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EXTERNAL STRATEGIC FACTORS MANAGEMENT AS PREDICTORS OF OPERATIONAL EFFICIENCY IN FEDERAL UNIVERSITIES IN NORTHEAST, NIGERIA

BY

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Abstract

This study examined External Strategic Factors Management as Predictors of Operational Efficiency in Federal Universities in North-East, Nigeria. The study adopted a predictive correlational research design. Six research questions were raised and answered and one composite hypothesis was formulated and tested at 0.05 level of significance. The population for this study is 20,949 personnel, comprising 6,715 academic staff and 14,234 senior administrative non-academic staff across Federal Universities in North-East Nigeria. The sample for this study consists of 762 personnel, comprising 375 academic staff and 387 senior administrative non-academic staff. The instruments titled: External Factors Management Questionnaire (EFMQ) and Operational Efficiency Questionnaire (OEQ) with 35 items were subjected to face and content validation and pilot tested using Cronbach Alpha statistic that yielded reliability coefficients 0.81 and 0.72 for the two instruments, indicating that they were reliable. The data collected were analysed using Mean and Standard Deviation to answer the research questions, while Multiple Regression Analysis was used to test the hypotheses at 0.05 level of significance. The study found that external factors comprising political, economic, social, technological, environmental, and legal significantly predicted operational efficiency in Federal Universities in North-East, Nigeria ($F_{(6, 380)} = 40.994$, $p < 0.05$). The study recommended, among others, that university administrators should strengthen collaborations with government for effective political alignment, diversify funding sources to withstand economic shocks, and adopt sustainability practices to enhance environmental management, enforce regulatory compliance to minimize legal challenges.

Keywords: External strategic factors, Strategic management, Strategic planning and Operational efficiency

Introduction

The effectiveness of universities in achieving these goals hinges on their operational efficiency, which encompasses the optimal use of resources to maximize educational outcomes and operational efficiency (Chankseliani, Qoraboyev & Gimranova, 2021). Operational efficiency refers to the ability of an organization to deliver services or products in the most cost-effective manner without compromising quality. In the context of federal universities, it encompasses the optimal use of resources human, financial, and technological to achieve educational objectives and enhance student outcomes. This includes effective management of faculty, infrastructure, administrative processes, and student support services. Universities operate efficiently and maximize their output while minimizing waste, leading to better educational experiences and higher levels of graduate employability (Akinsulire et al., 2024).

Focusing on Nigeria, the operational efficiency of the university system reflects both the challenges and potential within the African higher education landscape. Despite the establishment of numerous federal universities aimed at expanding access to higher education, issues such as bureaucratic inefficiencies, faculty shortages, and infrastructural deficits persist. In Northeast Nigeria, these challenges are compounded by socio-economic and security issues, including insurgency and instability, which disrupt educational activities and limit access to quality learning environments. An analysis of the operational efficiency of federal universities in this region is crucial for developing effective policies that can foster improvement and contribute to the broader socio-economic development of the area (Titus, Vamosiu, & McClure, 2017).

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In the Northeast region of Nigeria, the status of operational efficiency in federal universities presents significant challenges. Factors such as inadequate funding, infrastructural deficits, and a shortage of qualified faculty hinder the ability of these institutions to function effectively (Atungwu, 2023). Moreover, the socio-political climate, marked by economic and political instability and insecurity, exacerbates these issues, making it difficult for universities to attract resources and maintain operational standards. As a result, the universities struggle to fulfill their educational mandates, leading to lower student satisfaction and diminished academic performance, which ultimately impacts the broader socio-economic landscape of the region (Ogunode & Adah, 2022). To systematically analyze these challenges in tertiary institutions, particularly universities, there is need for external and internal management (Christodoulou & Cullinane, 2019).

The external factors, PESTEL (political, economic, social, technological, environment and legal) serve as valuable management analytical techniques that are systematically used to analyze the external variables in an institution. The PESTEL framework allows for an examination of the external factors affecting operational efficiency. Political instability, economic challenges, social dynamics, technological limitations, environmental concerns, and legal constraints all play a role in shaping the operational landscape of universities. For instance, political insecurity could disrupt academic calendars and deter potential students, while economic constraints may limit funding for essential resources. Identification of these external influences, stakeholders could better understand the context in which universities operate and formulate strategies to mitigate these challenges (Christodoulou & Cullinane, 2019). The conduct of this study is justified by the pressing need to understand and improve the operational efficiency of federal universities in Northeast Nigeria, a region facing unique challenges that hinder educational advancement.

Statement of the Problem

Federal universities in Northeast Nigeria are expected to operate efficiently by providing high-quality education supported by adequate infrastructure, skilled personnel, and innovative teaching practices that align with labor market demands. However, this ideal is undermined by persistent operational inefficiencies characterized by inadequate funding, poor infrastructure, limited access to learning resources, and frequent disruptions caused by industrial actions. Reports indicate that a significant proportion of students lack essential academic facilities, while recurring strikes and poor working conditions continue to destabilize academic calendars. Furthermore, the weak alignment between university education and labor market needs is reflected in low graduate employability rates. These challenges are further compounded by external factors such as political instability, economic constraints, and regulatory pressures, alongside internal weaknesses including poor resource management and unfavorable staff–student ratios. Consequently, these interrelated issues have reduced the effectiveness of universities in the region, limiting their capacity to produce a competent workforce and contribute meaningfully to socio-economic development. This study therefore addresses the problem of declining operational efficiency in federal universities in Northeast Nigeria by examining the influence of external factors with a view to improving institutional performance.

Research Questions

The following research questions are posed to guide the study:

RQ_1 What is the level of political factor management in Federal Universities in Northeast, Nigeria?
RQ_2 What is the level of economic factor management in Federal Universities in Northeast, Nigeria?
RQ_3 What is the level of social factor management in Federal Universities in Northeast, Nigeria?
RQ_4 What is the level of technological factor management in Federal Universities in Northeast, Nigeria?
RQ_5 What is the level of environmental factor management in Federal Universities in Northeast, Nigeria?
RQ_6 What is the level of legal factor management in Federal Universities in Northeast, Nigeria?

Hypothesis

H_{O1}: External combined factors management (political, economic, social, technology, environmental and legal) do not predict operational efficiency in Federal Universities in Northeast, Nigeria.

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Methodology

The study adopts a predictive correlational research design, which, as noted by Mertler, Vannatta and LaVenia (2021), is a quantitative approach used to examine the strength and direction of relationships between variables and to determine the extent to which predictor variables can forecast an outcome variable. This design is considered appropriate for assessing how external and internal factors predict operational efficiency in federal universities in Northeast Nigeria, while also allowing for the examination of multiple interacting predictors. The study population comprises 20,949 personnel, including 6,715 academic staff and 14,234 senior administrative non-academic staff across eight federal universities in the region. A sample of 762 respondents (375 academic and 387 non-academic staff) is selected using a multistage sampling procedure involving stratification, proportionate sampling, and purposive selection, with sample size determined using Taro Yamane's formula. Two instruments were used for data collection. The instruments were tagged External Factors Management Questionnaire (EFMQ) and Operational Efficiency Questionnaire (OEQ) designed to evaluate the impact of external factors on university management and operational efficiency. It uses a 5-point scale (ranging from Very High Level to Very Low Level). It is divided into sections covering Political, Economic, Social, Technological, Environmental, and Legal factors with specific measure for Operational Efficiency. The instruments were subjected to face and content validation and pilot tested using Cronbach Alpha statistic that yielded reliability coefficients 0.81 and 0.72 respectively. Data collected are subjected to both descriptive and inferential statistical analyses; means and standard deviations are used to answer research questions, while regression analysis at a 0.05 significance level is employed to test hypotheses and determine the predictive influence of independent variables on the dependent variable.

Results

Research Question 1: What is the level of political factor management in Federal Universities in North-East, Nigeria?

Table 1: **Mean and Standard Deviation of the Level of Political Factor Management in Federal Universities in North-east, Nigeria**

S/N	ITEMS n = 375	Mean	SD	Decision
1.	Government policies on the University Operations	3.15	1.02	ML
2.	Political stability in the count on the university	2.05	1.19	LL
3.	Government support for the university	2.12	1.98	LL
4.	Political regulations affecting university practices	3.19	1.13	ML
5.	Government's role in promoting competition in university	2.88	1.37	ML
	Grand Mean	**2.68**	**1.34**	**ML**

The data in Table 1 indicate that the overall level of political factor management in Federal Universities in North-East Nigeria is moderate, with a grand mean of 2.68 and a standard deviation of 1.34 (Decision: Moderate Level, ML). Specifically, items such as government policies on university operations (Mean = 3.15), political regulations affecting university practices (Mean = 3.19), and government's role in promoting competition in universities (Mean = 2.88) reflect a moderate level of management. However, political stability in the country (Mean = 2.05) and government support for the university (Mean = 2.12) are perceived at a low level (LL), indicating challenges in these areas. Overall, political factor management is somewhat adequate but shows weaknesses in political stability and government support within the university context.

Research Question 2: What is the level of economic factor management in Federal Universities in North-East, Nigeria?

Table 2: **Mean and Standard Deviation of the Level of Economic Factor Management in Federal Universities in North-east, Nigeria**

S/N	ITEMS n = 375	Mean	SD	Decision
6.	Economic growth on university performance	2.21	1.37	LL
7.	Inflation on university education costs	2.57	1.34	ML
8.	Exchange rates on university operations	2.46	1.19	LL

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9.	The university's ability to adapt to economic downturns	2.28	1.45	LL
10.	Level of cost fluctuations on university education	2.15	1.23	LL
	Grand Mean	**2.33**	**1.72**	**LL**

The data in Table 2 reveal that the overall level of economic factor management in Federal Universities in North-East Nigeria is low, with a grand mean of 2.33 and a standard deviation of 1.72 (Decision: Low Level, LL). Most items, including economic growth impact on university performance (Mean = 2.21), exchange rates on university operations (Mean = 2.46), the university's ability to adapt to economic downturns (Mean = 2.28), and cost fluctuations on university education (Mean = 2.15), are rated at a low level. Inflation's impact on university education costs shows a moderate level (Mean = 2.57), but still close to the low range. These results suggest that economic factor management is generally weak in these universities, highlighting challenges in handling economic pressures affecting operational efficiency.

Research Question 3: What is the level of social factor management in Federal Universities in North-East, Nigeria?

Table 3: **Mean and Standard Deviation of the Level of Social Factor Management in Federal Universities in North-east, Nigeria**

S/N	ITEMS n = 375	Mean	SD	Decision
11.	Social trends on students' behaviour in university practices	2.01	1.43	LL
12.	Demographic changes on university operations	2.23	1.03	LL
13.	University's ability to adapt to changing societal values	2.30	0.07	LL
14.	Ability to address social issues in the university community	2.57	1.40	ML
15.	Cultural diversity on university dynamic	2.29	1.00	LL
	Grand Mean	**2.28**	**1.21**	**LL**

The data in Table 3 indicate that the overall level of social factor management in Federal Universities in North-East Nigeria is low, with a grand mean of 2.28 and a standard deviation of 1.21 (Decision: Low Level, LL). Most items, such as social trends affecting student behavior (Mean = 2.01), demographic changes impacting university operations (Mean = 2.23), the university's ability to adapt to changing societal values (Mean = 2.30), and cultural diversity's influence on university dynamics (Mean = 2.29), are rated at a low level. Only the ability to address social issues in the university community shows a moderate level of management (Mean = 2.57). These findings suggest that social factor management is generally weak in these universities, highlighting challenges in effectively responding to social changes and diversity within the university environment.

Research Question 4: What is the level of technological factor management in Federal Universities in North-East, Nigeria?

Table 4: **Mean and Standard Deviation of the Level of Technological Factor Management in Federal Universities in North-east, Nigeria**

S/N	ITEMS n = 375	Mean	SD	Decision
16.	Technological advancements on university operations	2.15	0.23	LL
17.	Use of data analytics by university for improving decision making	2.05	0.36	LL
18.	Use of digital tools the university	2.25	0.36	LL
19.	University's technological collaboration with external partners	2.93	1.39	ML
20.	Ability of the university to manage cybersecurity risks in the digital landscape	3.31	0.46	HL
	Grand Mean	**2.54**	**0.56**	**ML**

The data in Table 4 indicate that the overall level of technological factor management in Federal Universities in North-East Nigeria is low, with a grand mean of 2.54 and a standard deviation of 0.56 (Decision: Low Level, LL). Most items, including technological advancements on university operations (Mean = 2.15), use of data analytics for decision-making (Mean = 2.05), and use of digital tools (Mean = 2.25), are rated at a low

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level. However, the university's technological collaboration with external partners (Mean = 2.93) and ability to manage cybersecurity risks (Mean = 3.31) show high levels of management. Overall, these findings suggest that while there are some strengths in specific technological areas, the general management of technology in these universities remains weak.

Research Question 5: What is the level of environmental factor management in Federal Universities in North-East, Nigeria?

Table 5: **Mean and Standard Deviation of the Level of Environmental Factor Management in Federal Universities in North-east, Nigeria**

S/N	ITEMS	n = 375	Mean	SD	Decision
21.	Environmental sustainability on the university		2.34	0.22	LL
22.	University's compliance with environmental regulations		2.44	0.50	LL
23.	Strategies in place to minimize the University environmental footprint		2.58	0.49	ML
24.	Climate change on university strategy		2.58	0.49	ML
25.	Waste management initiatives on university		2.02	0.23	LL
	Grand Mean		**2.39**	**0.39**	**LL**

The data in Table 5 show that the overall level of environmental factor management in Federal Universities in North-East Nigeria is low, with a grand mean of 2.39 and a standard deviation of 0.39 (Decision: Moderate Level, ML). Most items such as environmental sustainability (Mean = 2.34), compliance with environmental regulations (Mean = 2.44), climate change considerations in university strategy (Mean = 2.58), and waste management initiatives (Mean = 2.02) are rated at low levels. However, strategies to minimize the university's environmental footprint (Mean = 2.58) are rated at a moderate level. These findings suggest that while there are some efforts toward environmental management, overall, the universities have room to improve in effectively managing environmental factors.

Research Question 6: What is the level of legal factor management in Federal Universities in North-East Nigeria?

Table 6: **Mean and Standard Deviation of the Level of Legal Factor Management in Federal Universities in North-east, Nigeria**

S/N	ITEMS	n = 375	Mean	SD	Decision
26.	Legal regulations on university operations		2.58	1.37	ML
27.	The university's adherence to industry-specific legal requirements		2.57	1.23	ML
28.	Legal risks related to intellectual property protection		2.12	1.24	LL
29.	The university's ability to comply with labor laws		2.38	1.13	LL
30.	Legal disputes on the university reputation		2.68	1.24	ML
	Grand Mean		**2.47**	**1.24**	**LL**

The data in Table 6 indicate that the overall level of legal factor management in Federal Universities in North-East Nigeria is low, with a grand mean of 2.47 and a standard deviation of 1.24 (Decision: Low Level, LL). While legal regulations on university operations (Mean = 2.58) and adherence to industry-specific legal requirements (Mean = 2.57) are rated at moderate levels, other aspects such as legal risks related to intellectual property protection (Mean = 2.12), compliance with labor laws (Mean = 2.38), and legal disputes affecting the university's reputation (Mean = 2.68) are rated at moderate levels. These results suggest that legal factor management in these universities is generally weak, with notable gaps in critical areas of legal compliance and risk management.

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Hypothesis

H_O1: External combined factor management (political, economic, social, technology, environmental and legal) do not significantly predict operational efficiency in Federal Universities in North-East, Nigeria.

Table 7: Coefficient of Regression between External Combined Factor Management as Predictor of Operational Efficiency in Federal Universities in North-east, Nigeria

Model			Unstandardized Coefficients		Standardized Coefficients	T	Sig.
			B	Std. Error	Beta		
1	(Constant)		-8.649	1.754		-4.930	0.000
	Political Management	Factor	-2.996	.503	-5.140	-5.955	0.000
	Economic Management	Factor	1.137	.105	1.508	10.842	0.000
	Social Management	Factor	3.164	.464	1.379	6.818	0.000
	Technological Management	Factor	1.357	.152	2.701	8.911	0.000
	Environmental Management	Factor	1.280	.456	1.586	2.806	0.005
	Legal Management	Factor	-1.043	.154	-1.145	-6.775	0.000

a. Dependent Variable: Operational Efficiency

The regression coefficients in Table 7c show that, taken together, the external combined factors significantly predict operational efficiency in Federal Universities in North-East Nigeria, but their individual effects differ in direction and strength. Economic (B = 1.137, p < .001), social (B = 3.164, p < .001), technological (B = 1.357, p < .001), and environmental factor management (B = 1.280, p = .005) all have significant positive prediction on operational efficiency, indicating that improvements in these areas are associated with higher operational efficiency when other factors are held constant. In contrast, political (B = -2.996, p < .001) and legal factor management (B = -1.043, p < .001) show significant negative coefficients in the combined model, suggesting that, after accounting for the other external factors, higher levels or certain patterns of political and legal factor management are associated with lower operational efficiency likely reflecting overlap, trade-offs, or multicollinearity among predictors. Overall, the significance of all predictors and the model as a whole supports the rejection of H_O7 and confirms that external combined factor management significantly predicts operational efficiency, though with both enhancing (economic, social, technological, environmental) and constraining (political, legal) influences when considered simultaneously.

Discussion of the Findings

The study first established that political factor management is at a moderate level (, yet significantly and positively predicts operational efficiency. This suggests that although political issues such as government policies, regulatory frameworks and political stability are only moderately well managed, they still play a decisive role in shaping how efficiently universities operate. This result resonates with evidence that political dynamics and state involvement critically influence higher education governance, funding and institutional performance (Meyer, 2017; Ogunleye, 2020; Chankseliani, Qoraboyev, & Gimranova, 2021). In the Nigerian context, politicisation of university education, policy inconsistency and industrial actions have been shown to disrupt academic calendars and reduce institutional efficiency (Shimawua, 2020; Ogunode, Atobauka, & Ayoko, 2023; Wikipedia contributors, 2023). From a broader PESTEL perspective, political factors are central to environmental scanning and risk management in educational systems (Çitilci & Akbalık, 2020; Artyukhov, 2020; Mohd, Aasim, & Anas, 2023), and this study reinforces the view that strengthening political factor management through improved policy dialogue, advocacy, and institutional autonomy is essential for

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enhancing operational efficiency in universities in fragile regions such as North-East Nigeria (Abiodun et al., 2020; World Bank, 2021).

Second, the study found that the level of economic factor management is low, but economic factor management has a significant positive effect on operational efficiency. The low level reflects persistent funding inadequacies, inflationary pressures, exchange-rate volatility and cost fluctuations that constrain Nigerian universities, particularly in the North-East (African Development Bank, 2020; Jacob & Lawan, 2020; World Bank, 2021). Yet the strong predictive effect underscores that universities that more effectively plan, prioritize and manage economic risks and resources achieve better operational outcomes. This accords with previous studies showing that cost efficiency, prudent financial management and resource optimization are central drivers of institutional performance in both education and financial sectors (Alabi, Adebisi, & Fatimehin, 2020; Matsiliza, 2018; Mekolle, 2020; Zakhidov, 2024). Studies on university efficiency using DEA and related techniques similarly demonstrate that funding regimes, budget policies and economic conditions significantly explain variations in higher education efficiency (Nazarko & Šaparauskas, 2014; Titus, Vamosiu, & McClure, 2017; Ramírez-Gutiérrez, Barrachina-Palanca, & Ripoll-Feliu, 2020). In line with this, the present study suggests that reforms in financial planning, revenue diversification, cost control and accountability are crucial levers for improving operational efficiency in Federal Universities in North-East Nigeria.

Third, the study revealed that the level of social factor management is low, though social factor management significantly predicts operational efficiency. Social factors here include social trends in student behaviour, demographic changes, evolving societal values, cultural diversity, and the capacity of universities to address social issues. The low scores point to insufficient responsiveness to changing student needs, community expectations and social tensions in the region an issue particularly salient in a context marked by insecurity, socio-economic deprivation and cultural diversity (Abiodun et al., 2020; Adeleke, 2020; Funminiyi, 2018). Nonetheless, the significant predictive relationship supports sociological and organizational perspectives which argue that social integration, inclusive campus climate and community engagement are critical to educational outcomes and institutional effectiveness (Haymovitz et al., 2018; Chankseliani et al., 2021). Research in African and global contexts have shown that cultural norms, social expectations and stakeholder relationships shape both student success and organizational performance (Emon & Khan, 2023).

Fourth, the study established that technological factor management is moderate, whereas technological factor management is a strong positive predictor of operational efficiency. The constructs assessed included technological advancements, use of data analytics, digital tools, technological collaborations and cybersecurity management. The moderate level implies that while certain digital tools and systems have been adopted, technology is not yet fully embedded in core academic and administrative processes. This is consistent with literature that documents uneven ICT integration and persistent infrastructural gaps in African universities (Yakubu & Dasuki, 2019). However, the strong predictive effect aligns with research demonstrating that digital technologies, Industry 4.0 tools and data-driven systems significantly enhance operational efficiency, decision making and process optimization in education and other sectors (Liu & Kuo, 2018). Studies on smart campuses and digital transformation similarly argue that strategic ICT adoption improves resource management, service delivery and sustainability in universities (Awuzie et al., 2021). The present findings thus highlight the need for coherent digital strategies, adequate infrastructure, and capacity building to harness the full efficiency gains of technological innovation.

Fifth, the study showed that the level of environmental factor management is low, even though environmental factor management significantly predicts operational efficiency. Environmental factors cover sustainability practices, compliance with environmental regulations, reduction of environmental footprints, climate-change considerations and waste management. The low mean indicates that environmental governance is still marginal in the sampled universities, mirroring earlier evidence that sustainability initiatives in campuses are often fragmented or under-resourced, especially in developing contexts (Mohamed, Noor, & Sing, 2020). Yet the significant positive effect on operational efficiency is consistent with research showing that environmental innovations, green practices and sustainable campus operations enhance resource efficiency, reduce costs and

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improve institutional reputation (Adams, Martin, & Boom, 2018; Fernando, Jabbour, & Wah, 2019; Leal Filho et al., 2018; Tang et al., 2018). Environmental scanning and integration of sustainability into strategic planning have been identified as critical to long-term institutional resilience and performance (Mustika & Rahmayanti, 2019). The present study thus supports the argument that environmental management is not merely a compliance requirement but a strategic lever for efficiency and sustainable development in universities.

Sixth, the findings indicate that the level of legal factor management is low yet legal factor management significantly and positively predicts operational efficiency. Legal factors include adherence to regulations, sector-specific legal requirements, labour laws, intellectual property protection and management of legal disputes. The low level reflects challenges in compliance culture, regulatory complexity, and underdeveloped internal legal structures in public universities (Ogunode & Adah, 2022). Nonetheless, the strong predictive effect aligns with literature emphasizing that robust legal and internal control systems reduce risks, prevent disruptions and improve organizational performance (Cheng, Goh, & Kim, 2018). In higher education, effective legal governance is increasingly critical given the expansion of accreditation requirements, quality assurance regimes and intellectual property issues (Salas-Velasco, 2019). The present results suggest that strengthening legal compliance units, staff training, and internal policies can significantly enhance operational efficiency in Nigerian universities.

Conclusion

This study established that the levels of political factor management, technological factor management, and threat factor management in Federal Universities in North-East Nigeria were moderate, whereas economic, social, environmental, legal, strength, weakness, and opportunity factor management were found to be low. The study further revealed that each external PESTEL factor political, economic, social, technological, environmental and legal significantly predicted operational efficiency, just as the combined external factors jointly produced a significant predictive effect.

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