

A Discussion of Artificial Intelligence in Visual Art Education

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Abstract

Since *ChatGPT* emerged on November 30, 2022, Artificial Intelligence (AI) has been increasingly discussed as a radical force that will change our world. People have become used to AI in which such ubiquitous technologies as Siri, Google, and Netflix deploy AI algorithms to answer questions, impart information, and provide recommendations. However, many individuals including originators and backers of AI have recently expressed grave concerns. In this paper, the authors will assess what is occurring with AI in Visual Arts Education, outline positives and negatives, and provide recommendations addressed specifically for teachers working in the field regarding emerging AI usage from kindergarten to grade twelve levels as well as in higher education.

Keywords

Visual Art Education, Art Education, Artificial Intelligence, AI, Generative Artificial Intelligence, GAI, Art Teaching and Learning, Art Pedagogy, Art Curriculum Development, Digital Art Education, Art, Art Education, Critical Literacy

1. Introduction

Recently, *ChatGPT* hit the world like a storm when it was issued on November 30, 2022, by OpenAI. By January, two months later, it had 100 million monthly users [1]. We have seen in a short period of time tremendous availability of such artificial intelligence (AI) programs made available on the Internet including *DALLE*, Google's *BARD*, and Microsoft's *BING*. AI includes such visual programs as *Midjourney* allowing users to create imagery from prompts, and *Stable Diffusion* enabling consumers to make pictures from text descriptors [2] [3]¹.

¹For a discussion of the history of technology refer to Black's article [43] and Tavin, Kolb and Tervo (2021) [44].

Why is AI increasingly a concern in education? Innovators and entrepreneurs have called on AI regulations, licensing and testing models before new AI technologies emerge envisioning the harm AI could cause society. Among these expressing grave apprehensions include the “Godfather” of AI, Geoffrey Hinton (who recently resigned from Google), and Apple co-founder, Steve Wozniak, to the founder of Open AI, Elon Musk, and the creator of *ChatGPT*, Sam Altman. They argued humans need to halt processes, asking for a 6-month hiatus on emerging AIs ([4] [5] [6]).

Individuals are increasingly using AI globally from work to play from industry and healthcare to education [7]. AI has made a radical change creating digital programs having *entities with agency* or simply, “machines” enabled with a sense of control, or a capacity to influence “their own” (AI’s) thoughts and behaviors and have abilities to handle a broad range of human-oriented tasks and situations [8] [9]. In this article, we provide a brief background about AI, and its current educational usage, and examine opportunities and concerns for using it in Visual Art Education from K-12 and in higher education. Finally, we offer broad recommendations for educators teaching AI.

AI Usage in Art Education

Globally AI influences all aspects of our lives, from individuals’ credit scores to employability. Simply defined, AI could be considered a digital computer or robot intelligence mirroring many cognitive human performances and undertaking certain tasks that previously were undertaken by humans, such as compiling data, comprehending texts, writing, and making digital artworks [10] [11]. Traditional artmaking could be considered anthropocentric: it refers to human-made or human-centred art creation. Researchers suggest the pressing need for art educators to consider ways to adapt teaching and learning to new and emerging non-human AI technologies being developed for and utilized in art classrooms and how this will be applied to students’ art skills, abilities, knowledge, and creativity [10] [12] [13] [14].

The authors found in K-12 schools, students use programs like *ChatGPT* to aid writing, whether it is developing art essays, art reports, art critiques or creative texts. In higher education, some students in our Faculty of Education at the University of Manitoba in Canada have been experimenting with AI-based platforms to generate texts using AI such as OpenAI’s *ChatGPT*, Google’s *LaMDA*, and *Stability AI*. AI image generators are also being used like *Adobe Character Animator* for animations, videos using the *Runway App*, and slide presentations using *TOME*. Moreover, using such generative AI software as *Artiphoria* makes visual imagery with a click of the mouse. AI photo editing software enables users to create, manipulate, and edit images in an instant using, for instance, *Photo-leap*, *Luminar Neo* or *PhotoRoom*.

For research, art students/researchers within higher education, are discovering that AI can offer many possibilities. For instance, AI tools can help graduate students generate text-based research questions using programs such as *Gemini*

and aid with article summarization like *Scholarcy* while also assisting in writing literature reviews using tools like *Elicit and Consensus*. During data analysis readily available are such AI tools as *Tableau AI* or *Power Bi*. Consequently, users suggest that even though AI technologies are currently unsophisticated and have errors, it saves time, and enables students to obtain data and ideas. AI programs are often free, simple to use, and easily accessible to the international public. Overall, in discussing the possibilities of AI, we have found in our own teaching that many students' usage and reactions are positive reflecting possibilities within education.

Teaching visual art within art education encompasses a wide array of areas. Of particular importance is artmaking, which has been traditionally anthropocentric: some examples are the creation of traditional paintings, drawings, prints, and sculptures. Also embedded in teaching traditional visual arts include areas of import such as art theory, art aesthetics, art history, and artistic critical analysis. The authors believe the scope and application of generative artificial intelligence are wide-ranging with the capacity to help educators teach and students to learn in the above areas.

In kindergarten to grade twelve schools and within higher education, we have found that students and their teachers are using programs like *ChatGPT* to help with their artwork whether it be developing creative artworks, (examples are **Figure 1** & **Figure 2**), making presentations about art or writing art essays, art reports and art critiques (to cover the art history, aesthetics and theory of art) or responding critically to creative art texts. In his articles, Leonard [9] [12] suggests art educators need to consider how to adapt teaching and learning to new and emerging non-human AI technologies being developed for and utilized in art classrooms and how this will be applied to students' art skills, abilities, knowledge, and approaches to creativity. Others in Art Education agree that with the advent of certain easy-to-use and free AI software, there is a pressing need to address the above concerns about new generative AI programs in visual art education [10] [13] [14].

2. Benefits of AI in Art Education

Today's students flourish within a world ever more technologically advanced using AI [15]. There are benefits: some ideas are described by ChatGPT itself evident in **Figure 3**. Applications driven by AI technologies are increasingly utilized in K-12 schools and universities [11] [16]. What are the reasons for educational AI utilization?

The OECD [17] claims AI can enhance human thinking, augment educational processes, and maintain competitiveness in a globalized world. Moreover, AI can act as mechanisms to enhance [educational] organization's ability to adapt to changing environments and not reduce it to procedures for content delivery, control, and assessment [17] [18].

For educators AI can personalize educational plans according to specific student requirements. It can also foster student immersivity through highly

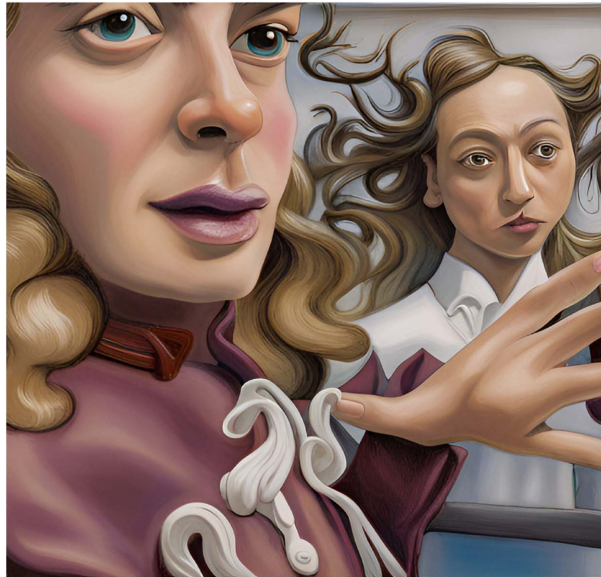


Figure 1. *Daughters*. June 2023 created by Tom Chaput using Dream. Studio. A teacher's example using AI to explore portraiture using acrylic paint.



Figure 2. *Wail*. August 2023 created by Tom Chaput using Night-Cafe. Studio. A teacher's example of using AI to explore the theme of loss using charcoal.

intelligent tracking, providing engagement in multiple perceptions and simulated interactive experiences [1] [12] [17]. This results in injecting vitality into personalized learning [17] [19]. Additionally, AI can detect some plagiarism, help exam integrity, and be utilized for enrollment/retention, learning management systems, and analysis of student success metrics [20]. Moreover, AI can be used to evaluate students' work [21] thereby freeing educators to focus on other duties [1].

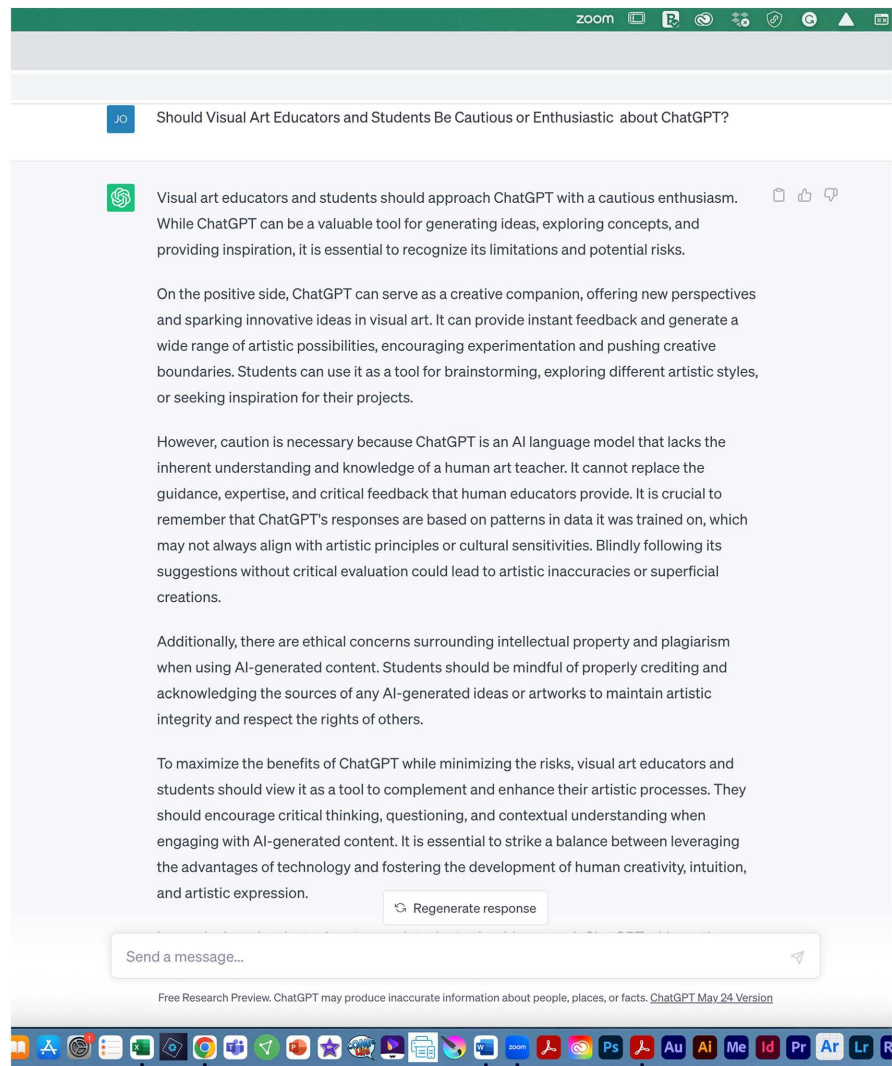


Figure 3. *A short essay on the value of ChatGPT*, created May 2023 by Joanna Black. The co-author queries ChatGPT about its usage for Visual Art Educators.

For students, AI can offer insights into complicated and challenging problems/inquiries giving learners the ability to mine untold amounts of data [3] [11] [13]. It enables experimental, playful, creative, and critical learning similar to professional artists AI usage [13] [14] consequently cultivating innovative thinking [18] [19]. Also, AI provides opportunities for learners to meet their societal and individual needs [16] [18].

In summary, it is claimed AI may foster positive teaching and develop more engaged pupils [1] [12] [18]. Many researchers argue this is an exciting era in which AI advances will benefit education.

3. Concerns for AI in Art Education

Presently, there are apprehensions regarding AI as is described by AI itself apparent in **Figure 3**. One concern is because AI is created by people, who can be biased, racist, and/or sexist, AI information can manifest these same qualities.

There is an AI defect which manifests biases of (mostly white male) AI creators [22]. Rather than transcend human limitations to develop an equitable future for all, AI platforms may inadvertently repeat the same mistakes and lapses in judgment human creators do—allowing racism and discrimination to continue to promulgate in society today. Chomsky [2] [11] [23] claims many algorithmic models have encoded human bigotry, intolerance, confusion, error, and prejudice into the software. O’Neil [24] terms these “poisonous prejudices” (p. 124).

Chomsky [2] discusses current AI chatbots which lack critical capacity, creative criticism, moral thinking, personal feelings, and personal experiences. Chatbots cannot differentiate real from unreal, and for these reasons, Chomsky [2] argues, “predictions of machine learning systems will always be superficial and dubious” (p. 2). Additionally, automatic systems cannot sift through enormous amounts of data to seek common-sense fairness [24]. Moreover, AI texts are simplistic and repetitive [2].²

For educators it is important to consider that AI chatbots are unable to generate new ideas. AI systems can only collect large amounts of data: these technologies cannot create novel, innovative concepts, nor can they produce abstract, complex thoughts. What they do is comb through large terabytes of databases to classify and mine information [25]. Finally, worrisome is AI’s ease of use. Teachers may view AI abilities to make texts a way for students to circumvent the development of research, organization, critical thinking, artistic, creative, and communication skills as learners could rely on AI to produce such texts as essays, artworks, and PowerPoint presentations for their assignments.

For students, the oversaturation of AI-generated imagery may prevent them from uncritically engaging with it, as compared to the employment of human-centric art [12]. Additionally, ethical repercussions are problematic regarding student plagiarism using chatbots, and the possibilities of their spread of disinformation and misinformation [1] [26]. Han, *et al.* [27] discuss increasingly intrusive surveillance of students. Students’ concerns are sometimes neglected further increasing their vulnerability.

The above considerations can potentially create harm. As a result of a multitude of extremely valid concerns from researchers, we recommend educators should proceed to use AI with caution. From our perspective, teachers play a seminal role in ways AI should be used in teaching and learning. **Figure 3** is a written response from *ChatPGT* to the question of perceived benefits and disadvantages of using GAIs.

4. Ten Recommendations for Art Educators

1) Keep Traditional Visual Arts the Program Foundation: Art Educators have developed strong, diverse visual art curricula and pedagogical approaches [28]. When exemplary programs are formed using digital technologies it was found traditional visual art was the foundation of these programs [29]. As we use

²Repetition and simplicity could change and improve as AI software becomes more refined in the future.

new AI technologies in art, we should keep this successful approach. Digital and AI-based art requires a different skill set, but no less skill than traditional art-making. A digital or AI platform may hold capacities to make a stroke look and layer like oil paints or imitate drawing textures with charcoal/pencils. However, traditional artmaking does entail a different mode of thinking. When students learn traditional artmaking techniques, they inherently gain a deeper understanding of materials and what they can achieve and can utilize this knowledge in AI artmaking.

2) Base Arts Curricula on Anthropocentric Art-Centred Themes: Traditional art denotes a human-centred and human-created experience, in exchange for a non-human creator [12] [15]. Art is a uniquely human phenomenon, communicating our emotions [30]. It expresses our individualistic, communal, and human-specific experiences. These purposes are often non-digital and engaged through human physical senses [31]. Therefore, art education could be viewed as a purely physical stimulus and means of a communicative medium of human experiences [30]. To engage students, traditional artmaking and idea development based on theme exploration are essential to creative growth.

3) Communicate AI Pros and Cons to Learners: To educate students about AI software, teachers should open discussions regarding AI benefits and pitfalls, its power, and limitations. These discussions must infuse communication of AI pros and cons using subject-specific curricula within art classes. Talks should be ongoing so visual art students can develop a broad understanding of how AI currently affects and will affect visual arts, as it becomes more invasive within art-making processes.

4) Oversee Learning: Students can become over-reliant on AI or take easy ways out of doing work. They could be selling themselves short in learning how to research, present sound arguments, and communicate these well. Additionally, they could lose skills like brainstorming, creative play, problem-solving and image creation if they constantly turn to AI to create texts. This may result in “a dumbing down” of our children if we, as teachers, allow students to mindlessly rely on AI. Therefore, we recommend vital, key learning take place in classrooms in real time. The adage is useful here, “If you don’t use it, you lose it!”

Emphasizing in-production learning during classes enables teachers to oversee in-class opportunities. They can watch over students’ skills and idea development using AI, opening discussions, collaborations, and critical thinking. This also enables educators to oversee learning processes, mark easily, and develop fluid AI pedagogy and curriculum that evolves as they watch students evolve.

5) Align AI Learning to Assessment Methods: As educators, one can stipulate to learners when AI should be used and when it should not. Consider that traditional processes such as handwritten notes, essays, tests, and sketchbooks can be assigned and assessed while incorporating AI: the traditional and the digital can be intertwined. When making digital art, students can be asked to save preproduction to postproduction processes digitally as screenshots and digital texts for formative and summative assessments. In discussing AI, Viljoen [11]

argues that project-based learning and assessments of these are key for AI teaching. It allows educators to comprehend student learning, critical thought, and creativity.

6) Focus on Project-Based Learning and the Dialogic: Art Educators excel in using a project-based-inquiry learning approach: so, do artists. Dialogue has been described as a relationship and experience that transcends teaching and becomes inspirational. It is a process requiring time, commitment, and mutual respect [32]. In using AI teachers can create dialogic, dialectical discussions within art-making processes. This may enhance critical and creative thinking proficiencies concerning, AI, and may allow for greater connections between students and educators during the creative process. These dialectic and dialogic processes, in addition to tactile art making, may act as a mechanism for stimulating and supporting the development of knowledge, meaning understanding, and utilization of AI.

7) Teach How to Research Well: With the advent of AI, Black and Fullerton [33] [34] argue it is imperative for art educators to teach students critical research skills, analytical thinking skills, and media education awareness. Why is this so important? In visual art classrooms, students are expected to create art, write art history texts, and offer presentations; consequently, they need to know how to research well. Students should become aware of roadblocks AI presents in research and production, including censorship, misinformation, disinformation, and fake news. Thus, developing critical literacy is key. Knowledge about cognitive biases, motivated reasoning, filter bubbles, censorship, deep fakes and other such Internet AI problems and texts are instrumental in any proper research undertaken [34] [35].

8) Criticize AI: Students should be taught that, currently AI is imperfect: it collects data although this data may promote hatred, fake news, gender bias, ageism, misogyny, and racism. Currently, it would be difficult with AI platforms and their existing advancements, to develop a completely ethical AI system because AI ethics are hard to define, implement, and enforce. Considering different forms of bias and ethical challenges in up-to-date AI applications in K-12 settings, the focus should be on privacy, surveillance, data security, autonomy, bias, and discrimination [36]. Therefore, students and educators must lead the way in handling AI ethics through critical thinking, dialogic discussions, and integration of AI into ethically focused art projects. This would allow students and teachers, opportunities to set ethical parameters, define norms, and engage in critical conversations regarding AI creative production. Ultimately, AI development will become an augmentation of who we are as individuals, and ethical standards of AI will be extensions of our ethics personally, and societally. In our efforts to build a more ethical society regarding our personal and societal lives, students and educators must endeavour to be critically-minded about AI usage and outcomes. We turn to Pente and Adams [37] who advise art educators to address the above concerns with their students. They advocate that art teachers examine professional artists who are critical of GAIs in order to foster their stu-

dents' comprehension of the above issues, investigate them further, and grapple with these very real and significant challenges.

9) Use AI Plagiarism Detectors: There are many available such as GPT Radar, Originally AI, GPTZero, and CopyLeaks. Although they are considered not well developed, imperfect and somewhat unreliable in detecting plagiarism as AI develops [21], Turnitin designed for academic usage is increasingly being used with great caution [26]. This can help detect student plagiarism and unethical practices.

10) Be Guided by Professional Artists' AI Usage: Current artists' professional use of AI has had a negative side regarding copyright issues [38]. Multiple unions have been fighting the handling of AI such as the Writers Guild of America (WGA) and the Screen Actors Guild-American Federation of Television and Radio Artists (SAG-AFTRA) [39]. It is important to be cognizant of this conflict while acknowledging many professional artists are excited about potentials of AI in making artwork [13] [14]. Teachers should use AI technologies to promote student creativity and offer them the means to address key issues in art production. Educators can look to professional artists to work with creative and exciting AI technologies using their approaches as models.

5. Added Reflections on AI in Visual Art Classrooms

The authors believe generative artificial intelligence can be used effectively to improve art teaching and art learning based on maintaining traditional teaching methods but integrating AI usage within this approach. For example, we will provide an example of one approach to the teaching of sculpture in the middle school classroom in order to illustrate this idea. After learning about hands-on sculptural techniques and professional artists' works that relate to a given art assignment, learners can proceed to the initial artmaking hands-on idea stage, wherein they can develop concepts for a creative sculptural work of art. Teachers can ask youths to utilize currently free AI programs such as *DALLE-E*, *Stable Diffusion* or *Midjourney* to develop artistic impressions. After thorough research, young learners can work out these ideas through drawings by refining them and combining them with their own content creation employing traditional drawing forms within their sketchbooks. The purpose is for students to develop many thumbnail sketches in the process of working on sculptural ideas. After selecting one sketch as the strongest, this final version can be used as the basis from which an initial maquette of the sculpture can be created. Young learners can then proceed to make their artwork through taking a photo of the maquette and employing a GAI program such as *ChatGPT* to obtain a critical response while also obtaining a critique from the class. After working with concepts that arise to improve their artwork, students can proceed to the second stage of art creation, specifically, hands-on production, by developing a full version of the sculpture using traditional sculptural techniques. The final stage of hands-on art creation is the sharing, the showing, and the reflection which students can embark upon to complete the project. The above approach is a con-

crete description of incorporating an example of a process using a traditional approach to teaching visual art while incorporating GAI tools into the assignment.

Another example of a project at the secondary level can be to create a painting of the Mona Lisa as she may look as an elderly woman. Undertaking the same process of researching this painting and the historical concepts pertaining to Leonardo da Vinci and the Renaissance, learners can brainstorm, ideas, look at painting techniques of that era, and use GAIs to generate ideas and drawings to use for the painting process. After selecting the best sketch, they can work with it in a similar manner as in the above sculpture assignment to create their hands-on or digital painting. **Figure 4** is an example.

Similar to Viljoen [11] we advocate for the ideas of bell hooks [40] who famously argued for the critical need to nurture students' self-reflection, and critical thinking skills, and to empower learners by advocating for and fostering their active participation in their own learning processes as we incorporate AI in our art classrooms today. Finally, we advocate for teachers to allow students to 'play' and 'explore' with the new AI technologies: this has always been useful in the past when using new forms of artmaking [31] [32]. Thus, GAI can be viewed both as a material and as a potential collaborator in the above description [37].

6. Conclusions

The authors acknowledge that presently AI is altering and developing rapidly, and great changes can possibly be ahead for art educators. In writing this article, our purpose is to delineate what is occurring at the present time in AI and Art Education, look at the pros and cons of AI usage, outline some propositions regarding AI in classrooms, and open up further discussions as we plunge into the future of AI and its use in Visual Art Education. We suggest art educators proceed using AI with caution and enthusiasm as policies have yet to be put in place consistently by universities, educational ministries, boards of education, and individual private and public schools and faculties [40]. We also advocate open discussions and experimentation of AI usage between professors/instructors and teachers-in-training, educators obtaining further credentials, and graduate students in Art Education. Dialogic discussions and the usage of AI practice in higher education are strategic and crucial to properly guide soon-to-be teachers and experienced art educators regarding the use of artificial intelligence by society and their future students.

Art educators should remember that AI, through all its innovation, is not a replacement for human creativity: rather it is useful to augment teacher and student-artistic creative processes, work as a collaborator and ultimately allow teachers and learners the opportunity to expand and achieve their creative goals. Being thoughtful and careful towards technology has a well-worn path. Towards the end of his life, about a half-century ago, the great technology/media theorist, Marshall McLuhan warned that, unlike previous technological changes, electric media made up an absolute and almost rapid alteration of culture, morals, and



Figure 4. *Mona Lisa at 80 Years Old.* Created June 2023 by Joanna Black using DALLE-E. A teacher's example to imagine a painting image in the future using oil painting.

beliefs [41]. McLuhan discussed media culture as a “maelstrom,” a metaphor for a whirling vortex in which people using technologies can be carried away [42]. Consequently, he wrote the laws of media in the hope of developing a media ecology to help human beings cope with and escape new technologies' effects. We contend that educators and students need to pay attention to the effects of AI usage upon us today and begin to create a media ecology for our AI era as it rapidly evolves³; the authors openly advocate for active discussions in Visual Art Education to do these.

In using AI in our contemporary art education classrooms, we put forth that educators should turn to our propositions discussed in this paper. Using AI is exciting: teachers who are informed about, knowledgeable of, and thoughtful toward the use of AI in visual art classrooms may be able to expand the ability of students to familiarize themselves with AI-oriented art instruction, methods, and experiences. We embrace looking towards the development of and cooperatively creating an AI-oriented art educational environment. The discussion focused on AI development in visual art, coupled with art creation using both AI and traditional tactile methods. It may be seen as a form of intimate collaboration between humans and machines in learning/creation dialogues. These do present their own limitations and advantages, and the choice will depend on the specific needs and goals of teachers and students. The authors foresee AI in Art

³For a more thorough discussion of the development of an AI media ecology refer to Black's article [43] entitled, *Past, present and tackling the future of artificial intelligence (AI) in education: Maintaining agency and establishing AI laws*.

Education may allow both educators and artists exciting opportunities to experiment with new AI applications in real-time, expand their creative perspectives, broaden their reach and capacity in relation to creative processes, and allow student artists opportunities to develop more difficult and complex works. Art educators need to keep up to date and in pace with our ever-changing world as AI increasingly becomes a part of our daily lives within our art classrooms.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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