AI Shaping the Future of Education: Science and Math Teachers' Satisfaction Level and Motivating Factors towards Integrating Artificial Intelligence in Teaching and Learning

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***Abstract*—This study aimed to assess the satisfaction levels and motivating factors towards integrating Artificial Intelligence (AI) in teaching and learning of Jordanian science and mathematics teachers. The study population consisted of Jordanian science and mathematics teachers, with a sample size of 218 teachers (both male and female). Data were collected using a questionnaire developed by the researchers, which was validated for accuracy and reliability, then electronically distributed to the study participants community using the snowball method. The researchers employed a descriptive analytical approach using descriptive statistics such as means, standard deviations, and (One-way ANOVA) since the requirements for this test were met. The results indicated that the overall satisfaction level of science and mathematics teachers associated with the use of AI applications was high, while the satisfaction level of the motivating factors for this integration was at a medium level. Furthermore, the findings revealed a statistically significant difference in satisfaction levels based on teachers' educational attainment, favoring those with higher qualifications, as well as regarding job satisfaction. However, no statistically substantial differences were found for the remaining variables, including specialization, gender, experience, Information and Communication Technology (ICT) skills mastery, and school type. Additionally, the study found no statistically significant differences in the motivating factors influencing science and mathematics teachers' satisfaction with AI applications across all independent variables (specialization, gender, experience, academic degree, ICT skills mastery, school location, and job satisfaction). Based on these findings, the researchers concluded that integrating AI has become a necessity rather than an option. Therefore, it is crucial to implement measures that include preparing the necessary infrastructure and providing services that support this integration, while also building the capacity of educators, including teachers and supervisors, on how to effectively utilize AI in a way that adds value and achieves educational goals.**

***Keywords*—Artificial Intelligence (AI), science and mathematics teachers, teachers' satisfaction level, AI motivated factors, AI in teaching and learning**

I. Introduction

The incorporation of Artificial Intelligence (AI) in education is rapidly transforming teaching and learning, particularly in the fields of science and mathematics. Understanding teachers' levels of satisfaction and the motivating factors that influence their use of AI tools is essential for ensuring successful implementation. Recent studies highlight that educators' perceptions of AI play a crucial role in their engagement with and willingness to adopt these technologies in their classrooms [1]. Key factors such as comprehensive professional development, access to necessary resources, and robust institutional support are vital for fostering positive attitudes towards AI integration [2]. As educational institutions increasingly embrace AI technologies, it is imperative to examine how these innovations can improve teaching practices while addressing educators' needs to foster an effective learning environment.

AI is recognized as a powerful catalyst for change in education, significantly altering methods of knowledge delivery and acquisition. On one hand, the integration of AI by educators enables a shift from traditional one-size-fits-all approaches to personalized and interactive learning experiences for students [3]. The adoption of AI technologies can tailor learning experiences, enhance student engagement, and provide educators with valuable insights from data analysis, ultimately improving educational outcomes [4]. This transformation is particularly relevant in STEM (Science, Technology, Engineering, and Mathematics) education, where demand continues to grow [5, 6].

On the other hand, these disciplines face unique challenges, including variability in student proficiency levels and the necessity for innovative teaching strategies to foster understanding and interest [7]. Furthermore, math teachers encounter several significant challenges when integrating AI into their teaching practices. Specifically, they are often required to exert greater effort compared to traditional methods when employing various AI systems and applications. Additionally, pressures from their educational environment may hinder their ability to effectively implement these technologies in the classroom [8].

In recent years, traditional educational approaches have undergone a significant shift from lecture-based methods to more interactive and student-centered frameworks. The rise of digital tools, including intelligent tutoring systems and virtual simulations, has made it possible to engage students more effectively in science and mathematics. These tools help address comprehension gaps that might otherwise lead to student disengagement [9]. AI plays a pivotal role in this transformation by enabling personalized learning experiences that adapt to individual student needs. This tailored instruction not only enhances the understanding of complex concepts but also improves retention [7].

Despite these advancements, the successful integration of AI in educational settings largely depends on teachers' satisfaction and motivation. Measuring their satisfaction and understanding their motivations for using AI tools provides valuable insights into the factors that influence successful integration in science and mathematics education. As key facilitators of learning, educators' attitudes toward technology significantly impact student engagement and outcomes [10]. Likewise, teachers who feel supported and confident in using AI tools are more likely to adopt innovative practices, whereas those who lack training or resources may resist integrating new technologies [11]. To effectively implement age-appropriate AI education, teachers need adequate resources and comprehensive professional development. It is crucial to develop and evaluate strategies that equip educators for this task [12].

This study aimed to investigate the satisfaction levels of science and math teachers regarding AI integration in their teaching practices, as well as to identify the primary motivating factors that shape their attitudes toward this technology. Understanding these dynamics is essential for crafting effective educational strategies that enhance teaching methods and improve student learning experiences in an increasingly digital landscape. The implications of this research extend beyond individual classrooms, with the potential to inform policy decisions and guide professional development initiatives that advance teaching and learning across STEM disciplines, ultimately equipping students for success in a technology-driven future.

In light of the above, the world today is witnessing a cognitive renewal and rapid technological transformation, resulting in support, empowerment, and advancement in scientific and practical development within community institutions, particularly educational institutions. These advancements contribute to their ability to prosper and keep pace with the technologies of the Fourth Industrial Revolution, which links technology to industry through multiple innovations, including AI, augmented reality, virtual reality, and other emerging technologies in the educational process. The use of AI applications does not merely involve transferring educational material into web pages or CDs but rather transforming content into interactive electronic activities. In this model, learners become active participants in information when applying this data as employees and analysts. The teacher's role shifts to facilitating and guiding students toward self-learning, necessitating activity systems that are user-friendly, low-cost, and capable of storing information and data efficiently [13].

After reviewing the role of AI in the educational process from varied and diverse perspectives, AI has demonstrated its inherent capacity to enhance the educational process and address the challenges and obstacles facing education [14]. Because AI in education is founded on scientific and theoretical principles with specific objectives, it fosters innovation and development by addressing challenges and identifying optimal solutions.

Amid the complexities and opportunities presented by the integration of AI in education, understanding teachers' satisfaction and the motivating factors influencing their adoption of these technologies is crucial. While previous research has highlighted both the potential benefits and barriers associated with AI in education, significant gaps remain in understanding how these factors impact teachers' attitudes and behaviors regarding AI integration in their teaching practices. This study aims to bridge these gaps by examining teachers' satisfaction and the motivating factors involved in AI integration in education.

The study seeks to address the following overarching questions:

1) What are the satisfaction levels among science and mathematics teachers regarding the integration of AI in teaching and learning, and what factors motivate this satisfaction?
2) Do satisfaction levels among science and mathematics teachers in employing AI in teaching and learning differ based on specific variables, such as specialization, gender, experience, education level, mastery of ICT skills, school location, or job satisfaction?
3) Are there differences in satisfaction levels related to the motivating factors for science and mathematics teachers using AI applications in teaching and learning based on variables such as specialization, gender, experience, academic degree, mastery of ICT skills, school location, or job satisfaction?

The importance of this study lies in its attempt to contributes to the existing body of knowledge on AI in education by thoroughly examining teachers' satisfaction levels and the motivating factors that influence AI integration. By identifying the critical elements that promote the adoption of AI in teaching, these insights will be instrumental in supporting and empowering educators to utilize AI effectively, thereby improving teaching and learning outcomes.

The study is particularly significant as it presents the perspectives of Jordanian teachers, especially science and mathematics teachers, regarding the use of AI applications in teaching and learning. These findings aim to inform educational leaders, policymakers, and decision-makers, enabling them to take necessary measures to enhance teachers' motivation to adopt AI. This is especially crucial in the current era, as we stand on the threshold of the third phase of AI applications and the Fourth Industrial Revolution.

Regarding the basic terms in research and their meanings, researchers define them as follows:

1) **Artificial Intelligence (AI)**: In this study, AI refers to technologies and systems that exhibit intelligent behavior through data analysis, pattern recognition, and decision-making processes designed to enhance educational outcomes and improve teaching and learning environments [15–17].
2) **Teachers' Satisfaction**: This concept encompasses educators' beliefs, attitudes, interests, and perceptions regarding the implementation of AI technologies in their teaching practices. It includes their views on the benefits, challenges, and implications of using AI in educational contexts [18, 19].
3) **Motivating Factors for AI Adoption:** Motivating factors for the integration of AI refer to the elements, incentives, or justifications that drive educators to adopt AI technologies in their instructional practices. These factors often include perceived benefits such as improved student engagement, enhanced learning outcomes, and

greater efficiency in administrative tasks [20, 21].

II. Literature Review

Artificial Intelligence (AI) has emerged as a transformational force in education, with the potential to revolutionize teaching and learning practices on a global scale. This literature review synthesizes findings from studies exploring AI applications across diverse educational contexts, emphasizing its potential to improve educational outcomes and deliver personalized learning experiences.

A. AI in Education

The integration of AI in education is revolutionizing traditional teaching methods, particularly in science and math, by personalizing learning experiences to meet individual students' needs [21]. AI technology holds tremendous potential to enhance educational quality through key advantages such as improved learning outcomes, increased time and cost efficiency, and broader access to quality education worldwide.

Enhanced learning outcomes are achieved as AI tailors educational experiences by identifying individual strengths and weaknesses, tracking knowledge progress, and analyzing past interactions. These capabilities foster greater student engagement and retention [22, 23].

Beyond these benefits, the integration of AI in education offers additional advantages, including immediate feedback, improved teaching methods, a more inclusive atmosphere, engaging materials, data-informed instruction, and enhanced administrative efficiency. These collective improvements enrich the educational experience for both students and educators, creating a dynamic and interactive learning environment [24].

Tools like AI-powered chatbots play a significant role in this transformation by simulating human conversations to provide personalized support and automate administrative tasks, thereby enhancing student engagement [13, 25]. For instance, a chatbot like "Woebot" offers mental health support to students by providing a confidential space for discussing feelings and coping strategies. This support not only promotes emotional well-being but also contributes to academic success [26].

Another effective AI tool, "Knewton" analyzes student performance data to deliver instant feedback and customized learning paths. This enables science and math teachers to adapt their instruction to meet individual needs, further enhancing the teaching and learning experience [27].

Chaka [28] pointed out that "the fourth generation of education, Education 4.0, is a trend that calls for aligning education, curriculum, teaching, and learning with the outcomes of the Fourth Industrial Revolution, the most prominent of which are artificial intelligence technologies." Meanwhile, Bawaneh *et al.* [14], AlAli, and Wardat [23], Najoua *et al.* [29] highlighted the roles of applying artificial intelligence in the educational process, which include:

- Individualization of education: One of the modern trends in education, AI can adapt to each student's cognitive level, learning speed, and desired goals. An individualized approach to learning is created based on the student's unique experiences and personal preferences.
- Teaching: AI teachers and chatbots serve as ideal supplementary tools in educational settings. Although no chatbot can fully replace a teacher, they can assist students in developing skills and addressing weaknesses outside the classroom environment.
- Breaking the barrier of time and space in learning: AI technologies provide access to educational tools anytime and anywhere, accommodating learning differences and helping learners discover what they need to know without waiting for instruction from a teacher.
- Task automation: AI can automate routine tasks for teachers and administrative staff, such as managing to-do lists, classifying files, assessing learning patterns in educational institutions, and responding to general inquiries.

Nevertheless, while AI facilitates structured and efficient learning, it also raises concerns about its impact on creativity and emotional engagement in academic settings. Ensuring student-centered design, accessibility, and information accuracy presents significant challenges to the effective implementation of AI technologies in education [30]. Therefore, it is essential to further investigate how AI influences creativity, the emotional aspects of learning, and teachers' satisfaction levels in science and math to maximize its potential benefits in teaching and learning.

B. Teachers' Satisfaction with AI

Teachers' satisfaction with AI in education is critical for its successful adoption and overall effectiveness. Research shows that teachers' attitudes are shaped by the perceived usefulness, ease of use, and compatibility of AI with existing teaching practices [31, 32]. Similarly, Ayanwale *et al.* [33] found that teachers' confidence in their ability to teach AI predicts their willingness to incorporate it into instruction, highlighting the influence of their perceptions on its relevance. These attitudes vary by subject area and academic level, underscoring the importance of understanding teachers' beliefs for effective implementation.

Satisfaction with AI is often linked to its capabilities in automating administrative tasks, providing personalized learning experiences, and facilitating differentiated instruction [31]. Educators value AI's ability to analyze extensive student data and provide timely feedback, enhancing teaching efficiency and improving student outcomes [34]. Furthermore, positive experiences with AI tools boost teacher engagement and motivation, as noted by Kumar and Sharma [35]. This underscores the necessity of professional development to equip teachers for effective technology use.

Targeted training on AI tools has been shown to significantly increase teachers' satisfaction and confidence in their integration [36]. This aligns with the findings of reference [37], which emphasize that supportive leadership and a collaborative school culture contribute to positive attitudes toward AI. Aligning AI with pedagogical goals not only supports instructional practices but also fosters a more adaptive and responsive learning environment. Consequently, educational stakeholders must prioritize teachers' needs and professional growth in the context of AI integration, ensuring that their beliefs and satisfaction are

central to the process.

C. Teachers' Motivating Factors in AI Integration

Instigating teachers' motivation is critical to achieving meaningful learning and teaching. Motivation can be described as the drive to exert maximum effort to facilitate learning [38]. Litchfield and Newman [39] argue that the tendency to succeed in learning varies among individuals and across different situations. Primarily, three factors influence motivation when undertaking a task: the motive for success, the probability of success, and the perceived value of success.

Educational research on teacher motivation has confirmed that it is a decisive and influential factor closely related to several variables in education, including student motivation, educational reform, teaching practices, and teachers' psychological satisfaction and well-being. Teacher motivation has been a highly discussed topic in psychology and education. Han *et al.* [40] defines teacher motivation as the internal forces that draw teachers to the profession, encouraging them to persist, remain engaged, and continue in the field of teaching.

Teachers' motivation to integrate AI into education is influenced by various factors, including perceived benefits, opportunities for professional development, and institutional support. Zhang *et al.* [41] emphasizes that preschool teachers' willingness to use Generative AI (GAI) is positively affected by performance expectations, social influence, and promotion conditions. Research highlights that educators are motivated by AI's potential to enhance instructional efficiency, deliver personalized learning experiences, and engage students more effectively [5, 42]. Positive experiences with AI technologies, such as improved student outcomes and reduced workload, further reinforce their willingness to adopt these tools [43].

Muhammad and Hegazy [44] confirmed that professional motivation is a psychological outcome resulting from the interaction between the teacher's personal characteristics and the work environment. Key factors that enhance professional motivation include appreciation and respect, enthusiasm for work, achieving results, feeling proud of success, empowerment and a sense of responsibility, gradual growth, promotions, incentives and bonuses, and fear of failure. These factors both influence and are influenced by the teacher's personality and psychology.

From an educational perspective, motivation is important because of its impact on teaching, learning, and behavior. Learning is unlikely to occur without a motive, which could stem from the object of learning itself. Many psychologists and educators attribute individual differences in students' learning to disparities in motivation levels [45]. In alignment with reference [46], which studied student motivation, teacher motivation to adopt AI is similarly influenced by both intrinsic and extrinsic factors.

Intrinsically, teachers are motivated by the opportunity to enhance their skills and knowledge, particularly in AI, which they perceive as improving their teaching effectiveness and fostering professional growth. Extrinsically, the pressure to stay relevant in a technology-driven educational environment, alongside the benefits of AI—such as reducing workload, personalizing learning, and improving student outcomes—drives teachers' motivation to integrate AI tools into their classrooms.

The integration of AI fosters teachers' continuous professional development, paralleling students' long-term academic motivations. When teachers view AI as a tool for both personal and professional advancement, their commitment to using these tools remains sustained and impactful [47, 48].

Altakhayneh [48] explored the impact of math anxiety on middle school students' achievement in Amman, finding that students with lower levels of anxiety performed better academically. This finding can be linked to teachers' motivation to integrate AI in classrooms, as emotional factors like anxiety can similarly influence teachers' willingness to adopt new technologies. Just as reducing students' anxiety improves their academic performance, addressing teachers' emotional barriers—such as fear of technology or lack of confidence in AI—can increase their motivation to embrace AI tools, leading to better outcomes. Motivational strategies aimed at reducing anxiety and fostering confidence in both students and teachers are essential for successful technology integration in education [48, 49].

Abdul-Haq and Hamzeh [50] explored student motivations in Jordanian universities, highlighting career, financial, social, and academic factors. Career goals and financial stability emerged as the primary drivers, followed by the satisfaction derived from learning new things. No significant differences were observed across gender, major, or academic year, suggesting consistent motivations among students. These findings align with teachers' motivations to adopt AI in the classroom. Similar to students, teachers are motivated by career advancement, personal development, and the desire to improve teaching effectiveness. The integration of AI provides both intrinsic and extrinsic rewards, encouraging teachers to enhance their skills and achieve meaningful outcomes in their practice. Just as students' motivations transcend demographic factors, teachers' motivations for AI adoption are often driven by a shared desire for professional growth and the benefits of technological integration.

Vermote *et al.* [51] conducted a study aimed at revealing the role of teachers' motivation and mindsets in predicting teaching styles (motivating vs. non-motivating). The study sample consisted of 357 teachers. The results demonstrated that teachers' intrinsic motivation and developmental mindsets are strongly associated with more motivating teaching practices.

Bani- Khalaf [52] conducted a study to identify the level of motivation towards schoolwork among science teachers in Jordan and determine whether motivation levels differ based on variables such as gender, teaching experience, and the educational cycle in which they teach. The study also aimed to examine the strength of certain factors influencing teachers' motivation. The results indicated that motivation levels among science teachers were moderate and revealed statistically significant differences based on gender, favoring female science teachers. Additionally, differences were observed based on teaching experience, with higher motivation levels among teachers with extensive experience.

In the same context, Abu Al-Haijaa and Bani Khalaf [53] conducted a study to investigate the relationship between Jordanian science and mathematics teachers' vision for education and their professional motivation for teaching. The results showed a positive and statistically significant

relationship between teachers' vision and their professional motivation for teaching. Professional motivation levels differed according to their vision for education, favoring science teachers. Furthermore, the study revealed that overall motivation levels among teachers were very high.

Ongoing training and collaborative environments can further inspire teachers to embrace AI, highlighting the need for institutional commitment to professional development [54]. Overall, attitude toward AI in Learning (AIL) and Perceived Usefulness (PU) significantly influence Behavioral Intention (BI) to use AI, emphasizing that promoting AI's practical benefits is crucial for encouraging its adoption in educational settings. Together, these insights provide a comprehensive understanding of the factors influencing teachers' acceptance and integration of AI in education.

D. Studies Related to Using AI in Education

The integration of AI into educational settings has garnered significant attention, highlighting its transformative potential for enhancing student learning outcomes. Xue and Wang [55] examined the implications of AI for teaching reform. They emphasized the necessity of developing a comprehensive curriculum that incorporates AI technologies to boost cognitive and pedagogical skills. Their study revealed that educators are increasingly familiar with various AI applications, such as mobile teaching apps and automated assignment correction systems, which can significantly reduce workloads and enhance professional development opportunities.

In a related study, Polak *et al.* [56] investigated middle school teachers' perspectives on teaching digital competencies for AI in several European countries, including Bulgaria, Greece, Italy, and Romania. They identified a positive attitude toward AI education and highlighted the need for supportive online platforms, despite teachers having limited AI-related skills.

Understanding teachers' perceptions and motivations is crucial for successful AI integration in education. Luckin *et al.* [16] introduced the concept of AI Readiness, emphasizing the need for tailored training programs that equip educators with the contextual knowledge necessary for effective AI application. Their framework underscores the importance of understanding AI's role across diverse professions, including education, and identifies the pressing need for training to empower educators.

Zhang and Wareewanich [57] explored factors influencing preschool teachers' willingness to adopt GAI in Jiangsu Province, China. Utilizing the Unified Theory of Acceptance and Use of Technology (UTAUT) model, their findings indicated that performance expectancy, social influence, and facilitating conditions significantly enhance teachers' adoption of GAI. This study highlighted the essential relationship between technological advancement and educators' motivation to innovate their teaching practices.

Wardat *et al.* [8] further investigated teachers' perceptions of AI in mathematics education in Abu Dhabi. Their survey revealed that while teachers recognize AI's potential to enhance teaching effectiveness and student performance, they also face challenges, such as the additional effort required for integration. These insights can guide the development of strategies that address educators' concerns while promoting AI adoption. Adding to this perspective, Cabero-Almenara *et al.* [58] examined teacher acceptance of AI in education at the Universidad Técnica Particular de Loja (UTPL) in Ecuador. Their study found that demographic factors and pedagogical beliefs significantly influence teachers' acceptance of AI technologies. Importantly, constructivist beliefs were positively correlated with AIEd adoption, suggesting that educational philosophies play a vital role in shaping teachers' motivations.

While study [59] focused on teacher education students' willingness to adopt AI technologies. They expanded the Technology Acceptance Model (TAM) by incorporating elements like Artificial Intelligence Literacy (AIL) and Subjective Norms (SN). Their findings stress the importance of demonstrating AI's tangible benefits to encourage broader adoption among future educators, thus promoting the integration of AI in digital instruction.

On the other hand, Jatileni *et al.* [60] investigated in-service teachers' perspectives on teaching AI in Namibian schools, guided by the theory of planned behavior. They found that factors such as AI relevance and teachers' confidence significantly influenced their intentions to teach AI, while AI anxiety did not play a significant role. In a complementary study, Yue *et al.* [61] explored K-12 teachers' readiness and attitudes toward AI education, revealing significant gaps in AI-related content knowledge. Their research identified interesting relationships between teachers' pedagogical knowledge and their attitudes toward integrating AI in their classrooms.

III. Method

The researchers adopted a descriptive analytical approach [62]. They used descriptive statistics such as means, standard deviations, and the rank of each item of the study tool, then adopted advanced statistics using a one-way analysis of variance test (one-way ANOVA) since the requirements for this test were met.

A. The Study Population and its Sample

The study population consisted of Jordanian science and math teachers working in Jordanian schools for the academic year 2023/2024. The questionnaire was built and made sure of its validity and reliability, then designed electronically through the account of one of the researchers via Google Forms. The study questionnaire was sent as an electronic link through various social networking sites using the snowball method to reach the largest possible number of male and female teachers through their communication groups on social networking sites, especially WhatsApp, every colleague sends it to the groups on his mobile phone, and so it was sent to the largest number of teachers in all regions of the Kingdom. According to Gay and Airasian [63], all the individuals in the defined population have an equal and independent chance of being selected.

Choosing this method of data collection makes it easier for researchers to work and allows them to reach the largest possible number of teachers from geographically distant areas of Jordan, especially remote villages and deserts. In fact, in the age of artificial intelligence, teachers prefer to respond to questionnaires digitally instead of paper copies. Likewise,

this method makes it easier for researchers to filter and analyze data and reach results very quickly, especially if the sample size is large. It also reduces the cost of data collection, such as printing questionnaires and visiting teachers in their schools. The study's sample was distributed according to its variables, as shown in Table 1.

Table 1. Description of the study sample of teachers according to the study variables

Variables		N	Percent (%)
Specialization	Science	115	0.527
	Math	103	0.473
	Total	218	100
Gender	M	91	0.417
	F	127	0.583
	Total	218	100
Experience	More than 15 years	65	0.3
	(10–15) years	43	0.2
	(5–10) years	66	0.3
	Less than 5 years	44	0.2
	Total	218	100
Education	PHD	20	0.092
	MA	52	0.24
	PGDE	58	0.266
	Bach	88	0.402
	Total	218	100
ICT Mastry	YES	129	0.592
	NO	9	0.041
	In-between	80	0.367
	Total	218	100
School location	City	128	0.587
	Village	90	0.413
	Total	218	100
Job satisfaction	YES	153	0.702
	NO	4	0.018
	In-between	61	0.280
	Total	218	100

It is noted from Table 1 that the study sample included 218 teachers: 115 science teachers (52.7%) and 103 math teachers (47.3%), of whom 127 were female (58.3%) and 91 were male (41.7%). The number of years of experience of teachers was divided into four levels: the first level (1–5 years) had 44 teachers (20%); the second level (5–10 years) included 30 teachers (13.8%); the third level (10–15 years) had 44 teachers (20%); and the fourth level included teachers with more than 15 years of experience (30%). Since the study is concerned with AI, the sample was classified according to their mastery of information and communication technology knowledge and skills. Teachers with technological knowledge and skills numbered 129 out of 218 (59.2%), while those without such knowledge and skills totaled 9 (4%), and those in between were 80 teachers (37.7%). The study also focused on the educational level of teachers. The percentage of teachers holding a PhD was 9.2%, while 52 teachers (24%) held a master's degree, 26.6% held a diploma after a bachelor's degree, and 40.2% held a bachelor's degree. Additionally, the study examined the location of the schools where the teachers work, distinguishing between those located in cities (58.7%) and those in villages (41.3%), with 90 schools participating from villages. Finally, the table indicates that 70.2% of teachers feel satisfied with their work, 1.8% do not feel satisfied, and 28% feel partially satisfied.

B. Study Instrumentation

The researchers reviewed the theoretical literature and previous studies concerned with AI and its relationship with education [14, 32, 64–68]. They then built a tool according to a six-point Likert scale (strongly agree: 6; agree: 5; somewhat agree: 4; somewhat disagree: 3; disagree: 2; strongly disagree: 1; for positively formulated items, and vice versa for negatively formulated items. They considered this when analyzing the findings through the Statistical Package for the Social Sciences (SPSS) program, opting for the six-point scale to avoid respondents resorting to the neutral option, thereby increasing the accuracy and credibility of the findings. The tool contained 42 items in its initial form, divided into three dimensions: teachers' satisfaction, motivating factors, and challenges, aimed at identifying the level of teachers' satisfaction with using AI in teaching and learning in Jordanian schools.

C. Validity and Reliability of the Instrument

To test the validity of the instrument, the preliminary version, consisting of 42 items, was submitted to a board consisting of six experts. Four of which were faculty members in educational technology, science and math education at Yarmouk and Jordan University; two teachers – MOE-Jordan; one female teacher majoring in physics, and one male teacher majoring in mathematics. The experts were invited to give their feedback regarding the clarity and suitability of individual items and their appropriateness for gauging the goals designed to measure. In light of their comments and opinions, the arbitrators deleted 5 items according to some criteria, necessary adjustments were made to three items, and the final version of the instrument included 37 items: 24 items measuring the teachers' satisfaction level towards using AI in teaching, 7 items to measure the motivated factors encouraging the teachers for using AI tools in the classrooms, and 6 items measuring the challenges faced by science and math teachers while using AI in education. The researchers also calculated the reliability factor through the Cronbach Alpha equation, obtaining 0.91. This result is considered good and acceptable for scientific research purposes [69, 70].

D. Statistical Standard

Items of the questionnaire are classified into three categories denoting weak (*W*), medium (*M*), and strong (*S*) according to the numerical value of the mean (*m*) of the individual items. For item classification, we adopted the following equation to obtain the paragraph class width (*P*) [71, 72]:

$$P = \frac{(U - L)}{N} \quad (1)$$

where *U* and *L* represent the upper and lower limits of the scale, respectively, and *N* represents the number of required categories. To obtain the numerical value of *P*, we substitute for *U*, *L*, and *N* in the above equation, yielding:

$$P = \frac{(6-1)}{3} = 1.67 \quad (2)$$

Using the numerical value of *P*, namely $P = 1.67P$, the three category intervals are determined along the range between 1.00 and 6.00. They were found to take the following values: $W \in (1.00; 2.67)$, $M \in (2.68; 4.35)$, and $S \in (4.36; 6.00)$, representing weak, medium, and strong, respectively. For example, an item whose mean (*m*) lies within the range of 4.36 to 6.00, i.e., satisfying the inequality ($4.36 < m < 6.00$), is categorized as *S*, denoting strong.

IV. Results

Assumptions associated with normality and linearity of regression were examined. Based on the range of values suggested by George and Mallery [73], it was found that the skewness and kurtosis values were approaching zero, leading to the conclusion that the distribution of the result scores was close to a normal shape. Additionally, the findings of this study did not violate the assumption of a linear relationship between variables.

Table 2. Means, standard deviations, and item classification for the level of satisfaction and motivating factors of Jordanian science and Math teachers towards using the AI (N = 218)

Variable	No	Items	Mean	SD	Category
Satisfaction level	1	AI applications add excitement to student learning	5.23	0.782	H
	2	Employing AI increases student achievement and enhances their learning	4.91	0.919	H
	3	The use of AI applications reduces fear and shyness in students' learning	4.83	0.944	H
	4	Communicating with students through AI applications is more effective	4.58	1.10	H
	5	The use of AI applications enhances collaborative learning for my students	4.65	1.05	H
	6	The teacher's use of AI applications facilitates the teaching process and has a greater impact	4.91	0.896	H
	7	Employing AI is appropriate for teaching specialized topics	4.84	0.956	H
	8	Using AI in teaching and learning saves effort and time	4.90	0.952	H
	9	Constantly search for the latest applications in AI to employ in teaching	4.64	1.06	H
	10	I feel that my students want to use AI in their learning	4.61	1.06	H
	11	My students employ AI applications in their learning and solving various assignments in science	4.18	1.22	M
	12	Employing AI applications in assessment and evaluation is easy and fun	4.62	0.992	H
	13	I believe that employing AI in education is fraught with risks and challenges	4.56	1.04	H
	14	I advise my fellow teachers to employ AI applications in their teaching	4.84	0.862	H
	15	I encourage my students to use AI in their learning and assignments	4.57	1.09	
	16	Employing AI in teaching and learning helps enhance 21st century skills such as (critical, creative thinking, ...)	4.93	0.882	H
	17	Employing AI in teaching and learning supports student diversity (thinking styles, diverse intelligences, attitudes, abilities, aptitude, ...)	4.83	0.909	H
	18	The use of AI supports student-centered learning and makes them self-learners and lifelong learners	4.80	0.898	H
	19	Scientific content presented through AI applications is more interactive and influential for students	4.71	0.977	H
	20	Employing AI in education increases students' passion and desire to learn	4.80	0.901	H
	21	I prefer teaching using AI applications	4.55	1.01	H
	22	Employing AI applications in teaching and learning distracts students from their learning	3.67	1.24	M
	23	I do not believe in the importance of employing AI in teaching	3.09	1.42	M
	24	Most applications of AI are not compatible with teaching methods and scientific content in curricula	4.06	1.28	M
		Overall	4.60		H
Motivated factors	25	The teacher who employs AI in teaching and learning is honored	3.73	1.52	M
	26	The educational supervisor encourages teachers to employ AI applications in teaching and learning	4.21	1.32	M
	27	The Departments of Education and the Ministry provide adequate support (within possible) to promote the use of AI applications in teaching and learning	3.57	1.47	M
	28	Preference points for promotion in the career ladder are given to teachers who use AI in teaching and learning	3.55	1.55	M
	29	It provides incentives (reducing the teaching quorum, early exit from school, exemption from administrative work, ...) for teachers who use AI in teaching and learning.	3.11	1.75	M
	30	Free, specialized courses are offered to teachers who employ AI in teaching and learning	3.25	1.65	M
	31	There is an item/items specifically for employing AI applications in the annual report (school principal or educational supervisor's report).	3.61	1.48	M
		Overall	3.60		M

To answer the first study question, which states, "What is the level of satisfaction of science and mathematics teachers in integrating AI in teaching and learning, and what are the motivating factors for that?" the researchers calculated the arithmetic means and standard deviations for all study variables, for each of its fields, and for each item of the three study dimensions. Evidently, the number of respondents reached 218 male and female teachers. The results are shown in Table 2.

The results in Table 2 depict three dimensions that constitute the dependent variables of the study: the level of satisfaction of science and mathematics teachers with the use of AI applications in teaching and learning, the factors that encourage science and mathematics teachers to use these applications in their work, and the challenges they face in classrooms. By reviewing the results in Table 2, the researchers found that the general arithmetic mean of the items related to the level of satisfaction of Jordanian science and mathematics teachers with the use of AI and its applications in teaching and learning (Items 1–24) was 4.60, indicating that their level of satisfaction was within the highest category. The researchers also noted that the results of the items supported each other, with the first item having the highest arithmetic mean of 5.23, reflecting the role of employing AI in providing an element of excitement for students towards learning. The second-highest item, with an arithmetic mean of 4.91, confirmed that the use of AI enhances learning and increases students' achievement. This finding was consistent with the sixth item, which indicated that learning through AI applications becomes easier and has a greater impact. Additionally, the eighth item confirmed the importance of saving time and effort in learning using AI applications. Conversely, Item 16 reaffirmed that employing AI applications enhances 21st-century skills such as critical thinking and creative thinking. Observing the minimum arithmetic means in this field (the satisfaction of science and mathematics teachers towards the use of AI applications), we find that the lowest arithmetic mean indicates teachers' strong conviction in the importance of these applications in teaching and learning, as shown in Item 23. Item 22 also confirmed that students' focus is not distracted when using AI applications, emphasizing their importance in solving homework, as indicated by Item 11.

Regarding the second variable, motivating factors for using AI applications in teaching and learning (Items 25–31), the results in Table 2 indicate that the general arithmetic mean was 3.60, which falls within the medium category. The researchers found that the highest arithmetic mean in this dimension was 4.21 (Item 26), indicating that educational supervisors encourage science and mathematics teachers to use AI applications in teaching and learning, thereby motivating and encouraging them to incorporate these applications in their work. Conversely, Items 29 and 30 indicate that the most significant factors reducing the motivation and desire of science and mathematics teachers to employ AI applications in their work are the lack of material and moral incentives, as well as the insufficient training for teachers in the mechanisms of effectively utilizing these tools with students.

To answer the second question, which states, "Does the level of satisfaction of science and mathematics teachers in employing AI applications in teaching and learning differ according to some variables (specialization, gender, experience, education level, mastery of ICT skills, school location, job satisfaction)?" the researchers calculated the arithmetic means and standard deviations associated with the study variables, and the results are shown in Table 3.

Table 3. Means and standard deviations of the satisfaction of Jordanian science teachers' level regarding using AI in education according to some variables

Satisfaction Level		N	Mean	Std. Deviation	Std. Error
Specialization	Science	115	4.5543	0.61770	0.05760
	Math	103	4.6464	0.66200	0.06523
	Total	218	4.5979	0.63919	0.04329
Gender	M	91	4.5815	0.56903	0.05965
	F	127	4.6096	0.68704	0.06096
	Total	218	4.5979	0.63919	0.04329
Experience	More than 15years	65	4.5532	0.62185	0.07713
	(10–15) years	43	4.6192	0.61719	0.09412
	(5–10) years	66	4.5890	0.73855	0.09091
	Less than 5 years	44	4.6562	0.53163	0.08015
	Total	218	4.5979	0.63919	0.04329
Education	PHD	20	4.8292	0.47235	0.10562
	MA	52	4.7620	0.56989	0.07903
	PGDE	58	4.5625	0.64876	0.08519
	Bach	88	4.4716	0.67737	0.07221
	Total	218	4.5979	0.63919	0.04329
ICT Mastry	YES	129	4.6476	0.63816	0.05619
	NO	9	4.2222	0.50432	0.16811
	In-between	80	4.5599	0.64427	0.07203
	Total	218	4.5979	0.63919	0.04329
School location	City	128	4.5898	0.67300	0.05949
	Village	90	4.5863	0.58774	0.06375
	Total	218	4.5979	0.63919	0.04329
Job satisfaction	YES	153	4.7032	0.60753	0.04912
	NO	4	3.4792	1.12706	0.56353
	In-between	61	4.4071	0.57481	0.07360
	Total	218	4.5979	0.63919	0.04329

Table 3 indicates the arithmetic means and standard deviations of the level of satisfaction of science and mathematics teachers towards the use of AI applications in teaching and learning, based on several variables. The

researchers found a difference in the arithmetic mean between science and mathematics teachers of 0.01 in favor of mathematics teachers, with the arithmetic mean for science teachers at 4.55 (standard deviation: 0.6177) and for mathematics teachers at 4.65 (standard deviation: 0.0662). The results also show a very slight difference in the arithmetic mean between males and females of 0.03 in favor of females, where the arithmetic mean for males was 4.58 (standard deviation: 0.5690) and for females was 4.61 (standard deviation: 0.6870). Regarding the arithmetic means of the level of satisfaction of science and mathematics teachers with the use of AI applications in education and learning based on years of experience, the means were close. The lowest arithmetic mean was for teachers with more than 15 years of experience, averaging 4.55, while the highest was for teachers with 1–5 years of experience, averaging 4.66. The means for the two experience categories of 5–10 years and 10–15 years were 4.59 and 4.62, respectively. The researchers also noted that the arithmetic averages of the variable concerning teachers' educational level decreased as the level decreased. The highest arithmetic mean of teachers' satisfaction with the use of AI applications was for those holding a PhD (4.83), followed by those with a master's degree (4.76), then teachers holding a post-bachelor's diploma (PGDE) (4.56), while the lowest arithmetic mean was for those who only held a bachelor's degree (4.47), resulting in a difference of 0.36 between the highest and lowest means.

Since the study focuses on the use of AI applications in teaching and learning, it examined the variable of teachers' possession of technical knowledge and skills. The arithmetic mean of satisfaction among science and mathematics teachers with the highest ICT skills was 4.6476, showing a difference of 0.4254 from the lowest mean. Regarding the level of teachers' satisfaction with the use of AI applications based on the school's location (city or village), the results were very close, with a difference in the arithmetic mean of 0.0035 in favor of city residents. Since employee satisfaction in general and teacher satisfaction in particular significantly impact performance and practices, the study aimed to reveal the level of satisfaction of science and mathematics teachers with the use of AI applications in their teaching practices. The arithmetic mean for teachers who feel satisfied with their job was the highest at 4.7032, with a difference of 0.2961 from the category of teachers who felt partially satisfied, and a difference of 1.224 from those who felt dissatisfied. By examining the results, we find apparent differences of varying magnitudes in the arithmetic means of the level of satisfaction of science and mathematics teachers with the use of AI applications in teaching and learning, depending on several variables (specialization, gender, experience, academic degree, mastery of ICT skills, school location, and job satisfaction). To ensure the significance of these differences, the researchers conducted a one-way analysis of variance (ANOVA), with the results presented in Table 4.

Table 4. One-way analysis of variance ANOVA for the level of satisfaction of Jordanian science teachers regarding using AI in education according to some variables

Variables		Sum of Squares	df	Mean Square	F	Sig.
Specialization	Between Groups	0.461	1	0.461	1.129	0.289
	Within Groups	88.198	216	0.408		
	Total	88.659	217			
Gender	Between Groups	0.042	1	0.042	0.102	0.750
	Within Groups	88.617	216	0.410		
	Total	88.659	217			
Experience	Between Groups	0.304	3	0.101	0.246	0.864
	Within Groups	88.355	214	0.413		
	Total	88.659	217			
Education	Between Groups	3.947	3	1.316	3.324	0.021
	Within Groups	84.712	214	0.396		
	Total	88.659	217			
ICT Mastry	Between Groups	1.705	2	0.852	2.107	0.124
	Within Groups	86.954	215	0.404		
	Total	88.659	217			
School location	Between Groups	0.828	1	0.414	1.014	0.365
	Within Groups	87.831	215	0.409		
	Total	88.659	217			
Job satisfaction	Between Groups	8.922	2	4.461	12.029	0.000
	Within Groups	79.737	215	0.371		
	Total	88.659	217			

The results in Table 4 indicate that there is a statistically significant difference in the level of satisfaction of science and mathematics teachers with the use of AI applications in teaching and learning concerning the variable of teachers' educational level (F = 3.324, p = 0.021), favoring teachers with the highest educational attainment (PhD, Master's, Higher Diploma, and finally Bachelor's). In addition, there is a significant difference for the variable of teacher job satisfaction (F = 12.029, p = 0.000), with satisfaction levels in favor of teachers who feel satisfied with their job, followed by those who feel partially satisfied, and finally those who do not feel job satisfaction. The results also show that the value of statistical significance at (α = 0.05) for the level of satisfaction of science and mathematics teachers with the use of AI applications in teaching and learning for the other study variables—specialization, gender, experience, mastery of ICT skills, and school location—was greater than 0.05, indicating that there are no statistically significant differences for these variables.

To answer the third question, which states, "Does the level of satisfaction regarding the motivating factors for science and mathematics teachers employing AI applications in teaching and learning differ according to some variables (specialization, gender, experience, academic degree, mastery of ICT skills, school location, job satisfaction)?" the researchers calculated the arithmetic means and standard

deviations associated with the study variables, and the results are shown in Table 5.

Table 5. Means and standard deviations of satisfaction level of motivated factors of science and mathematics teachers regarding using AI in education according to some variables

Variable	Satisfaction Level		N	Mean	Std. Deviation	Std. Error
Motivated factors	Specialization	Science	115	3.6236	1.19153	0.11111
		Math	103	3.5215	1.30559	0.12864
		Total	218	3.5754	1.24486	0.08431
	Gender	M	91	3.6562	1.25175	0.13122
		F	127	3.5174	1.24161	0.11018
		Total	218	3.5754	1.24486	0.08431
	Experience	More than 15years	65	3.4418	1.15416	0.14316
		(10–15) years	43	3.5681	1.30167	0.19850
		(5–10) years	66	3.4156	1.29816	0.15979
		Less than 5 years	44	4.0195	1.16937	0.17629
		Total	218	3.5754	1.24486	0.08431
	Education	PHD	20	3.4286	1.05996	0.23702
		MA	52	3.8462	1.24663	0.17288
		PGDE	58	3.4015	1.01173	0.13285
		Bach	88	3.5633	1.40328	0.14959
		Total	218	3.5754	1.24486	0.08431
	ICT Mastry	YES	129	3.6080	1.28983	0.11356
		NO	9	3.4921	1.22289	0.40763
		In-between	80	3.5321	1.18546	0.13254
		Total	218	3.5754	1.24486	0.08431
	School location	City	128	3.5960	1.26754	0.11204
		Village	90	3.5311	1.21170	0.13143
		Total	218	3.5754	1.24486	0.08431
	Job satisfaction	YES	153	3.6900	1.17607	0.09508
		NO	4	3.0000	1.70234	0.85117
		In-between	61	3.3255	1.35529	0.17353
		Total	218	3.5754	1.24486	0.08431

Table 5 indicates the arithmetic means and standard deviations of the satisfaction level regarding motivating factors for science and mathematics teachers towards employing AI applications in teaching and learning, based on several variables. The researchers found a difference in the arithmetic mean between science and mathematics teachers of 0.1021 in favor of science teachers, with the arithmetic mean for science teachers at 3.6236 (standard deviation: 1.19153) and for mathematics teachers at 3.5215 (standard deviation: 1.30559). The results also indicate a very slight difference in the arithmetic mean between males and females of 0.1388 in favor of males, where the arithmetic mean for males was 3.6562 (standard deviation: 1.25175) and for females was 3.5174 (standard deviation: 1.24161). Regarding the satisfaction level of motivated factors among science and mathematics teachers based on years of experience, the highest mean was for teachers with less than 5 years of experience (4.0195), while the lowest mean was for those with 5–10 years of experience (3.4156), and the mean for teachers with more than 15 years of experience was 3.4418. The arithmetic means of the variable related to teachers' educational level were close; the highest mean for satisfaction with motivated factors was for those holding a master's degree (3.8462), followed by those with a bachelor's degree (3.5633), those holding a PhD (3.4286), and finally, teachers with a post-bachelor's diploma (PGDE) (3.4015), resulting in a difference of 0.2829 between the highest and lowest means.

Since the study focuses on the use of AI applications in teaching and learning, it also examined the variable of teachers' mastery of ICT skills. The arithmetic mean for the satisfaction level of motivated factors for teachers with the highest technical skills was 3.6080, with a difference of 0.0759 from the lowest mean. Regarding the satisfaction level with the use of AI applications based on the school's location (city vs. village), the results were very close, with a difference in the arithmetic mean of 0.0649 in favor of city residents. Given that overall employee satisfaction, particularly teacher satisfaction, significantly impacts performance and practices, the study aimed to reveal the satisfaction level regarding motivating factors for science and mathematics teachers with the use of AI applications in their teaching practices.

The arithmetic means for teachers who feel satisfied with their job was the highest at 3.690, showing a difference of 0.3645 from the category of teachers who were partially satisfied, and a difference of 0.690 from those who felt dissatisfied with their job. Analyzing these results, the researchers found apparent differences of varying magnitudes in the arithmetic means of the satisfaction level regarding motivating factors for science and mathematics teachers using AI applications in teaching and learning, depending on several variables (specialization, gender, experience, academic degree, mastery of ICT skills, school location, and job satisfaction). To ensure the significance of these differences, the researchers conducted a one-way analysis of variance (ANOVA), with the results presented in Table 6.

The results in Table 6 indicate that there are no statistically significant differences in the satisfaction level of motivating factors for science and mathematics teachers using AI applications in teaching and learning across all independent study variables (specialization, gender, experience, academic degree, mastery of ICT skills, school location, and job satisfaction), as the statistical significance value was greater than 0.05. This means there are no statistically significant differences for these variables. Consequently, this result indicates that all teachers, regardless of specialization, experience, gender, workplace, or mastery of ICT, share similar motivation to employ AI applications in teaching and learning, as they work under the umbrella of the Ministry of

Education in similar conditions regarding infrastructure, privileges, student quality, and community culture, and they practice their profession according to the standards and instructions of the Ministry of Education.

Table 6. One-way analysis of variance ANOVA for the level of satisfaction of motivating factors of science and mathematics teachers regarding using AI in education according to some variables

Variables		Sum of Squares	df	Mean Square	F	Sig.
Specialization	Between Groups	0.566	1	0.566	0.364	0.547
	Within Groups	335.716	216	1.554		
	Total	336.282	217			
Gender	Between Groups	1.021	1	1.021	0.658	0.418
	Within Groups	335.262	216	1.552		
	Total	336.282	217			
Experience	Between Groups	11.526	3	3.842	2.532	0.058
	Within Groups	324.756	214	1.518		
	Total	336.282	217			
Education	Between Groups	6.010	3	2.003	1.298	0.276
	Within Groups	330.272	214	1.543		
	Total	336.282	217			
ICT mastry	Between Groups	0.349	2	.175	0.112	0.894
	Within Groups	335.933	215	1.562		
	Total	336.282	217			
School location	Between Groups	0.473	2	.237	0.152	0.859
	Within Groups	335.809	215	1.562		
	Total	336.282	217			
Job satisfaction	Between Groups	7.143	2	3.571	2.333	0.099
	Within Groups	329.140	215	1.531		
	Total	336.282	217			

V. Discussion

The result of the first question can be attributed to several reasons, the most important of which is teachers' awareness of AI and the significance of its application in the classroom. This result aligns with the positive impact of teachers' professional development programs related to the use of technology, which have led them to implement some AI applications in the classroom, showing a noticeable impact on student performance [31, 59, 60]. AI applications also save time and effort when carrying out classroom activities [42]. One of the most appealing features is AI's ability to design educational tools and materials quickly and efficiently, providing support to students with greater accuracy [74].

Moreover, AI promotes equality and justice among students through interactive applications that account for individual differences, facilitating the operationalization of differentiation strategies in the classroom [23, 42, 75]. AI applications also employ various educational phenomena through modeling, simulation, and the activation of mathematical and scientific representations, enhancing self-learning through diverse interactive applications [76]. AI transforms education by offering customized educational programs and interactive simulations that cater to each student's individual needs [77].

Regarding the answer to the second question, which indicated statistically significant differences in favor of educational level, it suggested that as educators develop professionally, their awareness of the importance of using AI applications increases, enhancing their ability to monitor and observe changes in student performance. This is particularly true for research orientations related to technology and AI applications [78]. The results from using AI-designed activities showed increased student participation in class, especially when motivating students to engage in formative activities. Furthermore, students' exam results have improved due to the incorporation of these activities [79]. Teachers who are highly satisfied with their profession are more motivated to implement learning principles, including the use of technology that supports the educational process within the classroom [80].

Regarding the results of the third question, which indicated that there are no statistically significant differences in the motivational factors across all independent variables of the study, these results suggested that all teachers, regardless of their specialization, experience, gender, workplace, or ability to use ICT, share similar motivations to employ AI applications in teaching and learning [81]. They work under the umbrella of the Ministry of Education in comparable conditions concerning infrastructure, privileges, student quality, and community culture, and they practice their profession according to the standards and instructions of the Ministry of Education. In Addition, they undergo similar professional development programs focused on technology use, which may reduce differences between teachers in this area and result in somewhat similar performance levels [57, 82, 83]. The incentives provided to teachers for using technology and AI applications are also similar.

The lack of statistically significant differences in the level of satisfaction regarding the motivational factors associated with using AI applications in education can be explained by the availability of these applications to everyone without discrimination and at reasonable prices, which minimizes the gap in teachers' satisfaction levels. This result may also stem from the fact that all teachers in the study sample share similar beliefs and concepts about AI and its effects, which uniformly influences their level of satisfaction. If the perceived benefits and challenges are alike among all teachers, this may lead to similar levels of satisfaction. AI applications offer equal support, guidance, and features accessible to all users, and it appears that science and mathematics teachers utilize them in similar ways and for comparable purposes, further reducing differences among them.

The results of the current research align with numerous studies [34, 57, 83–85] that highlight the positive and

enhancing impact of AI applications for teachers, regardless of their specialization, experience, workplace, or academic achievement. These studies indicate that today's teachers can effectively invest in and benefit from AI applications to develop their professional skills and engage in lifelong learning. Additionally, AI applications improve student engagement, understanding, problem-solving, and the implementation of collaborative projects, as well as assist in planning learning experiences and simplifying the evaluation process, thereby confirming the effectiveness of AI in diverse educational environments, which motivates students to achieve academically.

VI. Conclusion

The results indicated that the overall average satisfaction level of science and mathematics teachers regarding the use of AI applications was high, while their average satisfaction with the motivating factors was at a medium level. Moreover, there was a statistically significant difference in satisfaction based on teachers' educational level, favoring those with higher degrees, as well as in relation to job satisfaction. However, no statistically significant differences were found for the other variables, including specialization, gender, experience, mastery of ICT skills, and school location. Importantly, there were no significant differences in the satisfaction level concerning the motivating factors across all independent variables. These findings are crucial for educational planners and decision-makers, highlighting the need to enhance AI-related requirements and to train all stakeholders—students, teachers, educational supervisors, and technology lab officials—on effectively employing AI in their work. This underscores the importance of providing the necessary AI infrastructure for electronic supervision in schools.

The study's limitations should be considered when interpreting the findings. The ability to generalize the results is affected by several factors. The sample was limited to Jordanian science and mathematics teachers working in public schools only, and the data were collected during the 2023–2024 academic year. Additionally, data collection involved sending a link to the teachers via WhatsApp, which might have led to a situation where some respondents were not science or mathematics teachers, or teachers from rural and desert areas may not have received the questionnaire. Furthermore, the results heavily relied on the validity and reliability of the instruments used. The rapidly evolving landscape of AI technologies also suggests that the findings may become less relevant as new AI applications and teaching practices emerge.

Based on the study's findings, the researchers concluded that AI has become a necessity rather than just an option. Therefore, it is essential to take comprehensive measures, including preparing the infrastructure and providing services that facilitate the integration of AI. This includes empowering educators, such as teachers and supervisors, to leverage technology in a way that adds value to the educational process. Additionally, raising awareness and educating the educational community about the mechanisms of artificial intelligence technologies is necessary to facilitate their spread and to promote the use of applications relying on this technology. Establishing innovation work teams to study and analyze opportunities and challenges facing the teaching community, developing strategies, and finding appropriate solutions are also recommended. Furthermore, enhancing capabilities and competencies in the fields of artificial intelligence, as well as establishing specialized research centers to meet the requirements and needs of AI, are vital steps. Lastly, it is essential to allocate an independent subject for artificial intelligence in schools and universities to clarify the concept, principles, characteristics, and important applications of AI in education.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

AKB and SMA wrote the introduction, and the literature; AKB, AFA, and TMAS wrote the methods and conduct the statistical analysis; AKB, TMAS, and AFA discussed the results; SMA and AFA collected the data; SMA and AKB proofread and did all the corrections; all authors had approved the final version.

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