# Harnessing Artificial Intelligence to Advance Art Education Goals: A Study from Kuwait

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**ABSTRACT:** This research examined the role of artificial intelligence (AI) applications in realizing the objectives of art education in Kuwait. A descriptive research method was adopted to gather, summarize, and interpret data for the purpose of providing clarifications and the participants' insights. There were 117 participants who were public education teachers, and the questionnaire was used as the main research instrument. To analyse data, the descriptive statistics (means, standard deviations, frequencies and percentage) and inferential statistics (t-tests and ANOVA) were employed to quantify perceptions of teachers and group differences. The research findings specifically underscored that AI applications are instrumental in producing an overall positive impact for several of the key objectives for art education such as identifying art history, developing artistic communication, facilitating critical viewing and analysis of artworks, stimulating artistic production, and constructing national identity and national belonging is greatly enhanced. This study found that AI's effect on appreciation of art was moderate. The findings showed minor differences in responses between male and female teachers, with differences found to be statistically significant based on education qualification level used in describing/quantifying responses, but importantly differences expressed in responses suggest differences among those teachers with postgraduate degrees, AI training, or education experience at a higher level. The research suggested that the use of more artificial intelligence in art education would help students better appreciate art and the beauty of nature through realistic simulations, connecting the artificial tools of the digital world with the creativity of nature.

**Keywords:** artificial intelligence, art education, educational goals, teaching innovation, Kuwait.

## I. INTRODUCTION

Digitalization of education through artificial intelligence applications provides an imaginative and innovative foundation for art education and all its numerous functions. With the speed of technological advancement and dissemination of technology-based tools, the progress that artificial intelligence can make to all aspects of education can create innovative solutions to learning and enhance the achievement of multiple educational objectives. In Kuwait, the objectives for art education as a designated subject in all parts of pre-university education; include: aiding artistic development within the framework of identity and national belonging, stimulating creativity and artistic expression, helping to develop and appreciate aesthetic values, increasing students' understanding of the history of civilisations and "art" and developing their ability to critique and analyse art. Art education is also about facilitating artistic communication, encouraging students to participate in exhibitions and museum visits both nationally and internationally [1].

In general, applications of artificial intelligence (AI) have shown tremendous promise in education, and in art education to be specific. Applications are virtual museums (e.g., Dataland), digital libraries, and AI-

driven art such as AI Creator and Image AI for drawing and design. Other AI applications are Gemini API for image and graphic analyses, and AI chatbots such as ChatGPT and other conversational agents for exploring history of art and art movements [2].

The advantage of AI in art education is that it can assign for the unique differences among every one of learners. AI can adjust for learners individual learning experiences based on the four types of learners: Visual learners use images, graphics, or illustrations; Auditory learners seek listening experiences; Verbal learners are verbal or linguistic; Kinaesthetic learners emphasize the process in addition to the product [2]. AI automatically adjusts, some with human instructors' input, the cognitive complexity and mode of delivery to suit each student's needs. Additionally, with frame of reference framed around VR technologies, AI can assist students in the experimental learning (constructivist) environments, inspiring their skills in the realm of art (creativity and expression!) and arts education as one of the intended audience goals in art education [3].

By allowing students to establish artistic practice and creativity through virtual exhibits that use 3D models, AI applications support interactive learning experiences for students. Additionally, AI applications contribute to the evaluation of the students' artworks by producing rapid and accurate assessments by image recognition and analysis technologies. Evaluations frequently include feedback, and these may alleviate the teacher's workload while also enabling constructive and actionable feedback that can assist students in refining their work and developing independence [4].

While both the helpful use of AI in expressive arts education and in the educational process is obvious, there are many challenges including the student's potential loss of independent and manual skills, as well as algorithmic bias that might favour some patterns, orientations, topics or cultural contexts. Other concerns dealing with privacy and data security also muddle the integration of AI in education [5]. These challenges highlight the future research required to explore the possibilities of AI applications in terms of satisfying art education's general aims while also addressing these challenges.

## II. LITERATURE REVIEW

The growing advancements in Artificial Intelligence (AI) technologies are transforming many fields, including education. In the case of Kuwait, using AI in art education would provide a wonderful opportunity to enhance educational practices, outcomes, and innovate in preserving and changing customary cultural practice. With the evolution of education internationally, it is critical to explore how AI can be used in art education to foster creativity, allow for personalized learning, and promote the notion of culture as heritage. This section of the of the research provides a critical analysis of literature that examines the role of AI in education, the place of AI in art education in Kuwaiti context, the potential for AI to transform practice, the new opportunities of personalized learning, and the chances to develop and enhance new technologies alongside the learned forms of agendas.

Another study focused on a type of research about both perspectives of art education, educators and students, who aimed to stimulate an understanding of the visibility of digital visual culture within art education. The research addressed the participants perspectives about the exchanges within the domain of digital visual culture and artificial intelligence in the context of art education. This study documented art and design educators' views of the adoption of digital visual culture and artificial intelligence in teaching, alongside art and design students' views of the adoption of digital visual culture and artificial intelligence in their university education experience. The findings identified the main skills required to improve formal and informal teaching and learning in art education with respect to digital visual culture and artificial intelligence [6].

Another study considered the influence Artificial Intelligence (AI) will have on teaching and course assessment; to examine to what extent AI could be integrated into teaching, learning, and assessment processes to improve educational experiences, facilitate learning processes, and improve the precision and efficiency of course assessment processes. This study examined the use of various AI technologies, such as machine-learning algorithms, AI assistants to facilitate teaching, Brain-Computer Interface (BCI) for estimating students' attention, automated essay assessments, and virtual learning companions. This study

focused on the use of emerging tools such as AI in education, including MOOCs (Massive Open Online Courses), whereby AI is utilized to personalize learning paths for students. The research results highlighted the points of views of art and design educators about how to inclusively teach digital visual culture and artificial intelligence while also grounding the media in the art and design students' views about their educational experience while contemplating how best to include these media in their education. The research identified educational competencies for teaching and learning in art education in connection with digital visual culture and artificial intelligence [6].

Another research study explored the implications on teaching and course assessment types of Artificial Intelligence (AI) in determining how AI could support educational experiences, disrupt learning, and improve the accuracy and efficiency of course assessments. The study examined how a range of AI generally characterized and classified as follows: machine learning algorithms, AI-enabled teaching assistants, to Brain-Computer Interfaces (BCI), AI for measuring student attention and concentration, automated essay scoring, and virtual learning companions. The study focused on how AI was already being used in practice, including in MOOCs (Massive Open Online Courses) where AI is used to tailor student learning paths. The findings pointed to a shift towards AI becoming a central feature of traditional pedagogical approaches and assessments, providing case studies such as Jill Watson, a virtual teaching assistant, and the use of AI to take over grading and provide individualized feedback to students, concluding that AI had the potential to transform education by taking over low-level tasks, enhancing student learning, and offer more individualized curriculums [7].

Artificial Intelligence (AI) was also considered in computer-aided learning for teaching art, proposing a model of personalized learning and collaborative art making collaboration through AI-assisted systems. The study described the restrictions of conventional teaching methods and demonstrated a new pedagogical system based on AI, which developed an engaged, digital environment for students to learn about art and design. The model of the AI system included a variety of components, including knowledge bases, student models, diagnostic models, and teacher models, and the study was centred on the application of AI on art-based projects regarding logo designing, and measure the difference in effectiveness between teaching utilizing AI versus traditional teaching. The results recorded that AI based teaching improved speed on the creation process, improved design affect, and improved student creativity. The digital, networked learning platform enhances discussion, research, and design in a collaborative way. It also supports student engagement and teamwork outcomes, leading to heightened subject interest and motivation [8].

Another study addressed the attitudes of art education teachers in Saudi Arabia about using Artificial Intelligence (AI) to teach visual arts at the general education level. In that study, a descriptive analytical research methodology was utilized and to a sample of 144 teachers in Hail City; a questionnaire was given with questions explored teachers' awareness of AI, teacher attitudes towards AI, potential perks of AI, and challenges. The study's findings indicated teachers' awareness of AI in education rated at a moderate level when looking at mean scores (M=3.43). While teachers demonstrated high support for the integration of AI with mean scores of (M=4.69) highlighting potential students' engagement, creativity, assessment, and other perks of AI emerged. The few challenges included aspects like needing more technical and financial support, and specialized training for teachers. Teachers tended to agree that AI would impact the educational experience positively despite the challenges [9].

Another study explored the role of Artificial Intelligence (AI) in Science, Technology, Engineering, Arts, and Mathematics (STEAM) education by introducing the idea of "AI-Thinking," a structure developed to help students expand their human-centred reasoning and capabilities through AI tools, including machine learning and Bayesian networks. The study focused on how AI can help STEAM students to make predictions and to model simulations, more specifically in an engineering and arts context, for example, how components of a concrete mixture may affect compressive strength. As well, the study stressed the need for AI to be available to all STEAM learners regardless of programming or mathematics experience. The website tools were easy to use; therefore, the educators showed students how to use AI in a way that fosters interdisciplinary learning, engages students in critical thinking, and develops problem-solving skills [10].

To provide extensive analysis of the role of Artificial Intelligence (AI) in English Language Teaching (ELT), a systematic review was conducted by examining a variety of AI tools, applications, and pedagogical

334

implications. The systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines; used qualitative methods and thematic analysis for the literature review from Scopus and Web of Science. The review examined literature produced between the years 2014 – 2024 on specific AI technologies including chatbots, speech recognition systems, and writing assistants. The review concluded that AI tools like Duolingo and Grammarly support speaking, writing, and pronunciation development through its interactive characteristics to provide personalized feedback and gamified learning opportunities. AI tools provide learners with a lot of opportunities to pace learning, support their writing improvement and spelling/vocabulary retention. However, findings highlighted challenges related to teacher preparedness and ethical issues such as data privacy and biases in AI tools. The implications of the study confirmed the need to employ AI tools equitably, to provide teachers with professional development in the use of AI tools, and to establish an ethical standard for AI to be properly/ethically used in the ELT [11].

Another study outlined several practicable uses of AI in education in a variety of contexts including intelligent teaching systems, grading in real time, personalized tutoring, and intelligent speech interaction systems as generative AI technologies take shape for individualizing content, evaluating students' learning, and providing individualized feedback to make learning more interactive and effective. The investigators included some supportive guidance to encourage equity in personalized learning paths, the issue of inequities caused by unequal access to technologies and data privacy was discussed as it relates to fairness in learning outcomes. There were also predictions for personalized education of the future, where educators would leverage AI to make assessments, learning materials and strategies unique to individual needs. AI can also be a source of innovative intelligent systems for teaching, allowing for better tracking and real-time feedback for students as well as teachers. There was also a prediction for increased collaboration through cross-school and crossed-culture educational and virtual learning spaces, with gamification to enhance learning [12].

Artificial intelligence has significant game-changing potential in art education, in terms of personalizing learning, developing creativity, and celebrating culture and heritage, as highlighted in the reviewed research. A few studies [6, 8] supported the notion that AI supports student engagement and explores deeper understanding of traditional craft. It was identified that AI supports personalization of the ways that instruction and assessment happen [7, 12]. The reviewed studies strongly supported interdisciplinary approaches to teaching [10]. However, there was caution about equitable access to AI technologies, as well as preparedness and professional development for teachers [9, 11]. In summary, there is probably enough evidence to positively assert that AI has the potential to innovatively disrupt educational practices in art education; but, to realize that potential, the many infrastructures, professional learning supports, and ethical considerations must be considered.

With everything considered, the growing global participation in AI applications, and the significant impact and influence it can have across various age groups, shifted their landscapes from being the means of engagement for entertainment, to being the means of engagement for the most essential educational tools and resources. AI can enhance the scope of teaching and learning, or circumvent issues within the education sector, particularly during periods of rapid technological growth, and crises, such as the COVID-19 pandemic. A few educational studies have validated this notion. For example, AI's capacity to progress learners' creativity in art education can be evidenced through the research as it affords a personalized creative education (e.g. critical feedback, recognizing their learning style…), as well as a knowledge database of art, art history, philosophy, contemporary art and more, to create a more meaningful learning experience [13]. Similarly, Art education relies on physical manual skills. AI with Augmented Reality (AR) provides students with the opportunity to build live models; students had a high level of motivation, and enhanced creative and imaginative capabilities, though it diminished some of their traditional drawing and colouring skills [14]. It should also be noted that AI can prompt teachers to engage students in critical analysis of AI-created art through experiential learning [15].

Moreover, how education frameworks shaped by Artificial Intelligence (AI) could extend intelligent, adaptive teaching approaches, build knowledge and create rich learning environments for art and design was also presented.

International conferences have acknowledged the challenges of using AI, however, tackling traditional education and moving to e-learning in addition to utilizing a technical application is key in education. The significance of " Innovative remote education solutions to build back better" was expressed in the UNESCO Conference on Digital Learning (2020), and how to use "Innovation and AI in Education" was expressed in the UNESCO Conference on Artificial Intelligence in Education (2021). Significantly, the need to strengthen education systems to withstand future challenges was brought attention to. Conference delegations reiterated that interactive learning environments to stimulate ideas and knowledge production, can help achieve varied educational outcomes.

With this in mind, the future impact of artificial intelligence on education may be widely acknowledged across the globe, but there is little in terms of current research focused on this theme in the context of Kuwaiti art education. Previous studies have generally examined AI in art education or across other countries, but none have focused on its role in supporting art education objectives that were formulated with Kuwait's public education system—namely national identity and cultural heritage. So, there is a gap within the literature to understand what research data can present, through the voices of public-school art teachers from Kuwait, about how AI applications impact the actualization of the unique objectives of art education in a particular regional and cultural context. The current trend surrounding AI in education is promising and should be cautiously explored to analyse its impact on achieving the objectives art education like other subjects can provide. Therefore, the study further explored AI applications and enriched perspectives about achieving the aims and objectives of art education in Kuwait. The aim of the research was to explore the role of Ai applications in achieving the aims of the art education as perceived by general education teacher perspectives, in other words, exploring their perspectives of AI Applications in fulfilled objectives of art education curriculum. General education teacher participants' responses were further analysed for difference of responses based on variables such as gender, academic qualifications, AI training, and academic level.

## 1. QUESTIONS OF THE STUDY
The study seeks to answer the following research questions:
- RQ1: What is the role of artificial intelligence applications in achieving the objectives of art education from the perspective of general education teachers?
- RQ2: How do teachers' perspectives on the role of AI applications in achieving the goals of art education vary based on variables such as gender, academic qualifications, AI training, and academic level?

## 2. OBJECTIVES OF THE STUDY
The main objectives of this research are:
- Highlighting the general perceived role of artificial intelligence applications in achieving the aims of art education from the perspective of public-school teachers in Kuwait.
- Identifying the perceived influences of artificial intelligence applications on specific aims of art education (artistic production, art history, and aesthetic appreciation) as perceived by public school teachers.
- Delimiting whether public school teachers perceive a different role of artificial intelligence applications in art education according to the gender or level of academic qualifications.
- Demonstrating whether public school teachers perceive a different role of artificial intelligence applications in art education according to their participation in artificial intelligence training or the academic level that they teach.

## III. METHOD

### 1. RESEARCH DESIGN
This study employed descriptive survey research method to meet the research purpose. The descriptive survey design is commonly used in exploratory studies, allowing researchers to gather, summarize, and interpret data for the purpose of providing clarifications and insights. The chosen design facilitated an in-

depth investigation into the role of artificial intelligence (AI) applications in achieving the objectives of art education from the perspective of general education teachers [19].

## 2. RESEARCH PARTICIPANTS

The study population included art education teachers from all three stages of general education (primary, intermediate, and secondary) in Kuwait. There was a total of 5,637 teachers; the researchers used stratified sampling to allow for representation of teachers from all three stages of education. In other words, the study population was stratified into homogeneous subgroups (strata) and then sampled randomly from each stratum to ensure the final sample was proportionally representative of all three stages of education. The sample size, determined with a 95% confidence level and acceptable margin of error, was based on Krejcie and Morgan's sample size determination Table. The final sample comprised 117 teachers, with details reported in the following Table:

- Pilot sample: 41 teachers used for standardizing the research instrument.
- Experimental sample: 76 teachers (32 male teachers, representing 42.1%, and 44 female teachers, representing 57.9%).
- The distribution across educational levels was as follows:
- Primary level: 22 teachers (28.9%).
- Intermediate level: 28 teachers (36.8%).
- Secondary level: 26 teachers (34.2%).

**Table 1.** Study population and sample distribution of art education teachers in Kuwait.

| Category | Sub-Category | Number of Teachers (n) | Percentage (%) | Notes |
|---|---|---|---|---|
| Pilot Sample | | 41 | 35.0* | Used for instrument standardization and validation. |
| Experimental Sample | Total | 76 | 65.0* | Data used for primary research findings. |
| | Male | 32 | 42.1 | (of experimental sample) |
| | Female | 44 | 57.9 | (of experimental sample) |
| | Primary Level | 22 | 28.9 | (of experimental sample) |
| | Intermediate Level | 28 | 36.8 | (of experimental sample) |
| | Secondary Level | 26 | 34.2 | (of experimental sample) |
| Total Sample | | 117 | 100 | |

## 3. DATA COLLECTION INSTRUMENT

The data collection was accomplished using a structured questionnaire that have been developed in the form of a survey that used specific questions, used to obtain answers or specific information from people. It was developed carefully and constructed by specialists and experts for the specific purpose of measuring what the questionnaire was trying to measure for accuracy. The survey was designed to help assess the role of Artificial Intelligence-AI Applications, towards achieving the goals of art education. The initial form of the questionnaire was constructed around the goals of art education in Kuwait's general education background system [1]. As part of judging the questionnaire's validity, 14 specialists and experts in art education reviewed the questionnaire which summarised a level of agreement at 92.9% acceptance rate indicating that the questionnaire is valid merit to administer.

The final questionnaire comprised 47 items grouped under six main dimensions:

- Identity and national belonging: 10 items.

- Artistic production: 12 items.
- Artistic appreciation: 6 items.
- Art history: 8 items.
- Art criticism: 5 items.
- Artistic communication: 6 items.

Respondents were asked to indicate their level of agreement using a three-point Likert scale (Agree, Neutral, and Disagree). The questionnaire was delivered to the study participants using Google Forms to ensure ease of access, efficient data collection, and consistency in responses across a wide sample of art teachers. The study utilized a combination of descriptive statistics and inferential statistics to present its findings. Descriptive methods included calculating means, standard deviations, and frequencies/percentages to summarize teacher responses on a three-point Likert scale. For inferential analysis, independent samples t-tests were used to compare two groups, while Analysis of Variance (ANOVA) was applied for comparisons involving three or more groups, with p-values determining statistical significance.

## 4. VALIDATION AND RELIABILITY OF THE INSTRUMENT

More importantly, to enhance the validity and reliability of the questionnaire, a pilot test was performed with 41 teachers. Content validity was confirmed when specialists and experts reviewed it, and internal consistencies were determined by the correlation coefficients ranging from 0.35* to 0.89**, indicating a strong internal structure. To assess the reliability of the questionnaire, it was evaluated using Cronbach's alpha to arrive at an alpha of 0.97**, giving credibility to the reliability of the instrument. A reliability value of 0.70 or greater is acceptable, subsequently strengthening the robustness of the instrument and suggesting that the questionnaire is ready for publication [21].

Moreover, in keeping with ethical practice, informed consent was obtained from the participants prior to their involvement in the study. The study details and the voluntary nature of their participation were fully explained to the participants. Participants' responses to the questionnaire were kept strictly confidential for ensuring anonymity.

## IV. RESULTS

This section provides complete, detailed results of the statistical investigation outlining public art educators' perspectives in Kuwait on utilizing artificial intelligence applications to achieve the six fundamental aims of art education. Overall, these data indicate a number of important findings regarding the perceived role of AI in supporting certain educational aims, along with significant differences based on teachers' demographic characteristics and professional backgrounds.

## 1. THE FIRST RESEARCH QUESTION

"What is the role of artificial intelligence applications in achieving the objectives of art education from the perspective of general education teachers?"

To address this question, we analyzed teacher perceptions regarding AI's contribution to each of the six art education goals. The subsequent subsections detail these findings, highlighting the varying levels of agreement and the specific ways AI is believed to impact each objective.

*1.1 Identity And National Belonging*

**Table 2.** The role of AI applications in promoting national identity and belonging.

| No | Items | Agree | | Statement Neutral | | Disagree | | Mean | Std. Dev. |
|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | | |
| 1 | Raising the learner's artistic taste by contemplating nature's beauty and aesthetic values through 3D drawing programs. | 1 | 1.3 | 47 | 61.8 | 28 | 36.8 | 1.64 | 0.51 |
| 2 | Refining learner behavior through controls, copying rules, and intellectual property rights. | 43 | 56.6 | 13 | 17.1 | 20 | 26.3 | 2.30 | 0.86 |
| 3 | Instilling religious principles through artistic models of religious rituals. | 41 | 53.9 | 13 | 17.1 | 22 | 28.9 | 2.25 | 0.88 |
| 4 | Strengthening learners' connection to their environment through virtual reality programs. | 68 | 89.5 | 8 | 10.5 | - | - | 2.89 | 0.31 |
| 5 | Enhancing the learner's artistic expression in social and national contexts. | 68 | 89.5 | 8 | 10.5 | - | - | 2.89 | 0.31 |
| 6 | Fostering learners' sense of belonging through realistic programs that illustrate national epics. | 65 | 85.5 | 11 | 14.5 | - | - | 2.86 | 0.35 |
| 7 | Increasing learners' pride in their country through programs featuring historical figures. | 58 | 76.3 | 18 | 23.7 | - | - | 2.76 | 0.43 |
| 8 | Expanding learners' reflection on aesthetic values through balanced artistic expression. | 40 | 52.6 | 13 | 17.1 | 23 | 30.3 | 2.22 | 0.89 |
| 9 | Raising learners' awareness of the importance of moral and aesthetic values in art. | 43 | 56.6 | 13 | 17.1 | 20 | 26.3 | 2.30 | 0.86 |
| 10 | Strengthening learners' artistic expression on national and religious issues. | 64 | 84.2 | 12 | 15.8 | - | - | 2.84 | 0.37 |
| Total | | 491 | 64.6 | 156 | 20.5 | 113 | 14.9 | 2.50 | 0.46 |

Key: 1- 1.66 = Disagree, 1.67- 2.33 = Neutral, 2.33- 3 = Agree.

The most surprising finding in those data is that the mean response for the art education teachers' sample was 2.50, which indicated high levels of agreement regarding AI applications' role in developing learners' national identity and sense of belonging. The respondents' approval responses accounted for 64.6%, neutral responses accounted for 20.5%, and disagreement responses accounted for 14.9%. The approval responses demonstrated AI applications' clear and significant role in this area. Just as licensed programs comply with rules about copying and intellectual property, the role of programs in developing learners' conduct, religious values, perceptions of their environment, their ability to create art, and their sense of belonging to their homeland is clear. AI applications can also extend their options of contemplation and awareness of the importance of moral values and facilitate their artistic statements about national/social issues. However, it is clear that there are also challenges because when using 3D drawing programs, using contemplation and appreciation to develop learners' artistic taste regarding natural beauty and aesthetic values will be difficult. These findings certainly indicate that even though artificial intelligence is invaluable in developing national identity and self-agency applications, and providing relatively easier access to many unlimited perspectives, more needs to be done to develop learners' further awareness in relation to developing a deep aesthetic appreciation of natural beauty.

### 1.2 Artistic Production

**Table 3.** The role of AI applications in supporting artistic production.

| No | Items | Agree F | Agree % | Neutral F | Neutral % | Disagree F | Disagree % | Mean | Std. Dev. |
|----|-------|---------|---------|-----------|-----------|------------|------------|------|-----------|
| 1 | Providing learners with technical information on tools and materials and their role in artistic production. | 60 | 78.9 | 16 | 21.1 | - | - | 2.79 | 0.41 |
| 2 | Offering opportunities to explore creative abilities in plastic arts. | 42 | 55.3 | 15 | 19.7 | 19 | 25.0 | 2.30 | 0.85 |
| 3 | Training learners to use modern technologies in artistic work. | 68 | 89.5 | 8 | 10.5 | - | - | 2.89 | 0.31 |
| 4 | Introducing basic concepts of technical expertise. | 68 | 89.5 | 8 | 10.5 | - | - | 2.89 | 0.31 |
| 5 | Training learners in free artistic expression techniques. | 61 | 80.3 | 15 | 19.7 | - | - | 2.80 | 0.40 |
| 6 | Developing skills for building artistic works. | 40 | 52.6 | 14 | 18.4 | 22 | 28.9 | 2.24 | 0.88 |
| 7 | Helping learners choose artistic fields that suit their interests. | 62 | 81.6 | 14 | 18.4 | - | - | 2.82 | 0.39 |
| 8 | Meeting learners' needs in visual arts. | 65 | 85.5 | 11 | 14.5 | - | - | 2.86 | 0.35 |
| 9 | Applying exploratory methods in artistic expression. | 66 | 86.8 | 10 | 13.2 | - | - | 2.87 | 0.34 |
| 10 | Discovering and nurturing artistic talents. | 41 | 53.9 | 10 | 13.2 | 25 | 32.9 | 2.21 | 0.91 |
| 11 | Engaging learners in artistic work both inside and outside the classroom. | 67 | 88.2 | 9 | 11.8 | - | - | 2.88 | 0.33 |
| 12 | Encouraging material selection for artistic expression. | 42 | 55.3 | 12 | 15.8 | 22 | 28.9 | 2.26 | 0.88 |
| Total | | 682 | 74.8 | 142 | 15.6 | 88 | 9.6 | 2.65 | 0.41 |

The data presented in Table 3 indicate that the mean response of the art education teachers' sample was 2.65, suggesting a strong level of agreement about the significant role of AI applications in enhancing learners' overall artistic production. The distribution of responses was 74.8% approval, 15.6% neutral, and 9.6% disagreement, providing a clear indication that AI applications positively impact learners' artistic production and production overall. AI applications prepare learners by providing information related to the tools, materials, and equipment they used in artistic production, and encourage learners to explore their creative possibilities in plastic arts processes. AI applications also promote using contemporary techniques and support their incorporation into artistic fields connected to the learners' interest, satisfy their needs related to free artistic expression, and help them discover their talents by suggesting materials for their preferred artistic fields. Overall, the results affirmatively support the usage of artificial intelligence through the tangible benefits of AI in providing learners with resources and frameworks for creative expression along with their artistic production.

*1.3 Artistic Appreciation*

**Table 4.** The role of AI applications in enhancing artistic appreciation.

| No | Items | Agree | | Statement Neutral | | Disagree | | Mean | Std. Dev. |
|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | | |
| 1 | Training learners to have an artistic vision of natural and artificial elements. | 2 | 2.6 | 43 | 56.6 | 31 | 40.8 | 1.62 | 0.54 |
| 2 | Applying artistic vision in plastic work through simulation programs. | 43 | 56.6 | 13 | 17.1 | 20 | 26.3 | 2.30 | 0.86 |
| 3 | Organizing artistic elements according to aesthetic standards. | 41 | 53.9 | 13 | 17.1 | 22 | 28.9 | 2.25 | 0.88 |
| 4 | Introducing learners to the philosophy of art and beauty. | 62 | 81.6 | 12 | 15.8 | 2 | 2.6 | 2.79 | 0.47 |
| 5 | Training on artwork components related to nature's aesthetics. | 38 | 50.0 | 14 | 18.4 | 24 | 31.6 | 2.18 | 0.89 |
| 6 | Linking artistic elements to nature's creativity. | 4 | 5.3 | 41 | 53.9 | 31 | 40.8 | 1.64 | 0.58 |
| Total | | 190 | 41.7 | 136 | 29.8 | 130 | 28.5 | 2.13 | 0.61 |

The findings emphasize that learners' average response was 2.13, indicating a level of neutral agreement regarding the function of the application of AI to support the appreciation of art. The agreement response rate was 41.7%, the neutral response rate was 29.8%, and the disagreement rate was 14.9%. This suggests that learners moderately recognize the contributions of AI applications in facilitating artistic appreciation. AI applications contribute to multiple formats. For example, AI applications assist learners to become involved in learning about the philosophy of art and beauty while learning about how art is integrated into their lives and society. In another format, AI applications act as a medium for learners to apply their artistic vision in building and organizing the components of plastic artwork in a balanced, harmonious manner with respect to aesthetic standards that various simulation programs allow. While there are ways to apply AI applications in this manner, there are significant challenges in implementing them, especially the challenge of developing learners' artistic vision of natural elements and their appreciation for the natural beauty and creative elements. Similarly, there is a challenge in linking artificial scenarios that students create with natural scenarios that are immersive of creativity, aesthetics, and unseen "complexities". Overall, these results demonstrate that while artificial intelligence has provided some promising tools for theoretical art appreciation and understanding of composition, there are still some barriers hindering its ability to support a deeper, more organic appreciation of the innate aesthetics of nature and their relationship to art.

*1.4 ART HISTORY*

**Table 5.** The role of AI applications in art history learning.

| No | Items | Agree | | Statement Neutral | | Disagree | | Mean | Std. Dev. |
|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | | |
| 1 | Introducing learners to local, Arab, and international arts. | 62 | 81.6 | 7 | 9.2 | 7 | 9.2 | 2.72 | 0.62 |
| 2 | Presenting famous artworks through virtual museums. | 61 | 80.3 | 8 | 10.5 | 7 | 9.2 | 2.71 | 0.63 |

| No | Items | Statement | | | | | | Mean | Std. Dev. |
|---|---|---|---|---|---|---|---|---|---|
| | | Agree | | Neutral | | Disagree | | | |
| | | F | % | F | % | F | % | | |
| 3 | Highlighting heritage arts using augmented reality. | 66 | 86.8 | 10 | 13.2 | - | - | 2.87 | 0.34 |
| 4 | Developing artistic trends based on cultural heritage. | 64 | 84.2 | 12 | 15.8 | - | - | 2.84 | 0.37 |
| 5 | Providing a comprehensive history of arts and cultures. | 61 | 80.3 | 14 | 18.4 | 1 | 1.3 | 2.79 | 0.44 |
| 6 | Deepening artistic thought through philosophical schools. | 61 | 80.3 | 13 | 17.1 | 2 | 2.6 | 2.78 | 0.48 |
| 7 | Utilizing art history knowledge to enrich critical thinking. | 64 | 84.2 | 10 | 13.2 | 2 | 2.6 | 2.82 | 0.45 |
| 8 | Emphasizing cultural heritage in artistic projects. | 57 | 75.0 | 18 | 23.7 | 1 | 1.3 | 2.74 | 0.47 |
| Total | | 496 | 81.6 | 92 | 15.1 | 20 | 3.3 | 2.78 | 0.39 |

The data presented in Table 5 show that the participants' mean response was 2.78, indicating higher levels of agreement regarding the usefulness of AI applications in helping learners be acquainted with the history of art. The responses included agreement responses (81.6%), neutral (15.1%) disagreement (3.3%), meaning there is good positive indication of AI's contribution. This is provided by familiarizing learners with the identity and historical heritage of their own country's artistic traditions, exposing them to the artistic schools of surrounding cultures, and by showcasing the works of local and international visual artists through international art museums and research opportunities through AI application powered transcontinental museums. The results definitely suggest that artificial intelligence is viewed as a very good technology for teaching art history by allowing learners to engage with irregular artistry, the heritage of learners, historiography of different arts, and engagement with multimedia artefacts through organized and advanced platforms digitally.

## 1.5 ARTISTIC CRITICISM

**Table 6**. The role of artificial intelligence applications in achieving artistic criticism.

| No | Items | Statement | | | | | | Mean | Std. Dev. |
|---|---|---|---|---|---|---|---|---|---|
| | | Agree | | Neutral | | Disagree | | | |
| | | F | % | F | % | F | % | | |
| 1 | Facilitating discussions and feedback on artworks. | 63 | 82.9 | 7 | 9.2 | 6 | 7.9 | 2.75 | 0.59 |
| 2 | Supporting analysis through smart evaluation cards. | 58 | 76.3 | 16 | 21.1 | 2 | 2.6 | 2.74 | 0.50 |
| 3 | Encouraging objective criticism of artworks. | 57 | 75.0 | 16 | 21.1 | 3 | 3.9 | 2.71 | 0.54 |
| 4 | Providing opportunities for individual and group feedback. | 59 | 77.6 | 16 | 21.1 | 1 | 1.3 | 2.76 | 0.46 |
| 5 | Promoting self-critique of personal artwork. | 60 | 78.9 | 14 | 18.4 | 2 | 2.6 | 2.76 | 0.49 |
| Total | | 297 | 78.2 | 69 | 18.2 | 14 | 3.7 | 2.74 | 0.44 |

The high agreement level (78.2%) reflects the positive impact of AI on artistic criticism, especially in fostering dialogue and structured critique. Teachers show strong agreement on the positive impact of

artificial intelligence on art criticism (mean = 2.74, 78.2% agreement), highlighting its effectiveness in facilitating discussions, feedback, and objective critique of artworks.

### 1.6  Technical Communication

**Table 7**. The role of AI applications in technical communication.

| No | Items | Agree | | Neutral | | Disagree | | Mean | Std. Dev. |
|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | | |
| 1 | Engaging in cultural art activities. | 62 | 81.6 | 11 | 14.5 | 3 | 3.9 | 2.78 | 0.51 |
| 2 | Enriching artistic vision through activities. | 59 | 77.6 | 11 | 14.5 | 6 | 7.9 | 2.70 | 0.61 |
| 3 | Participation in art exhibitions and forums. | 63 | 82.9 | 12 | 15.8 | 1 | 1.3 | 2.82 | 0.42 |
| 4 | Understanding the role of art in daily life. | 61 | 80.3 | 13 | 17.1 | 2 | 2.6 | 2.78 | 0.48 |
| 5 | Fostering teamwork through group art projects. | 63 | 82.9 | 8 | 10.5 | 5 | 6.6 | 2.76 | 0.56 |
| 6 | Exploring online art schools and resources. | 63 | 82.9 | 10 | 13.2 | 3 | 3.9 | 2.79 | 0.50 |
| Total | | 371 | 81.4 | 65 | 14.3 | 20 | 4.4 | 2.77 | 0.43 |

The data showed a high level of agreement (81.4), with findings corroborated where AI contributed significantly to art-related activities and offered new and dynamic ways to communicate culture. Agreement responses were closely positioned at 78.2%, neutral responses were also relatively high at 18.2%, and disagreements were positioned at 3.7% suggesting a strong positive indicator of the effectiveness of AI applications within a teaching-and-learning context. This is demonstrated particularly in generating dialogue, discussions, and subsequently articulating opinions in analysing and interpreting artistic works through the use of AI powered evaluation cards. Notably, AI applications supported the learners by providing complete autonomy to conduct individual and group analysis and objective critique of artworks, with learners being able to engage in creative critical thinking and evaluative activities. In conclusion, teachers provided broader support that artificial intelligence had a meaningful role in technical communication, suggesting that it was effective in enabling dialogue and supported learners testing out and engaging in a critical analysis and interpretation of art through AI.

### 2.  THE SECOND RESEARCH QUESTION

"How do teachers' perspectives on the role of AI applications in achieving the goals of art education vary based on variables such as gender, academic qualifications, AI training, and academic level?" The fourth research question examined the extent to which the research sample responses varied regarding the role of artificial intelligence (AI) applications in achieving the goals of art education based on variables such as gender, academic qualification, AI courses, and academic stage.

### 2.1  Differences based on Gender, Academic Qualification, and AI Courses

**Table 8**. Differences in responses according to Gender, Academic Qualification, and AI Courses.

| Variable | Classification | N | Mean | Std. Dev. | df | t | Sig. |
|---|---|---|---|---|---|---|---|
| Gender | Males | 32 | 2.64 | 0.39 | 74 | 0.77 | 0.444 |
| | Females | 44 | 2.57 | 0.38 | | | |
| Educational Qualification | Bachelor's | 57 | 2.52 | 0.40 | 74 | 3.14 | 0.002 |
| | Postgraduate | 19 | 2.82 | 0.16 | | | |
| AI Courses | No Courses | 36 | 2.30 | 0.35 | 74 | 9.70 | 0.000 |
| | Took Courses | 40 | 2.87 | 0.12 | | | |

The data show no statistically significant differences in responses based on gender (t = 0.77, p = 0.444) allowing us to conclude that male and female teachers have more or less similar perceptions of the role of AI applications in art education. There was, however, statistically significant difference in responses based on academic qualification (t = 3.14, p = 0.002) showing teachers with postgraduate qualifications rated their ability to use AI tools as more proficient, indicating some correlation between higher qualifications and competency to use AI applications. Finally, a statistically significant difference was found on the basis of participation in courses about AI applications (t = 9.70, p = 0.000), with teachers who participated in AI courses noting higher levels of agreement about the benefits of AI in art education compared to teachers who did not take AI courses, which points to a correlation between courses and teacher agreement. Collectively, these findings suggest that while gender did not influence perceptions of artificial intelligence in art education, higher academic qualifications most importantly, specialized courses in AI applications were found to account for more teacher agreement and competency with leveraging the benefits of AI.

## 2.2 DIFFERENCES BASED ON ACADEMIC STAGE

**Table 9**. Differences in responses according to the academic stages.

| Variable | Classification | N | Mean | Std. Dev. | F | Sig. |
|----------|----------------|----|------|-----------|-------|-------|
| Academic Stage | Primary | 22 | 2.37 | 0.44 | 6.401 | 0.003 |
| | Middle | 28 | 2.67 | 0.37 | | |
| | High School | 26 | 2.71 | 0.26 | | |
| | Total | 76 | 2.60 | 0.38 | | |

The data presented in the above table indicate a statistically significant difference (F = 6.401, p = 0.003) between the teachers' responses on the academic stage. The high school teachers had a higher level of agreement compared to the primary school teachers demonstrating that the older the students were, the more likely the teacher will use advanced art AI tools. The findings suggest that the teachers' perception of benefits of advanced art AI tools and their readiness to implement advanced art AI tools in teaching outside of arts expanded considerably from primary to secondary teachers, with the highest level of agreement from high school teachers.

## V. CONCLUSION

The research examined the role of AI applications in achieving the objectives of art education in Kuwait, the results processed by statistical analysis revealed a number of results; the results for the first research question revealed the positive significant role of AI applications in achieving the art education objectives, with an overall level of agreement of 2.60 (86.7%).

The highest rated objective was art history, with an agreement level of 2.78 (92.7%). This shows that AI is effective in enriching learners' understanding of art history and cultural heritage as well as giving them access to a range of local and international artists highlighting the essential role of AI in art education, and specifically art education history and its different schools of thought, which is in alignment with other studies in the same area [22, 23].

The second objective, technical communication, received a mean agreement level of 2.77 (92.3%), once again emphasizing the role of AI in creating educational interaction and collaboration among learners, and teachers and educational institutions by forming virtual art museums and sharing digital art works. AI is positive & effective for educational communication [5]. Artistic critique received a high level of agreement also at 2.74 (91.3%), and this shows AI applications are providing teachers with more means by which to engage students actively in the critique and critiquing of works of art and art-based products. These findings corroborate previous studies that demonstrated the value of AI in enhancing the analytical abilities of

learners within the context of experiential interactive learning - although none of the studies specifically addressed art-based interactions.

The artistic production goal achieved a level of agreement of 2.65 (88.3%) with the participants demonstrating that AI opened up avenues for learners to engage in artistic expression and experimentation through the use of contemporary tools, materials and devices. Participants agreed to a level of 2.50 (83.3%) for deepening identity and national belonging goals as the AI Applications plays role in allowing learners to engage with their environment and cultural heritage through their artistic projects and express their sense of belonging.

However, the artistic appreciation goal had the lowest agreement level of 2.13 (71.0%) as participants noted issues with engaged learners in developing their ability to appreciate the beauty of natural aesthetics, especially when relating artificial depictions to the beauty and complexity of nature. Some problems noted with developing the aesthetic abilities of learners included engaging them with their artistic taste and style using 3D drawing programs, developing an appreciation for the aesthetic elements of natural components with virtual representations, and connecting the artificial scenarios to the imagination and beauty present in nature.

Other issues, such as data privacy, reliability, and intellectual property, were also concerns. This echoes findings from other studies [2, 5], as well as issues related to privacy, reliability, and active educational engagement by the application of AI. Although AI applications enhance student motivation, creativity, etc., they may also erode students' normal skills such as drawing, colouring, and art appreciation skills [14].

The results for the second research question yielded the following results. There is no statistically significant difference in the responses of male or female teachers in regard to AI applications in teaching, (t = 0.77, p = 0.444). This indicates that both male and female teachers exhibited similar intensions toward adopting AI applications within their teaching practice. The lack of difference may be attributed to availability of advanced tools, that will allow users to research art history, artistic identity, and philosophical paint an array of perspectives on artists were presented with visual and video content to enrich their view on art.

There is a statistically significant difference in qualifications (t = 3.14, p = 0.002), in favour of the postgraduate qualified teachers. This indicates that the most qualified teachers would have increased abilities to use the more recent AI applications for research, drawing, artistic formation, creativity, and enrichment, which correlates to advanced uses of AI applications in art education.

When considering AI training, it was found that there was a statistically significant difference (t = 9.70, p = 0.000) involving the AI training group of teachers. The difference indicated that there was a benefit for teachers participating in AI-related course work. The difference illustrates the significance of training in developing teachers' ability to apply AI applications effectively. Training helps developing teachers to understand the limitations of usage, the importance of retaining cultural identity, while understanding how to use AI apps in a manner that best supports sophistication, student's artistic preferences, and needs; and the possibilities available in terms of exposing students to local and international modes of creative expression to extend learner's talents.

Finally, looking at academic stage, it was shown that there was a statistically significant difference (F = 6.401, p = 0.003). High school teachers were more inclined to agree with using AI technology in education compared to primary, or middle grades. This suggests that as learners mature and the educational stage increased, both the learners and the teachers had more exposure and understanding of advanced educational technology which allowed teachers to incorporate AI technology into their practice, therefore engaging in more advanced art education. This creates a stronger foundation for deeper learning, and ensuring educational goals and objectives are achieved.

The research results highlight the significant contribution of AI applications in order to achieve the goals of the art education curriculum in Kuwait. AI applications expanded learners' understanding of art history, increased technical communication, aided in participation in virtual exhibitions, and supported students in developing artistic criticism through interactive analysis. AI tools also enhance artistic production by assisting students in accessing materials and tools and motivating creativity, and advance students' sense of identity and belonging to a nation and its citizenship by enabling artistic expression about issues within that

nation and society. However, there is still several important gaps, for example, the limitations of fostering aesthetic appreciation using AI tools has been shown, especially because of the difficulties in effectively mimicking natural aesthetics and the challenges of creating and enforcing rules regarding intellectual property.

The findings about artificial intelligence in Kuwait relate to the literature and reveal an established positive outlook, addressing relevant challenges. As in the present study, recent studies of AI and art education [24, 25, 26] report positive findings related to AI's contributions to students' appreciation of art history, technical communication, and artistic production. Challenges uncovered in the study, such as fostering students' deeper aesthetic appreciation of natural beauty, in addition to data privacy, limits of intellectual property contributions, have also been noted in the literature [27, 28]. This literature reports the above issues as areas for further consideration and not as reasons to dismiss AI's overall contribution. Thus, while the findings highlight the substantial contribution of AI to art education, it must be recognized that AI's use within art education must be mediated to address these provisions.

This study is notable for its specific focus on the aims of art education in Kuwait, providing a distinctive Middle Eastern context contrasting with much of the literature emphasizing a Western worldview. It offers substantive detail regarding the perceived implications of artificial intelligence across six different art education aims: aesthetic perception of significance and value (finely grained beliefs and knowledge); artistic skill and highly contextual knowledge of artistic practice (practical capabilities); and socio-cultural and political knowledge (contextual capability), and illuminates how public-school art teachers a relevant key stakeholder group understand the implications of the integration of AI applications. The study highlights the overwhelming complexities of aesthetics, stating that aesthetics represents a problematic and perplexing challenge for AI tools, which were seen as ineffectively connecting artificial simulations with natural aesthetic perception. Further, the study reveals pathways for mapping reasonably moderate variations between the perceived benefits of AI by academically qualified-teachers, profession-based AI training, and teaching at higher levels of education valuable perspectives for educational policy and professional development.

This study's practical recommendations largely reflect the themes of the findings as they recommend some approach to a multi-faceted implementation of artificial intelligence in art education. The policymakers in the Ministry of Education need to incorporate significant infrastructures such as technological devices and internet accessibility; to implement a standard for the implementation of educator-based artificial intelligence tools to ensure emphasis on not infringing on intellectual property and better simulation realism, which can help inform aesthetic appreciation; and for adequate funding to ensure retrieval of training for educators.

Additionally, policymakers should participate in programs that encourage general and licensed access to AI tools for learners to foster ongoing learning and imaginative experimentation. Policymakers also need to secure and maintain technical support for both teachers and students that assist in helping address the challenges encountered while using AI applications.

On the other hand, art educators should become participants in a professional development program that offers a comprehensive overview of how to weave AI into many different aspects of art education topics, as well as run student workshops using AI with a focus on using AI to investigate forms of creativity related to artistic expression and national identity. Finally, learners should be encouraged to use AI for learning purposes consistently, and to participate in organized workshops that use AI in creative art experiences.

Yet, the research study has limitations, and a large limitation is that it has a descriptive level of research that uses teachers' perceptions through self-assessment questionnaires making it difficult to determine any cause and effect, and these self-assessments could affect perceptions as biases exist. Another significant limitation to this study is the lack of student voice, which cannot give us a complete picture of what artificial intelligence means to art education from the learners' standpoint. Moreover, the focus of this study was contextualized in regard to identity, place, and culture. Therefore, if any of the findings are specifically related to cultural dimensions, they might not be generalizable or transferrable to other curricula or cultural contexts.

Future studies should also consider a few other areas in order to further disentangle the role of AI within the context of art education. Specifically, I think it's important to also consider how AI design and teaching practices can help to foster students' appreciation of art, especially if there is a connection between the digital experience and natural aesthetics. Future studies should also focus on the effect of AI-focused teacher training on teacher practices and student creativity in an art education context. It would be insightful to compare AI in a range of contexts, particularly across the primary, intermediate, and secondary educational levels, to better understand what might be age-appropriate for art-making experiences. Finally, longitudinal studies are important for understanding the long-term impact of AI on the experience and processes of traditional making and skills, but also for developing understandings of ethics related to authorship and intellectual property in student work that has involved AI.

## Data Availability Statement

The data supporting the findings of this study are available from the author upon request.

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