Faculty of Natural and Applied Sciences Journal of Mathematics and Science Education
Print ISSN: 2814-0885 e-ISSN: 2814-0931
www.fnasjournals.com
Volume 4; Issue 1; March 2023; Page No. 28-36.

ARTIFICIAL INTELLIGENCE AND ROBOTIC TOOLS FOR EFFECTIVE EDUCATIONAL MANAGEMENT AND ADMINISTRATION IN THE STATE-OWNED UNIVERSITIES IN RIVERS STATE, NIGERIA

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Abstract
The study examined artificial intelligence instruments as a tool for efficient educational management and administration in the university system in Rivers State, Nigeria. The study adopted a descriptive survey design. Consequently, three research questions and three hypotheses were formulated for the study. The population consists of 154 administrators from Rivers State University and Ignatius Ajuru University of Education, Port-Harcourt. The whole population is used as the sample size. The instrument was titled, "Artificial Intelligence Tools for Educational Management and Administration Questionnaire (AITEMAQ). Sixteen (16) structured items were designed for the study. Hence, 154 copies of the questionnaire were distributed and 143 copies of the questionnaire were retrieved. The statistical tools used were frequency, mean scores, and standard deviation for the research questions, while the Z-test was used to test the hypothesis at a 0.05 level of significance. According to the findings, the use of artificial intelligence tools improves mobility and the production of knowledge capacity among administrators. In other words, it makes organizational duties more efficient as well as projects the university's global acknowledgement. It was therefore concluded that the utilization of artificial intelligence tools enhances the efficiency of the educational system. This is based on the fact that there is access to information and data concerning administrative and instructional activities. It was therefore recommended that the administrators should be intermittently trained to be acquainted with the current trend of artificial intelligence tools to ameliorate distance in job responsibilities.

Keywords: Artificial Intelligence, Robotic, Educational Management, Administration

Introduction

Revolutions in every area of human growth brought about by the use of information communication and technology have caused ongoing, dynamic changes in the educational system. Currently, computing applications fueled by Augmented Reality (AR), Virtual Reality (VR), and Artificial Intelligence (AI) have forced educational managers and administrators to keep up with technological change. The 1956 invention of artificial intelligence by John McCarthy, a retired Professor of Computer Science at Stanford, has proven to be the most efficient means of overcoming the challenges of learning 21st-century management and administrative skills. Artificial intelligence is said to have improved the effectiveness of administration and learning (Chen et al., 2020). This is because it provides reassuringly competitive benefits in task responsibility. Artificial intelligence systems, by implication, provide efficient assistance for online learning and teaching, customizing and energizing learning, automating administrative mundane activities, and adaptive evaluations. Therefore, any administrator, lecturer, or student who does not comprehend the application of artificial intelligence will not keep pace with modern technology.

Artificial Intelligence (Al) is a term that refers to a machine or computer program that performs a task by using elements of human-like reasoning. The instrument is used for planning, problem-solving, or logical behaviour, maps and navigation, facial recognition, text editors, autocorrect, search and recommendation algorithms,

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chatbots, digital assistants, social media, and e-payments are a few instances of artificial intelligence in action (Dalia et al., 2021; Fazlagic & Skikiewicz, 2014). In another development, the term is frequently applied to the project of developing systems with human-like cognitive processes, such as the ability to reason, discover meaning, generalize, or learn from experience. Artificial intelligence is the driving force behind a wide range of everyday computing applications, including internet search engines, mobile assistants, and facial recognition tagging on social media. It is typically installed by computer programs that can improve our knowledge, judgment, and ability to interact and communicate (Blanchard et al., 2009).

There are revolutionary impacts on the manner and behaviour of both school administrators, lecturers and students when this tool is applied and made accessible through smart devices and computers. This implies that educational management and administration will be more convenient and personalized as a result of AI applications. Currently, the introduction of AI has gradually been recognized in educational management and administration as the most important means by which administrators connect both administrative and academic tasks. In other words, AI is gradually being introduced into institutions to reduce the amount of time required to complete administrative tasks (Johnson, 2019).

In another development, the use of Al has resulted in new tasks being assigned to organizations. This is because administrative staff typically manage a variety of organizational duties in addition to instruction (Forbus & Feltovich, 2001). AI has the potential to automate administrative tasks for lecturers and academic institutions. There appears to be a proclivity for managing a variety of non-teaching responsibilities, such as grading exams, creating assignments, assessing homework, as well as coordinating attendance, parents' meetings, and other duties thereby simplifying both academic and administrative responsibilities. The infiltration of artificial intelligence and robotic tools that gravitate towards tutoring and support outside the school environment is making educational management and administration more relevant (Ku Chhaya et al., 2020). In other words, because of artificial intelligence, tutoring and studying programs are becoming more advanced, and they will soon be more available to respond to a variety of learning styles. Based on the appearance of virtual global conferences, many AI applications for educational management and administration are available for mentoring learners. Although educational administrators may be slower to adopt artificial intelligence and machine learning, the changes are beginning to spread throughout the educational system.

The AI approach has virtually resulted in constructive feedback in educational system management. The world has shrunk to the size of a village with no walls. As a result, there is complete mobility and production of knowledge, ideas, and facts (Koko & Edo, 2014). In this case, artificial intelligence-powered programs can immediately provide valuable feedback to administrators, lecturers, and students. For example, the use of AI in a classroom setting demonstrates how instructions can be provided to students, making administrative and academic tasks more enjoyable and interesting.

Certainly, the discovery of AI has made educational management and administration more adaptable. The use of Smart Content has remained a popular tool for subject matter in nearly all disciplines. Smart content appears to be a reflection of virtual content such as video conferencing and video lectures. Artificial intelligence is used in transforming textbook production. This is because AI systems use traditional syllabi to create customized textbooks for subject areas. In summary, textbooks are being digitized, and new learning interfaces are being developed to create a new learning model. Cram 101 is one such mechanism that uses AI to make textbook content more understandable. This mechanism makes it simple to navigate with chapter summaries, flashcards, and practical tests. Another useful AI interface is Netex Learning, which focuses on online assistance programs, audio and illustrative videos to enable individuals to create electronic curriculums and educational information that can be accessed via a variety of devices (Johnson, 2019).

Globalization of educational management and administrative policies is accelerating. With the application of artificial intelligence and robotic tools, education has no limits or boundaries. Technology facilitates administrative tasks anywhere in the world and at any time (Pragya, 2021). Artificial intelligence and robotic instruments have aided educational management and administration by providing individuals with fundamental information communication and technological skills. This instrument’s preference is that it has necessitated a broader range of knowledge and skills available for work productivity and enhancement.

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Furthermore, the use of AI has resulted in improved educational management and administrative efficiencies. Artificial intelligence by extension improves internet processes and unleashes new efficiencies. For example, schools use it in the modelling of complex data to enable administrative operations by creating data-driven forecasts. This, in turn, allows for proper future planning, thereby eliminating or avoiding a lot of waste and inefficiency. It invariably develops adaptive administrative techniques with customized tools for improving management strategies and advancing experience.

The 21st century has brought about real opportunities for educational management and administration to be more capable and diligent. The management of the educational system is being transformed by artificial intelligence technology, which eliminates tedious and inefficient jobs (Owoc & Marciniak, 2013). The management and administration of education require the use of technology, such as deep learning, cloud computing, robots, data intake chatbots, and robotics. Robotic and artificial intelligence applications have made remarkable, flexible strides that enable individualized learning through mobile materials. Additionally, it includes provisions for information systematization in line with the management and administration system for schools. In this aspect, AI provides for the improvement of outstanding abilities by continuously supplying information from several sources. In other words, having simple access to directories like Wikipedia or Google Scholar increases the efficiency and productivity of an educational manager or administrator. This has led to an improvement in management and leadership techniques.

Again, it leads to the formation of adaptive tasks in educational management and administration. In this case, it assigns tasks such as planning, coordinating, organizing, budgeting, and so on based on the designed objectives and goals. In other words, projects and programs can be easily integrated to increase accessibility and relevance. Artificial intelligence and robotics instruments generate adaptive data group formation. Artificial intelligence offers a novel approach to making educational management and administrative activities more engaging at all levels. This is because interactive learning techniques that are not currently available in educational institutions can provide instant feedback and gauge interest. This implies that artificial intelligence can improve current administrative methods. For example, Google Lens can be used to convert handwritten words to typing mode, making administrative tasks easier. This technology also allows for the effortless translation of the text into other languages, which assists managers and administrators in carrying out their duties.

It includes dynamic scheduling and predictive analysis of educational tasks. This is due to technology's ability to integrate with modern education, resulting in dynamic scheduling and predictive analysis for tracking progress (Ku Chhaya et al., 2020). It has the potential to revolutionize a wide range of projects and programs in the process of educational management and school administration. According to a study conducted at Carnegie Mellon University (CMU), artificial intelligence can provide more efficient ways of providing powerful administrative tools for dynamic work schedules. Thus, the evolution of artificial intelligence has been unavoidable in recent years. Numerous established technology firms, including industry titans such as Amazon, Facebook, and Microsoft, have established new testing laboratories. It is not an exaggeration to say that computing has become synonymous with artificial intelligence.

Educational management and administration are distinct fields of specialization that necessitates the application of bodies of knowledge in the process of task execution. However, this is complicated by the multifaceted issues that may arise as a result of the advancement of artificial intelligence and robotic technology. Among these difficulties are the following:

1. Human interaction may decrease due to a loss of interest, the ability to practice and learn some basic skills, and the lack of close interaction with a colleague or friend. Al-enabled machines may eliminate job opportunities (Spasic, 2000), as bots are replacing most repetitive tasks with Al. The need for human intervention is decreasing as businesses strive for more error-free and risk-free work.
2. It has an impact on the mode of human creativity because AI is capable of learning over time and from prior experiences. For example, the Bot Quill can be used to gather information on any decision. This type of report contains data and facts that have already been provided to the Bot application.

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3. It is difficult to maintain moral and ethical policies, which are aspects of human characteristics that cannot be incorporated into artificial intelligence. It is widely acknowledged that modem artificial intelligence applications lack morality (Sahar, 2021).
4. Artificial intelligence lacks complete freedom to modify, copy, cancel, uninstall, or use computer programs, at least as far as the programmes themselves are concerned. In other words, the advancement of AI has raised concerns that it will one day wipe out humanity (Akpomi et al., 2022; Prayga, 2021).
5. AI is more likely to result in job losses and increased income inequality because activities such as trucking, food service, and distribution can be automated (Sahar, 2021).
6. The invasion of privacy is another growing issue. This has already happened in China, where AI-powered systems are being used for mass surveillance, wreaking havoc on the country's so-called social credit system.
7. It reduces the thinking power of administrators and educational planners. In this case, it will lower the administrators' creative capacity, leading to doldrums or unproductiveness in the workplace.
8. The popularity of artificial intelligence has grown, and thus the finance and banking industries face an increasing number of complex identity theft and fraud loss cases (Sahar, 2021). It can significantly increase the risk of financial cyber security threats, unusual activity, and potential fraud among the administrators of the educational system.

Statement of the Problem

Scientists have argued that artificial intelligence will result in inventions, discoveries, and scientific advancements. This is supported by the fact that machines can perform activities that are too complex for human brains, work more quickly than people do, eliminate errors and faults, and find patterns and deeper meanings in data. So, artificial intelligence has the potential to significantly increase productivity. Currently, automation is the main area of artificial intelligence that is attracting attention. The tool presently has resulted in the representation of groupings of programmed processes that are scheduled to be executed upon a certain trigger, condition, or command, rather than a self-thinking and self-evolving artificial being.

Despite the core advantages of artificial intelligence, the tool has negatively impacted the nature of the human mind due to a lack of self-thinking and self-evolving, which hinders the development of original ideas as well as exhibits laxness in its users. In other words, relying on the pre-loaded facts in a machine affects individuals' ability to display intellectual sagacity. On this note, the researchers intend to look into the use of artificial intelligence as an instrument for effective educational management and administration in the university system in Rivers State, Nigeria, based on this discovery.

Purpose of the Study

The purpose of the study was to ascertain that artificial intelligence instruments are a tool for effective educational management and administration in the University system in Rivers State, Nigeria. Specifically, we set out to:

1. Examine how artificial intelligence and robotic tools contribute to educational management and administration of the school system;
2. Determine the positive impacts of artificial intelligence on the educational management and administration of the school system; and to
3. Investigate the negative impacts of artificial intelligence on the educational management and administration of the school system.

Research Questions

1. How do artificial intelligence and robotic tools contribute to the educational management and administration of the school system?
2. What are the positive impacts of artificial intelligence on educational management and administration?
3. What are the negative impacts of artificial intelligence on educational management and administration?

Hypotheses

1. There is no significant difference in the mean responses of RSU and IAUE administrators on how artificial intelligence contributes to educational management and administration.

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2. There is no significant difference in the mean responses of RSU and IAUE administrators on the positive impacts of artificial intelligence on educational management and administration.
3. There is no significant difference in the mean responses of RSU and IAUE administrators on the negative impacts of artificial intelligence on educational management and administration.

Methodology

The study is a survey design intended to investigate and examine Artificial Intelligence as a Tool for Effective Educational Management and Administration in Schools. Consequently, three research questions and three hypotheses guided this study. The population consists of 154 administrators from Rivers State University and Ignatius Ajuru University of Education, Port-Harcourt. The whole population is used as the sample size. The instrument for the study was entitled, "Artificial Intelligence Tools for Educational Management and Administration Questionnaire (AIRTEMAQ)". Hence, the Likert scale of 4-point rating scales of: strongly agreed (SA), agreed (A) Disagreed (D) and Strongly Disagreed (SD) was used to elicit responses. The researcher, therefore, administered 154 copies of the questionnaires to the respondents and retrieved them for the analysis of the research questions and hypotheses. Frequency counts, mean scores and descriptive tables were used for the data analysis while z-test was used for the hypotheses.

Results

Research Question 1: How do artificial intelligence tools contribute to the educational management and administration of the school system?

Table 1:Weighted mean scores on artificial intelligence and educational management and administration

S/N	Items	RSU Administrator S (N = 132)		IAUE Administrators S (N = 22)	
		Mean	STD	Mean	STD
1	Accessibility of data through smart devices and computer	3.34	0.78	3.36	0.49
2	Simplifying both academic and administrative responsibilities	3.19	0.69	3.45	0.51
3	Minimizes the time required to complete difficult task	3.36	0.70	3.18	0.59
4	Manage a variety of organizational duties effectively	2.99	0.83	3.18	0.59
5	Participation in virtual global conferences	3.15	0.84	3.14	0.83
6	Absolute mobility and production of knowledge, ideas and data	3.24	0.77	3.14	0.77
	Total	**3.21**	**0.77**	**3.24**	**0.77**

Data from Table 1 shows a grand mean value of 3.21 for RSU administrators and 3.24 for IAUE administrators. These values being greater than the cut-off mean value of 2.50 indicates that artificial intelligence tools contribute to the educational management and administration of the school system.

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Research Question 2: What are the positive impacts of artificial intelligence on educational management and administration?

Table 2: Weighted mean scores on the positive impact of artificial intelligence tools and educational management and administration

S/N	Items	RSU Administrator S (N = 132)		IAUE Administrators S (N = 22)	
		Mean	**STD**	**Mean**	**STD**
1	Eliminate inefficiency and boring tasks	3.28	0.82	3.32	0.57
2	Artificial intelligence and robotic technologies allow incredible and adaptable advancements	3.27	0.77	3.14	0.71
3	Organizing information from Wikipedia or Google Scholar, Google Lens etc.	3.13	0.80	3.18	0.66
4	Adaptive planning, coordinating, organizing, and budgeting of administrative goals and objectives	3.16	0.83	3.14	0.83
5	Provides for variety of skills and experiences	3.17	0.68	3.09	0.75
	Total	**3.20**	**0.78**	**3.17**	**0.70**

Data from Table 2 shows a grand mean value of 3.20 for RSU administrators and 3.17 for IAUE administrators. These values being greater than the cut-off mean value of 2.50 indicates that artificial intelligence tools have a positive impact on educational management and administration.

Research Question 3: What are the negative impacts of artificial intelligence on educational management and administration?

Table 3: Weighted mean scores on the positive impact of artificial intelligence and robotic tools and educational management and administration

S/N	Items	RSU Administrator S (N = 132)		IAUE Administrators S (N = 22)	
		Mean	**STD**	**Mean**	**STD**
1	Decreases the thinking power of the administrative personnel	3.32	0.74	3.27	0.63
2	Pre-nourishing data and past experiences	3.28	0.82	3.55	0.51
3	Human features of creativity cannot be incorporated into the artificial intelligence	3.20	0.76	3.18	0.66
4	Requires a high level of human intelligence	3.19	0.76	3.41	0.67
5	High cost of training of administrative personnel	3.08	0.84	3.45	0.60
	Total	**3.21**	**0.78**	**3.37**	**0.60**

Data from Table 3 shows a grand mean value of 3.21 RSU administrators and 3.37 IAUE administrators. These values being greater than the cut-off mean value of 2.50 indicates that artificial intelligence tools harm educational management and administration.

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Hypotheses

Ho_1: There is no significant difference in the mean responses of RSU and IAUE administrators on how artificial intelligence contributes to educational management and administration.

Table 4: Weighted means on artificial intelligence

Administrators	N	X	STD	df	Z-cal	Z-crit	Decision
RSU	132	3.20	0.77				
IAUE	22	3.23	0.77	152	0.63	1.96	Not Significant

The result of Table 4 shows that the Z-cal value (0.63) is less than the Z-crit (1.96) at a 0.05 level of significance at the degree of freedom (DF) 152. Hence, the null hypothesis of no significant difference in the mean responses of RSU and IAUE administrators on how artificial intelligence contributes to educational management and administration was retained.

Ho_2: There is no significant difference in the mean responses of RSU and IAUE administrators on the positive impact of artificial intelligence on educational management and administration.

Table 5: Weighted Means on the Positive Impact of Artificial Intelligence

Administrators	N	Mean	STD	df	Z-cal	Z-crit	Decision
RSU	132	3.16	0.78				
IAUE	22	3.17	0.70	152	0.81	1.96	Not Significant

The result of Table 5 shows that the Z-cal value (0.81) is less than the Z-crit (1.96) at 0.05 level of significance at the degree of freedom (DF) 152. Hence, the null hypothesis of no significant difference in the mean responses of RSU and IAUE administrators on the positive impact of artificial intelligence on educational management and administration was retained.

Ho_3: There is no significant difference in the mean responses of RSU and IAUE administrators on the negative impact of artificial intelligence on educational management and administration.

Table 6: Weighted Means on the Negative Impact of Artificial Intelligence

Administrators	N	Mean	STD	Df	Z-cal	Z-crit	Decision
RSU	132	3.21	0.78				
IAUE	22	3.36	0.60	152	0.81	1.96	Not Significant

The result of Table 6 shows that the Z-cal value (0.81) is less than the Z-crit (1.96) at 0.05 level of significance at a degree of freedom (df) 152. Hence, the null hypothesis of no significant difference in the mean responses of RSU and IAUE administrators on the negative impact of artificial intelligence on educational management and administration was retained.

Discussion of Findings

The result of findings on research question one indicated that artificial intelligence tools contribute to educational management and administration in respect of accessibility of data through smart devices and computers, simplification of both academic and administrative responsibilities, minimization of the time required to complete difficult tasks, management of a variety of organizational duties effectively, participation in virtual global conferences and absolute mobility and production of knowledge ideas and data. This viewpoint

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is in line with Johnsonts' (2019) assertions that the introduction of AI has gradually gained acceptance in educational management and administration. In other words, AI is gradually being introduced into institutions to reduce the amount of time required to complete administrative tasks.

The outcome of research question two demonstrated that artificial intelligence positively eliminated monotonous tasks, permitted incredible and adaptable advancements, and organized information from Wikipedia or Google Scholar, Google Lens, etc., leading to adaptive planning, coordinating, organizing, and budgeting of administrative goals and objectives and thus providing for a variety of skills and experiences. These results are consistent with the opinions expressed by Owoc et al. (2013), who said that artificial intelligence technology is changing the way the educational system is managed by getting rid of boring and ineffective employment. By continuously feeding knowledge from many sources, Al enables the development of exceptional skills.

The answer to research question three showed that artificial intelligence has a negative impact on educational management and administration in the following ways: It lowers the administrative staff's capacity for thought, lessens their capacity for creativity, necessitates a high level of intelligence, and increases the cost of administrative staff training. This view is supported by Spasic (2000), who said that because AI is capable of learning over time and from earlier experiences, it has an impact on the manner of human creativity. In other words, it limits administrators' and educational planners' capacity for thought. In this instance, it will undermine the administrators' potential for creativity, resulting in a lack of productivity at work.

Conclusion

The adoption of AI has thus been steadily acknowledged in educational management and administration as the most significant method by which administrators connect organizational activities. To put it another way, AI is being gradually incorporated into institutions to shorten the time needed to execute administrative chores. The advantage of this instrument is that it has called for a wider range of information and abilities to be available for job productivity and enhancement.

Recommendations

1. The administrators should be intermittently trained to be acquainted with the current trend of artificial intelligence tools used to ameliorate distance in job responsibilities.
2. Universities should collaborate on the use of artificial intelligence for effective and efficient utilization
3. The government should make provisions for facilities to be available in every higher institution.

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