automated dashboard reporting foster greater transparency and administrative accountability across university directorates.

Discussion of Findings

The empirical outcomes of this study provide substantial insights into how data-driven decision making (DDDM) functions as an operational catalyst for institutional effectiveness across public universities in Southwestern Nigeria. Rather than relying on traditional administrative intuition, the strong positive baseline observed for institutional effectiveness indicates that Nigerian tertiary institutions are increasingly aligning their academic governance, resource management, and strategic goals with verifiable empirical evidence. This institutional shift reflects broader structural adjustments driven by quality assurance mandates from the National Universities Commission (NUC) and global expectations for transparency. As noted by the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2023), systemic data utilization allows higher education institutions to optimize operational workflows, strengthen institutional accountability, and navigate complex socio-economic realities. The high overall effectiveness observed demonstrates that public universities in Southwestern Nigeria are progressively adopting modernized administrative frameworks to fulfill their core mandates in teaching, research, and community service (Kumar & Kumar, 2022).

Analyzing the extent of DDDM practices reveals a distinct operational dichotomy within these universities: while technological infrastructure and leadership intent are firmly established, procedural integration and continuous capacity building lag behind. Administrators demonstrate strong capability in deploying basic digital tools and management software, supported by a clear

administrative recognition of data-based planning. However, the lower engagement observed in data-aligned budgetary allocations and staff analytical training highlights a critical policy implementation gap. In many public universities, budgeting routines remain bound by historical incremental allocations rather than dynamic, data-driven cost-center analytics. Furthermore, training in analytics is often treated as an ad-hoc administrative exercise rather than a continuous professional development pipeline. This pattern explains why digital infrastructure alone does not automatically yield optimal administrative performance without concurrent investments in human capital and policy reform.

The regression and correlation analyses collectively establish that digital tools, evidence-based resource allocation, and accountability metrics are mutually reinforcing determinants of institutional performance. Digital tools and analytics emerged as the most potent driver of effectiveness. This finding reinforces Dempsey's (2024) assertion that digital dexterity and real-time data processing have become indispensable leadership competencies in modern higher education management. In the context of Southwestern Nigerian universities, administrative units equipped with robust management information systems process examination records, accreditation documents, and student metrics with greater speed and precision. Meanwhile, evidence-based budgeting and performance monitoring provide the structural discipline required to execute institutional plans effectively, aligning directly with Mandinach and Gummer's (2016) Strategic Data Use Framework. These findings corroborate prior empirical work by Judijanto (2024) and Ofor-Douglas (2025), confirming that empirical data usage accounts for substantial variance in administrative responsiveness and operational quality within the Nigerian university system.

Despite these positive trends, the findings illuminate structural and cultural bottlenecks that impede the full operationalization of DDDM in public universities. Infrastructural deficits—such as intermittent power supply, fluctuating internet bandwidth, and inadequate hardware distribution across sub-departments—continue to limit seamless data capture and automated dashboard tracking. Culturally, organizational inertia and resistance to technological change among academic and administrative staff frequently delay the transition from paper-based routines to digital workflows (Akintunde & Olumide, 2022; Yusuf & Babalola, 2023). To bridge these gaps, university governing councils and executive management must prioritize targeted capital investments in enterprise resource planning (ERP) systems, mandate data literacy workshops across all administrative cadred staff, and institutionalize policies that explicitly link departmental funding allocations to verifiable performance indicators. Transitioning from reactive decision-making to a sustained, data-driven governance model is vital for public universities in Southwestern Nigeria to maintain academic competitiveness and administrative excellence in an increasingly digital global landscape.

Conclusion

This study establishes that data-driven decision making is an indispensable operational engine for elevating institutional effectiveness across public universities in Southwestern Nigeria. By demonstrating that digital analytics, evidence-based budgeting, and systematic monitoring collectively predict institutional outcomes, the empirical evidence confirms that modernizing administrative workflows yields measurable gains in university performance. Consequently, sustaining higher education quality and competitiveness in Nigeria requires moving decisively beyond traditional, intuition-based governance toward structured, empirical management practices. Addressing infrastructural bottlenecks and institutionalizing staff data literacy remain imperative steps for university leaders seeking to fully realize the transformative potential of data-driven administrative systems.

Recommendation

1. In direct response to the low score observed for aligning university funding with data insights (Mean = 2.56, Table 2, Item 7), university governing councils and financial planning committees should formulate and enforce explicit policies that tie quarterly budgetary distributions to empirical departmental metrics rather than historical incremental allocations.
2. Given that the frequency of DDDM-related seminars and workshops recorded the lowest individual mean across all evaluated practices (Mean = 2.51, Table 2, Item 14), university management should establish mandatory quarterly data analytics workshops for administrative heads and deans, leveraging partnerships with tech firms to build hands-on capacity in institutional reporting.
3. While basic digital management software availability rated high (Mean = 3.40, Table 2, Item 1), the lower utilization of dedicated data analysis platforms (Mean = 2.86, Table 2, Item 4) and automated accountability dashboards (Mean = 2.72, Table 2, Item 15) indicates that university leadership must prioritize investments in enterprise-grade analytics software and integrated management information systems (MIS).
4. Capitalizing on the strong leadership support observed for data-based budgeting (Mean = 3.34, Table 2, Item 8) and digital software deployment (Mean = 3.40, Table 2, Item 1), university executive officers should translate this administrative backing into formal policy mandates that require all strategic plans and accreditation submissions to include empirical key performance indicator (KPI) tracking (Mean = 3.22, Table 2, Item 11).
5. Recognizing that Digital Tools and Analytics generated the strongest relative predictor coefficient for institutional effectiveness (beta = 0.31, $t = 3.72$, $p < .001$, Table 3; $r = 0.34$, Table 4), university ICT directorates should prioritize stabilizing core digital infrastructure specifically reliable internet bandwidth and cloud storage—to maximize the operational return on digital investments.
6. To strengthen the link between accountability measures and overall institutional performance ($r = 0.27$, $p = .002$, Table 6), university management should deploy automated performance monitoring dashboards (Mean = 2.72, Table 2, Item 15) and structured stakeholder feedback mechanisms (Mean = 2.88, Table 2, Item 13) across all academic and non-academic directorates.

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