



Participatory Educational Research (PER)
Vol.11 (Prof. Dr. H. Ferhan Odabaşı Gift Issue), pp. 57-79, December 2024
Available online at <http://www.perjournal.com>
ISSN: 2148-6123
<http://dx.doi.org/10.17275/per.24.94.11.6>

Id: 1588351

Integrating Digital Technologies and AI in Art Education: Pedagogical Competencies and the Evolution of Digital Visual Culture

Suzan Duygu BEDİR ERIŞTİ*

Art Education, Anadolu University, Eskişehir, Türkiye
ORCID: 0000-0002-2511-6830

Kerry FREEDMAN

Art Education, School of Art and Design, Northern Illinois University, USA
ORCID: 0009-0002-9760-2237

Article history

Received:

20.10.2024

Received in revised form:

25.11.2024

Accepted:

05.12.2024

Key words:

digital visual culture, AI-based education, competencies in digital visual culture, art education.

Digital visual culture is a crucial concept in today's digital landscape, influencing socio-cultural interactions, communication and education. It necessitates a holistic understanding of changes and their potential disruptive effects on society. The integration of digital technologies, particularly in art education, has transformed teaching process, emphasizing the need for new competencies among educators and students alike. Art educators are expected to foster critical thinking, effective communication, and adaptability in a technology-mediated environment while engaging students dynamically. Incorporating AI into art education enriches learning experiences, providing personalized instruction and enhancing creative processes. Critical and creative pedagogical approaches emerge as fundamental strategies in navigating digital visual culture. Overall, as digital visual culture reshapes art education, educators must bridge traditional and contemporary practices, equipping students with essential skills for critical engagement with the digital visual world. The purpose of this study is to conduct an instructor and student-centered inquiry that focuses on interactions within the realm of digital visual culture and AI in art education. The research reflects the perspectives of art and design education regarding digital visual culture and AI in teaching, alongside the perspectives of art and design students concerning the integration of these elements within their learning experiences. Additionally, the research identified the competencies necessary to enhance teaching and learning outcomes in art education related to digital visual culture and AI. Through these inquiries, the research aims to foster a comprehensive understanding of digital visual culture's impact on art education.

Introduction

Digital visual culture has emerged as a significant concept in today's digital world, highlighting the interactions and socio-cultural extensions within the digital realm. This multifaceted structure evolves alongside social change, transformation, and communication, necessitating holistic awareness (Manovich, 2013). This awareness involves not only observing changes in the digital landscape but also questioning their potential disruptive effects, facilitated

* Correspondency: sdbedir@anadolu.edu.tr

by human-technology interactions (Bedir Erişti, 2023a). Digital visual culture is closely linked to digital transformation, which introduces plurality, dynamism, and subjectivity in decision-making processes (Becker, 2017). Today digital visual culture includes transformations in information, communication, and collaboration. Because communication has evolved, creating sustainable, interactive narratives that enhance message construction between senders and receivers. As individuals integrate with digital technologies, they develop competencies essential for personal and professional growth, highlighting the importance of lifelong learning (Biesta, 2014). On the other hand, digital media introduces rapid consumption and manipulative contexts, influencing how we interpret and interact with the digital world. Together, these components foster adaptive, collaborative, and transformative opportunities in the digital space. Understanding and interpreting these dynamics is crucial for navigating surveillance-focused policies (Casemajor, 2015). At this stage, digital visual culture goes beyond the limits of specific communities or identities, embracing universal and diverse cultural elements that become enriched through interaction and participation in the digital world.

Digital technologies have reshaped art education through digital visual culture, enabling interactive creative processes. This transformation has given rise to a new generation of art educators who actively engage in interactive experiences, requiring skills that promote critical thinking and participation. As art educators delve into the digital realm, they produce content designed to involve students, highlighting the importance of adopting critical perspectives (Erişti, 2022).

The public dimension of digital media-based digital visual culture supports social transformation by democratizing art and promoting shared ownership of visual narratives (Casemajor, 2015). Art educators should focus on artistic processes that provoke inquiry and sensitivity, fostering dialogue between themselves and society to drive social change. Within the framework of digital visual culture, they must adopt contemporary technological approaches to create a foundation for enriching students' learning experiences and encouraging critical thinking.

Today, the evolution of digital visual culture necessitates a re-evaluation of the content and contexts presented through visual mediums. Advancements in artificial intelligence, machine learning, and generative technologies continue to expand the scope of art education, requiring both teachers and students to develop new competencies aligned with these emerging opportunities and contexts (Bedir Erişti, 2023b). These competencies enable individuals to question established norms within the digital media landscape, promoting curiosity and critical engagement.

This dynamic environment facilitates creative exploration, in-depth learning experiences, and personal growth. It integrates virtual and real-world skills, fostering a more profound understanding of the digital realm and emphasizing the need to navigate it with enriched perspectives.

When digital-oriented change encompasses society, culture, and tradition, carrying them into the future, the symbiosis between humans and technology will transform into a human-centered power. Within this transformation, discussing competencies in the context of digital visual culture requires alignment with the nature of the socio-cultural structures we inhabit (Bedir Erişti, 2023b). Digital visual culture, while presenting virtual realities that increasingly resemble the tangible through technological advancements, also involves questioning reality within the virtual to preserve these socio-cultural foundations.



The utopian and dystopian constructs enriched by artificial intelligence within digital visual culture must integrate with human-centered experiences (Vermeulen & Van den Akker, 2010). Concepts such as the digital revolution and digital transformation introduce new possibilities daily, making hybrid structures inevitable for individuals. In art education processes, it is essential to establish connections between virtual and real-world artistic experiences, fostering deeper understanding and engagement.

Key processes in digital visual culture, including experimentation, creativity, and boundary-pushing, create continuity that enhances individuals' intellectual competencies in generating digital meanings. Maintaining this continuity fosters collaborative connections in digital spaces, emphasizing inclusivity and the creation of hybrid and egalitarian structures for artists and audiences alike (Finnis & Kennedy, 2020).

The integration of artificial intelligence (AI) into art is revolutionizing content management and creation through digital visual culture. AI enables efficient data analysis and personalized digital experiences, with platforms like GPT-4 and Jasper excelling in text generation and analysis. Image-focused AI tools like DALL-E and Midjourney facilitate the creation of AI-generated art, while video editing platforms such as Supercreator.ai and Windsor expand the scope of creative possibilities. AI-based sound technologies further personalize digital experiences, enabling individuals to create in diverse roles as artists, scientists, and professionals (Erişti, 2023b). These tools shift the perception of knowledge and skills, emphasizing intuition, self-awareness, and emotional expression through digital mediums. Future production will prioritize experimentation and emotional transfer over obligation, as technology increasingly meets human needs in innovative ways.

The interplay between digitality and AI transforms art into a collaborative and adaptive cultural condition. It empowers individuals and communities to redefine artistic processes, fostering an inclusive and resilient framework for future creativity.

Methodology

The research, conducted through an interpretative qualitative design, focuses on understanding how participants perceive their circumstances through an interactive process. The participants' evaluations of how they structure their life experiences also play a significant role within this framework (Merriam, 1998). Throughout the research process, it is crucial to comprehend how participants make sense of their situations. In this context, interviews and document reviews are among the most commonly used data collection methods to describe experiences based on participants' observations.

Conducting a multidimensional analysis of interpretations grounded in participants' life experiences holds paramount importance throughout the process. In the fundamental interpretative qualitative research process, it becomes imperative to structure both data collection and analysis within the context of articulating life experiences related to the research topic with their individual significance. Within the scope of basic interpretive qualitative research, the researcher generates concepts, hypotheses, and theories through an inductive approach (Altheide & Johnson, 2011).

The Aim of Study

The aim of this study is to explore the perspectives of art and design education experts/instructors and students regarding pedagogical competencies and instructional content based on digital visual culture. The research will focus on instructors, MA and BA students from the Art Education Department at Northern Illinois University, School of Art and Design. The researcher, Suzan Duygu Erişti, conducted this study under the TÜBİTAK 2219 postdoctoral support program at the Art Education Department of NIU, School of Art and Design, with guidance from her advisor, Prof. Dr. Kerry Freedman. The research is limited to data collected between July and October of the 2023-2024 academic year, during Erişti's tenure at the department.

In digital visual culture pedagogy, both students and instructors collaborate to expound upon and reinterpret meanings, concepts, and structures grounded in visuality. This process of creation can take various approaches, such as establishing digital visual cultural domains jointly constructed by teachers and students in the digital realm, or implementing diverse learning experiences (such as personalized art education or peer-oriented art education). Hence, it is crucial to tailor digital visual culture pedagogy to the context of students and instructors. Within this framework, the objective of this study is to conduct instructor and student-centered interaction-based perspective inquiry. In pursuit of this goal, we intend to create instructional content on Digital Visual Culture Pedagogy for prospective teachers, which will be recommended for Arts Education and, as per requirements, in various departments within Education Faculties. Within this scope, the research questions and corresponding sub-objectives are as follows:

- How are the perspectives of art and design instructors regarding digital visual culture and AI in the context of art teaching?
- How are the perspectives of art and design students regarding the integration of digital visual culture and AI in art learning?
- What competencies should be developed within digital visual culture and AI pedagogy to enhance teaching and learning outcomes in the field of art education?

Participants

Throughout the research process, the criterion sampling method, which is one of the purposive sampling techniques, was employed. Purposive sampling facilitates a thorough examination of the situations identified in the research. (Patton, 1997). On the other hand, the criterion sampling method involves studying all situations that provide a clear examination of the research objectives with specific indicators. It involves identifying participants based on predetermined criteria. Researchers can establish these criteria themselves or utilize existing criteria based on the literature.

The field specialist's data for this study comprises of interviews conducted with NIU, School of Art and Design, Art Education and Photography Departments instructors. The criteria for selecting field specialists as participants in this study were based on their expertise in fields related to the research objectives.

The criterion sampling approach, rooted in purposive sampling, was also applied when selecting graduate participants. At this stage, the initial criterion for selecting participants was their completion of courses focused on visual culture or visual culture awareness, or their



involvement in research, articles, or theses centered on visual culture. Undergraduate student participants were chosen based on their enrollment in the School of Art & Design's art education program.

In this context, graduate students were identified as contributing to Visual Culture courses or demonstrating an awareness of visual culture issues. The courses, led by field experts, emphasized topics such as visual culture, art curriculum, technology, and art education. The selection of students for participation in lectures, sessions, practical exercises, and research studies led by Prof. Dr. Kerry Freedman, Prof. Dr. Doug Boughton, Dr. Kelly Gross and Instructor Nicholas Leonard was based on these criteria. Meanwhile, undergraduate students of Dr. Gross and Instructor Amy Fleming, who were involved in data collection for the research under the same criteria, actively engaged in the focus group discussions.

The PhD participants in this study consist of six Ph.D. students who are enrolled in the Fall 2023 ARTE 791-1 New Ideas in Art & Design Education course instructed by Prof. Dr. Kerry Freedman.

It also includes observations from the ARTE 543: Art and Technology in the K-12 Classroom for MA students led by Nicholas Leonard, observation from ARTE 343 Art and Technology in the K-12 Classroom course led by Dr. Kell Gross, focus group interview with BA students of Kelly Gross, and observations from the ARTE 342 Visual Culture course led by Prof. Dr. Kerry Freedman. The research data, encompassing document analysis, interviews, SWOT analysis, focus group discussions, and researcher diaries, were gathered between August and September 2023 at the NIU School of Art and Design, Art Education Department. Discussions with graduate students were held from September 6th to 20th, 2023, while focus group sessions with BA students took place from September 6th to 12th, 2023.

Data Collection Process

The data collection process for this study consists of two stages. The first stage includes interviews with field experts and instructors, while the second stage involves focus group discussions with students. Additionally, document analysis was employed to collect data from PhD students.

Based on the research's objectives and questions, a focus group interview was conducted with doctoral and undergraduate students, guided by the advisor. This study employed qualitative data collection approaches, including open-ended interviews, observations, focus grouping and discussion sessions and document analysis. The qualitative data obtained were analyzed using content analysis.

Analysis of Interviews with Field Specialists

The analyzed data from field specialists serves as the foundation for developing content related to pedagogical approaches based on digital visual culture in the study.

Interviews were conducted within the context of art education in digital visual culture, focusing on the need for change in the learning process and teacher competencies. Discussions were held with senior faculty members from the art education department, as well as an instructor from the photography department. Additionally, a conversation took place with an expert in the field of art education, addressing the current technological shifts and transformations within the

discipline. The goal was to explore how art education is adapting to contemporary technologies. Further, an interview was conducted with a specialist in digital technologies and artificial intelligence, delving into topics such as algorithmic structures, digital art pedagogy, and the relevance of digital visual culture in modern contexts. A discussion was held with an experienced photography instructor, focusing on image analysis processes and the changes brought about by the integration of digital technologies in the field of photography. An interview was conducted with a distinguished scholar in art education regarding the transformations required in the realm of art education concerning digital visual culture.



Figure 1. Courses Led by Field Specialists

Following the interviews, a content analysis based on key themes and subthemes is presented. The primary themes are addressed in two sections: One focusing on the framework of transformations in art education, and the other on teacher focused issues based on digital visual culture pedagogy. Due to the broad scope of expert opinions, a thematic differentiation approach based on two main categories has been adopted. In this context, the data has been organized into tables under two categories: Field Specialist Interviews: General Framework and Field Specialist Interviews: Teacher-Focused Inquiry. The structure revealed by the primary theme of General Framework is outlined as follows:

Table 1.1. Themes and Sub-themes of Field Specialist Interviews-General Framework

Digital Visual Culture and Curriculum Development
Integration of digital visual culture in education programs
Challenges and opportunities in digital visual culture education
Changes in Art Education
The transition from traditional to digital approaches in education
The importance of critical thinking and adaptability in digital culture
Studio programs and blending traditional with digital
Impact of Technology on Arts and Arts Education/Teaching and Learning
The role of teacher education in shaping the future of education
The impact of digital technologies on pedagogy
Changing pedagogical approaches
Incorporating Creativity in the Digital Realm
Digital skills and competencies
Boundaries in using AI
Analyzing AI-generated images
Impact on creativity
Fostering Collaboration Across Disciplines
Project-based learning and collaboration
Evaluation in Digital Era

Image analysis based on creative pedagogical approaches
Ethical Considerations in Digital Art
Ethics and accountability
Ethical digital practices

Since both tables encompass the perspectives of field specialists, the findings have been presented through direct quotations within the integrated structure of the two tables.

Under the theme of *"Digital Visual Culture and Curriculum Development"* it becomes evident that teachers must cultivate competencies related to digital visual culture. This is crucial for their ability to connect effectively with students in today's digital era. Visual Culture Specialist underscores this necessity as follows: *"Many teachers here aren't very competent in digital culture... So that's something that's really important in the visual culture movement to try to get teachers and students to understand on a tacit level."*

When we look at the sub-theme of *"Integration of digital visual culture in education programs"*, the focus point of the sub-theme is creativity and innovation. For expanding creativity and innovation, it is essential to focus on problem solving based approaches in educational content. Visual Culture Specialist's perspective resonates with the captivating convergence of art, technology, and education. This dynamic intersection not only captivates but also ignites profound excitement. The other sub-theme

The general framework presented by field specialists under the theme of *"Challenges and Opportunities in Digital Visual Culture Education"* highlights the dynamic interaction between digital and visual culture, which fosters creativity and encourages innovation across a wide spectrum of opportunities. In today's educational context, it is not only crucial for students to understand technology but also to master its use as a powerful tool for artistic self-expression and effective problem-solving. This holistic approach equips students with the competencies needed to navigate the complexities of the digital age while enhancing their ability to innovate and create in an ever-changing world. However, the challenges of this process stem from the limitations imposed by digital complexity. Yet, finding a pathway for self-expression within this complexity is closely tied to developing competencies relevant to contemporary technologies.

Specialist in Art Educational Practices/Pedagogy highlights *"Changes in Art Education"* with several key considerations regarding the role of technology in art education. First, there is a need for better integration of technology into art education, but both students and teachers can find it challenging due to the specialized technical language used in digital design programs. To address this, Specialist in Art Educational Practices/Pedagogy suggests more project-based learning and collaboration between students and teachers. He also emphasizes the importance of changing pedagogical approaches and acknowledging that teachers may need to adapt to a more collaborative and co-learning role. Additionally, he underscores the importance of contemporary art in education, as students often produce work with relevance to contemporary art without being fully aware of it. Lastly, there's a call for the development of studio programs that blend traditional and digital art-making methods. Overall, the discussion points to the evolving nature of art education in the digital age and the need for innovative approaches to bridge the gap between traditional and digital art forms while involving students as active co-learners in the process.

Specialist in Photography and Digital Technology viewpoint underscores the complex relationship between technology and the arts, particularly in the realm of photography and

digital skills under the themes of *“Impact of Technology on Arts and Arts Education/Teaching and Learning”* and *“Incorporating Creativity in the Digital Realm”*. She expresses concerns about the potential overreliance on AI tools like Photoshop Beta, which can easily manipulate images, thus raising doubts about the authenticity and artistic integrity of the final product. This highlights the ongoing debate surrounding the benefits and drawbacks of such technological advancements in the field of art. Furthermore, she emphasizes the importance of cultivating digital skills and competencies in students, suggesting a need for adjustments in the education system to better prepare students for the digital age. She also discusses the importance of setting boundaries in using AI, suggesting that its integration should be carefully monitored and regulated for specific assignments. Lastly, she touches upon the impact of AI on creativity, noting the potential risk of reducing the depth and passion in artistic creation when compared to traditional, time-intensive methods. Overall, her viewpoint reflects a nuanced perspective on the evolving role of technology in arts and arts education, balancing the advantages and challenges that arise in this digital era.

The theme *“Incorporating Creativity in the Digital Realm”* involves encouraging creativity in the context of modern art forms. Visual Culture Specialist shares her thoughts on the matter as follows: *“It's not just about learning the tools; it's about fostering creativity in that digital realm. We want students to not only use technology but also push its boundaries to create new forms of art. This means encouraging experimentation, risk-taking, and a willingness to challenge the status quo.”*

“Fostering Collaboration Across Disciplines” is a good point of view based on symbiosis between art and technology. Alternate backgrounds and the collaboration of students should create an innovative and multidisciplinary competency. Visual Culture Specialist emphasizes the theme with the explanations below: *“Collaboration across disciplines is key; it's where the magic happens in the intersection of arts and technology. We need to break down silos and encourage students to work with peers from different backgrounds. This not only sparks innovation but also prepares them for the multidisciplinary nature of the modern workforce.”*

Through the theme *“Evaluation in Digital Era”* Visual Culture Specialist emphasize as follow: *“Success isn't always measured in traditional ways, especially in the arts and technology. It's not just about grades or job placements. It's about whether a student can think critically, solve complex problems, and contribute meaningfully to the field. We need to redefine success in these terms and nurture a passion for lifelong learning.”*

Within the theme of *“Ethical Considerations in Digital Art”* Visual Culture Specialist places a strong emphasis on the instruction of ethics: *“Ethical considerations in digital art are vital, and we need to instill a sense of responsibility in our students. They should be aware of the impact their creations can have on society and the ethical dilemmas that may arise. Teaching ethics alongside technical skills is non-negotiable.”*

The framework for digital visual culture pedagogy and teacher focused inquiry is presented below:

Table 1.2. Themes and Sub-themes of Field Specialist Interviews-Teacher Focused Inquiry

Teacher	Competencies in The Digital Era
	Critical thinking in digital visual culture
Teacher	Awareness of Digital Visual Culture
	Teacher professional development based on digital visual culture
	Making digital art approachable
	Data and algorithmic literacy

- Exploring bias and ethics
 - Informed decision-making
 - Role of arts in digital literacy
 - Digital visual culture pedagogy in Art Education
 - Effective use of digital tools
 - Innovative teaching approaches
 - Digital literacy and skills
 - Adaptability in the digital era
 - Enhancing accessibility
 - Digital collaboration and communication
 - Assessment and evaluation in the digital context
 - Interdisciplinary learning
 - Effective Use of Technology
 - Defining effective use
 - Modeling problem solving
 - Remote teaching and accessibility
 - Data privacy and safety protocols
 - Utilizing traditional art materials
 - Algorithmic understanding
 - Addressing bias and discrimination
 - Aesthetics and visual analysis
 - Creative pedagogy
 - Diverse theoretical approaches
 - Challenges in Art Education with AI
 - Policy challenges and curriculum of AI
 - Impact of AI on pedagogy
 - Understanding AI in the context of digital visual culture
 - Digital literacy and relevance
 - Ethics and accountability
 - Equity in technology access
 - Environmental concerns
 - Future-proofing education
-

“*Teacher Competencies in The Digital Era*” theme covers “*Critical Thinking in Digital Visual Culture*” sub-theme that reflects the importance of critical thinking. Visual Culture Specialist places great emphasis on the significance of critical thinking skills in the context of the competencies required in the digital era. She argues that critical thinking not only empowers students but also prepares them effectively for the demands of the digital world.

Specialist in Digital Technologies and Creative Practices focuses on “*Teacher Professional Development*”. This subtheme emphasizes the significance of continuous professional development for art educators in the digital age. Educators need to stay updated with digital art tools and technologies to effectively teach their students. The evolution of technology requires teachers to be lifelong learners, ensuring they can provide relevant and up-to-date instruction to their students.

Another key point of art teachers is “*Making Digital Art Approachable*”. According to Specialist in Digital Technologies and Creative Practices creating an approachable and collaborative learning environment is essential in digital art education. Encouraging students to explore and learn together fosters a supportive atmosphere that reduces intimidation often associated with complex digital tools. This approach can enhance student engagement and creativity.

One of the focus points of understanding digital era is related with “*Data and Algorithmic Literacy*”. In the digital era, students should not only learn to manipulate digital images but

also understand the algorithms and data that underlie digital technologies. This knowledge is critical for digital literacy, enabling students to make informed decisions and critically assess the tools they use.

“Exploring Bias and Ethics” includes art educators to have a responsibility to address issues of bias and ethics in digital art. They should guide students in understanding how algorithms can produce bias and how to avoid perpetuating biases. This approach promotes ethical and socially responsible digital art.

“Informed Decision-Making” is another key point of digital era that was emphasized by Specialist in Digital Technologies and Creative Practices. Equipping students with information and knowledge is key to helping them make informed decisions in their digital art practices. Educators should empower students with the skills and awareness to navigate the complex landscape of digital technologies and creative choices responsibly.

“Role of Arts in Digital Literacy” includes the significance of art in the digital age is another focal point that highlights the importance of the arts in promoting digital literacy." Traditional art education methods can uniquely contribute to digital literacy. The intersection of traditional and digital art allows students to explore nuanced ways in which different materials convey context, knowledge, and meaning. Art educators can leverage this integration to enhance digital literacy skills in their students.

The main pedagogical approach of Digital Visual culture is digital visual culture pedagogy. Under the main theme of *“Digital visual culture pedagogy in Art Education”* there are several sub-themes; *“Effective use of digital tools”*, *“Innovative teaching approaches”*, *“Digital literacy and skills”*, *“Adaptability in the digital era”*, *“Enhancing accessibility”*, *“Digital collaboration and communication”*, *“Ethical digital practices”*, *“Assessment and evaluation in the digital context”*, *Interdisciplinary learning”*

Based on the field specialist’s perspective digital visual culture pedagogy revolves around the effective use of digital tools and platforms in art education. It emphasizes the selection and integration of digital resources to enhance teaching and learning experiences in both traditional and digital art contexts. Digital visual culture pedagogy encourages innovative teaching approaches that leverage technology to engage students in creative and interactive learning experiences. It involves the exploration of digital methods that go beyond traditional pedagogical practices. A key component of digital visual culture pedagogy is the development of digital literacy and skills among students. Art educators aim to equip students with the competence to navigate digital environments, create digital art, and critically assess digital content.

Digital visual culture pedagogy acknowledges the fast-paced evolution of technology and the need for Art educators to adapt continuously. It emphasizes the importance of flexibility and ongoing professional development to keep up with technological advancements, accessibility by ensuring that digital learning materials and platforms are inclusive and accessible to students with diverse needs and abilities, collaboration and communication among students in digital spaces (Blanchette, 2011). Based on digital visual culture, pedagogy assessment and evaluation methods need to be tailored to the digital context. Art educators need digital assessments design that measure students' digital skills and creativity and interaction between technology and students.

Digital visual culture pedagogy also encourages interdisciplinary learning, where students can explore connections between art and other fields through the use of digital tools and cross-disciplinary collaboration based on technology. Ethics is a fundamental aspect of digital visual culture pedagogy. Art educators guide students in ethical digital practices, including responsible use of technology, digital citizenship, and awareness of digital ethics in art creation.

By highlighting *"Digital visual culture pedagogy in Art Education"* as a distinct theme, it emphasizes the critical role that technology and pedagogical strategies play in shaping contemporary art education. Digital visual culture pedagogy aims to enhance teaching and learning experiences, promote digital literacy, and prepare students for a future characterized by digital advancements.

"Effective Use of Technology" includes several subthemes focusing on *"Defining effective use"*, *"Modeling problem solving"*, *"Remote teaching and accessibility"*, *"Data privacy and safety protocols"*, *"Utilizing traditional art materials"*, *"Algorithmic understanding"*, *"Addressing bias and discrimination"*, *"Aesthetics and visual analysis"*, *"Creative pedagogy"* and *"Diverse theoretical approaches"*

The definition of effective technology use in art education can vary widely. This subtheme underscores the need for a clear understanding of what constitutes "effective" technology use to avoid confusion and ensure that technology serves educational goals effectively.

Encouraging educators to model creative problem-solving and critical thinking is crucial. By thinking out loud and demonstrating low-stress problem-solving, art teachers can help students develop essential skills that apply not only to art but also to various aspects of life. In remote teaching environments, accessibility and art teacher support are paramount. Art teachers must adapt to the digital realm and make themselves available to assist students, ensuring that online learning is as effective as traditional in-person education. Student safety and data privacy are top priorities in the digital era. Educators must be aware of and implement safety protocols to protect students while utilizing digital tools and platforms. Blending traditional art materials with digital technologies allows students to explore the nuances of different mediums. This approach enriches the learning experience, providing students with a broader range of creative possibilities. Understanding the basics of algorithms is essential for informed technology use (Leonard, 2021). Art educators should aim to make students informed about how digital tools work behind the scenes, promoting digital literacy and informed decision-making.

Combatting bias and discrimination in digital art education is imperative. Teaching students to analyze aesthetics and visuals enhances their critical thinking skills. This subtheme highlights the importance of developing students' ability to assess and appreciate visual elements, promoting effective use of technology in creative endeavors.

Creative pedagogy encourages flexible and holistic approaches to using technology effectively in education. Emphasizing creative teaching methods can engage students and foster innovation in the learning process. Encouraging diverse theoretical perspectives in art education enables students to develop a comprehensive understanding of technology's role in creativity. This approach promotes critical thinking and a deeper appreciation of digital art.

"Challenges in Art Education with AI" theme includes sub-themes as follow; *"Policy challenges and curriculum of AI"*, *"Understanding AI in the context of digital visual culture"*,

“Digital literacy and relevance”, “Ethics and accountability”, “Equity in technology access”, “Environmental concerns”, “Future-proofing education”

Through the theme *“Policy challenges and curriculum of AI”* it is indicated to touched upon the lack of policies related to the use of artificial intelligence in education, both in Türkiye and in the United States. The challenges of creating and implementing policies in the education is an important issue today. But the balance for art education is an important task as Visual Culture Specialist reflects: *“There’s always going to be a challenge in shaping a curriculum that’s responding to rapidly changing technologies. It’s like aiming at a moving target. We want our students to be well-prepared for the digital age, but we also want to ensure that the core principles of art and creativity aren’t lost amidst the tech advancements. Striking that balance is no easy task.”*

Based on the field specialist’s perspective developing policies that address the unique needs and experiences of students in art education with AI can be challenging. Policies must align with the evolving landscape of digital art and technology, ensuring that students are adequately supported and protected. Art educators and students should have a basic understanding of AI and data sets to navigate AI-related challenges effectively. This knowledge is fundamental for making informed decisions in the digital realm.

“Impact of AI on pedagogy” highlights various innovative pedagogical approaches as reflected in the perspectives of field specialists. AI-driven processes in pedagogy must be integrated into a broader digital pedagogical framework. Digital pedagogy serves as the foundation for these approaches, but it requires further refinement through elements such as remix pedagogy, which incorporates technology management within educational practices; post-digital pedagogy, which emphasizes both critical inquiry and critique of AI; and AI pedagogy, which not only focuses on developing competencies for utilizing AI but also on fostering insights derived from AI-based models and processes.

“Understanding AI in the context of digital visual culture” sub-theme refers to staying relevant in the rapidly evolving field of digital art education requires continuous learning and adaptation.

“Digital literacy and relevance” sub-theme is another focus theme of field specialists. Digital literacy is essential for Art educators to effectively integrate technology into their teaching and keep students engaged.

“Ethics and accountability” promotes ethical use of AI in art education and holding students accountable for their choices are crucial. Art educators play a pivotal role in fostering responsible and ethical behavior in the digital landscape. Art educators must consider the ethical implications of their use and guide students in making responsible decisions regarding these technologies. Ensuring equitable access to digital technologies is essential to prevent disparities in education. Ethical considerations must be at the forefront of decisions regarding technology integration. Art educators should approach technology with a critical and ethical lens, ensuring responsible use and decision-making.

“Equity in technology access” is a big problem based on the technological advancement of today’s digital world throughout the field specialist interview. It should be a priority in the implementation of technology in art education.

“Environmental concerns” indicates the environmental impact of AI technology. The environmental impact of digital technologies replacing traditional tools is a growing concern.



Sustainability should be considered when incorporating technology into art education, aligning with broader environmental goals.

“Future-proofing education” is another sub-theme related to prepare students for adapting to future technological advancements. While the future is uncertain, teaching students to ask critical questions and adapt to changing circumstances equips them with valuable skills for lifelong learning.

Analysis of Interaction-Based Data with Doctoral Students

Interview questions consisting of 8 open-ended inquiries were prepared concerning the implications of artificial intelligence and digital visual culture in the process of art education. These questions were sent to doctoral students in advance through Google Forms, and the aim was to engage in discussions on this topic during the class after students had filled out the form. The main topic of document analysis revolved around AI-based environments and their impact on digital visual culture. It became evident that these AI-driven environments are causing a profound transformation in arts education.



Figure 2. Focus Group Data Gathered Through Sticky Notes

To better understand how this transformation is shaping art education, it was imperative to gather data with a strong focus on specific concepts and their implications. Therefore, a focus group interview was also conducted with doctoral students.



Figure 3. Focus Grouping with PhD Students of Dr. Freedman

Table 2. Themes and Sub-themes of PhD Candidates' Perspectives

Impact of AI on Visual Culture Education
Integration of AI in Art Education as a tool
Evolving discussions in the classroom
Competencies for Future Visual Culture Educators
Adaptation to new technologies
Interdisciplinary approach
Updates in Visual Culture Education Programs
Integration of ai topics

Addressing bias
Future of Digital Visual Culture in the Age of AI
Uncertainty and debate
AI shaping visual culture
Analysis of Visual Images in Digital Visual Culture
Purpose and intent based analysis
Conceptual and contextual analysis

Under the sub-theme of *“Integration of AI in art education”* Sarah and Eva highlight that AI technologies are not inherently good or bad but should be viewed as tools to be used appropriately. Ailysh mentions the increased use of AI-generated content in digital visual culture, making it more accessible to individuals without extensive art backgrounds. Katie discusses the fear among artists of being replaced by AI and emphasizes the need for AI to be seen as a useful tool rather than a threat.

Under the sub-theme of *“Evolving discussions in the classroom”* Sarah mentions that discussions about AI technologies have become more common, particularly among older students, who sometimes have divided opinions about AI. Ailysh observes that discussions around AI occur more frequently in high school graphic design classes. Katie expresses concern about traditional and handmade artwork getting overshadowed by AI-generated art, particularly when seeking inspiration online.

Based on the sub-theme of *“Adaptation to new technologies”* all of PhD students emphasize the importance of future educators staying informed and up-to-date on the latest digital visual culture and AI technologies. They also highlight the need for educators to continuously adapt to new technologies and incorporate them into their teaching methods.

Under the sub-theme of *“Interdisciplinary approach”* Eva mentions the necessity of merging art with other disciplines, such as literature, math, and music, in response to the increasing prevalence of AI in the digital world. Ailysh suggests that teachers should learn from students and adapt to their preferences and needs.

Related the sub-theme of *“Integration of AI topics”* the PhD students suggest that updates to visual culture education programs should include discussions about the evolution of AI technologies. They stress the importance of teaching students how to use AI technology skillfully and conceptually to create imagery.

Another sub-theme *“Addressing bias”* includes the focus point of bias. The PhD students mention the need to incorporate activities that help students recognize and address bias in AI systems. They also discuss the importance of guidelines and policies for the acceptable use of AI in education.

Under the sub-theme of *“Uncertainty and debate”* the PhD students foresee debates about the use of AI in education, with some educators embracing it and others banning it. Concerns about the theft of non-consenting artists' work by AI are raised.

“AI shaping visual culture” is one of the important sub-themes of the data. The PhD students believe that AI will continue to shape digital visual culture and artistic creation. They acknowledge that AI's impact on visual culture will require artists and educators to adapt to new challenges.

“*Analysis of Visual Images in Digital Visual Culture*” main theme includes two sub-themes. Under the sub-theme of “*Purpose and intent based analysis*” PhD students emphasize the importance of analyzing visual images with regard to the artist's purpose, intention, and the resulting impact. They also suggest that digital art may influence the purpose and meaning of the artwork. The other sub-theme is “*Conceptual and contextual analysis*”. The analysis of visual images should include traditional elements and principles of art and design, as well as postmodern or contemporary elements. Socio-cultural context, audience, and the interaction between images and text are also important components of analysis.

The PhD students provide valuable insights into the impact of AI on digital visual culture education, the competencies future educators should possess, necessary updates in education programs, and the evolving landscape of digital visual culture. Their responses reflect a combination of optimism, concerns, and the recognition of the evolving role of AI in shaping the future of visual culture.

A Focus Group Discussion with Undergraduate Students

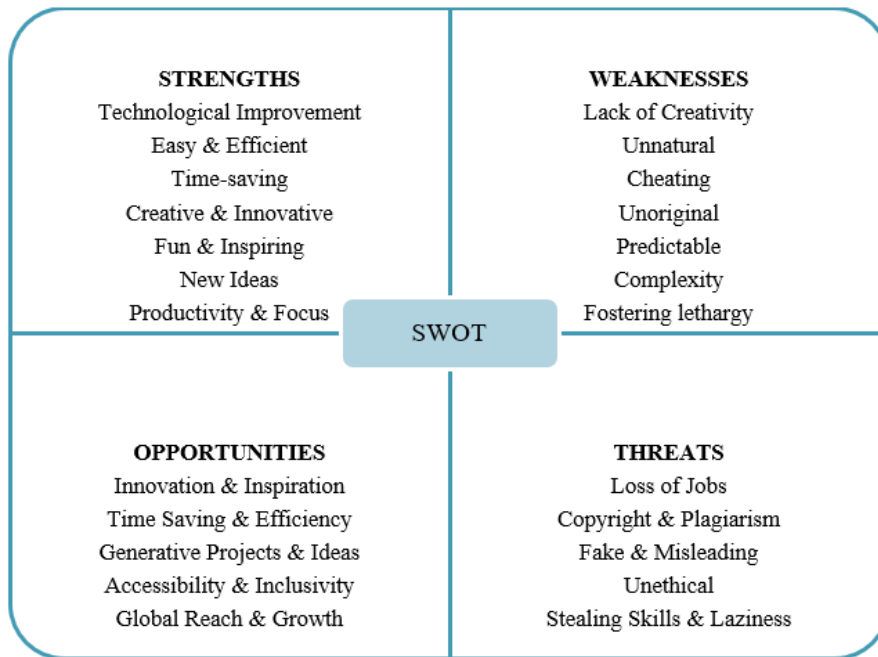
On September 12th 2023, participation in the ARTE 343 "Art and Technology in the K-12 Classroom", led by Dr. Kelly Gross, was ensured, enabling interaction with undergraduate students. Furthermore, the process was completed through classroom observations, discussions, and a focus group interview.



Figure 4. Focus grouping of Dr. Kelly Gross Class

In the course ARTE 343 Art and Technology in the K-12 Classroom, a situation assessment based on SWOT analysis was conducted with undergraduate students, focusing on the future of art education, digital transformation, and digital visual culture. Subsequently, a discussion was held based on open-ended questions to gather insights and recommendations. The key themes that emerged within the context of the SWOT analysis are as follows:

Table3. SWOT Analysis constructed with Undergraduate Students



Students inputted keywords for the SWOT analysis via an online platform called Mentimeter. Following the analysis, we engaged in a focus group meeting to discuss the SWOT framework.

Focus grouping data was collected from 10 students. During the focus group analysis process, students identified the following themes and subthemes:

Table 4. Themes and Subthemes of Undergraduate Students Focus Grouping

Productivity and Creativity with AI
AI as a Tool for Idea Generation
AI in Generating Content
Ethical and Artistic Concerns with AI
Ethical Dilemmas
Artistic Integrity and Authenticity
Art Education and Technology
Integration of Technology in Art Education
Technology Advancements
Bias in AI
Bias in AI Outputs
The Future of Art and Technology
Impact on Art and Design
Consumerism and Art

Under the theme "AI as a Tool for Idea Generation" students explored how AI can stimulate and support their idea generation processes. They also discussed AI's role in assisting them in articulating and nurturing creative concepts.

S1 indicated: "I think it's productive in general just to, I think we're the productivity with Artificial Intelligence. It does kind of like encourage the students, you know, to come up with, to storm ideas even though technically, they are just like coming up with the words in their head and then they just would, they should try to like describe it through AI like what it is that they want."

"I love A, I for the reason of like idea generation...asking questions about like what I could write for a story and then getting ideas that way."

"But like a lot of people have like the relation that they, they relate it back to like, oh AI is just doing what artists do."

Within the subtheme "AI in Generating Content" participants recounted their experiences with using AI to create images and emphasized AI's efficiency in facilitating content creation and design.

Under the sub-theme of "Ethical Dilemmas" students voiced their worries regarding the ethical ramifications of employing AI to create content. They engaged in discussions concerning matters like copyright, authenticity, and the possibility of AI substituting human artists.

"...so you use AI, it has a lot to do intention and if the intention is just to get a free piece of work just to have it and without like paying anybody and just say that it's your own. That's not right."

"...I saw an artist take an AI drawing that they found online and then redraw it in a way that they interpreted it."

Within the context of "Artistic Integrity and Authenticity" students engaged in debates concerning whether AI-generated art can be deemed authentic and if it depreciates the worth of conventional art. They also delved into the concept of utilizing AI-generated content as points of reference or for modifications.

"I myself have, I have not used a I as a means of like creating artwork but I, I feel like using it as reference tools or using it like taking something created by AI and altering it significantly."

"I will say the reason I did it for our little icons is that I then avoided copyright issues. So I wasn't using found images on the web."

Within the sub-theme of "Integration of Technology in Art Education" students deliberated on the significance of integrating technology into educational environments. They underscored the necessity of instructing students on how to navigate technology and critically assess its outcomes. The primary emphasis of this theme lies in cultivating critical thinking skills, enabling access to suitable technology, and equipping future educators to guide their students in utilizing technology effectively. Students engaged in a discussion about incorporating technology into art education, with a particular emphasis on the opportunities it presents for collaboration and networking between both students and teachers.

"I think it's just incorporating saying, OK, this is a reality of life. AI is going to be you know, in society and instead of trying to shy away from or hide it, it's more so let's face it, let's encounter it and educate and learn how to criticize that and take it, trying to keep it behind closed doors."

Under the sub-theme of "Technological Advancements" students emphasized the swift progress in technology and the necessity for educators to stay updated with these ever-evolving technologies. They also raised concerns about potential difficulties arising when students possess greater technological proficiency than their instructors. To harness the skills of future students and address their needs effectively, it is imperative to establish a robust interaction and

collaboration between students and teachers, primarily aimed at the efficient utilization of technology.

"Some of your students coming in are going to be more advanced in a program than you are. And so, you have to play catch up, right? Because they're learning new things and you're kind of like, oh my gosh, there's a new application. I have to go and take a look at how to run that one."

"....But I just think understanding like the history of technology being traditionally seen as a career in tech ED versus an art ed is important to understanding like how art education has evolved in the US."

Under the sub-theme of *"Bias in AI Outputs"* students shared examples of bias in AI-generated content, such as gender or racial biases and discussed the importance of addressing and countering these biases in AI systems. This was a crucial sub-theme concerning the socio-cultural context of art education in the realm of AI. Presently, digital technology-based environments often fail to generate significant social value. The primary emphases in future art education systems are on social value, policy, and content designed to promote human well-being. Therefore, the noteworthy aspect raised by students revolves around the concept of democracy in AI.

Under the sub-theme of *"Impact on Art and Design"* students speculated about the impact of technology and AI on art and design fields in the future. And they raised questions about the role of human creativity and the potential for AI to mass-produce art.

"Are we going to lose that love for human creation or solely AI creation? Are filmmakers gonna lose their jobs? Like it's a really scary thing to think about because then, because what other choice do you have besides just making art for yourself?"

And under the sub-theme of *"Consumerism and Art"* the consumerist mindset and how people often prioritize art as a commodity rather than appreciating the creative process. They also explored concerns about the devaluation of art in a consumer-driven society. Furthermore, they voiced their critique regarding the appreciation of the art creation process, the role of the artist, the environment, and the interaction involved. This criticism holds significant weight because AI-driven digital visual culture generates numerous images in a unique manner. However, the intrinsic value and depth of the process underline the enhanced significance and effectiveness of human-based creativity. Hence, the AI-driven creative process should prioritize the effective use of technology. Nonetheless, it's essential to acknowledge the substantial gap in AI-based processes when compared to the intricate nature of human creation processes. Another aspect to consider is that for those who lack artistic skills, turning to AI for art creation becomes a feasible alternative.

"So, what does art really serve for our society. And it's like, instead of not saying, like, we make things for you, it's like, well, technology now only makes something that you desire for yourself and not really something for, not even society anymore, just like for an individual. So, it is kind of terrifying."

"So, you know, on the one hand, I think the process is important, but I think that also AI has the potential to make art making more accessible for those who are

afraid, they don't have the skills or the knowledge to engage with programs or these concepts."

"But don't you think that it can also make things more accessible? Like people who couldn't afford to hire a graphic designer can now..."

When examining students' perspectives regarding Digital Technologies and the Future of Arts Education influenced by Digital Visual Culture, it becomes evident that there are certain competencies they require. These competencies based on the perspectives of students collectively address the diverse needs of art education students as they prepare for their future teaching careers. They empower students to become well-rounded educators who can effectively integrate technology, foster collaboration, promote critical thinking, and nurture a profound appreciation for the arts in their future students.

Recommended Concepts for Digital Visual Culture Education

Based on the collected data, a wide network of themes and approaches within the context of digital visual culture fosters the creation of a dynamic and inclusive learning environment for the future students. Digital visual culture pedagogy serves as a cornerstone in this process, supporting the development of critical analysis skills, multifaceted literacies, practice-based learning experiences. This foundation empowers students to explore a wide range of topics based on digital visual culture. In this multifaceted setting, students engage in creative remixing processes grounded in technological interaction while participating in collaborative production within digital realm (Leonard, 2022b; Gunkel, 2016). The research findings highlight the need for new competencies rooted in digital visual culture and digital visual culture pedagogy. Building upon these competencies, proposed concepts and subject content for digital visual culture are structured as follows:

Table 5. Recommended concepts for Digital Visual Culture Through the Interview and Focus Grouping with Field Specialists and Students

Digital Art Pedagogy	Digital Environment and Arts Education	Approaches to Digital Art Education	Digital Literacy Development	Interdisciplinary Interaction to Emphasize the Arts	Digital Video Creation
Digital Visual Culture and Media	Develop an Inclusive Digital Art Lesson	Augmented Reality: Rendering and Holograms	3D Modeling and Printing	Coding (Scratch/Blockly)	AI Art and New Materialism
Relations to Digital Technologies	Contemporary Art and Digital Visual Culture	Collaborative Production	Unique Digital Image Editing	Hybridization of Content and Digital Technology to Create Meaning	Critical Production
Digital Remixing as a Tool of Creative Expression	Post-digital/Post-modern Aesthetics	Technology Transition between Traditional and Digital	Liminal Spaces Exploration	Critical Analysis Skills	Social Meaning Analysis
Critical Artistic Production	Developing Mastery of Digital Tools	Creative Tool Utilization	Documentation Techniques	Post-Internet Creativity	Technology Hybridization Exploration

Conclusion and Suggestions

Digital technologies have introduced new learning processes that require various competencies, particularly for teacher candidates to effectively and efficiently utilize these technologies. Within the context of art education, several skills come to the forefront. These skills revolve around questioning a visually-oriented environment within a visual-cultural framework and designing a quality teaching process.

The integration of digital technologies in art education curricula requires a multifaceted skill that aligns with the evolving demands of the digital age. Proficiency in utilizing digital tools effectively, fostering communication in technology-mediated interactive environments, and facilitating student-centered interactions are essential for creating engagement in art education (Leonard, 2022b). Additionally, designing effective curricula that incorporate current technological trends and applying innovative evaluation and feedback methods are critical to ensuring the relevance and impact of art education. Inquiring the improvement of technological changes for creative process underscores the importance of adaptability and lifelong learning, enabling art educators to remain responsive to the dynamic nature of education in a digital context. These skills form the foundation for a transformative approach to art education, one that prepares students for both personal and professional growth in an increasingly digital world.

Digital technology skills should be tailored to the context of art education, emphasizing their connection to the teaching process. Effective communication is closely related to using technology efficiently, but it also encompasses guiding students through their digital-native world, leveraging their expertise.

When considering digital technologies within the framework of digital visual culture, teachers need to engage in self-renewal, enhance their professional development, and improve the quality of student interaction through subjective evaluation processes.

AI-supported art education involves integrating AI technologies into traditional art education to provide students with a richer, interactive, and personalized learning experience. This approach offers opportunities for artists and art enthusiasts to enhance their creative processes using AI algorithms and tools.

In the context of AI, various teacher competencies emerge that are crucial for effectively navigating the intersection of technology and art education. These include the ability to integrate AI into art education, enabling the use of AI algorithms, creative techniques, and tools in artistic practices and production. Teachers must also possess analytical thinking skills to understand the implications of AI algorithms on the image creation process, considering factors like context and transformations (Wise & Jung, 2019). Furthermore, implementing AI to personalize content in art education allows for a holistic approach, where educators can explore art history, critically engage with artists, and conduct data-driven inquiries into the relationship between societal events and art. Teachers are also expected to critically examine AI's generative structures in digital visual culture, transforming the visual production process and fostering human-technology collaboration for creative content creation. Lastly, questioning digital ethics and security in the context of digital visual culture is essential, as educators, while navigating evolving protocols, must establish personalized rules to ensure student protection and define ethical boundaries. These competencies collectively equip teachers to guide students through the complexities of AI and its implications in the artistic realm.

The integration of digital technologies, including AI, into art education requires teachers to develop a diverse set of competencies that encompass effective technology use, personalized instruction, critical thinking, and ethical considerations in the digital visual culture context.

Digital visual culture presents us with some creative pedagogical competencies. In this context, experimental pedagogical processes can be effectively linked with artificial intelligence. Critical pedagogy emerges as one of the significant pedagogical approaches in this process. Constructing competencies like critical thinking and problem-solving based on critical pedagogical approaches is important for students. This enables them to question distinctions and connections between reality and virtuality, in conjunction with creative thinking. Creative pedagogical approaches and collaborative literacy based pedagogical approaches can assist students in learning and comprehending digital visual culture-focused visual analysis more effectively (Worsley et al., 2021; Verhulsdonck, 2014). These approaches can be used to enhance students' artistic expressions, strengthen their visual analysis skills, and deepen their understanding of digital visual culture. They provide an alternative perspective for examining and analyzing visuals critically.

Digital art pedagogy is another significant pedagogical context within the realm of digital visual culture. It stands out with aspects such as cultural change and collaboration based on art education, awareness, and social responsibility (Heaton & Lai Kuan, 2023). Furthermore, through digital art experiences, it becomes possible to establish a dynamic connection among learning strategies in art education. The strong connection between digital art and digital visual culture, along with the possibilities of the digital medium, allows for the implementation of enriched pedagogical approaches in art education.

In summary, the rise of digital visual culture has made art education more vital than ever. Art teachers today must navigate the digital realm, bridging traditional and digital art, and equipping students with the skills to critically engage with digital imagery. This evolution underscores the importance of digital visual culture in our contemporary world.

Conflict of Interest

There are no conflicts of interest regarding the publication of this article.

Informed Consent

Participants were informed about the study's objectives, procedures, and potential risks. They were informed that participation was voluntary and that they could withdraw from the study at any point if they felt reluctant without any consequences. All personal information was anonymized to protect participants' confidentiality.

Data Availability

The data are not publicly available due to privacy or ethical restrictions.

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