Management Of School Units And Artificial Intelligence: Applications And Concerns

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Abstract:

Background: *Applications of artificial intelligence in school administration emerge as a critical factor for improving efficiency and transparency. Through real-time data analysis, it supports evidence-based decision-making while facilitating the rational management of resources. Artificial intelligence does not replace the human element but functions as a tool that empowers strategic thinking and promotes sustainable development within the school community.*

Materials and Methods: *The study falls under exploratory research and aimed to capture the current state of affairs among educators in Primary and Secondary Education regarding Artificial Intelligence (AI). It was conducted using data collection through an anonymous self-reported questionnaire. The questionnaire was distributed via email to all schools in the country through the Primary and Secondary Education Directorates in December 2023. Data were collected using the Google Forms platform, and statistical analysis was performed using IBM SPSS v29. The research sample was formed from the voluntary participation of N=1736 educators. A unique aspect of our research was that after the demographic information, participants were asked not to proceed with completing the questionnaire if they answered "Not at all" to question A1: How well do you know what Artificial Intelligence is? Thus, the first data showed that 51% of the participating educators knew nothing about AI, while 49% knew a little, a lot, or very much. After filtering out incomplete questionnaires, our sample was N=862, and data processing was based on this.*

Results: *The present study aimed to investigate teachers' perceptions regarding the applications of artificial intelligence in the effective execution of administrative tasks in schools, data analysis support, and decision-making, as well as to identify the key factors influencing these perceptions. The theoretical framework emphasized that artificial intelligence significantly contributes to the optimization of school administration by providing tools that facilitate decision-making through real-time data analysis. It enhances transparency, efficiency, and the rational allocation of resources while supporting strategic planning with personalized solutions. However, its integration requires adequate technological infrastructure and ongoing staff training to ensure the human dimension and ethical use of its capabilities. Our findings largely align with this framework, indicating that teachers recognize the positive outcomes of artificial intelligence, particularly in areas such as effective administrative methods and its application in the educational field.*

Conclusion: *AI offers unique opportunities for improving the management of school units, providing tools that enhance transparency, efficiency, and evidence-based decision-making. However, its proper implementation requires strategic planning, adequate infrastructure, and the enhancement of the technological education of staff. By addressing ethical and technical challenges, AI can serve as a catalyst for the evolution of school administration*

Key Word: *Administration, Artificial Intelligence, Applications, Concerns, School.*

I. Introduction

The rapid development of Artificial Intelligence (AI) has brought significant changes across many sectors, including education. In educational administration, AI is emerging as an innovative solution to longstanding challenges such as bureaucracy, data analysis, and decision-making support. The aim is to leverage its capabilities to enhance efficiency, optimize processes, and create a more agile and productive administrative environment[9]. AI is defined as the ability of systems to simulate human cognitive processes such as decision-making, data analysis, and problem-solving[27]. Within the context of school administration, it is used to manage large volumes of data, improve evaluation processes, and support educators and executives in making effective decisions. Such applications bolster administrative capacity, freeing up resources and time for more strategic activities[20]. The integration of AI in school administration is not limited to managing administrative tasks. It also

provides tools that enhance the personalization of the educational experience, such as automated assessment systems and personalized teaching, allowing educators to focus more on their pedagogical work[1]. However, the implementation of AI in education comes with ethical and practical challenges, such as data protection, ensuring objectivity, and the need for continuous user training. Successful design and implementation of such systems require careful analysis of their capabilities and limitations, with a focus on ensuring quality in educational administration[38]. This study aims to explore the applications of AI in school administration, examining both its potential and the challenges it presents. The focus will be on the effectiveness of AI in reducing bureaucracy, supporting data-driven decision-making, and aiding education executives in daily and strategic activities

The introduction of Artificial Intelligence (AI) in the field of education represents one of the most emerging sectors of technological innovation. AI offers capabilities that transform the structure and operation of educational systems, contributing to both the enhancement of educational processes and the support of administrative functions. AI applications in education are distinguished into two main categories: academic support and the enhancement of administrative efficiency. In the academic realm, AI technologies enhance the learning experience through personalized approaches. Platforms based on AI use machine learning to tailor educational content to the needs and capabilities of each student, promoting personalized teaching and enhancing learning performance[9]. These applications include the creation of customized exercises, automated assessment, and the analysis of data related to learning progress. Concurrently, AI systems are integrated into virtual reality (VR) tools and simulations, offering students the opportunity to engage in educational scenarios that would not be feasible in a traditional school environment[1]. An example is the application of simulation systems for teaching scientific phenomena, which enhance understanding through interaction. AI also emerges as a valuable tool in the administrative sphere of educational organizations. Through the use of data analysis algorithms and the automation of processes, bureaucratic requirements are reduced, allowing educators and administrators to focus more on the strategic aspects of management[38]. A characteristic example is the use of AI systems for managing large databases, such as student records and their performances, aiming at easy information retrieval and informed decision-making. Additionally, these systems enhance the reliability of evaluation and selection processes for students and teachers, limiting subjectivity and potential errors. Through the application of advanced predictive models, such as those based on machine learning, future needs can be anticipated and strategies designed to meet upcoming requirements[20]. Despite the capabilities of AI, challenges remain. The ethical dimension of using AI in education requires particular attention. Issues such as the protection of student and teacher data, ensuring transparency in processes, and avoiding excessive dependence on technology are significant barriers that must be addressed[27]. Artificial Intelligence in education is continuously evolving. With proper implementation and understanding of its limitations, it can serve as a catalyst for improving the learning experience and administrative efficiency.

The introduction of Artificial Intelligence (AI) in the administration of educational institutions has highlighted new opportunities for enhancing efficiency, accuracy, and effectiveness in administrative functions. Modern AI technologies allow for the automation of repetitive processes, analysis of large data volumes, and optimization of decision-making, transforming the management of educational establishments. AI enhances the automation of repetitive administrative tasks such as student data management, report generation, and resource allocation. For instance, AI systems have been utilized to automate request processing, significantly reducing response times and allowing staff to focus on more strategic activities[9]. Moreover, these tools facilitate real-time data entry, enhancing the accuracy and transparency of administrative operations[30]. The automation of administrative processes in education, using AI, has emerged as a critical innovation that can transform how schools and educational organizations operate. AI technologies allow for the management of large data volumes, automation of repetitive tasks, and improvement of administrative efficiency. This development provides educational professionals and administrative bodies the opportunity to focus more on the educational process and strategic decision-making. AI has proven effective in many areas of educational administration, offering solutions for automating repetitive processes. Specifically, AI tools are used for collecting, processing, and analyzing data related to student progress and performance. These data are used to generate personalized reports and support decision-making[30]. Additionally, AI systems can compile reports from real-time data, reducing the need for human intervention in time-consuming tasks[36]. AI applications are also used for resource allocation, budget planning, and monitoring financial reports in educational institutions[39]. Thus, through the automation of administrative processes via AI, there are multiple benefits, such as reducing the time required for performing repetitive tasks, freeing up valuable time for educators and administrative executives[6]. Automated systems reduce the human factor, decreasing errors in processes like data entry or report drafting[28]. Through data analysis, AI systems will provide insights to administrators, facilitating informed decision-making[21]. However, despite the benefits, the implementation of AI in automation comes with challenges such as data protection. Managing sensitive student and teacher data raises privacy and security issues[3]. Furthermore, installing and maintaining AI systems requires significant financial resources, as well as high-standard technical infrastructures[32]. Also, many educators and administrative staff exhibit distrust towards technology, which can

delay the adoption of AI solutions[31.] The future use of AI for automating administrative processes is expected to be further strengthened, with ongoing technological development and its integration into broader educational systems. Investments in training, technical support, and the establishment of clear ethical frameworks are essential for the successful implementation of AI in educational administration.

One of the most significant roles of Artificial Intelligence (AI) in administration is supporting decision-making through data analysis. These systems provide educational leaders the ability to identify trends and patterns in large datasets, facilitating informed decision-making. For example, through the application of machine learning models, future needs in staffing and infrastructure can be predicted, aiding strategic resource management[13]. Additionally, AI systems are capable of analyzing data related to student and teacher performance, providing valuable insights for developing targeted educational interventions[22]. Decision-making is a critical area in the administration of educational units, where directors and managers are called to manage complex data and make informed decisions. Artificial Intelligence offers capabilities for enhanced decision-making through data analysis, trend forecasting, and process automation, improving efficiency and accuracy. AI technologies support managers in educational administration by analyzing data. Through machine learning techniques, AI platforms can process data from multiple sources, providing valuable information to improve the quality of decisions[9]. Also, by using predictive models, they enable the identification of needs in infrastructure, personnel, and resources, facilitating strategic planning[13]. Subsequently, through Process Automation, AI applications improve request management and resource allocation, reducing the time for executing repetitive tasks[40]. Thus, the application of AI in decision-making provides the capability for increased accuracy. AI tools reduce errors arising from human estimates, enhancing the reliability of decisions[35]. There will be improved performance and resource allocation, such as classrooms and equipment, based on demand data[37.] Through predictive capabilities, administrators can design policies and strategies that respond to the future demands of education[20]. Despite the advantages, the implementation of AI in decision-making is accompanied by challenges such as privacy issues. Data collection and processing raise concerns about the protection of student and staff privacy[38]. Another challenge is the complexity of AI algorithms, which may complicate transparency and understanding of results by managers[27]. Another issue concerns technical infrastructure. Successful integration of AI requires significant resources for the development and maintenance of systems[37]. AI shapes the future of educational administration, enhancing the decision-making process with new technologies, such as Algorithmic Analysis, using big data technologies for the analysis of behavioral patterns and learning outcomes, and Self-Improving Systems: AI applications that evolve autonomously to adapt to new needs[26].

The use of Artificial Intelligence (AI) contributes to improving resource management within a school unit. Through data-driven algorithms, administrative executives can plan more efficiently the use of facilities, scheduling, and personnel management[36]. AI technologies have also proven effective in optimizing the allocation of classrooms and facilities based on student characteristics and their learning needs[21]. Effective resource management and strategic planning are essential functions of school unit administration, crucial for the sustainability and quality of the educational system. AI offers innovative solutions for optimizing these processes, facilitating informed decision-making and fair resource distribution. The use of AI in resource management provides opportunities for process automation and enhanced efficiency, specifically in optimizing facility usage. AI algorithms can schedule the use of rooms, laboratories, and equipment, minimizing unused capacity and reducing operational costs[9]. Additionally, AI systems assess budget and expenditure data to propose optimized resource allocation models, promoting transparency and accountability[5]. Predictive maintenance technologies based on AI can detect potential facility failures, preventing larger issues[41]. AI enhances strategic planning through data analysis and trend prediction. By analyzing historical and geographic data, AI systems can forecast increases in student numbers, allowing timely adjustment of staff and infrastructure[10]. Also, by monitoring demand for specific educational programs, administrators can better allocate resources to support learning priorities[33.] Additionally, AI tools aid in estimating staffing needs based on factors such as departures and retirements[1]. AI systems reduce the likelihood of human error and enhance transparency in resource management (Anguelov, 2021). By processing large volumes of data, AI provides more comprehensive and substantiated proposals[9]. However, challenges related to privacy issues arise concerning the protection of personal information[41] and the high cost of implementation because integrating AI systems requires significant investments in infrastructure and staff training[1].

Overall, the integration of AI in administration is not without challenges. Protecting personal data, addressing biases in algorithms, and dependence on technological solutions are issues requiring careful management. Additionally, adequate training of administrative executives is critical for the success of these technologies[15]. The introduction of AI in school administration creates many opportunities but is accompanied by ethical and technical challenges. Ensuring transparency, managing personal data, and the reliability of algorithms are just some of the issues requiring careful handling. The use of big data by AI raises concerns about privacy and security of students and staff. Algorithms that collect and analyze personal data require robust protections to prevent breaches. Regulations, such as GDPR, underscore the importance of transparency and

consent in data usage[11]. The transparency of decisions made by AI is crucial for building trust. Algorithms often operate as "black boxes," resulting in administrators being unable to understand how specific decisions are reached[18]. A lack of transparency can undermine the system's credibility and accountability. Training algorithms on biased data can lead to discrimination against certain groups of students or educators, a serious challenge as it can exacerbate social inequalities instead of reducing them[2]. Integrating AI systems requires significant technical infrastructure, such as powerful computing resources and fast internet connections. The financial constraints of many school units make it difficult to implement these technologies[34]. AI systems must be effectively integrated with existing school management platforms. A lack of interoperability can cause issues in data collection and analysis, reducing AI efficiency[8]. The maintenance of AI systems is critical for maintaining their accuracy and effectiveness. Technical upgrades and continuous performance monitoring require specialized staff, often lacking in schools[17]. Therefore, there is a need for training and awareness among administrators and educators regarding the capabilities and limitations of AI for its proper use[32]. Algorithms should be designed based on the principle of "ethics by design" to ensure fairness and transparency[29]. Regulatory frameworks should be created to encourage responsible use of AI, ensuring the technology is used in a manner that benefits all[22].

Based on this theoretical framework, a key question addressed in this study concerns educators' attitudes regarding the implementation of Artificial Intelligence (AI) in school administration, its assistance in data analysis, and decision-making (Section C1). It also explores educators' readiness to use AI in education and the requirements for its effective integration (Section F). Specifically, this presentation will outline the research findings regarding Question C1: In which of the following areas do you believe AI applications can positively impact education? Particular emphasis is placed on Area 20: Reducing bureaucracy in administrative tasks and Area 21: Assisting education administrators in data analysis and decision-making.

Furthermore, the results will include findings related to the questions in Section F: (1) Educators' attitudes toward the introduction of AI in education, and (2) their readiness to use AI in educational settings. Finally, findings will be presented concerning Section F5: (F5.1) The need for training and certification in AI usage and (F5.6) The requirements for infrastructure and support for the application and use of AI in education.

The research objectives are thus formulated as follows:

-To what extent are educators' perceptions positive or negative regarding the application of AI in reducing bureaucracy in administrative tasks and assisting educational administrators in data analysis and decision-making to enhance their effectiveness?

- What are educators' attitudes toward the use of AI in education, and what is the level of their readiness to work with AI?

- Are there needs for training and technical infrastructure to optimize the use of AI in education?

- Is there a correlation between perceptions of AI application in administrative tasks and its utilization, readiness for use, and the needs for its application in education?

-Is there a correlation between perceptions of AI application in administrative tasks, its utilization, readiness for use, and the needs for its application in education with demographic characteristics?

II. Material And Methods

The study falls under exploratory research and aimed to capture the current state of affairs among educators in Primary and Secondary Education regarding Artificial Intelligence (AI). It was conducted using data collection through an anonymous self-reported questionnaire. The questionnaire was distributed via email to all schools in the country through the Primary and Secondary Education Directorates in December 2023. Data were collected using the Google Forms platform, and statistical analysis was performed using IBM SPSS v29.

Sable: The research sample consisted of the voluntary participation of N=1736 educators. A unique feature of this study was that, following the collection of demographic data, participants were instructed not to complete the questionnaire if they answered "Not at all" to Question A1: How well do you know what Artificial Intelligence is? Consequently, the first key finding revealed that 51% of the educators in the study had no knowledge of AI, while 49% reported knowing "A little," "A lot," or "Very much." After excluding incomplete questionnaires, the final sample was adjusted to N=862, and this subset was used for data analysis.

The Questionnaire: The questions included in the research questionnaire are part of a broader study[16]. They consist of two questions from Section C, focusing on AI applications in administration, and four questions from Section F, addressing educators' attitudes and needs regarding the introduction of AI in education.

Statistical analysis

The data analysis was conducted using descriptive and inferential statistics with the IBM SPSS v.29 software. Percentages and frequencies were calculated, and the results were presented through tables and graphs. The normality of the variables related to skills was tested using the Kolmogorov-Smirnov test as well as skewness and kurtosis indicators. The results showed that the variables followed a normal distribution (p-

value>0.05). To explore correlations, parametric tests such as Pearson's correlation, t-Test, and ANOVA were employed.

III.   Result

Table no 1 *Frequency and Percentage Distribution of AI Application for School Administration.* According to the results of the present study, the majority (67.7%) of the 862 educators in the sample believe that the application of Artificial Intelligence (AI) has a positive impact—ranging from very to extremely positive—on the efficient performance of education leaders and the reduction of bureaucracy in administrative tasks. Similarly, a significant proportion (60.8%) evaluated AI as very to extremely positive in supporting education leaders in data analysis and decision-making.

Table no 1: Frequency and Percentage Distribution of AI Application for School Administration

Question C1: In which of the following areas do you believe AI applications can positively impact Education?	N=862	
Areas	**Not at all - A little N (%)**	**Very – Extremely N (%)**
20. More effective performance of education leaders' tasks and reduction of bureaucracy in administrative work.	278 (32.3%)	584 (67.7%)
21. Supporting education leaders in data analysis and decision-making.	338 (39.2%)	524 (60.8%)

Table 2 *Frequency and Percentage Distribution of Educators' Attitudes Toward Artificial Intelligence.* The majority of participants (59.9%) consider the introduction of Artificial Intelligence (AI) in education to be positive. A relatively high percentage (63.8%) report no concerns about the evolution of AI's integration into education, while a significant proportion (58.2%) feel relatively well-prepared to work with AI.

Table 2: Frequency and Percentage Distribution of Educators' Attitudes Toward Artificial Intelligence

Section F	N=862	
Questions	**Not at all - A little N (%)**	**Very – Extremely N (%)**
1. Based on your education, experience, and overall outlook on life, do you consider the introduction of Artificial Intelligence (AI) in Education to be positive?	346 (40.1%)	516 (59.9%)
2. Do you feel concerned about the evolution of AI's integration into Education?	550 (63.8%)	312 (36.2%)
3. Do you feel ready to work with Artificial Intelligence?	502 (58.2%)	360 (41.8%)

Table 3 *Frequency and Percentage Distribution of Educators' Needs for Using Artificial Intelligence.* The educators in the sample overwhelmingly (92.3%) expressed a need for training and certification in the use of Artificial Intelligence (AI) in education. Similarly, a very high percentage (94.9%) highlighted the need to resolve issues related to technological and physical infrastructure, such as internet connectivity and the use of digital technology, to effectively work with AI support.

Table 3: Frequency and Percentage Distribution of Educators' Needs for Using Artificial Intelligence

If you were called upon to work with the support of Artificial Intelligence, what would you need most to feel secure and effective?	N=862	
	Not at all - A little N (%)	**Very – Extremely N (%)**
F5.1 - Participation in a training program and certification in the use of Artificial Intelligence in Education.	66 (7.7%)	796 (92.3%)
F5.6 - Primary resolution of technological and physical infrastructure issues (interactive whiteboards, fiber-optic internet, etc.).	44 (5.1%)	818 (94.9%)

Correlation analysis with AI applications in administration

Table 4 *Correlation Analysis with AI Applications in Administration*. A Pearson correlation analysis was conducted between AI applications for improving the effectiveness of education leaders' tasks and reducing bureaucracy in administrative work and other variables, including applications supporting education leaders in data analysis and decision-making, the evaluation of AI use in education, concerns about AI, readiness to work with AI, the need for training and certification in AI use, and the need for infrastructure to support AI applications.

Correlation with Applications for More Effective Administrative Performance and Bureaucracy Reduction:

a) Applications for Data Analysis and Decision-Making. A strong positive correlation was found ($r=0.544$, $p<0.001$). This indicates that applications aimed at improving administrative efficiency and reducing

bureaucracy are closely related to tools facilitating data analysis and decision-making. Efficiency is enhanced when decision-making tools are integrated into administrative processes.

b) Positive Attitudes Toward AI. A moderate positive correlation (r=0.387,p<0.001) was observed. Participants who recognize the role of these applications in improving efficiency and reducing bureaucracy are more likely to express a positive attitude toward AI. This connection emphasizes the importance of practical utility in increasing acceptance of AI tools.

c) Concerns About AI. A weak negative correlation (r=−0.183, p<0.001) was recorded. Those who value the contribution of these applications tend to have fewer concerns about the introduction of AI. Functional effectiveness appears to alleviate fears about potential challenges.

d) Readiness to Work with AI. A low positive correlation (r=0.192, p<0.001) was identified. Despite recognizing AI's usefulness, readiness remains limited, highlighting the need for further preparation and training to fully leverage these tools.

e) Need for Training. A low positive correlation (r=0.193,p<0.001) was found. The use of these applications reinforces the perception of the need for certified training, indicating that the acceptance of AI is linked to the availability of educational resources.

f) Need for Infrastructure Improvement. A low positive correlation (r=0.20, p<0.001) was observed. Acceptance of AI depends on the availability of adequate infrastructure. The lack of modern technological resources may limit the use of these applications.

Correlation with Applications Supporting Education Leaders in Data Analysis and Decision-Making:

a) Positive Attitudes Toward AI. A moderate positive correlation (r=0.360, p<0.001) was observed. Applications supporting decision-making enhance positive attitudes, emphasizing their utility in fostering acceptance of AI.

b) Concerns About AI. A weaker negative correlation (r=−0.265, p<0.001) was identified. Users who perceive the utility of these applications exhibit reduced concerns, but the effect is less pronounced compared to other parameters.

c) Readiness to Work with AI. A weak positive correlation (r=0.208, p<0.001) was found. Although readiness is higher compared to the previous category of applications, it still indicates the need for further specialization.

d) Need for Training. A positive but low correlation (r=0.162, p<0.001) was observed. While the use of such applications highlights the need for training, the intensity of the relationship remains relatively low.

e) Need for Infrastructure Improvement. A very low positive correlation (r=0.094, p=0.006) was noted. The need for infrastructure is less pronounced compared to applications related to efficiency, possibly due to the inherent technological nature of decision-making support tools.

Conclusion: The two categories of applications exhibit similar trends, with efficiency-focused applications being more closely linked to the need for infrastructure improvements, while data analysis applications emphasize the need for positive attitudes and training. This indicates that each category has distinct but complementary requirements for optimal integration into education.

Table 4: Correlation Analysis with AI Applications in Administration

		Applications for improving the effectiveness of education leaders' tasks and reducing bureaucracy in administrative work.	Applications supporting education leaders in data analysis and decision-making.
Applications for improving the effectiveness of education leaders' tasks and reducing bureaucracy in administrative work.	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	862	
Applications supporting education leaders in data analysis and decision-making.	Pearson Correlation	.544**	1
	Sig. (2-tailed)	<.001	
	N	862	862
Based on your education, experience, and overall outlook on life, do you consider the introduction of Artificial Intelligence in Education to be positive?	Pearson Correlation	.387**	.360**
	Sig. (2-tailed)	<.001	<,001
	N	862	862
Do you feel concerned about the evolution of Artificial Intelligence integration in Education?	Pearson Correlation	-.183**	-.265**
	Sig. (2-tailed)	<.001	<.001
	N	862	862
Do you feel ready to work with Artificial Intelligence?	Pearson Correlation	.192**	.208**
	Sig. (2-tailed)	<.001	<.001
	N	862	862
For working with the support of Artificial Intelligence, I would need to attend a training program and obtain	Pearson Correlation	.193**	.162**
	Sig. (2-tailed)	<.001	<.001

certification in the use of Artificial Intelligence in Education.	N	862	862
For working with the support of Artificial Intelligence, there is a need to resolve technological and physical infrastructure issues (interactive whiteboards, fiber-optic internet, etc.).	Pearson Correlation	.201**	.094**
	Sig. (2-tailed)	<.001	.006
	N	862	862

Correlations with Demographic Characteristics

A correlation analysis was conducted between the following variables: applications for improving the effectiveness of education leaders' tasks and reducing bureaucracy in administrative work, applications supporting education leaders in data analysis and decision-making, the evaluation of AI use in education, concerns about the introduction of AI in education, readiness to work with AI, the need for training and certification in AI use, and the need for infrastructure to support working with AI. This analysis was performed in relation to demographic characteristics (Gender, level of education, years of service, and job position within the school).

Table 5 *Descriptive Measures of Readiness to Use AI by Gender.* Regarding Gender, a t-Test was performed. The results indicate a statistically significant correlation only with readiness to work with AI.

Table 5: Descriptive Measures of Readiness to Use AI by Gender

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Do you feel ready to work with Artificial Intelligence?	Male	278	1.47	.500	.030
	Female	584	1.39	.488	.020

Table 6 *Independent Samples Test.* The results of the t-Test, according to Levene's Test (p<0.05), indicate that the second line of the table (t=2.334, p=0.020<0.05) shows a statistically significant difference in the mean scores between men and women. This confirms a statistically significant correlation between perceptions of readiness to use AI and Gender. Specifically, men feel more prepared (mean=1.47) to work with AI in education compared to women (mean=1.39).

Table 6: Independent Samples Test

		Levene's Test for Equality of Variances				Significance	
		F	Sig.	t	df	One-Sided p	Two-Sided p
Do you feel ready to work with Artificial Intelligence?	Equal variances assumed	12.235	<.001	2.354	860	.009	.019
	Equal variances not assumed			2.334	533.090	.010	.020

Table 7 *Descriptive Measures of Readiness to Use AI and Concerns About AI Integration by Level of Education.* Regarding the level of education of teachers [Primary Education (PE Teacher) and Secondary Education (SE Teacher)], a t-Test was performed. The results indicate statistically significant correlations only with readiness to work with AI and concerns about the evolution of AI's integration into education.

Table 7: Descriptive Measures of Readiness to Use AI and Concerns About AI Integration by Level of Education

	Level of Education	N	Mean	Std. Deviation	Std. Error Mean
Do you feel ready to work with Artificial Intelligence?;	PE Teacher	346	1.47	.500	.027
	SE Teacher	516	1.38	.487	.021
Do you feel concerned about the evolution of AI integration in Education?	PE Teacher	346	1.42	.495	.027
	SE Teacher	516	1.32	.468	.021

Table 8 *Independent Samples Test.* The results of the t-Test, according to Levene's Test (p<0.05), indicate the following. Based on the second row of the table (t=2.459, p=0.014<0.05), the mean scores of Primary Education (PE) and Secondary Education (SE) teachers differ significantly. This indicates a statistically significant correlation between perceptions of readiness to use AI and the level of education. PE teachers feel more prepared (mean=1.47) to work with AI in education compared to SE teachers (mean=1.38). Similarly, based on Levene's Test (p<0.05) and the second row of the table (t=2.982, p=0.003<0.05), the mean scores of PE and SE teachers differ significantly in terms of concerns about AI integration in education. PE teachers feel less concerned (mean=1.42) about the integration of AI compared to SE teachers (mean=1.32).

Table 8: Independent Samples Test

		Levene's Test for Equality of Variances				Significance	
		F	Sig.	t	df	One-Sided p	Two-Sided p
Do you feel ready to work with Artificial Intelligence?;	Equal variances assumed	16.049	<.001	2.471	860	.007	.014
	Equal variances not assumed			2.459	726.621	.007	.014
Do you feel concerned about the evolution of AI integration in Education?	Equal variances assumed	28.741	<.001	3.015	860	.001	.003
	Equal variances not assumed			2.982	711.297	.001	.003

Table 9 *ANOVA*. A one-way analysis of variance (One-Way ANOVA) was used to examine differences in mean scores based on Educational Background. The findings of this analysis indicate equality of mean scores and thus no statistically significant differences (p>0.05). This suggests that educational background does not influence participants' perceptions regarding the applications for improving the effectiveness of education leaders' tasks and reducing bureaucracy in administrative work, applications supporting education leaders in data analysis and decision-making, evaluation of AI use in education, concerns about the introduction of AI in education, readiness to work with AI, the need for training and certification in AI use, and the need for infrastructure to support AI applications.

The same analysis was conducted to examine differences in mean scores based on Years of Service using one-way ANOVA. The findings for variance based on years of service show no equality of means and therefore a statistically significant difference (p<0.05) only regarding concerns about the introduction of AI in education (F(7)=3.105,p=0.003<0.05).

Table 9: ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Do you feel concerned about the evolution of AI integration in Education?	Between Groups	4.940	7	.706	3.105	.003
	Within Groups	194.132	854	.227		
	Total	199.072	861			

Table 10 *Multiple Comparisons*. The comparisons of mean values indicate that statistically significant differences in concerns about the introduction of AI in education are observed based on years of service between the "41-43 and above" category and the following groups:

a) "1-5 years" (p=0.014<0.05): The difference shows that the mean level of concern regarding the introduction of AI in education among those with "41-43 and above" years of service is 0.684 points higher compared to those with "1-5" years of service, and vice versa.

b) "6-10 years" (p=0.048<0.05): The difference shows that the mean level of concern regarding the introduction of AI in education among those with "41-43 and above" years of service is 0.627 points higher compared to those with "6-10" years of service, and vice versa.

c) "16-20 years" (p=0.032<0.05): The difference shows that the mean level of concern regarding the introduction of AI in education among those with "41-43 and above" years of service is 0.632 points higher compared to those with "16-20" years of service, and vice versa.

d) "21-25 years" (p=0.049<0.05): The difference shows that the mean level of concern regarding the introduction of AI in education among those with "41-43 and above" years of service is 0.602 points higher compared to those with "21-25" years of service, and vice versa.

e) "26-30 years" (p=0.016<0.05): The difference shows that the mean level of concern regarding the introduction of AI in education among those with "41-43 and above" years of service is 0.678 points higher compared to those with "26-30" years of service, and vice versa.

f) "31-40 years" (p=0.007<0.05): The difference shows that the mean level of concern regarding the introduction of AI in education among those with "41-43 and above" years of service is 0.732 points higher compared to those with "31-40" years of service, and vice versa.

Therefore, teachers with more years of service exhibit a higher level of concern about the evolution of AI's integration into education compared to those with fewer years of service.

Dependent Variable	(I)) Years of Service	(J) Years of Service	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
Table 10: Multiple Comparisons							
Tukey HSD							
						Lower Bound	Upper Bound
Do you feel concerned about the evolution of AI integration in Education?	41-43 years and above	1-5	.681*	.198	.014	.08	1.28
		6-10	.627*	.206	.048	.00	1.25
		11-15	.515	.203	.183	-.10	1.13
		16-20	.632*	.198	.032	.03	1.23
		21-25	.602*	.198	.049	.00	1.20
		26-30	.678*	.200	.016	.07	.28
		31-40	.732*	.202	.007	.12	1.34

IV.   Discussion

This study aimed to explore educators' perceptions regarding the applications of Artificial Intelligence (AI) in the administrative work of school principals, as well as their attitudes, readiness, and needs for adopting and utilizing AI in education. The core theoretical framework highlights the potential of AI applications to reduce the burden of administrative tasks and enhance strategic thinking in educational environments. The use of AI tools for data analysis has been proven critical in supporting evidence-based decision-making, particularly within administrative and academic contexts. AI serves as a pivotal element for improving efficiency in education, underlining the importance of integrating these technologies into administrative processes and decision-making. Gradual AI integration is often accompanied by increased acceptance as users become familiar with its capabilities and benefits. This highlights the necessity for professional training and improved technological infrastructure. Specialized training can bolster educators' confidence and effectiveness in using new technologies, while robust infrastructure is a vital prerequisite for the successful incorporation of AI into education.

The findings of this study appear to align significantly with this framework, demonstrating that educators recognize the positive impact of AI, particularly in enhancing school administration and improving educational effectiveness. Regarding perceptions of AI's application in reducing bureaucracy in the administrative tasks of education leaders and supporting their work in data analysis and decision-making, 67.7% of the 862 participating educators evaluated the use of Artificial Intelligence (AI) as highly positive for improving the efficiency of education leaders and reducing bureaucracy. Similarly, 60.8% considered AI to provide significant support in data analysis and decision-making. These findings align with previous studies highlighting AI's capacity to alleviate the burden of administrative tasks and enhance strategic thinking in educational settings[1]. Moreover, the use of AI tools for data analysis has been demonstrated as critical for supporting evidence-based decision-making, particularly in administrative and academic contexts[39]. The results underscore AI's role as a catalyst for improving efficiency in education, while also emphasizing the importance of integrating these technologies into administration and decision-making processes.

Regarding participants' attitudes toward the use of Artificial Intelligence (AI) and their readiness to work with it, the majority (59.9%) evaluated the introduction of AI in education positively. This perspective aligns with international studies that highlight AI's potential to significantly enhance teaching and learning processes, as well as the management of educational institutions[1]. Additionally, 63.8% of participants reported no significant concerns about AI's introduction, affirming the observation that gradual integration is often accompanied by increased acceptance as users become familiar with its capabilities and benefits[19]. Furthermore, 58.2% of educators felt relatively prepared to work with AI, though this readiness appears to be closely linked to the availability of adequate training and infrastructure. This finding is consistent with other research indicating that the effective use of AI requires educational support and skill development[23]. Regarding the needs for training and infrastructure, an impressive 92.3% of participating educators emphasized the necessity for training and certification in the use of Artificial Intelligence (AI) in education. This aligns with the observation that specialized training can boost educators' confidence and effectiveness in adopting new technologies[39].

Additionally, 94.9% highlighted the need for improved technological and physical infrastructure, such as internet access and digital tools, to support the effective integration of AI. This demand corresponds to the recognition of technological infrastructure as a fundamental prerequisite for the sustainable adoption of AI in educational settings[14]. Regarding perceptions of the application of Artificial Intelligence (AI) in administrative tasks, its utilization, readiness for use, and the needs for leveraging AI in education, the use of AI applications in the educational sector emerges as a critical factor for improving administrative efficiency, supporting education leaders, and promoting evidence-based decision-making. The integration of these technological tools has proven to be a catalyst for adapting educational structures to an ever-changing environment.

This analysis focuses on the correlation between two categories of applications: (a) those that enhance the efficiency of administrative tasks and reduce bureaucracy and (b) those that support decision-making through data analysis. Applications aimed at improving administrative efficiency exhibit a strong correlation (r=0.544) with tools for data analysis and decision-making. This connection demonstrates that the combined use of these technologies contributes to creating holistic solutions that reduce administrative challenges and enhance the strategic thinking of leaders. Additionally, there is a moderate positive correlation (r=0.387) with a favorable attitude toward AI, suggesting that participants who recognize the practical utility of these applications tend to express greater acceptance of AI. In contrast, a negative correlation (r=−0.183) with concerns about AI adoption highlights the ability of these tools to alleviate fears regarding potential negative impacts. However, readiness to work with AI shows a low positive correlation (r=0.192), underscoring the need for additional training and specialization. Participants appear to recognize the necessity of attending educational programs and improving technological infrastructure (r=0.193 and r=0.201, respectively) to fully utilize these applications.

Applications facilitating data analysis and decision-making follow similar trends, with a strong correlation (r=0.544) with efficiency and bureaucracy reduction. This connection highlights that decision-making applications do not function in isolation but strengthen overall administrative tasks. The correlation with a positive attitude toward AI remains moderate (r=0.360), while the negative correlation with concerns is stronger in this category (r=−0.265). This finding indicates that the ability to make evidence-based decisions through data analysis boosts confidence in AI technologies. The correlation with readiness to work with AI remains low (r=0.208), while the needs for training (r=0.162) and technological infrastructure (r=0.094) are less pronounced compared to the first category of applications. AI applications focused on administrative tasks, such as data analysis, student evaluation, and information management, reduce bureaucracy and increase the efficiency of administrative processes. These technologies allow educators to dedicate more time to teaching, thereby enhancing the overall quality of education[1]. Simultaneously, they facilitate evidence-based decision-making through AI tools that analyze large datasets, improving strategic thinking and effectiveness in educational administration[39]. Data analysis applications assist in making more accurate and targeted decisions, supporting the personalization of learning experiences. These capabilities are closely linked to efficiency improvements, as the two types of applications complement each other. Their use reduces concerns about AI adoption since educators perceive the practical value of these tools in their daily work[23]. Positive attitudes toward AI are reinforced by applications that simplify daily tasks and offer tangible benefits, such as reduced workload and improved performance. Concerns related to technology, such as uncertainty about its use or ethical challenges, diminish when users perceive the utility and reliability of the applications[19]. The adoption of these applications requires investments in infrastructure and training. Educators express a need for training programs to familiarize them with the use of these technologies, as well as for improvements in technological infrastructure, such as interactive whiteboards and high-speed internet connectivity[14].

Regarding correlations with demographic characteristics, no statistically significant correlation was identified between perceptions of AI applications and their effectiveness in supporting education leaders' administrative tasks, data analysis, and decision-making. However, significant variations were observed in educators' perceptions and attitudes toward the use of Artificial Intelligence (AI) in education, based on gender, educational level, and years of service. Specifically, male educators appeared to feel more prepared to integrate AI into their teaching, with a higher mean score (mean=1.47) compared to female educators (mean=1.39). This difference may reflect varying levels of confidence or familiarity with new technologies. This finding aligns with international studies indicating that men tend to feel more comfortable adopting new technologies, while women often experience reduced confidence or limited access to relevant training[25]. Similarly, research shows that perceptions of ease of use and usefulness are influenced by gender, with men placing greater emphasis on technology's practicality[24]. Educators in Primary Education reported lower levels of concern about AI adoption (mean=1.42) compared to their counterparts in Secondary Education (mean=1.32). This variation could be linked to the differing demands characterizing each educational level. Secondary Education educators may perceive AI adoption as a greater challenge due to the increased complexity and adaptability required[12]. Respondents with more years of service (41–43 years and above) expressed greater concern about AI's development compared to younger colleagues (1–40 years). This could be attributed to older educators' reluctance to adapt to new technologies and their lack of experience with modern digital platforms[7]. Additionally, the absence of appropriate training programs for older educators amplifies their sense of insecurity[4].

V.   Conclusion

The findings of the research highlight that AI applications in education are not merely auxiliary tools but strategic catalysts for improving the quality, efficiency, and overall effectiveness of administrative tasks, data analysis, and decision-making in the educational sector. The systematic integration of these applications requires appropriate investments in infrastructure and continuous training, thereby maximizing the benefits they

offer and addressing concerns related to technology use. Additionally, the results indicate the need for targeted interventions tailored to different groups of educators. Specifically, training programs and infrastructure development for AI use can enhance readiness and alleviate concerns. Understanding differences based on gender, educational level, and years of service is crucial for the sustainable integration of AI into the educational system.

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