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The Attitudes of Art Education Teachers towards the use of AI in Teaching Visual Arts at General Education Stages in the Kingdom of Saudi Arabia

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Abstract

This study aimed to study the attitudes of art education teachers towards the use of AI in teaching visual arts at the general education levels in the KSA. The study sample consisted of 144 art education teachers at the general education levels in the KSA. The study relied on the descriptive analytical approach, as the study used the questionnaire as a tool to achieve its objectives, for a random sample of art education teachers, where a questionnaire was prepared and developed related to the attitudes of art education teachers towards the use of AI in teaching visual arts. The results showed that the average knowledge of art education teachers about AI techniques in the field of education was about 3.43, while the average general attitudes of art education teachers towards integrating AI into the teaching process was about 4.69, while the average potential benefits of using AI in teaching art education from the teachers' was about 4.75, the average challenges and difficulties facing art education teachers when applying AI techniques was about 4.7, while the attitudes of art education teachers towards the use of AI in teaching visual arts at the general education stages in the KSA were strongly agree, with an average of 4.39. It also showed that there were no statistically significant differences between the average attitudes of art education teachers towards the use of AI in teaching visual arts in general education in the Kingdom of Saudi Arabia in the study sample according to (gender, academic qualification, and years of experience).

Keywords: *Art Education, AI, Visual Arts.*

Introduction

Visual arts are considered one of the essential elements in the general education curricula in the Kingdom of Saudi Arabia, as they play a vital role in developing creative thinking and interactive abilities of students, as they contribute to shaping the student's personality and developing his social, motor and emotional skills (Al-Alam, 2018). With the beginning of the twenty-first century, the roles of teachers have evolved to require the introduction of educational modifications aimed at enhancing their efficiency in dealing with information technology (Al-Rahili and Al-Omari, 2020, 209). In light of the major developments witnessed by education in the Kingdom of Saudi Arabia, it has become necessary to understand the impact of industrial revolution technologies on the educational process. (Badarneh,2020) indicated that the use of AI in teaching enhances students' skills in achieving the goals of educational programs with high efficiency, contributing to improving the quality of education in general. AI applications are a modern method that provides interactive educational environments, allowing direct interaction between students and smart devices and enhancing learning effectiveness (How & Hung, 2019). The results of using these environments showed positive effects on students' thinking and problem-solving skills (Al-Farani and Fatani, 2020), which highlights the importance of integrating modern technologies into teaching processes, in addition to the recommendations of the 19th Conference of Ministers of Higher Education and Scientific Research in the Arab World held in November 2024, to encourage member states to adopt, promote and regulate AI technologies in higher education and scientific research in Arab countries. Therefore, understanding the attitudes of art education teachers towards using these technologies is a step towards integrating AI technology into education in the Kingdom of Saudi Arabia. Therefore, this study came to shed light on the factors influencing the attitudes of art education teachers in the city of Hail towards integrating AI into teaching art activities, which paves the way for improving the art education environment and enhancing the visual arts education experience for general education students, helping them achieve high levels of achievement.

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Study Problem

Recent studies indicate the positive impact of AI applications in education, as the study (Jena, 2018) demonstrated the role of AI in improving academic achievement and enhancing the sustainability of the learning impact. The study (Al-Youssef and Issa, 2024) recommended enhancing the role of AI in education departments to ensure the effective use of these technologies. The study (Al-Asimi and Al-Zahrani, 2023) showed a great agreement on the importance of AI in teaching visual arts, especially in terms of providing flexible lessons and individual support for learners, providing immediate and effective feedback. However, some studies indicate that there are challenges that hinder the use of AI in education. The study (Al-Khaibari, 2020) showed the weakness of teachers' possession of the necessary skills to use these technologies, and the study (Al-Omari, 2022) showed that the use of AI applications is at an average level. The study (Al-Kanaan, 2021) explained the low level of awareness of the use of AI technologies. The study (Ramadan, 2021) indicated the average use of AI skills by teachers, while the study (Mahmoud, 2020) confirmed the need to train teachers and enhance the role of AI in improving education. Hence, the need to study the attitudes of art education teachers towards the use of AI in teaching visual arts at the general education levels in the Kingdom of Saudi Arabia arises, with the aim of providing a clear vision about the challenges of employing AI technologies in education.

Study Questions

The study problem is included in the following main question: What are the attitudes of art education teachers towards using AI in teaching visual arts at the general education levels in the Kingdom of Saudi Arabia? From which the following sub-questions emerge:

What is the level of knowledge of art education teachers about AI techniques in the field of education?

What are the general attitudes of art education teachers towards integrating AI into the teaching process?

What are the potential benefits of using AI in teaching visual arts at the general education levels in the Kingdom of Saudi Arabia?

What are the challenges and difficulties facing art education teachers when applying AI techniques?

Are there statistically significant differences between the attitudes of art education teachers towards integrating AI into teaching attributed to gender, years of experience, and academic qualification?

Study Objectives

Measure teachers' knowledge of AI techniques in art education.

Reveal the general attitudes of art education teachers towards integrating AI into teaching.

Identify the potential benefits of using AI in art education.

Identify the challenges and difficulties facing art education teachers when applying AI techniques.

Know the extent of differences in the attitudes of art education teachers towards integrating AI in teaching according to gender, years of experience and academic qualification.

Importance of the Study

First: Theoretical Importance

This study contributes to the development of scientific literature on art education by determining the level of teachers' knowledge of AI techniques and their applications.

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The study provides a deep understanding of teachers' psychological and cognitive orientations towards the use of AI, which helps in enhancing educational theories related to innovation in visual arts education.

The results of this study may enhance the understanding of the relationship between technology and learning outcomes, which helps in developing theoretical models that explain how to improve the visual arts education experience using AI.

The study reveals the most important obstacles and difficulties facing the use of AI applications in visual arts education, which may lead to the development of future studies on how to overcome these difficulties.

The results of this study contribute to understanding the factors affecting teachers' orientations, which enhances the development of new theories in the field of visual arts education.

Second: Practical importance:

This study may shed light on the aspects that require designing effective training programs to raise the level of teachers' knowledge and skills in applying AI techniques in teaching visual arts, which is positively reflected in the quality of education.

The study provides data for decision-makers that contribute to improving educational policies related to integrating technology into education.

The study may provide practical suggestions for implementing new technologies that enhance the effectiveness of learning visual arts for students in general education stages in a way that meets their needs.

The results of this study may contribute to directing training efforts in a way that suits the needs of art education teachers, which enhances the success of the visual arts education process.

Study Limitations

Objective Limits: The study was limited to knowing the attitudes of art education teachers towards the use of AI in teaching visual arts at the general education stages in the Kingdom of Saudi Arabia.

Human Limits: The study targets a sample of male and female art education teachers.

Spatial Limits: The study is limited to public education schools affiliated with the Education Department in Hail City in the Kingdom of Saudi Arabia.

Time Limits: This study was applied during the first semester of the 2024/2025 academic year.

Study Terms

Attitudes: It is an emotional state that explains the individual's acceptance or rejection of a specific topic. It is closely related to the previous experiences of this individual and all the information he has acquired about various topics. Although attitudes are characterized by relative stability and constancy, the possibility of changing and modifying them is very likely, especially if the attitudes are related to the individual's basic needs. (Assaf and Al-Yamani, 2022, 30)

The researcher defines it procedurally as: "The attitudes of art education teachers in the city of Hail and their intellectual and emotional orientations towards using AI techniques in teaching visual arts to general education students. These trends are measured through the responses of the teachers targeted by the study to a questionnaire prepared to measure their acceptance, interest, and readiness to employ AI in improving their educational practices and enhancing students' experience in learning visual arts."

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AI: It was defined by (Al-Farani and Fatani, 2020, 9): "One of the advanced computer sciences, and represents one of the technologies of the Fourth Industrial Revolution, as it is concerned with designing and innovating machines and computerized systems that have the ability to perform many tasks and operations in a manner similar to human performance."

The researcher defines AI procedurally as: "A set of technologies and software that enable art education teachers in the city of Hail to use advanced educational tools to improve the teaching of visual arts, including smart learning systems and data analysis that enhance the interaction of general education students and the effectiveness of the educational process."

Visual arts: It is "a group of arts that are concerned with producing artistic works that require visual and tangible vision to be appreciated, regardless of the media used in their production (Essak, 2019).

(Al-Rasheed, 2022) believes that visual arts are the arts that are presented through fine and applied arts institutions and the Ministry of Labor and are presented to the public and include drawing, sculpture, photography, formation and printing.

The researcher defines it procedurally as: "Artistic activities in which public education students participate in the Kingdom of Saudi Arabia, including drawing, photography, sculpture, graphic design, and other arts that aim to develop their creative and expressive skills, and enhance their abilities in visual communication and critical thinking."

Theoretical Framework:

The concept of AI:

AI is one of the branches of computer science that is concerned with designing intelligent computers that have characteristics usually associated with human intelligence" (Al-Talhi, 2020, 31). (Bozkuit,2019) defines AI as "the ability to perform certain tasks through devices controlled by computers in a way that simulates humans."

(Tredinnck, 2017) also indicates that AI is a set of technologies and computing methods that focus on the ability of devices to make rational and flexible decisions in response to changing conditions, and includes natural language processing and self-learning, in addition to intelligent agents and logical decision-making.

Development of AI

The term "AI" appeared in 1956, where it was associated with the name of John McCarty, then it was developed into the "logical view" program to solve various problems, then expert systems appeared as one of the applications of AI in medicine, engineering, chemistry and accounting (Al-Awfi and Al-Rahili, 2021).

Features of AI

AI has several basic features, including (Al-Khaibari, 2020)

High speed and accuracy in managing and analyzing data.

The ability to work for long periods without fatigue or boredom.

The ability to reason and infer.

The ability to deal with contradictory data.

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(Foggell, 2019) indicates that AI contributes to enhancing self-direction for learners, acquiring students' 21st century skills, enabling continuous learning and interaction with learners, and providing opportunities to access classrooms remotely.

The Importance of AI

AI contributes to employing human expertise by transforming it into smart technologies that enhance accuracy in medical fields, such as diagnosing diseases and determining treatments. It contributes to developing interactive learning methods and supporting the provision of legal advice. It is also an effective tool to facilitate scientific research and accelerate access to new discoveries (Mahmoud, 2020; Karsenti, 2019).

Types of AI: (Al-Subhi, 2020)

Narrow AI: Relies on pre-programming to perform specific functions, such as robots designed to play chess and defeat champions.

Strong AI: Has the ability to collect and analyze data and gain experiences, which enables it to make autonomous decisions, such as self-driving cars and chatbots

Super AI: Represents a model that seeks to simulate the human mind in terms of thinking, understanding emotions and social interaction.

Applications of AI: (Huang et al, 2018)

Expert Systems: Programs that simulate the performance of experts in specific fields, allowing knowledge to be applied automatically in specific environments. It is called knowledge engineering (Vallati & Kitchin, 2020), as it is the process of creating and managing knowledge bases, programming and processing algorithms. It includes acquiring knowledge from experts, books, references, documents, and smart sensors, then representing it in the knowledge base of smart systems, then inferring and reasoning based on the knowledge base, then providing advice to the user through programming capable of explaining and justifying to the user.

Augmented Reality: An interactive technology that integrates the virtual and real worlds, which contributes to creating two- and three-dimensional experiences.

Smart chatbots: Aim to simulate human conversations, which enhance interaction between the user and the system.

Smart Agent (Smart Learning Systems): Educational systems that rely on supporting and developing the learner's skills by providing guided lessons without direct human intervention.

Applications of AI in education: (Abdul Wahid, 2022) include:

Grades: Some companies provide training and testing programs that include assessment and correction.

Specialization: Some systems allow students' performance to be evaluated in customized and skill-focused ways.

Quality of curricula and teaching: Evaluating students' performance allows identifying educational gaps and working to improve them.

Training: Building training programs aimed at improving students' learning methods and approaches.

Immediate assessment: AI programs provide the ability to evaluate students' skills immediately and directly.

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Distance learning: AI programs provide remote testing opportunities with the imposition of student control systems.

(Kaplan & Haenlein, 2018) also confirms the ability of AI systems to interpret and analyze external data, and learn from this data to achieve specific goals through flexible adaptation in the field of education.

Literature Review

Study (Al-Bashar, 2020) aimed to identify the requirements for employing AI applications in teaching Saudi university students, and the challenges that may face the application of these technologies from the point of view of experts. The study used the descriptive survey method with a questionnaire as the main tool to collect data from a sample of curriculum and teaching methods experts in Saudi universities. The study reached a set of organizational, human and financial requirements necessary for the application of AI in education, and the results showed that the sample largely agreed with these requirements.

Study (Chen & Lin, 2020) aimed to evaluate the impact of AI in education in China, focusing on AI applications in the fields of management, teaching and learning. The study used the qualitative method with a literature review, as the study confirmed that AI has been widely adopted in education, and the results showed that these technologies helped teachers perform their administrative functions more effectively, such as reviewing and classifying students' assignments, which contributed to improving the quality of educational activities.

Study (Al-Subhi, 2020) aimed to identify the reality of the use of AI applications in education by faculty members at Najran University, and the challenges facing their use. The study used the descriptive analytical approach with a questionnaire as the main tool to collect data from a sample of (301) faculty members. The study showed that the use of AI in education was low among faculty members, and there was a consensus on the existence of many challenges that prevent the use of these applications. Study (Al-Khaibari, 2020) aimed to determine the degree to which secondary school teachers in Al-Kharj Governorate possessed the skills to employ AI applications in education, and the obstacles they face. The study used the descriptive analytical approach with a questionnaire as the main tool, and data was collected from a sample of (130) teachers. The study showed that the level of teachers' possession of AI employment skills was low, and that there was agreement on the existence of many obstacles that hinder the use of these technologies in education.

Study (Mahmoud, 2020) aimed to explore the various applications of AI that can be used to improve the educational process in light of the challenges of the Corona pandemic. The study used the descriptive analytical approach with the questionnaire as the main tool to collect data from a sample of (31) officials in university education and pre-university education. The study found many challenges such as limited teacher readiness and digital infrastructure, and poor training in the use of modern technologies. Study (Ramadan, 2021) aimed to identify the reality of secondary school teachers in the Kingdom of Saudi Arabia applying the skills of employing AI applications in the educational process from the point of view of school leaders and teachers. A questionnaire consisting of (53) skills was applied to a sample selected in a random stratified manner, numbering (386) individuals. The study used the descriptive survey method, and the results showed that secondary school teachers apply the skills of employing AI applications in the educational process to an average degree, and there were no statistically significant differences in the reality of secondary school teachers' application of the skills of employing AI applications in education attributed to the job, gender, years of experience, city, and obtaining training courses in AI.

Study (Al-Atal, et al., 2021) aimed to explore the importance of AI in education, the challenges facing its use from the point of view of students of the College of Basic Education in Kuwait. The study used the descriptive analytical method, as data was collected using a questionnaire from a sample of (229) male and female students. The results showed that there were statistically significant differences between the average responses of sample members regarding the importance of AI in education based on the academic year, and that there were differences regarding the challenges facing the use of AI attributed to gender and cumulative average. In the study (Shaaban, 2022) aimed to identify the requirements for employing AI in

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university education from the point of view of faculty members at the Faculty of Graduate Studies at Cairo University. The study used the descriptive analytical approach, and relied on the questionnaire as the main tool for collecting data, as a sample of (67) faculty members were selected. The study concluded that one of the most important requirements for employing AI in education is the need to provide an infrastructure that includes wireless communications, computers and programs, and the need for highly qualified specialists to support the technical system and address faults before applying the technologies.

Study (Kim, et al., 2022) aimed to identify the ability of AI technologies to transform teachers' roles by providing personalized learning that suits the needs of each student. The study used the experimental approach with a sample of (234) teachers and (2220) students in the United States. The study relied on an AI-based guidance system, as teachers were provided with weekly reports on student progress, which contributed to improving students' academic levels.

Study (Al-Asimi and Al-Zahrani, 2023) aimed to explore the role of AI, specifically expert systems and their knowledge engineering, in improving visual arts education, while highlighting the human, technical, and financial requirements necessary to implement these systems. The study used the descriptive approach and the questionnaire as a tool for a sample of 347 participants, including academics from the College of Arts and the College of Computer and Information Sciences at King Saud University, in addition to male and female artists interested in technology through social media networks in Saudi Arabia. The results showed that AI can achieve flexible and personalized high-quality education, enhance the cognitive and skill aspects of learners, and provide immediate and effective feedback. The study also showed that the success of these systems requires the availability of knowledge engineers and experts in visual arts, an advanced technical infrastructure that supports machine learning and natural language processing, and sufficient financial resources to establish and maintain the systems. The study recommended the need to support educational institutions to implement expert systems in visual arts education due to their positive impact on improving the quality of education and raising the efficiency of learners.

Comment on Previous Studies

There is increasing interest in employing AI to improve education in various fields and technical education. Studies have addressed multiple dimensions related to the impact of AI on education, whether at the level of interaction between teacher and student or on improving teaching practices or motivating students to develop their skills. The current study, which addresses the attitudes of art education teachers towards the use of AI in teaching visual arts in general education stages in the Kingdom of Saudi Arabia, contributes to adding a deeper and comprehensive vision on this topic. Previous studies agreed and differed with the current study in some aspects:

First: Society and Sample

The study (Al-Asimi and Al-Zahrani, 2023) included academics from the fields of arts and computer science, in addition to independent artists. The study (Shaaban, 2022) focused on faculty members in university education, while the study (Al-Atal, et al., 2021) targeted university students. The study (Al-Bashar, 2020) focused on experts in curricula and teaching methods, while the study (Al-Subhi, 2020) focused on faculty members at Najran University. The study (Kim, et al., 2022) dealt with a sample of teachers and students in the United States, while the study (Chen & Lin, 2020) relied on a literature review without a direct field sample. The study (Al-Khaibari, 2020) is the closest to the current study, as it dealt with secondary school teachers, but was limited to women only. However, the current study focused on male and female art education teachers in the general education stages in the Kingdom of Saudi Arabia, which gives it specificity in studying the trends of this category towards the use of AI in the context of general education. It is clear from this comparison that the current study focuses on a specific field category in general education, and this is what distinguishes it from previous studies, most of which focused on higher education.

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Second: Basic Variables

The study (Al-Asimi and Al-Zahrani, 2023; Shaaban, 2022) dealt with variables related to the use of AI in education, the study (Al-Subhi, 2020; Al-Bashar, 2020) dealt with the challenges associated with the use of this AI, while the study (Al-Khaibari, 2020) addressed the required skills, while the study (Al-Atal, et al., 2021) focused on students' opinions. While the study (Kim, et al., 2022) addressed the practical applications of AI, the current study is distinguished by its treatment of new variables including the attitudes of art education teachers towards the use of AI, with an analysis of the differences in these attitudes based on gender, years of experience, and academic qualification.

Third: Study Methodology and Tools

Previous studies relied on various approaches, as most of them used the descriptive analytical approach, as in the study (Al-Asimi and Al-Zahrani, 2023; Shaaban, 2022; Al-Subhi, 2020) to measure the requirements and challenges related to the use of AI, while the study (Kim, et al., 2022) relied on the experimental approach to study the impact of AI applications on the educational process. As for the tools, the questionnaire was used as the main tool for collecting data in most studies, such as the study (Al-Khaibari, 2020; Al-Atal, et al., 2021). The current study was characterized by the use of a descriptive analytical approach with a questionnaire designed to measure the attitudes of art education teachers towards AI, with a statistical analysis of the differences based on demographic variables, which allows for the collection of more accurate data to understand the impact of AI on teaching practices.

Fourth: Benefiting from Previous Studies

Previous studies contributed to building the theoretical framework such as technical and human requirements (Al-Asimi and Al-Zahrani, 2023), challenges associated with employing AI in education (Al-Subhi, 2020). The current study also benefited from the descriptive analytical methods used in previous studies (Al-Atal, et al., 2021). The current study also benefited from previous studies in designing the study tools, which are the questionnaire to measure variables related to attitudes, knowledge and skills, allocating questions that are appropriate for technical education and analyzing differences based on gender, years of experience, and academic qualification.

Fifth: Aspects of the Current Study's Distinction

The current study was distinguished from previous studies in its focus on the attitudes of art education teachers towards the use of AI, and analyzing the differences in these attitudes based on demographic variables.

Study Methodology and Procedures

This section deals with the methodological procedures of the study, its tools, determining the sample, the study tool, procedures for applying the study tool, and determining the statistical methods used in analyzing and processing the data:

Study Methodology

The study used the descriptive method; Because it is suitable for the nature of the study problem, as the descriptive method is defined as the scientific approach that focuses on a comprehensive description of the phenomena and topics studied, whether by descriptive explanation, or by using numbers and data to clarify the relationships and interactions between these phenomena (Dabab and Barwais, 2019).

Study Community

The study community consisted of male and female art education teachers affiliated with the Hail Education Department in the first semester of the academic year 2024/2025 - Table (1):

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Table (1). Shows the Distribution of the Study Community Members in the Schools of Hail City

Distribution of teachers by gender	Art Education Teachers (male)			Art Education Teachers (female) .1			Total .2
Education stage	Primary	Middle	Secondary	Primary	Middle	Secondary	
North Hail Education Department	42	36	2	6	1	0	87
South Hail Education Department	47	38	4	20	5	3	117
Total	89	74	6	26	6	3	204

Table (1) shows that the study community consisted of (204) male and female teachers, including (169) male art education teachers, representing (82.84%) of the original community and (35) female art education teachers, representing (17.16%) of the target community of the study. (117) male and female teachers belong to the South Hail Education Office, representing (57.35%), while (87) male and female teachers belong to the North Hail Education Administration, representing (42.65%) of the study community.

Study Sample

The study sample consisted of (204) male and female teachers, as all members of the community were selected due to the limited number of male and female art education teachers in the city of Hail, whose total number is (204) male and female teachers, according to statistics from the General Administration of Education in Hail.

Study Tool

The study used the closed questionnaire as a suitable tool for the nature of the study. The researcher identified four axes for the questionnaire, which included (25) statements distributed over the four axes, (5) statements related to the first axis related to the level of knowledge of art education teachers of AI techniques in the field of education, (10) statements related to the second axis related to the general trends of art education teachers towards integrating AI into the teaching process, (5) statements related to the third axis related to the potential benefits of using AI in teaching art education, (5) statements related to the fourth axis related to the challenges and difficulties facing art education teachers when applying AI techniques.

The components of the study tool

The questionnaire consisted of a cover page that included the purpose of the study, personal data of the sample members, including gender, academic qualification, number of years of teaching experience, and distribution of phrases on the main axes of the questionnaire:

Table (2): Shows the Questionnaire Axes and the Number of its Phrases

Axis	Number of phrases	Cronbach's Alpha coefficient
First axis: The level of knowledge of art education teachers about AI techniques in the field of education	5	0.85
Second axis: General trends of art education teachers towards integrating AI into the teaching process	10	0.82
Third axis: Potential benefits of using AI in teaching art education	5	0.88
Fourth axis: Challenges and difficulties facing art education teachers when applying AI techniques	5	0.91

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Total Axes	25	0.87

A questionnaire was prepared to collect data in line with the study objectives and questions, where the answer options were based on a five-point Likert scale that includes: strongly agree, agree, neutral, disagree, strongly disagree. A numerical score was assigned to each choice: strongly agree (5) points, agree (4) points, neutral (3) points, disagree (2) points, strongly disagree (1) point - Table (3):

Table (3). Shows the Division of the Five-Point Likert Scale Categories (Response Average Limits)

Category Limits		Category	Power of Consent
4.21	5.00	Strongly agree	very strongly
3.41	4.20	Agree	highly
2.64	3.40	Neutral	moderate
1.81	2.60	Disagree	weakly
1.00	1.80	Disagree strongly	very weakly

Validity of the Study Tool

The researcher verified the validity of the study tool through the following:

First: The Apparent Validity of The Questionnaire (The Validity of the Arbitrators)

The questionnaire was presented to a group of specialized experts from the faculty members in the Department of Curricula and Teaching Methods at the College of Education at Hail University. These arbitrators were asked to evaluate the questionnaire in terms of its ability to achieve the objectives, the accuracy of its measurement of the targeted phenomenon, review the phrases, the extent of their connection to the axes, the extent of modifying, deleting, or adding any phrase. Based on the opinions of the arbitrators, modifications were made, and the questionnaire was converted into an electronic questionnaire via the link: (https://forms.gle/SxSk8ZexxoqsZVEK9), to be applied to the survey sample, to verify the validity of the internal consistency of the tool.

Second: Validity of the Internal Consistency of the Questionnaire

To ensure the validity of the questionnaire, (Pearson's Correlation Coefficient) was used to determine the extent of the relationship of each statement of the questionnaire with the total score of the axis to which it belongs. It is clear from Table (5) that all correlation coefficients between each statement and the total score of the axis to which it belongs were statistically significant at a significance level of (0.01). This reflects a high level of internal consistency validity of the study tool, confirming the validity of the tool for measurement.

Table (4). Pearson Correlation Coefficients Between the Phrase Scores and the Total Score of the Axis to Which Each Phrase Belongs

First axis: The level of knowledge of art education teachers about AI techniques in the field of education	Second axis: General trends of art education teachers towards integrating AI into the teaching process	Third axis: Potential benefits of using AI in teaching art education	Fourth axis: Challenges and difficulties facing art education teachers when applying AI techniques
0.82**	0.89**	0.90**	0.91**
0.69**	0.89**	0.78**	0.87**
0.82**	0.83**	0.76**	0.87**
0.87**	0.83**	0.87**	0.87**
0.80**	0.85**	0.89**	0.82**

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**Statistically significant at a significance level of (0.01).

Stability of the Study Tool

Table (5) shows the values of the stability coefficients for each axis of the questionnaire using Cronbach's Alpha (α). It is clear that all values indicate internal stability, ranging between (0.78 and 0.88), indicating that the questionnaire is statistically consistent. The overall alpha coefficient reached (0.87), indicating that the questionnaire as a whole has high internal stability.

Table (5). Shows the Stability Coefficients of the Study Tool Axes

Axis	Number of phrases	Cronbach's Alpha coefficient
First axis: The level of knowledge of art education teachers about AI techniques in the field of education	5	0.85
Second axis: General trends of art education teachers towards integrating AI into the teaching process	10	0.82
Third axis: Potential benefits of using AI in teaching art education	5	0.88
Fourth axis: Challenges and difficulties facing art education teachers when applying AI techniques	5	0.78
Total Axes	25	0.87

Study Application Procedures

After verifying the validity and reliability of the study tool, and its suitability for application, the researcher applied the following steps:

The questionnaire was distributed electronically via the questionnaire link to all sample members of art education teachers.

The responses of the sample members were received, and their number reached (144) responses.

The questionnaire responses were reviewed, and their suitability for statistical analysis was verified.

Statistical Processing Methods

The study used many appropriate statistical methods using the (SPSS) program, including:

Pearson Correlation Coefficient to verify the validity of the internal consistency of the study tool.

Cronbach's Alpha Reliability Coefficient to measure the stability of the study tool.

Mean, Standard Deviation.

Independent samples T test for the difference between two independent samples

One-way ANOVA for the difference between two or more samples

Results and Discussion

Answering the first question: What is the level of knowledge of art education teachers of AI techniques in the field of education?

To identify the level of knowledge of art education teachers of AI techniques in the field of education, frequencies, percentages, means, standard deviations, and ranks were calculated. The results of Table (6)

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showed that the first axis related to the level of knowledge of art education teachers of AI techniques in the field of education included five statements, as it was shown that the weighted average of the axis as a whole amounted to about 3.43 with a standard deviation of about 0.63 and a relative weighted strength of about 69%, which indicates the existence of a relative indication of approval of the level of knowledge of art education teachers of AI techniques in the field of education. The axis statements came within the category of agreement, disagreement and neutral, the highest of which was the statement I see that AI provides new capabilities in organizing and presenting visual arts content to students, with a weighted average of about 4.6. While the lowest was the phrase "knowledgeable how to use AI applications such as: (photo and video editing - augmented and virtual reality - interactive drawing - artistic pattern recognition - drawing and artistic transformation) in teaching with a weighted average of about 2.56.

Table (6). Shows the Means and Standard Deviations of the Sample Members' Responses Regarding Their Level of Knowledge of AI Techniques

	Strongly	%	Agree	%	Neutral	%	Strongly	%	Strongly	%	Mean	S.D	Total	Weighte	Score	Rank
I have good knowledge of AI applications suitable for teaching visual arts to students in general education.	17	11.8	61	42.4	43	29.9	23	16.0	0	0.0	3.50	0.90	144	0.70	Agree	2
I am familiar with how to use AI applications such as: (photo and video editing - augmented and virtual reality - interactive drawing - artistic pattern recognition - drawing and artistic transformation) in teaching.	9	6.3	10	6.9	35	24.3	89	61.8	1	0.7	2.56	0.88	144	0.51	Strongly Disagree	5
I am familiar with digital tools and technologies that can be used to improve visual arts teaching.	10	6.9	63	43.8	40	27.8	31	21.5	0	0.0	3.36	0.90	144	0.67	Agree	3
I can identify areas where AI can support the teaching of art education courses.	10	6.9	53	36.8	30	20.8	51	35.4	0	0.0	3.15	0.99	144	0.63	Neutral	4
I see that AI provides new possibilities in organizing and presenting visual arts content to students.	99	68.8	36	25.0	5	3.5	4	2.8	0	0.0	4.60	0.69	144	0.92	Strongly Agree	1
Total axis	145	20.1	223	31.0	153	21.3	198	27.5	1	0.1	3.43	0.63	720	0.69	Agree	-

Source: Collected and calculated from the study questionnaire

Answering the second question: What are the general trends of art education teachers towards integrating AI into the teaching process?

To identify the general trends of art education teachers towards integrating AI into the teaching process, frequencies, percentages, means, standard deviations, and ranks were calculated. The results of Table (7) showed that the second axis, which relates to the general trends of art education teachers towards integrating AI into the teaching process, included ten statements, as it was shown that the weighted average

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of the second axis reached about 4.69 with a standard deviation of about 0.3 and a relative weighted strength of about 94%, indicating a relative indication of strong agreement with the general trends of art education teachers towards integrating AI into the teaching process. All the statements of the second axis came within the category of strong agreement, the highest of which was the statement I believe that integrating AI techniques into art education courses helps improve the educational experience, with a weighted average of about 4.90. While the lowest was the phrase "I support the development of policies that encourage the wider integration of AI into the teaching of art education," with a weighted average of about 4.59.

Table (7). Shows the Means and Standard Deviations of the Sample Members' Responses Regarding Their Attitudes Towards Integrating AI Into the Teaching Process.

	Strongly	%	Agree	%	Neutral	%	Strongly	%	Strongly	%	Mean	S.D	Total	Weighte	Score	Rank
I believe that integrating AI technologies into art education courses helps improve the learning experience.	130	90.3	14	9.7	0	0.0	0	0.0	0	0.0	4.90	0.30	144	0.98	Strongly Agree	1
I feel comfortable using AI in visual arts education to enhance students' creativity.	116	80.6	28	19.4	0	0.0	0	0.0	0	0.0	4.81	0.40	144	0.96	Strongly Agree	2
I support the use of AI as a means to support traditional teaching methods in visual arts education.	103	71.5	41	28.5	0	0.0	0	0.0	0	0.0	4.72	0.45	144	0.94	Strongly Agree	3
I believe that AI can add more variety and interaction to the visual arts education experience.	95	66.0	48	33.3	1	0.7	0	0.0	0	0.0	4.65	0.49	144	0.93	Strongly Agree	6
I believe that the application of AI makes the visual arts education process more interesting and engaging for students.	89	61.8	54	37.5	1	0.7	0	0.0	0	0.0	4.61	0.50	144	0.92	Strongly Agree	8
I would like to receive specialized training on how to integrate AI into visual arts education.	90	62.5	52	36.1	1	0.7	1	0.7	0	0.0	4.60	0.54	144	0.92	Strongly Agree	9
I am willing to use AI applications to develop new educational methods in visual arts.	97	67.4	46	31.9	1	0.7	0	0.0	0	0.0	4.67	0.49	144	0.93	Strongly Agree	5
I support the development of policies that encourage the broader integration of AI into art education.	86	59.7	57	39.6	1	0.7	0	0.0	0	0.0	4.59	0.51	144	0.92	Strongly Agree	10
I believe that training teachers on AI will enhance the quality of visual arts education in general education.	92	63.9	51	35.4	1	0.7	0	0.0	0	0.0	4.63	0.50	144	0.93	Strongly Agree	7
I look forward to exploring more applications that can serve visual arts education using AI.	103	71.5	39	27.1	1	0.7	1	0.7	0	0.0	4.69	0.52	144	0.94	Strongly Agree	4

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Total axis	1001	69.5	430	29.9	7	0.5	2	0.1	0	0.0	4.69	0.30	1440	0.94	Strongly Agree	-

Source: Collected and calculated from the study questionnaire

Answering the third question: What are the potential benefits of using AI in teaching art education from the point of view of teachers?

To identify the potential benefits of using AI in teaching art education from the point of view of the sample members, frequencies, percentages, means, standard deviations, and ranks were calculated. The results of Table (8) showed that the third axis related to the potential benefits of using AI in teaching art education included five statements, as it was shown that the weighted average of the third axis reached about 4.75 with a standard deviation of about 0.33 and a relative weighted strength of about 95%, indicating a relative indication of strong agreement on the potential benefits of using AI in teaching art education. All the statements of the axis as a whole came within the category of strong agreement, the highest of which was the statement I see that AI can enhance students' interaction with the content of art education, with a weighted average of about 4.92. While the lowest was the phrase "I see that the use of AI contributes to improving the process of assessing and developing students' skills in visual arts" with a weighted average of about 4.62.

Table (8): Shows the Means and Standard Deviations of the Sample Members' Responses Regarding the Potential Benefits of Using AI in Teaching Art Education

	Strongly	%	Agree	%	Neutral	%	Strongly	%	Strongly	%	Mean	S.D	Total	Weighte	Score	Rank
I believe that AI can enhance students' engagement with art education content.	133	92.4	11	7.6	0	0.0	0	0.0	0	0.0	4.92	0.27	144	0.98	Strongly Agree	1
AI can support students in acquiring critical and creative thinking skills in the visual arts.	121	84.0	23	16.0	0	0.0	0	0.0	0	0.0	4.84	0.37	144	0.97	Strongly Agree	2
Using AI helps me customize and adapt content to each student's needs.	99	68.8	43	29.9	2	1.4	0	0.0	0	0.0	4.67	0.50	144	0.93	Strongly Agree	3
AI contributes to providing rich and diverse learning experiences in the visual arts.	99	68.8	44	30.6	0	0.0	1	0.7	0	0.0	4.67	0.51	144	0.93	Strongly Agree	4
I believe that using AI contributes to improving the process of assessing and developing students' skills in the visual arts.	92	63.9	50	34.7	1	0.7	1	0.7	0	0.0	4.62	0.54	144	0.92	Strongly Agree	5
Total axis	544	75.6	171	23.8	3	0.4	2	0.3	0	0.0	4.75	0.33	720	0.95	Strongly Agree	-

Source: Collected and calculated from the study questionnaire

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Answering the fourth question: What are the challenges and difficulties facing art education teachers when applying AI techniques?

To identify the challenges and difficulties facing art education teachers when applying AI techniques from the point of view of the sample members, frequencies, percentages, arithmetic means, standard deviations, and ranks were calculated. The results of Table (9) showed that the fourth axis related to the challenges and difficulties facing art education teachers when applying AI techniques included five statements, as it was shown that the weighted average for the axis as a whole reached about 4.70 with a standard deviation of about 0.33 and a relative weighted strength of about 94%, which indicates a relative indication of strong agreement on the existence of challenges and difficulties facing art education teachers when applying AI techniques. All the statements of the fourth axis came within the category of strong agreement, the highest of which was the statement I believe that applying AI in teaching visual arts requires additional material and technical support, with a weighted average of about 4.92.While the lowest was "I think that relying entirely on AI could affect human interaction in the classroom," with a weighted average of about 4.46.

Table (9). Shows the Means and Standard Deviations of the Sample Members' Responses Regarding the Challenges and Difficulties Faced By Art Education Teachers When Applying AI Techniques

	Strongly	%	Agree	%	Neutral	%	Strongly	%	Strongly	%	Mean	S.D	Total	Weighte	Score	Rank
I believe that the application of AI in visual arts education requires additional financial and technical support.	133	92.4	11	7.6	0	0.0	0	0.0	0	0.0	4.92	0.27	144	0.98	Strongly Agree	1
I fear that the application of AI may make the educational process less interactive if it is not supported by the necessary skills	114	79.2	27	18.8	1	0.7	2	1.4	0	0.0	4.76	0.53	144	0.95	Strongly Agree	2
The use of AI requires intensive training for teachers on how to employ it effectively.	98	68.1	46	31.9	0	0.0	0	0.0	0	0.0	4.68	0.47	144	0.94	Strongly Agree	3
I believe that the lack of technical knowledge may limit the full benefit of AI in visual arts education.	101	70.1	41	28.5	1	0.7	1	0.7	0	0.0	4.68	0.52	144	0.94	Strongly Agree	4
I believe that relying on AI completely may affect human interaction in the classroom.	84	58.3	48	33.3	7	4.9	4	2.8	1	0.7	4.46	0.77	144	0.89	Strongly Agree	5
Total axis	530	73.6	173	24.0	9	1.3	7	1.0	1	0.1	4.70	0.33	720	0.94	Strongly Agree	-

Source: Collected and calculated from the study questionnaire

Answering the fifth question: Are there statistically significant differences in the attitudes of art education teachers towards integrating AI in teaching based on gender, academic qualification, and number of years of experience?

Are there statistically significant differences in the attitudes of art education teachers towards integrating AI in teaching based on gender?

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To reveal the extent of the existence of statistically significant differences at the significance level (α = 0.05) between the averages of the response of art education teachers towards the use of AI in teaching visual arts in the Kingdom of Saudi Arabia according to gender, the Independent Samples T test was used. Table (10) shows that there are no statistically significant differences at the significance level (α = 0.05) between the averages of the responses of art education teachers on the total axes of the research sample related to the response of art education teachers towards the use of AI in teaching visual arts in general education in the Kingdom of Saudi Arabia attributed to the gender of the teachers of the study sample.

Table (10). Results of the Independent Samples T Test to Reveal the Significance of the Differences Between the Average Responses in the Study Sample According to Gender

Axis	T	Sig.
First axis: The level of knowledge of art education teachers about AI techniques in the field of education	-1.094	0.276
Second axis: General trends of art education teachers towards integrating AI into the teaching process	-0.705	0.482
Third axis: Potential benefits of using AI in teaching art education	-0.010	0.992
Fourth axis: Challenges and difficulties facing art education teachers when applying AI techniques	-0.577	0.565
Total axes	-1.467	0.145

Source: Collected and calculated from the results of the research sample analysis using the SPSS program

Are there statistically significant differences between the attitudes of art education teachers towards integrating AI in teaching attributed to academic qualification?

To reveal the extent of the existence of statistically significant differences at the significance level (α = 0.05) between the average responses of art education teachers towards the use of AI in teaching visual arts in the Kingdom of Saudi Arabia according to the academic qualification, the Independent Samples T test was used. Table (11) shows that there are no statistically significant differences at the significance level (α = 0.05) between the average responses of art education teachers on the total axes of the research sample related to the response of art education teachers towards the use of AI in teaching visual arts in general education in the Kingdom of Saudi Arabia attributed to the academic qualification of the study sample teachers.

Table (11). Results of the Independent Samples T Test to Reveal the Significance of the Differences Between the Average Responses in the Study Sample According to Academic Qualification

Axis	T	Sig.
First axis: The level of knowledge of art education teachers about AI techniques in the field of education	1.030	0.305
Second axis: General trends of art education teachers towards integrating AI into the teaching process	1.080	0.282
Third axis: Potential benefits of using AI in teaching art education	1.364-	0.175
Fourth axis: Challenges and difficulties facing art education teachers when applying AI techniques	1.239	0.217
Total axes	0.991	0.323

Source: Collected and calculated from the results of the research sample analysis using the SPSS program

Are there statistically significant differences between the attitudes of art education teachers towards integrating AI in teaching according to years of experience?

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To reveal the extent of the existence of statistically significant differences at the significance level (α = 0.05) between the average responses of art education teachers towards the use of AI in teaching visual arts in the Kingdom of Saudi Arabia according to years of experience, the (One way ANOVA) test was used. Table (12) shows that there are no statistically significant differences at the significance level (α = 0.05) between the average responses of art education teachers on the total axes of the research sample related to the response of art education teachers towards the use of AI in teaching visual arts in general education in the Kingdom of Saudi Arabia attributed to the years of experience of the teachers of the study sample.

Table (12). Results of the One-Way ANOVA Test to Reveal the Significance of the Differences Between the Average Responses in the Study Sample According to Years of Experience

Axis	F	Sig. F
First axis: The level of knowledge of art education teachers about AI techniques in the field of education	1.581	0.209
Second axis: General trends of art education teachers towards integrating AI into the teaching process	0.015	0.985
Third axis: Potential benefits of using AI in teaching art education	0.693	0.502
Fourth axis: Challenges and difficulties facing art education teachers when applying AI techniques	1.112	0.332
Total axes	2.507	0.085

Source: Collected and calculated from the results of the research sample analysis using the SPSS program

Discussion of the Results of the Study with Previous Studies

The current study agreed with some previous studies in using the questionnaire as a study tool, and also agreed to use the descriptive analytical approach as a study (Al-Asimi and Al-Zahrani, 2023; Shaaban, 2022; Ramadan, 2021; Al-Atal et al., 2021; Al-Bashar, 2020; Al-Khaibari, 2020), and the results of the current study agreed with some previous studies as a study (Shaaban, 2022; Ramadan, 2021; Al-Atal et al., 2021; Al-Bashar, 2020; Chen & Lin, 2020; Al-Khaibari, 2020; Mahmoud, 2020; Al-Subhi, 2020) in the study of employing AI applications in teaching, the results of which confirmed the existence of obstacles to the use of AI applications in teaching, including the lack of an advanced technical infrastructure suitable for the use of AI applications in teaching, the lack of sufficient financial resources to establish AI systems AI, Low Skills for Teachers to Use AI Applications.

While the results of the current study differed from some studies in the degree of skills of employing AI applications in the educational process, as it was very high, while some studies had skills of employing AI applications in the educational process, as in the study (Ramadan, 2021) or low, as in the study (Al-Subhi, 2020). The results of the current study also agreed with some studies in the absence of statistically significant differences between the responses of sample members on the employment of AI applications in teaching according to gender, college, academic rank, years of experience, as in the study (Ramadan, 2021), while it differed with some studies, as it was found that there were statistically significant differences between the averages of sample members' responses attributed to gender, academic year, and cumulative average, as in the study (Al-Atal et al., 2021).

Recommendations

Encouraging school teachers at different levels of education to use AI in teaching visual arts

Holding training courses for school teachers on the use of AI in teaching visual arts.

Providing infrastructure, devices and AI programs in schools at different educational levels.

Providing financial support to employ AI applications in schools at different educational levels.

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Schools' interest in developing a plan to employ AI applications in teaching visual arts.

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