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School administrators and artificial intelligence: reshaping educational administration in the digital transformation process

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Abstract

Digital transformation in education is no longer merely a technological innovation; it is a process in which strategic leadership is being redefined. This research aims to examine school administrators' perceptions and attitudes toward artificial intelligence (AI) technologies, exploring the factors shaping these attitudes and their implications for institutional practices. Using a mixed-methods approach, the study collected quantitative data via surveys from 203 school administrators and conducted semi-structured interviews with 13 administrators who actively use AI technologies. Quantitative results showed that administrators displayed generally positive attitudes toward AI, particularly regarding its potential to improve efficiency and decision-making processes, with mean scores highest in the dimensions of innovative leadership and performance enhancement. However, lower scores were found in areas related to ethical awareness and data privacy. Qualitative findings further revealed that administrators perceive AI as a supportive tool for evidence-based management and communication, though they emphasized the need for institutional guidance and professional development. Overall, the study highlights that administrators view AI not merely as a technical instrument but as a key driver of transformation-oriented leadership.

Keywords

Artificial intelligence
School administrator
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Introduction

The 21st-century digital revolution signals a paradigmatic shift that transforms educational ecosystems not only superficially but also structurally. The dizzying pace of technological advancement is reshaping both the pedagogical and administrative components of education systems (Selwyn, 2022). This transformation has also brought about a fundamental shift in the understanding of educational administration. Traditionally defined by Weberian bureaucratic principles, educational administration is now being restructured around new values such as flexibility, agility, and technology integration (Taktak & Özgenel, 2023). The complex and rapidly changing conditions presented by the digital age demand that administrators not only maintain operational functions but also develop strategic vision, execute data-driven decision-making processes, and effectively integrate innovative technologies. Within this framework, advanced technologies such as artificial intelligence (AI), the internet of things (IoT), and big data analytics are fundamentally transforming not only teaching and learning processes

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but also the nature of school administration (Luckin, 2018). The technological support of values such as transparency, efficiency, and accountability in management processes is leading to the rise of more horizontal, collaborative, and data-driven organizational models over structures based on traditional vertical hierarchies. This new managerial approach necessitates supporting decision-making processes with participatory and flexible structures rather than centralized ones, and aims to transform educational institutions into learning organizations.

This digital transformation should be considered not only as an instrumental modernization process, but also as a strategic imperative that determines the direction of education policies. The rapid development of educational technologies (EdTech) and the proliferation of artificial intelligence (AI)-based applications, especially augmented reality (AR) and virtual reality (VR) solutions (HolonIQ, 2023; Zawacki-Richter et al., 2019), are radically transforming the roles of school administrators. This transformation necessitates that administrators transcend traditional management approaches and develop the leadership skills required by the digital age. Recent research reveals that the digital competencies of educational leaders are not limited to technical knowledge alone, but also encompass multidimensional skills such as strategic thinking, data-based decision-making, and digital ethical awareness (Crompton et al., 2024. Therefore, digital literacy, innovation management, and transformation-oriented leadership have become central to contemporary school administration. In this context, leadership is not merely a role that implements technology; It is also gaining importance as a managerial approach that supports innovation and creates a sustainable school culture (Harris & Jones, 2020). Indeed, the empirical findings of Berkovich (2025) and Göçen and Döğer (2025) reveal that the task, relationship and change-oriented responsibilities of school leadership are being redefined through artificial intelligence-supported managerial processes, and this transformation has radically restructured the theoretical foundations and practical dimensions of educational leadership. Furthermore, Leithwood et al.'s (2020) comprehensive meta-analysis reveals that effective leadership practices, especially the skills of creating a vision, providing instructional support, and developing a professional learning culture, have a universal impact on student achievement, regardless of cultural differences.

This transformation significantly impacts the understanding of how school leaders position technological tools in digital management processes and integrate them into decision-making. This shift also increases the need for a theoretical framework to explain administrators' perceptual and behavioral tendencies toward technology. In this context, when school administrators' adoption of digital tools is examined within the context of Davis's (1989) Technology Acceptance Model (TAM), it is observed that the model's core components perceived usefulness, perceived ease of use, attitudes, and intention to use shape administrators' evaluations and behaviors toward digital innovations. Therefore, school leaders' internalization of technology not only as a managerial necessity but also as a pedagogical opportunity stands out as a key element that accelerates the development of personalized learning and innovative teaching models in education (Fullan et al., 2024). However, this transformation process faces two main structural obstacles. First, although technological infrastructure has been provided in many educational institutions, the failure to effectively integrate these resources into administrative and pedagogical processes deepens the "institutional digital divide" (Van Dijk, 2020). This shows that investments in technology may be ineffective if they are not supported by visionary leadership and cultural transformation strategies. According to the OECD's (2023) Digital Education Outlook report, the success of digital transformation depends not only on infrastructure investments; It also depends on leaders' ability to build digital capacity, strengthen teaching communities, and drive data-driven innovation.

Second, students' inadequate equipping with high-level skills such as critical digital literacy, creative thinking, and complex problem-solving hinders the deepening of pedagogical transformation. Recent studies emphasize the need for stronger strategic capacity among teachers and administrators to design learning environments that support such high-level digital skills (Howard et al., 2021). In this context, the sustainable success of digital transformation depends not only on the adoption of technological tools but also on the positioning of administrators as "transformational leaders" who

support these skills and model an innovative teaching culture (Anwar & Saraih, 2024). Given this profound impact on educational administration, a comprehensive examination of school administrators' perceptions and attitudes toward the use of AI will not only provide practical strategic contributions but also contribute significantly to addressing theoretical gaps in this area.

School administrators' use of artificial intelligence

Artificial intelligence (AI) technologies offer transformative opportunities in many areas, such as monitoring student achievement in educational institutions, personalizing learning processes, strengthening decision-making processes based on learning analytics, and streamlining resource management (Alonso et al., 2025; Asri, 2024). However, the effective implementation of these technologies largely depends on school administrators' attitudes toward AI and their digital leadership competencies (Nubun et al., 2024). At this point, the Technology Acceptance Model (TAM) (Davis, 1989), which is frequently used to explain administrators' perceptions and behaviors toward technology, offers an explanatory theoretical framework. According to the model, perceived usefulness and perceived ease of use determine administrators' attitudes toward AI and their intentions to use it. Current research shows that school leaders more readily adopt these technologies when they recognize the potential of AI to improve teaching quality and make data-driven decisions (Adedeji, 2025; Batu & Taşdan, 2025). The roadmap, consisting of four main goals and 40 action steps, established by the Ministry of National Education (MoNE, 2025) in Turkey within the scope of the Artificial Intelligence in Education Policy Document and Action Plan (2025-2029), stands out as a significant step toward the systematic integration of AI-enabled learning analytics tools through the EBA and e-School platforms. This plan serves as a concrete reflection of the theoretical framework envisioned by the Technology Acceptance Model in practice, demonstrating that AI is not only a technical innovation in education management but also paves the way for the construction of a new paradigm in terms of institutional leadership, ethical awareness, and data-driven governance.

The international literature includes numerous studies on teachers' attitudes towards artificial intelligence technologies, their intentions to use them, and their levels of pedagogical adaptation (Salas-Pilco et al., 2022; Taktak et al., 2024; Zawacki-Richter et al., 2019). However, a significant portion of the existing studies focusing on educational administrators (Dai et al., 2025; Kafa, 2025; Seriki & Köprülü, 2024; Taktak, 2025a) reveal the attitudes and awareness levels in a specific period through descriptive designs based on cross-sectional or qualitative data, but cannot explain the dynamics behind these findings in depth. For this reason, the literature still has limited analytical, mixed, and causal studies that examine "how" and "why" the integration of artificial intelligence into school management. However, administrators are not only technology users; They are also leaders who guide teachers, transform institutional culture, and determine the strategic direction of digital transformation (Taşdemir et al., 2024). For example, some studies show that managers are unable to adequately integrate artificial intelligence tools into their decision-making processes (Dai et al., 2025; Kafa, 2025). Similarly, Mogas et al. (2022) reveal that despite positive attitudes, a lack of information and insufficient guidance constitute a significant obstacle to implementation processes.

A similar situation is observed in the Turkish context. Çelik et al. (2025) stated that school administrators' awareness levels of AI are heterogeneous and that the need for in-service training is increasing, while Atasever (2021) emphasizes that while administrators recognize the potential of AI, they face uncertainties regarding the integration of these technologies into schools. These studies demonstrate that the digital transformation process cannot be limited to investments in technical infrastructure; they also demonstrate the need to strengthen managerial capacity and develop digital leadership skills. In this context, a significant gap in the literature is striking. Empirical studies that holistically examine school administrators' attitudes, knowledge competence, ethical sensitivity, and usage experiences regarding AI technologies are quite limited. Mixed method designs, in particular, that address administrators' cognitive, affective, and behavioral dimensions together, offer a significant advantage in explaining this multilayered phenomenon (Creswell & Clark, 2018). This research adopted a mixed methods approach to address this gap in the literature. This approach aims to identify general

trends through quantitative data and provide an in-depth analysis of administrators' experiences, perceptions, and strategic approaches through qualitative data. Thus, by evaluating school administrators' managerial and ethical approaches to AI within an explanatory framework, the study aims to offer strategic insights into digital transformation at both the individual and institutional levels.

Method

Research Model

The research adopted an explanatory sequential mixed methods approach by integrating quantitative and qualitative data collection processes (Creswell & Clark, 2018). In the first phase, the perceptions, attitudes, and usage trends of school administrators toward AI technologies were determined through quantitative data; these findings formed the basis for the qualitative data collection process. In the second phase, a semi-structured interview form consisting of three questions[2] was developed based on the patterns revealed in the quantitative analyses. The interview questions focused on understanding the ways administrators integrate AI into their decision-making processes, the opportunities and limitations they face, and the effects of the organizational context on these attitudes. Thus, the qualitative phase served as a complementary stage by deepening the meaning of the quantitative findings. Furthermore, in the findings section, the intersections of the two data sets are presented holistically using a joint display approach.

Participants

In the quantitative phase of this mixed-methods study, 203 administrators were selected using simple random sampling from a predetermined list from public and private schools in various provinces across Turkey. This sampling method was chosen to ensure that each individual in the population had an equal probability of being selected and to increase the representativeness of the sample (Büyüköztürk et al., 2020). In the qualitative phase, interviews were conducted with 11 school administrators who initially reported using AI applications. However, it was observed that the participants' experience with AI applications was quite limited. To overcome this limitation, the criterion sampling approach suggested by Patton (2002) was adopted, and the qualitative sample was strategically restructured. The criteria were defined as administrators effectively using at least three different AI applications. In-depth semi-structured interviews were conducted with 13 administrators who met this criterion; four of them were general managers of multi-branch private schools. This arrangement not only increased the analytical depth of the data set, but also strengthened the study's internal consistency and contextual validity, and prevented limited analyses conducted with administrators who did not use AI.

Data Collection Tools

The data collection process was structured in two stages. In the first stage, the researcher conducted direct school visits and administered the "Artificial Intelligence Perception Scale" and information form developed by Taktak (2025a) to 203 school administrators.[3] This eight-item, single-factor scale was designed to measure administrators' attitudes toward artificial intelligence technologies. Responses were on a 5-point Likert-type scale, with higher scores indicating more positive attitudes. Sample items: “I believe artificial intelligence saves time,” “I believe artificial intelligence is an effective tool for improving academic success,” and “I think acquiring artificial intelligence skills is important for my professional development.” The factor structure and validity of the scale were tested for the sample using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), and the model fit indices were found to be acceptable ($\chi^2/df = 1.87$; CFI = .94; TLI = .95; GFI = .94).

In the second stage, face-to-face semi-structured interviews were conducted with selected participants to obtain in-depth data. This method was chosen to ensure participants provided more clear, confident, and detailed responses (Schober, 2018). Before the interviews, participants were informed about the purpose and process of the research, and content validity of the questions was

[2] Interview questions were given at the end of the study.

[3] This study was conducted in accordance with the ethical guidelines established in the Helsinki Declaration. Approval was obtained from the İstanbul Gelişim University Ethics Committee (Decision No: 2024-16). No personally identifiable information was collected from the participants.

verified through a literature review and by three field experts. The interview form consisted of three open-ended questions assessing managers' experiences with artificial intelligence. Each interview lasted approximately 40 minutes and was conducted in the educational institutions where the participants worked.

Analysing the Data

This study employed a two-stage analysis process. In the first stage, quantitative data were collected using a Personal Information Form and the Artificial Intelligence Perception Scale, and the resulting data were analyzed using SPSS 26.0. Data on participants' demographic characteristics and perceptions of artificial intelligence were evaluated using descriptive statistics, including arithmetic mean, standard deviation, skewness, and kurtosis. Table 1 presents the normality and reliability analyses for the scale items.

Table 1. Normality and reliability analyses for the scale items

AVE*	**CR****	**Skewness**	**Kurtosis**	**Cronbach's α**
0.76	0.96	-.512	.513	.886

*Average Variance Extracted, ** Composite Reliability

According to Table 1, the obtained AVE (.76) and CR (.96) values are well above the acceptable limits (AVE > .50; CR > .70) specified by Fornell and Larcker (1981). This finding demonstrates that the scale has high convergent validity and composite reliability. Furthermore, the calculation of Cronbach's α coefficient as .886 demonstrates the scale's strong internal consistency. The skewness (-.512) and kurtosis (.513) values within the ±1 range indicate that the data set conforms to a normal distribution and supports the statistically robust structure of the measurement model.

For the qualitative data, content analysis was employed in line with the framework proposed by Yıldırım and Şimşek (2016). This analytical process involved four systematic stages: (1) transforming raw data into meaningful codes, (2) grouping similar codes under sub-themes, (3) establishing conceptual relationships between themes, and (4) interpreting the findings in connection with the theoretical framework. Interview recordings were transcribed using VEED software and enriched with researcher notes to support the analytical process. To ensure the reliability of the coding process, the qualitative data were independently analyzed by two researchers. The resulting codes were compared and consistency checks were conducted. This approach strengthened the validity and reliability of the qualitative findings, thereby enabling a comprehensive understanding of participants' perceptions of artificial intelligence.

Validity and Reliability

To ensure the methodological rigor of this study, multiple validity strategies widely accepted in qualitative research were implemented through an integrated approach. In line with the quality standards proposed by Glesne (2011) and Merriam (2015), systematic measures were taken across three key dimensions (credibility, confirmability, and transferability) to enhance the study's reliability. For ***credibility***, the member checking technique was extensively employed to validate data accuracy (2024-2025 academic year). Following each interview, analytical summaries and key findings were shared with participants to collect their feedback and correction requests. When necessary, follow-up interviews were conducted to verify data accuracy. Additionally, the researcher's prolonged engagement in the field and established rapport with participants enabled in-depth data collection.

Regarding ***confirmability***, particular emphasis was placed on maintaining complete transparency and traceability throughout the research process. All interviews were digitally recorded and transcribed verbatim. Every analytical decision and interpretation was meticulously documented in a research journal. Findings were presented using direct participant quotations without modification, allowing readers to evaluate the primary data themselves. For ***transferability***, detailed information about participant selection criteria and demographic profiles was provided to support the potential generalizability of findings to similar contexts. Key participant characteristics - including professional

experience, education level, and position - were presented in tables to clearly illustrate the research context. These comprehensive descriptions offer guidance on how findings might be interpreted in different educational settings. These rigorous methodological measures significantly strengthened both the internal consistency and external validity of the study, enhancing the scientific value of its findings. The multiple verification mechanisms implemented during data collection and analysis systematically supported the research's reliability. The triangulation of data sources and analytical methods further reinforced the trustworthiness of the results.

Findings

In this section, the main trends and patterns that emerged as a result of the data analysis processes conducted regarding the focus questions of the research are discussed in detail. The findings presented are based on a holistic synthesis of quantitative statistical evaluations and qualitative analyses.

Quantitative findings

Descriptive statistical analyses of the scale were conducted within the scope of the quantitative findings. Additionally, school administrators' perceptions of AI were examined across gender, age, and school level. Gender-related differences in participants' use of AI applications were analyzed using an independent samples t-test. The scale's descriptive findings are presented in detail in Table 2.

Table 2. Means and standard deviations of scale items

Item	Mean	SD
1. I believe that artificial intelligence saves time.	3.65	.955
2. I believe that artificial intelligence increases professional efficiency.	3.65	.934
3. Artificial intelligence applications increase teacher-student communication.	3.65	.856
4. I believe that artificial intelligence is an effective tool in increasing academic achievement.	3.60	.846
5. I believe that artificial intelligence supports administrative processes.	3.33	.908
6. I believe that artificial intelligence will strengthen my communication with younger generations.	3.47	1.06
7. I believe that acquiring artificial intelligence skills is important for my professional development.	3.79	.993
8. The use of artificial intelligence improves decision-making processes in school administration.	3.43	.1.02
Mean/SD	3.57	.703

According to Table2, the overall mean of the participants was (M = 3.57, SD = 0.70), indicating a generally positive attitude. The items with the highest mean values were: Item 7: "I believe that acquiring artificial intelligence skills is important for my professional development." (M = 3.79, SD = 0.99), Item 1: "I believe that artificial intelligence saves time." (M = 3.65, SD = 0.96), Item 2: "I believe that artificial intelligence increases professional efficiency." (M = 3.65, SD = 0.93), and Item 3: "Artificial intelligence applications increase teacher-student communication." (M = 3.65, SD = 0.86). Participants particularly strongly emphasized the importance of artificial intelligence skills for professional development and the positive effects of artificial intelligence on efficiency, time savings, and communication. The items with the lowest mean values, in order, are: Item 5: "I believe that artificial intelligence supports administrative processes." (M = 3.33, SD = 0.91), Item 8: "The use of artificial intelligence improves decision-making processes in school administration." (M = 3.43, SD = 1.02), Item 6: "I believe that artificial intelligence will strengthen my communication with younger generations." (M = 3.47, SD = 1.06), and Item 4: "I believe that artificial intelligence is an effective tool in increasing academic achievement." (M = 3.60, SD = 0.85). These items indicate that the participants are more cautious about the impact of artificial intelligence on administrative processes and decision-making. Findings regarding the gender variable are presented in detail in Table 3.

Table 3. Distribution of Artificial Intelligence Perception by Gender

Gender	N	Mean	ss	t	df	p
Female	64	3.60	.680	-.448	201	.654
Male	139	3.56	.757			

According to Table 3, there is no significant difference between the mean scores of school administrators by gender. While female mean scores are slightly higher than men's, this difference is not statistically significant ($p > 0.05$). The distribution of school administrators' AI use by age was analyzed using ANOVA and is presented in Table 4.

Table 4. Distribution of Artificial Intelligence Perception by Age

Age	N	Mean	sd	Source of Variance	SS	df	MS	F	p
35 Years and under	56	3.65	.707	Between Groups	.967	2	.483	.976	.379
36-45 Years	109	3.57	.707	Within Groups	99.09	200	.495		
46 years and older	38	3.44	.686	**Total**	100.06	202			
Total	203	3.57	.703						

When Table 4 is examined, it is seen that there is no significant difference between the participants' opinions according to the age variable ($F=0.976$; $p>.05$). When looking at the mean values, it was determined that the group aged 35 and under ($M=3.65$) had a slightly higher mean compared to the other age groups. The use of artificial intelligence by school administrators according to the types of schools they work in is presented in detail in Table 5.

Table 5. Distribution of Artificial Intelligence Perception by School Levels

School	N	Mean	sd	Source of Variance	SS	df	MS	F	p
Primary school	38	3,73	,698	Between Groups	4,29	2	2,149	4,488	,012
Middle school	56	3,72	,545	Within Groups	95,76	200	,479		
High school	109	3,43	,753	**Total**	100,06	202			
Total	203	3,57	,703						

The one-way ANOVA analysis presented in Table 5 shows a significant difference in the perception of artificial intelligence according to school types ($F=4.48$; $p>.05$). Looking at the mean values, it is seen that the primary school (Mean=3.73) and middle school (Mean=3.72) groups have higher scores than the high school group (Mean=3.43). However, the unequal sample sizes of the groups and the non-homogeneous distribution of variances are points to be considered in the interpretation of the ANOVA results. Therefore, in the post-hoc analyses performed, it was determined that there is a significant difference between the middle school and high school groups; however, the difference between the primary school and high school did not reach a statistically significant level due to variance differences. In addition, no significant difference was found between the primary school and middle school groups.

Table 6. Joint Display Approach to School Administrators' Perception and Experiences of Artificial Intelligence

Quantitative Findings	Qualitative Findings	Integrated Findings
General Trend	**Emergent Themes From Managers**	AI is generally viewed positively by school administrators, seen as a reliable tool, and is being integrated into many areas of management practice.
• Scale item means (3.33 - 3.79) indicate an overall positive perception. • The scale demonstrates high reliability (Cronbach's $\alpha > .85$).	• Administrators find AI effective primarily in these areas: Decision Making, Administrative Affairs, Communication, Leadership, and Professional Development.	

Table 6. Continued

Quantitative Findings	Qualitative Findings	Integrated Findings
Demographic Variables	**Qualitative Supporting Evidence**	Demographic factors like age and school level strongly influence the adoption and perception of AI. Younger administrators and primary/middle schools are more receptive, while there is evident resistance and a digital divide among high school levels and older/experienced teachers, as supported by qualitative data.
• Gender: No significant difference in AI perception based on gender. (Table 3) • Age: The highest AI perception is seen in the 30 and under age group, decreasing with age. (Table 4) • School Level: High school administrators' AI perception is significantly lower compared to primary, middle school, and kindergarten administrators.(Table 5)	• "Some of my colleagues have a very high resistance to technology. Especially our older teachers." (P7) • "Teachers think that artificial intelligence is something that they cannot achieve." (P14) • " In primary school, students have an endless curiosity about technology; it is imperative for us educators to recognise this fact and guide them correctly." (P4)	
AI Use & Perception	**Tangible Benefits of AI**	Administrators particularly value the adoption of AI for its tangible benefits in operational efficiency, time management, and data-driven decision-making. These contributions underpin the overall positive perception of AI. The findings indicate that school administrators view AI skills as an integral component of their professional development and have a high level of awareness in this area.
• The average value for the statement "I believe that acquiring artificial intelligence skills is important for my professional development", which is the item with the highest average in the scale (X=3.79), shows that the participants agree with this opinion at a high level. (Table 2)	• Time Saving: "It saves a school administrator an incredible amount of time." (P2) • Decision Support: "I have started to do very little without asking it in terms of decision making." (P6) • Operational Efficiency: "I had the minutes of the meetings... analyzed by artificial intelligence. We ignore so many important points." (P12)	
AI Use & Perception	**Professional Development & Leadership**	AI is empowering administrators not only in administrative tasks but also in their leadership influence and personal professional development. It is used as a tool for better planning, gaining new ideas, and motivating their teams.
• AI use and perception vary according to the type of school the administrators work in.	• Planning: "NotebookLM... has given me an incredible time advantage." (P12) • Inspiration & Awareness: "I ask artificial intelligence what can be done in situations I experience for the first time." (P13) • Motivation: "The visual and design details of the presentations I prepare attract the attention of teachers." (P9)	
Implicit Finding	**Implicit Finding**	The intersection of the two data sets reveals that AI is positioned not as a "revolutionary" change, but as an "evolutionary" tool that supports and enhances existing processes in school management. Human judgment and communication ("just a look") remain critical, while AI provides powerful support to these processes.
• Quantitative data shows a general positive perception, while demographic analyses reveal disparities in adoption levels.	• Qualitative data provides the underlying "reasons" for this perception (time savings, data analysis) and the "obstacles" encountered (resistance, skill gaps) with concrete statements.	

Table 6 presents an integrated analysis of quantitative and qualitative findings regarding school administrators' perceptions and experiences of AI. The findings indicate that administrators generally have a positive attitude toward AI. Quantitative data reveal high perception scores and levels of trust, while qualitative data highlight AI's contributions in concrete areas such as decision-making, administrative affairs, communication, leadership, and professional development. Demographic factors such as age and school level influence perception, while qualitative findings highlight barriers such as resistance and the digital divide.

Qualitative findings:

The views of school administrators on artificial intelligence were examined using the content analysis method within the scope of qualitative research. During the analysis process, certain sub-themes and codes related to the administrators' use of artificial intelligence were revealed. The obtained sub-themes and codes are visualized in Figure 1.

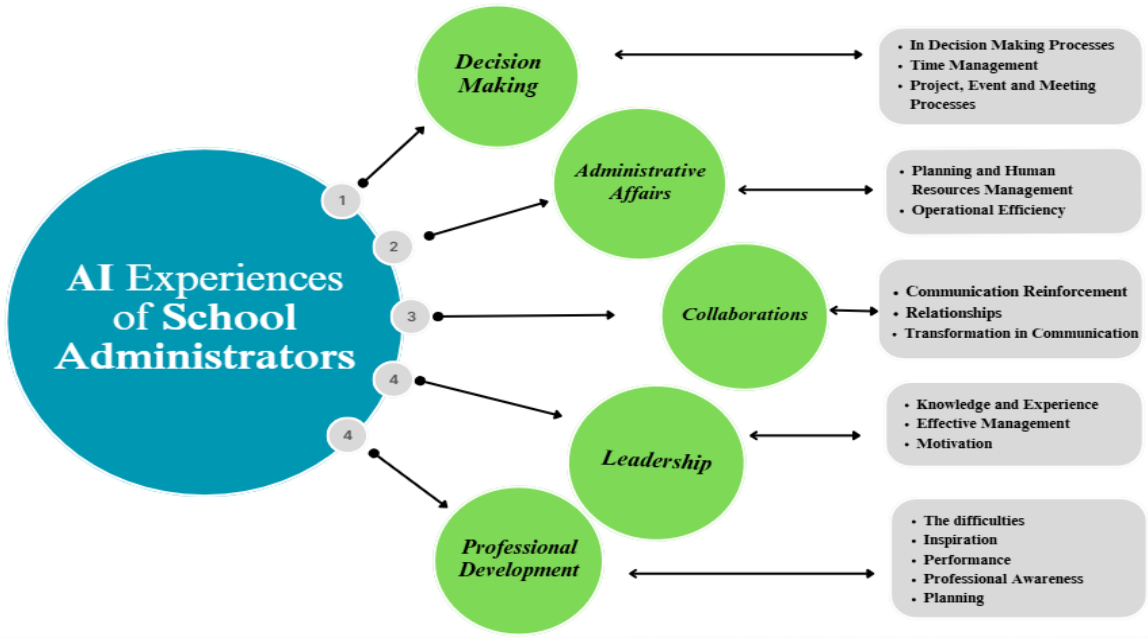

Figure 1. Themes and Sub-themes

In the analysis process of the research, the views of school administrators on the use of artificial intelligence were classified within the framework of five main themes. These themes are; decision making, management processes, communication, leadership and professional development. The sub-themes of each theme and the participant views on these sub-themes are given below.

Decision Making

Participants stated that they effectively use artificial intelligence applications in decision-making mechanisms, time planning and project, event and meeting processes as school administrators.

Decision-making processes: The research conducted, the participants' views within the scope of the relevant sub-theme, emphasize the role of artificial intelligence in the decision-making processes of school administrators. The support that artificial intelligence-based data analysis and prediction models provide to administrators, especially when making strategic decisions, stands out. In this context, some of the participants' views are presented below:

> *I wanted to do something that everyone would really enjoy on Teachers' Day. I gave the AI the gender, age and branch of the teachers according to the number of people. I adapted the suggestions it gave me with small changes and in the end I was very satisfied. (P11)*

> *I have started to do very little without asking it in terms of decision making. In fact, I feel like I've made some mistakes in some subjects that I've made decisions without asking it. (P6)*

Project, event and meeting processes: Artificial intelligence helps to make more accurate and effective decisions in the planning and management of projects, events and meetings in the decision-making process. Some of the participant opinions about this sub-theme are as follows:

> *As a school, we wanted to plan a themed trip. Normally, planning such an event with all its details requires a lot of experience. However, when we planned with AI, it uncovered many details we might have overlooked. It considered everything from transportation times and reservations to alternative routes and weather conditions. This saved us time and made our trip much more efficient. (P4)*

> *I write the meeting agenda before the meeting. When I ask what we need, it helps me remember topics that I sometimes cannot remember because of my intensity, even though I have been doing this job for 30 years. I can say that my meetings were more productive. (P9)*

Time management: Artificial intelligence helps make faster and data-based decisions by improving time management in the decision-making process. Thanks to data analysis and forecasting models, school administrators can save time and plan processes more efficiently. Some of the participant opinions about this sub-theme are as follows:

> *I used to spend a large portion of my time on accounting and paperwork. I could not focus much on the deficiencies I noticed or the areas that needed improvement. Now, artificial intelligence does these administrative tasks and I can focus very easily on eliminating the deficiencies I noticed. (P10)*

Administrative Affairs

The responses of school administrators regarding the impact of artificial intelligence applications on administrative affairs are grouped under two subthemes: planning and human resources management and operational efficiency.

Planning and human resources management: Artificial intelligence helps to make more accurate and effective decisions by using predictive models and data analysis in personnel management and future planning processes. Some of the participant opinions regarding this subtheme are as follows:

> *I actively use it to analyze teacher performance... (P8)*

> *As an administrator, one of the most challenging things for me is organizing teachers' schedules. This process can be tedious. Recently, I've realized that inputting teacher information into AI and requesting schedule adjustments has made my job much easier. (P9)*

Operational efficiency: Artificial intelligence helps to increase operational efficiency in administrative work and to carry out processes more quickly and without errors. Thanks to data analysis and forecasting models, school administrators can carry out routine administrative processes more systematically and effectively. Some of the participant views on this sub-theme are as follows:

> *Let me tell you about an area where every school administrator has a problem. For example, meetings are held and minutes are kept. These minutes are only archived afterwards. They are almost never evaluated. I realized what I said when I had the minutes of the meetings held in the last 3 months analyzed by artificial intelligence. We ignore so many important places. (P12)*

Collaborations

Participants' responses regarding the impact of artificial intelligence applications on intra-school communication are grouped under three sub-themes: strengthening communication, collaborations, and transformation in communication.

Communication reinforcement: Artificial intelligence strengthens communication, making the flow of information within and outside the institution more organized and effective. Interaction between stakeholders becomes easier and information sharing is accelerated thanks to data analysis and automated systems. Some of the participant views regarding this sub-theme are as follows:

Since teachers know that I am proficient in artificial intelligence-related applications, they avoid making excuses on certain issues. I think this makes the communication between us more open and contributes to the more orderly functioning of the school. P(10)

Since teachers know that I actively use artificial intelligence-related applications, they sometimes come and explain the subject they will do in class and ask what kind of application they will use... (P1)

Relationships: Thanks to automated systems and data analysis, a more harmonious and efficient working environment is provided between teams, and joint projects and tasks are carried out more effectively. Some of the participant opinions about this sub-theme are as follows:

The Ministry wants us to be active in many activities and projects... I get activity and project ideas for different branches from ChatGPT and have individual meetings with teachers. This method strengthens my communication... (P14)

Transformation in communication: Artificial intelligence transforms communication, making the flow of information within and outside the institution more regular and effective. Thanks to data analysis and automated systems, the interaction between stakeholders is strengthened and information sharing is accelerated. Some of the participant opinions regarding this sub-theme are as follows:

Students have grown up with technology. If it were up to me to hire teachers, I wouldn't hire someone who doesn't understand technology. (P4)

Teachers think that artificial intelligence is something that they cannot achieve. I even receive great appreciation for the artificial intelligence applications I have made in the smallest way. (P14)

Leadership

The impact of artificial intelligence applications on leadership, which is one of the important characteristics of school administrators, is grouped under three main sub-themes: Knowledge and Experience, Effective Management and Motivation.

Knowledge and experience: Artificial intelligence helps school administrators gain knowledge and experience in developing their leadership skills. Thanks to data analysis and automated systems, administrators become more competent and achieve more effective results. Some of the participant views on this sub-theme are as follows:

Artificial intelligence applications are like both an assistant and a consultant for me… (P5)

Effective management: Artificial intelligence helps school administrators develop their leadership skills in effective management processes. Thanks to data analysis and automated systems, administrators become more competent and can carry out management processes more efficiently and effectively. Some of the participant opinions regarding this sub-theme are as follows:

Because teachers know I have experience with AI applications, they avoid making excuses about certain topics. I think this makes communication between us more open... (P10)

...My 30 years of experience have shown me that in addition to the aspects a machine can handle, there's also a spiritual aspect that only humans can handle. Because sometimes we can convey so much with just a look, without even needing words. (P2)

Motivation: Artificial intelligence helps school administrators develop their leadership skills and motivate their teams more effectively. This process allows administrators to increase the performance of their teams by providing more motivation. This subtheme has a frequency distribution of 7. Some of the participant opinions about this subtheme are as follows:

I use AI applications like Gamma and Prezi to provide information on specific topics during teacher meetings. The presentations I prepare attract the attention of teachers. I think a person should care about their work and make that felt to those around them... (P9)

Professional Development

The impact of artificial intelligence applications, which play an important role in the professional development of school administrators, consists of five sub-themes: Challenges, Inspiration, Performance, Professional Awareness and Planning.

The difficulties: Artificial intelligence positively increases the professional development of school administrators and helps them gain more qualified leadership skills. This process allows administrators to effectively overcome the challenges they face and support their professional development. Some of the participant views on this sub-theme are as follows:

Some of our teachers are even against using photocopiers or projectors, let alone artificial intelligence. (P7)

Inspiration: Artificial intelligence inspires school administrators in their professional development and helps them develop their leadership skills. This process enables administrators to discover new ideas and approaches, allowing them to produce innovative solutions in their professional lives. Some of the participant opinions on this subtheme are as follows:

A certain style prevails in official documents, but sometimes I cannot focus enough when I am busy writing. At such moments, artificial intelligence applications come to my rescue and really make my job much easier. (P6)

Sometimes, there are situations with students or teachers that I experience for the first time and do not know how to act. I ask artificial intelligence what can be done in such situations. (P13)

Performance: Artificial intelligence helps school administrators increase their performance in their professional development processes. This process enables administrators to develop more efficient and effective management strategies, allowing them to increase their professional success. Some of the participant opinions on this subtheme are as follows:

I actively use it in analyzing teacher performance. As a result, I can say that I decide whether the teacher will continue in the new academic year with artificial intelligence. (P8)

I almost never act without consulting in planning. In fact, teachers ask how can you look at it in such detail. I did not share my secret for now. (P3)

Professional Awareness: Artificial intelligence helps school administrators increase their professional awareness in their professional development processes. This process allows administrators to realize their strengths in the fields of educational management and leadership and to support their professional development by improving their weaknesses. Some of the participant opinions about this sub-theme are as follows:

When students' habits of doing homework using artificial intelligence increased, we had a meeting with the teachers and decided to change the way we assign homework. I would not have believed them if they had said I would hold such a meeting until recently. (P5)

I had all the teachers in the school receive in-service training on artificial intelligence applications. In order for the training to be permanent and to be reflected on the students, I gave each student the task of giving an assignment to be done with artificial intelligence. (P1)

Planning: Artificial intelligence contributes to the planning skills of school administrators in their professional development. This process allows administrators to make more systematic and efficient plans. Some of the participant opinions about this subtheme are as follows:

We have a lot of unplanned work during the day. Therefore, I could not spend much time on reading or R&D. This bothered me. I have been using NotebookLM for about a year. It has given me an incredible time advantage and has almost completely changed my management skills. (P12)

Discussion

This research aimed to provide a multidimensional analysis of the functional and transformative effects of technology on educational administration by examining school administrators' perceptions and attitudes toward artificial intelligence (AI) technologies from both quantitative and qualitative perspectives. The discussion is structured around the interpretation of the findings and their integration with existing literature.

Quantitative findings reveal that school administrators generally have a positive attitude toward artificial intelligence (AI), but this positive approach varies from "acceptance" to "effective use." When evaluated within the framework of Davis's (1989) Technology Acceptance Model (TAM), this suggests that administrators have developed a cognitive awareness of the potential benefits of AI, but this awareness has not always translated into behavioral adoption. The high scores obtained in the "time savings" item, in particular, suggest that AI is positioned as an operational technology that provides efficiency in administrative processes rather than a tool for pedagogical revolution. Qualitative data, however, further reinforces this trend, demonstrating that some administrators effectively use AI in decision-making, strategic planning, and communication processes, viewing it as a transformative component of their leadership identities. These findings suggest that AI functions at two levels in educational leadership: on the one hand, as a complementary tool supporting administrative processes, and on the other, as a catalyst accelerating cognitive, pedagogical, and administrative transformation. The quantitative findings of the study revealed no significant differences in terms of gender. However, the higher scores observed among female school administrators suggest that traditional gender stereotypes regarding technology are changing and that they are embracing artificial intelligence as an empowering leadership strategy. Findings regarding the age variable reveal a higher tendency toward AI among younger administrators. However, this tendency may be associated with digital proficiency and frequency of exposure to technology, not with the concept of “digital nativeness” (Prensky, 2001), as is often suggested. The literature suggests that the discourse of digital nativeness is overgeneralized, suggesting that interaction with technology is based on experiential learning processes rather than age (Creighton, 2018; Helsper & Eynon, 2010). Therefore, the more active adoption of AI by young administrators may be related to technological self-efficacy and openness to innovation (Ertmer & Ottenbreit-Leftwich, 2010). In contrast, the lower means observed among older administrators may be related to intergenerational resistance to technology, security, ethical, and control concerns (Kraus et al., 2021). The findings regarding the school level variable are also noteworthy; middle school administrators were found to use AI more intensively compared to administrators in other school types. This can be explained by factors such as the diversity of student and parent expectations at the middle school level, increased pressure for academic performance, and easier access to technological infrastructure (Bayne & Gallagher, 2021). Indeed, Chai et al.'s (2021) study also shows that elementary school administrators use AI-based analytics not only in individual decision-making processes but also as a tool to strengthen institutional efficiency and strategic direction. Taken together, these findings suggest that AI is no longer a purely operational support tool in educational management but has become a fundamental element in shaping institutional strategies and redefining the leadership paradigm.

Qualitative findings indicate that AI has transformed communication and leadership interactions within schools. Participants stated that AI increases transparency in relationships with teachers and parents, facilitates the flow of institutional information, and makes decision-making processes more systematic. These findings align with Corbeil and Corbeil's (2021) findings regarding the role of digital tools in building social capital and trust in educational institutions. Furthermore, administrators' competencies in AI appear to increase teachers' motivation and are reflected in the form

of "leadership by modeling" (İmamoğlu et al., 2024). This suggests that administrators have internalized technology not only as an instrumental but also as a cultural and behavioral domain. One of the striking aspects of the research is the insight it offers into how AI relates to leadership skills. While participants viewed AI as valuable for rational leadership functions such as rapid access to information, efficiency, and decision support, they expressed their limited potential for processes requiring empathy, intuition, and emotional intelligence. As Steele (2024) noted, AI is valuable as a supportive component in leadership; however, maintaining ultimate authority in decision-making processes with humans is essential for ethical and organizational balance. In parallel, participants' themes of "reduced anxiety about making mistakes" and "feeling supported in decisions" suggest that AI functions not only as a technical but also as a cognitively expansive tool (Hernández-Orallo, 2025; Williamson & Eynon, 2020). This finding aligns with Taktak's (2025b) research, which found that managers experience AI not only as a tool that streamlines operational processes but also as a "mind companion" that strengthens their professional self-efficacy and provides cognitive support in decision-making.

This mixed-methods study reveals that school administrators experience artificial intelligence not merely as a routine tool, but as an organizational element transforming strategic decision-making and leadership practices. Quantitative data show that administrators use AI to enhance strategic decision-making and leadership practices beyond individual development, while qualitative findings reveal underlying themes. For example, some administrators use AI-based analytical tools to quickly assess performance data and identify areas of support needed by teachers, while others utilize them in administrative processes. Qualitative findings reveal underlying themes of perception, organizational culture, and pedagogical sensitivity to these practices; quantitative scores varying by school level are explained by the perception of AI as a "silent advisor" or "decision support actor" (Selwyn, 2019). Relatively low scores in administrative processes can be attributed to administrators' cautious adoption of human-machine collaboration and a lack of a fully developed organizational culture (Aoun, 2017). The findings also show that the concepts of “perceived benefit” and “perceived ease of use” within the TAM framework are valid not only at the teacher level but also in the context of school administration, and provide theoretical information on the applicability of this model to educational leadership (Venkatesh & Bala, 2008). Reinforcing this trend, Berkovich (2025) reveals that approximately half of school leaders are in the “early majority” stage of GenAI adoption and that AI-assisted instructional leadership surpasses all other leadership areas. Similarly, Bellibaş et al. (2025) found significant relationships between technology acceptance, AI literacy, and leadership self-efficacy; and that perceived benefit and ease of use strongly increased the intention to use AI. Furthermore, the hesitant attitude towards AI in areas requiring pedagogical sensitivity coincides with the low expectations expected from quantitative analyses. While administrators view AI as a technology that provides benefits on an institutional scale, it has not completely replaced human intuition in pedagogical processes. Taken together, all this evidence suggests that AI has not yet fully transformed educational management, but as it integrates with existing leadership practices, it lightens the cognitive load on managers, provides a broader perspective in decision-making, and gradually transforms organizational culture. Consequently, the research not only offers general policy recommendations but also provides practical implications by highlighting concrete practices to enhance the design of executive training programs, AI integration strategies at the enterprise level, and leaders' technological literacy.

Conclusion

The key findings from this study's qualitative and quantitative analyses reveal that school administrators' perceptions of AI are layered. While initially positive, these perceptions are shaped more around pragmatic benefits such as time management, increased productivity, and professional development. The unique contribution of our study is that it clarifies that administrators are still uncertain about integrating AI into complex management areas such as stakeholder relations, pedagogical interactions, and emotional dynamics. This highlights the need to approach AI not merely as a functional tool but as a profound transformational factor that also impacts the cultural and epistemological structure of the education system. Furthermore, it was determined that administrator

attitudes are determined not by gender, but by individual digital competencies and technology usage habits. The finding that young administrators, in particular (in line with digital nativeness), approach AI with greater cognitive familiarity and flexibility specifically highlights the importance of age in digital leadership development.

In conclusion, this study demonstrates that AI technologies are not merely technical innovations in educational management; It also demonstrates that it has the potential for a deep and comprehensive transformation in cultural, epistemological, and leadership dimensions. The findings necessitate the development of multilayered strategies for the sustainability of this transformation. These strategies should include a holistic approach that increases administrators' pedagogical awareness, focuses on ethical sensitivity, and prioritizes change management. Administrators should be positioned as active leaders who determine the direction of this technological transformation, rather than simply being technology users. These unique findings provide a critical roadmap for policymaking regarding artificial intelligence applications in educational administration and for restructuring digital leadership training programs.

Limitations and suggestions for future research

While this research provides important findings for understanding school administrators' perceptions of AI and their implementation practices in Turkey, the results should be evaluated within the framework of certain limitations. First, the data were collected at an early stage, when AI technologies had not yet reached institutional maturity in school administration. This limits the generalizability of the findings and makes it difficult to extend interpretations beyond the current level of implementation. Second, the Artificial Intelligence Perception Scale used in the study is a single-factor, eight-item measurement tool. While the psychometric indicators are robust, elements such as ethical awareness, leadership transformation, and institutional change discussed in the discussion section are outside the dimensions directly measured by the scale. These themes are predominantly based on indirect interpretations derived from qualitative data. Therefore, it is important to explicitly consider this disjunction between the scope of the quantitative instrument and the broad conceptual framework discussed in the discussion, as part of the study's methodological limitations. Furthermore, the mixed-methods design created certain limitations in data integration. While quantitative and qualitative findings are correlated, they do not allow for direct measurement of the causal effects of AI applications on administrative processes. This necessitated the research to focus on perceptual patterns and limited causal inferences.

To increase the generalizability of the findings, future research should be restructured with broader and more inclusive samples encompassing different socioeconomic levels and diverse administrative experiences. To provide more concrete guidance, experimental and longitudinal designs aimed at testing the potential causal effects of AI on educational leadership and decision-making are recommended. In particular, empirical studies should directly examine the causal effects of AI-enabled tools on administrative efficiency or staff satisfaction in comparative studies. Such empirical studies will provide a clearer theoretical and practical understanding of how AI is positioned not just as a tool but as a factor transforming educational leadership.

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Qualitative Interview Questions

Research Question 1: How do school principals experience and understand the role of artificial intelligence (AI) in improving school management and decision-making?

- Can you describe your first encounter with AI as an educational administrator? What was that experience like for you?
- Has AI impacted your approach to school management or decision-making in any way? If so, how?
- Can you share an example of a specific decision or management task where AI played a role?
- How would you describe the role of AI in your daily leadership practices?

Research Question 2: What personal and contextual factors influence principals' adoption and integration of AI tools in their educational practices?

- How have factors within your school environment (e.g., staff attitudes or school policies) influenced your approach to AI use?
- Can you discuss any external influences (e.g., district policies, professional training, societal trends) that influenced your decision to use or not use AI tools?
- What are your personal top motivations or barriers to integrating AI in your school?

Research Question 3: How do principals describe and interpret their experiences with AI in terms of benefits, challenges, and impact on their leadership identities and leadership practices?

- As a principal, have you observed any benefits from using AI? Can you provide examples?
- What challenges or limitations have you encountered when using AI in your leadership practices?
- How do you think AI has impacted your perception of yourself as a leader?
- Can you describe how AI has impacted your relationships with staff, students, or the broader school community?
- Reflecting on your journey with AI, how do you envision this technology shaping your future leadership practices?