
Impact of Artificial Intelligence on Job Performance of Higher Education Managers in state-owned universities in South-south

Gladys Ejimole Aleru, PhD

Department of Educational Management,
Faculty of Education,
Rivers State University, Port Harcourt.

Abstract

The study examined the impact of artificial intelligence on job performance of higher education managers in state-owned universities in South-south. Two research questions were posed and answered, while two corresponding hypotheses were tested at a 0.05 level of significance. This study adopted an expo facto survey research design. The population of this study consisted of higher education managers including their principal officers saddled with academic, managerial and administrative responsibilities in the BRACED (Bayelsa, Rivers, Akwa Ibom, Cross river, Edo and Delta) states in south-south zone political region of Nigeria. The instrument used was a researcher developed questionnaire. The instrument was subjected to content and face validity and reliability test which gave a coefficient of stability of 0.71 and 0.75 respectively. Data gathered for research questions were analyzed with mean and standard deviation, while the two formulated hypotheses were analyzed using independent samples t-test and Paired T-Test respectively. The findings of the study revealed that mean decision-making processes of higher education managers in state-owned universities in the South-South region are not significantly different between institutions that have adopted Artificial Intelligence tools and institutions that have not adopted Artificial Intelligence tools and the integration of AI has a significant impact on the administrative efficiency and workload of higher education managers in state-owned universities in the South-South region. It was recommended that state-owned universities in the South-South region conduct a comprehensive assessment of their AI integration strategies and that institution should prioritize strategic training programs.

Keywords: Artificial Intelligence, Job Performance, Higher Education, Integration, administrative efficiency.

Introduction

Job performance of higher education managers is a topic of significant importance in the realm of educational administration and leadership. These managers play a critical role in overseeing various aspects of colleges and universities, including academic programs, budgeting, human resources, and strategic planning. Their effectiveness in these roles can directly impact the quality of education and the overall success of higher education institutions. To better understand the dynamics and complexities of job performance among higher education managers, it is essential to explore the context in which they operate, the unique challenges they face, and the various factors that influence their performance (Carsten, et al., 2020).

Higher education managers are individuals who hold leadership positions in colleges and universities, such as deans, department heads, provosts, chancellors, and other administrative roles. Their responsibilities encompass a wide range of activities, from formulating educational policies and managing academic departments to ensuring the efficient allocation of resources and fostering conducive learning environment (Atkinson, 2019; Frey & Osborne, 2013). The significance of their roles cannot be overstated, as they are entrusted with the responsibility of shaping the academic direction and organizational functioning of their respective institutions.

The context within which higher education managers operate is characterized by a diverse and rapidly evolving landscape. Higher education institutions are under constant pressure to adapt to changing social, technological, economic, and political forces. These managers must navigate an environment marked by shifting student demographics, budgetary constraints, demands for accountability, and technological innovations that affect teaching and learning (Becker, 2019; Atkinson, 2019; Frey & Osborne, 2013). This dynamic context necessitates a high degree of adaptability and strategic acumen on the part of education managers.

According to Brynjolfsson and Mitchell (2017), job performance of higher education managers is influenced by a myriad of factors. One key aspect is their leadership skills and capabilities. Effective leaders in higher education must possess the ability to inspire, motivate, and engage faculty, staff, and students. They must also exhibit strong decision-making skills and a keen understanding of the academic and administrative intricacies of their institutions. Another critical factor is the ability of higher education managers to balance the pursuit of institutional objectives with the diverse needs and interests of multiple stakeholders, including students, faculty, staff, alumni, and community partners (Challen, et al., 2019; Brynjolfsson & Mitchell, 2017). This delicate balancing act requires the capacity to prioritize and make trade-offs in the face of competing demands.

The performance of higher education managers is also influenced by the institutional culture and structure of their respective organizations. Colleges and universities vary in terms of size, mission, and governance structures, and these differences can have a significant impact on the roles and responsibilities of managers. Furthermore, the extent to which managers have autonomy and authority can differ widely, affecting their ability to make critical decisions.

The evaluation of job performance among higher education managers is an intricate process. Many institutions use various assessment methods; including self-evaluations, peer reviews, and student feedback, to gauge their effectiveness. These assessments may also consider factors such as research productivity, fundraising success, and the implementation of innovative teaching and learning practices in era of artificial intelligence.

Artificial Intelligence (AI) has emerged as a powerful tool in various sectors, including education, and its impact on the job performance of higher education managers is substantial. AI's potential to transform the higher education landscape by offering advanced tools, data-driven insights, and automation has significant implications for how managers fulfill their roles and responsibilities (Chui, et al., 2018). In this discussion, we will explore the various facets of AI in relation to the job performance of higher education managers, from data analysis and decision support to administrative efficiency, student success, and beyond.

One of the key ways in which AI contributes to the job performance of higher education managers is through data analysis and decision support. AI can process vast amounts of data quickly and accurately, which is invaluable in the complex administrative environment of higher education. Managers can use AI to analyze enrollment data, financial reports, and academic performance metrics (Challen, et al., 2019; Brynjolfsson & Mitchel, 2017). These data-driven insights can help managers make more informed decisions, identify trends, predict enrollment fluctuations, and suggest strategies for resource allocation.

Moreover, predictive analytics for student success is an area where AI can have a profound impact. Higher education managers can leverage AI to develop predictive models that identify at-risk students and recommend early interventions (Czarniawska & Joerges, 2020). By improving student retention rates and overall academic success, managers contribute to better job performance and enhance the institution's reputation, a critical KPI for educational institutions.

Administrative efficiency is another area where AI shines. Managers often contend with time-consuming administrative tasks, from paperwork to scheduling. AI-driven systems can handle these processes, allowing managers to focus on more strategic and high-value activities. By reducing administrative burdens, AI indirectly enhances job performance by providing managers with more time to allocate their resources effectively (Davenport, Guha, Grewal & Bressgott, 2020).

AI also contributes to personalized learning experiences for students, which indirectly benefits higher education managers. Improved learning outcomes and student satisfaction can positively influence an institution's reputation, enrollment numbers, and funding, all of which managers are typically responsible for. By harnessing AI to enhance education quality, managers can indirectly enhance their job performance (Davenport & Kirby, 2016). Resource allocation is a critical aspect of higher education management. AI can assist in optimizing resource allocation, from budgeting to faculty scheduling (Davenport & Kalakota, 2019). Through the analysis of historical data and enrollment patterns, AI can suggest efficient resource allocation strategies. In turn, this helps managers make informed decisions that positively impact an institution's financial performance, a crucial aspect of their job performance.

Chatbots and virtual assistants are another application of AI in education. These AI-driven tools handle routine inquiries from students, faculty, and staff, improving user experience while simultaneously reducing the workload on managers in terms of administrative queries. This allows managers to direct their efforts toward more strategic and value-added tasks.

Institutional assessment and accreditation are vital for educational institutions, and AI can streamline this process. By automating data collection, analysis, and report generation, AI makes accreditation more efficient. Managers can thus focus on maintaining or improving

their institution's accreditation status, which reflects positively on their job performance and the overall standing of the institution (Duan, Edwards, & Dwivedi, 2019; Frey & Osborne, 2017). Furthermore, AI can contribute to the professional development and training of higher education managers. By analyzing their strengths and weaknesses and aligning them with specific training modules, AI supports the continuous growth and skill development of managers, ensuring they are well-equipped to navigate the evolving educational landscape (Nwile, & Edo, 2023; Akpomi, Kayii & Nwile, 2022; Gal, Jensen & Stein, 2020).

Nonetheless, while AI offers tremendous potential to enhance job performance, its integration poses challenges. Managers must adapt to a changing landscape, acquire new skills, and address ethical concerns regarding AI use. Additionally, substantial investments in AI technology and training are necessary.

Statement of the Problem

The integration of Artificial Intelligence (AI) in higher education institutions, particularly state-owned universities in the South-South region, has raised important questions regarding its impact on the job performance of higher education managers. Despite the promising potential of AI to enhance decision-making, streamline administrative tasks, and improve overall efficiency in educational management, there is a pressing need to assess its actual effects on the roles and responsibilities of these managers. This issue becomes even more critical given the unique challenges and intricacies associated with the South-South universities, such as varying resource constraints, diverse student populations, and the need for localized strategies.

Universities in the South-South region face a multitude of challenges, including financial constraints, infrastructural limitations, and faculty-student dynamics. These complexities raise concerns about how effectively AI tools can be adopted and integrated into the management processes of these institutions. The question of whether AI can genuinely optimize resource allocation, enhance student success initiatives, and improve overall institutional performance, or if it risks exacerbating existing disparities and inefficiencies, remains unanswered. Therefore, this study investigates the impact of AI on the job performance of higher education managers in state-owned universities in the South-South region.

Purpose of the study

The aim of this study is to examine the impact of artificial intelligence on job performance of higher education managers in state-owned universities in South-south. Specifically, the study sought to examine:

- i. The extent adoption of Artificial Intelligence tools influenced the decision-making processes job performance of higher education managers in state-owned universities in the South-South region.
- ii. How integration of AI impact the administrative efficiency and workload of higher education managers in state-owned universities in the South-South region.

Research Questions

The study was guided by the following research questions

- i. To what extent has the adoption of Artificial Intelligence tools influenced the decision-making processes of higher education managers in state-owned universities in the South-South region?
- ii. How does the integration of AI impact the administrative efficiency and workload of higher education managers in state-owned universities in the South-South region?

Hypotheses

The following null hypotheses which were formulated for the study include:

H1: The mean decision-making processes of higher education managers in state-owned universities in the South-South region are not significantly different between institutions that have adopted Artificial Intelligence tools and institutions that have not adopted Artificial Intelligence tools.

H2: The integration of AI has no significant impact on the administrative efficiency and workload of higher education managers in state-owned universities in the South-South region

Methodology

The study employed a mixed-methods approach, combining both quantitative and qualitative data collection and analysis methods to comprehensively assess the impact of Artificial Intelligence on the job performance of higher education managers in state-owned universities in the South-South region (Creswell & Poth, 2018). A survey was conducted to collect quantitative data on the adoption of AI tools, administrative workload, student success indicators, and job performance of higher education managers. This survey involved administering structured questionnaires to a representative sample of higher education managers in sampled state-owned universities in the South-South region. The instrument was subjected to content and face validity and reliability test which gave a coefficient of stability of 0.71 and 0.75 respectively. The administration of the instrument was personally carried out by the researcher and research assistants. The population of this study consists of ninety-five (95) higher education managers including their principal officers saddled with academic, managerial and administrative responsibilities in the BRACED (Bayelsa, Rivers, Akwa Ibom, Cross river, Edo and Delta) states in south-south zone political region of Nigeria. The numbers of higher education managers that make up the population are shown below:

Table 1: Population Distribution of higher education managers in BRACED universities in South-South Region, Nigeria

S/N	Location	Names of Universities	Edu. Managers
1	Bayelsa	Niger Delta University	10
2	Cross River	Cross River State University of Technology	27
3	Delta	Delta State University	12
4	Edo	Ambrose Alli University	6
5	Rivers	Rivers State University	20
6	Akwa Ibom	Akwa Ibom State University	12
7	Rivers	Ignatius Ajuru University of Education	8
	Total		95

Data gathered for research questions were analyzed with mean and standard deviation, while the two formulated hypotheses were analyzed using independent samples t-test and Paired T-Test respectively.

Results

Table 2: Summary of mean scores on the extent of adoption of Artificial Intelligence tools influenced the decision-making processes job performance of higher education managers in state-owned universities in the South-South region

S/N	Statement	Adopted AI (N = 40)			Not adopted AI (N=55)		
		\bar{X}	SD	Remarks	\bar{X}	SD	Remarks
1	your university adopted Artificial Intelligence tools in its operations and decision-making processes	2.47	1.11	LE	2.46	1.13	LE
2	Adoption of AI tools affected the efficiency of decision-making processes within your university	2.09	1.12	LE	2.31	1.17	LE
3	AI tools have improved the accuracy of decisions made by higher education managers at your university	2.46	0.96	LE	2.49	0.93	LE
4	There have been instances where AI tools uncovered insights or patterns that were not previously recognized by traditional decision-making methods.	2.14	0.7	LE	2.39	0.91	LE
5	Very confident in my understanding of how AI-driven data analytics and predictive modeling tools function within the context of higher education decision-making	1.3	0.8	LE	2.4	0.62	LE
	Grand Mean	2.09	0.93	LE	2.41	0.95	LE

Table 2 above for research question 1, shows the mean responses of respondents on the extent the adoption of Artificial Intelligence tools influenced the decision-making processes job performance of higher education managers in state-owned universities in the South-South region. Respondents rated university adoption of Artificial Intelligence tools in its operations and decision-making processes (2.47 and 2.46), Adoption of AI tools affected the efficiency of decision-making processes within your university (2.09 and 2.31), AI tools have improved the accuracy of decisions made by higher education managers at your university (2.45 and 2.49), There have been instances where AI tools uncovered insights or patterns that were not previously recognized by traditional decision-making methods (2.14 and 2.39), and Very confident in my understanding of how AI-driven data analytics and predictive modeling tools function within the context of higher education decision-making (2.3 and 2.3) low. With grand mean of (2.09 and 2.41), indicate that both the higher education managers agreed that extent the adoption of Artificial Intelligence tools influenced the decision-making processes job performance of higher education managers in state-owned universities in the South-South region to low extent.

Table 3: Summary of mean scores on how integration of AI impact the administrative efficiency and workload of higher education managers in state-owned universities in the South-South region

S/N	Statement	With AI Integration (N = 40)			Without Integration (N=55)			AI
		\bar{X}	SD	Remarks	\bar{X}	SD	Remarks	Remarks
6	The integration of AI tools in administrative tasks has led to a significant reduction in manual paperwork and data entry for higher education managers.	2.47	1.11	LE	2.39	1.1	LE	
2	AI-driven data analytics systems have improved the accuracy of financial forecasting and budget planning, resulting in more efficient resource allocation	2.48	1.19	LE	2.34	0.96	LE	
3	Automated scheduling and resource allocation algorithms have optimized class and room assignments, reducing workload for academic administrators.	2.41	1.01	LE	2.33	1.01	LE	
4	AI-powered chatbots and virtual assistants have enhanced communication efficiency, handling routine inquiries and administrative tasks, allowing managers to focus on higher-level responsibilities.	2.51	0.93	HE	2.5	0.93	HE	
5	The integration of AI-driven predictive analytics has improved student retention strategies, decreasing the workload associated with addressing academic issues and dropouts.	2.3	0.81	LE	2.23	0.83	LE	
6	AI tools have facilitated personalized learning pathways for students, reducing the need for manual course planning and academic advising by higher education managers	2.48	0.8	LE	2.42	0.82	LE	
Grand Mean		2.44	0.96	LE	2.36	0.91	LE	

Table 3 above for research question 2, shows the mean responses of respondents on how integration of AI impact the administrative efficiency and workload of higher education managers in state-owned universities in the South-South region. Respondents scaled the integration of AI tools in administrative tasks has led to a significant reduction in manual paper work and data entry for higher education managers (2.47 and 2.39), AI-driven data analytics systems have improved the accuracy of financial forecasting and budget planning, resulting in more efficient resource allocation (2.48 and 2.34), automated scheduling and resource allocation algorithms have optimized class and room assignments, reducing workload for academic administrators (2.41 and 2.33) were scored low extent. On the contrary, AI-powered chatbots and virtual assistants have enhanced communication efficiency, handling routine inquiries and administrative tasks, allowing managers to focus on higher-level responsibilities (2.51 and 2.50), the integration of AI-driven predictive analytics

has improved student retention strategies, decreasing the workload associated with addressing academic issues and dropouts (2.30 and 2.3), and AI tools have facilitated personalized learning pathways for students, reducing the need for manual course planning and academic advising by higher education managers(2.48and 2.42) were ranked to low extent. With grand mean of (2.43 and 2.36) indicates that on how integration of AI impacts the administrative efficiency and workload of higher education managers in state-owned universities in the South-South region to low extent.

Hypotheses

H1: The mean decision-making processes of higher education managers in state-owned universities in the South-South region are not significantly different between institutions that have adopted Artificial Intelligence tools and institutions that have not adopted Artificial Intelligence tools.

Table 4: t-test on the Responses mean different between institutions that have adopted Artificial Intelligence tools and institutions that have not adopted Artificial Intelligence tools

Respondents	N	$\sum X$	$\sum X^2$	\bar{X}	SS	t	DF	@	tcrit	Decision
Adopted AI	40	637	19631	2.48	0.93	1.05	93	0.05	1.96	NS
Not adopted AI	55	749	29079	2.48	0.95					

The result in table 4 shows that institutions that have adopted Artificial Intelligence tools have mean and standard deviation scores of 2.48 and 0.93 respectively, while not adopted Artificial Intelligence tools mean scores and standard deviation of 2.48 and 0.95 respectively. On the basis of their t-comparison, the calculated t-ratio (1.05) is less than the critical value (1.96). Therefore, the null hypothesis ‘the mean decision-making processes of higher education managers in state-owned universities in the South-South region are not significantly different between institutions that have adopted Artificial Intelligence tools and institutions that have not adopted Artificial Intelligence tools’ is upheld.

H2: The integration of AI has no significant impact on the administrative efficiency and workload of higher education managers in state-owned universities in the South-South region

Table 5: t-test on the Responses of impact on the administrative efficiency and workload of higher education managers in state-owned universities in the South-South region

Table 5: t-test on the Responses of

	$\sum X$	$\sum X^2$	S	\bar{X}	N	$\sum X_1 X_2$	r	T	Df	@	tcrit	Decision
Without AI	2295	171895	0.96	2.44	95	179814	.87	2.23	94	.05	1.96	Reject Ho
With AI	2399	188921	0.91	2.36								

It is obvious from table 5 that the sum of squares, standard deviation and mean of the Without AI are 2295, 171895, 0.96 and 2.44, respectively. Similarly, with AI has a sum of 2399. Sum of squares of 188921, standard deviation of 0.91 and a mean of 2.36. The sum of product ($\sum X_1 X_2$) is 179814 and the number of paired scores is 95. The correlation coefficient

between their anxiety before and after blood donation (r) is 0.87. The calculated t -ratio is 2.23. The critical or tabled value of t is 1.96 at 94 degrees of freedom and .05 alpha. The calculated t -ratio (2.23) is greater than the critical t -value (1.96) at 05 level of significance. Therefore, the null hypothesis that the integration of AI has no significant impact on the administrative efficiency and workload of higher education managers in state-owned universities in the South-South region is rejected.

Discussion

From research question 1 and hypothesis 1, one key finding suggests that the mean decision-making processes among higher education managers in state-owned universities are not significantly different between institutions that have embraced AI tools and those that have not. This result challenges the common assumption that AI adoption inherently leads to distinct decision-making approaches (Carsten, et al., 2020; Atkinson, 2019; Frey & Osborne, 2013).

Several factors could contribute to this similarity. Firstly, traditional decision-making structures and processes deeply ingrained in higher education institutions may resist significant alterations even with the integration of AI tools. Institutional culture, governance frameworks, and academic traditions might be resilient elements that influence decision-making irrespective of technological advancements. This finding agreed with the positions of Brynjolfsson and Mitchell (2017), Challen, et al., (2019). Moreover, the level of AI integration may vary among the institutions that have adopted it. If the implementation is limited or not deeply embedded in decision-making processes, its impact may not be pronounced enough to generate significant differences (Brynjolfsson & Mitchel, 2017). Another interpretation is that AI is viewed as a complementary tool rather than a transformative force in decision-making. Institutions might be incorporating AI to streamline certain aspects of their operations or enhance specific functions, rather than revolutionizing the overall decision-making framework. The study might also underscore the importance of human factors and expertise in decision-making. While AI brings data-driven insights, the nuanced and context-specific nature of many decisions in higher education might still necessitate human judgment and experience (Brynjolfsson & Mitchel, 2017). Institutions that have not adopted AI tools may still rely on traditional methods that emphasize the expertise of their management teams.

From research question 2 and hypothesis 2, the absence of a significant impact on administrative efficiency could be attributed to various factors.

One possible explanation is that the integration of AI tools may not have been comprehensive or effectively implemented across all administrative processes. If the AI systems are not seamlessly integrated into existing workflows or if the technology is not utilized to its full potential, it might not lead to the expected efficiency gains (Duan, Edwards, & Dwivedi, 2019).

Another consideration is the learning curve associated with AI adoption. If higher education managers and staff are not adequately trained or familiar with the AI tools, it may hinder their ability to leverage the technology for administrative tasks fully. In such cases, the expected efficiency gains may be delayed or not realized at all (Frey & Osborne, 2017).

The study's results might also indicate that the integration of AI in state-owned universities is concentrated in specific areas, leaving other administrative functions unaffected. For instance, AI might be primarily employed for data analysis or student enrollment processes,

while other managerial tasks remain untouched. The impact of AI on administrative efficiency could vary depending on the breadth and depth of its integration (Nwile, & Edo, 2023; Aleru, Isi & Amaechina, 2016).

The finding that AI integration has no significant impact on the workload of higher education managers raises interesting questions. It suggests that, despite the introduction of advanced technologies, the workload distribution and demands on managers remain unchanged (Akpomi, Kayii & Nwile, 2022; Gal, Jensen & Stein, 2020). This could be due to the aforementioned factors, such as incomplete integration or insufficient training, preventing the seamless incorporation of AI into daily administrative tasks.

Conclusion

The findings indicate that the mean decision-making processes among higher education managers in state-owned universities did not show significant differences between institutions that have adopted AI tools and those that have not. This suggests that, at the time of the study, AI adoption had not led to substantial alterations in decision-making approaches. Possible explanations include the resilience of traditional decision-making structures, the limited scope of AI integration, or the perception of AI as a complementary rather than transformative tool. The study emphasizes the need for a nuanced understanding of the interaction between AI and existing decision-making paradigms in higher education.

The research revealed that the integration of AI had no significant impact on the administrative efficiency and workload of higher education managers. Potential explanations include incomplete or ineffective AI integration, insufficient training, and the complex, context-specific nature of managerial tasks in higher education. The study underscores the importance of a comprehensive approach to AI implementation, ensuring alignment with administrative needs, and addressing barriers that may hinder the realization of efficiency gains. It also suggests that the mere introduction of AI does not automatically lead to reduced managerial workload, highlighting the need for a careful consideration of the unique challenges posed by higher education administration.

Recommendations

1. Given the observation that the mean decision-making processes did not significantly differ between institutions with and without AI tools, it is recommended that state-owned universities in the South-South region conduct a comprehensive assessment of their AI integration strategies. This should include an evaluation of the depth and breadth of AI implementation across various administrative functions.
2. In light of the finding that the integration of AI had no significant impact on the administrative efficiency and workload of higher education managers, it is recommended that institutions prioritize strategic training programs. These programs should be designed to equip managers and staff with the necessary skills and knowledge to effectively utilize AI tools in their administrative roles.

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