

Understanding the Use of Emerging Technology in the Middle School Art Classroom

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ABSTRACT

This study explores the use of emerging technology in middle school art classrooms. It is intended to assist the Wake County Public School System's Middle School Professional Learning Community identify where their members most need support accessing resources and guidance for emerging technology integration. The research methods included a survey and an interview. A sample size represented the middle school art teachers within the county. 22 teachers completed the survey, and two were interviewed. The participating art teachers gave insights into factors that influence their perspectives of technology integration and opinions on the support received from the professional learning community and school system. Art teachers indicated a need for technology-oriented professional development opportunities, the facilitation of technology training to promote digital citizenship for their students, potential collaborations between art and career and technical education departments, and funding for both installations and maintenance of technologies. Overall, the findings highlighted the need for increased guidance and support from the professional learning community and school system to help teachers integrate technology effectively into their art classrooms.

Understanding the Use of Emerging Technology in the Middle School Art Classroom

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Chapter 1: Introduction

Art education is constantly evolving as we continue to grow as a society that prioritizes the advancement of technology. Teachers, parents, students, and administrators use technology both in and outside the classroom; however, how teachers choose to use technology can directly impact the quality of learning delivered to their students, especially within the art classroom. When used as a resource or art medium, technology can encourage collaboration, immersive learning, communication, engagement, and creativity; therefore, as art educators, it is our responsibility to evolve within our field in hopes of producing an enriching and rigorous visual art experience for our students.

Statement of Problem

This research was designed to understand the current use of existing and emerging technology in the middle school art classrooms of Wake County Public School Systems (WCPSS) by surveying the Professional Learning Community (PLC) made of 50 middle school art teachers and examining factors that influence their technology access, integration, potential obstacles, and use. As a professional learning community, the middle school art teachers in WCPSS are responsible for attending monthly meetings to discuss five key questions. These five key questions are: Where are we going? Where are we now? How do we move learning forward? What did we learn today? Who benefited and who did not? This set of questions encourages the professional learning community to reflect, revise, and progress within the art education field for the students' benefit. During the COVID-19 pandemic, the key questions discussed during the PLC meetings prioritized emerging technology integration. However, now that we are no longer at the height of the pandemic, the meeting agendas have decentered technology. In fact, during the 2023-2024 school year, our agendas focused on writing grant proposals, studio environment,

local and state resources, creating gallery spaces, best clay practices, and even organizing an art club. Emerging technology integration is less significant in the professional learning community, which is not congruent with the current evolution of technology in art education.

In our modern society, technology is a standard tool used for educational instruction (Ibraahim & Shiring, 2022). At the basic level, teachers use technology such as laptops, internet access, and web-based learning management systems to communicate with parents and students, deliver virtual instruction, share online resources, and organize their curriculum. However, art educators should aim to expand their basic understanding of art technology integration.

Technology such as digital design software, 3D printers, artificial intelligence, augmented reality, fractal art, etc., can enrich the creative design process, connect learning to contemporary movements, and even explore art through other cultures. Google has just created Gemini; a multimodal generative AI tool teacher can use. Imran and AL Musharraf (2024) believe that Gemini will aid in creating individualized learning plans, developing engaging material, adding visual effects, transcending language barriers, and engaging learning elements. Cutting-edge technology, such as Gemini, has a place in education; therefore, utilizing emerging technology as an art medium can be a complete asset to the art classroom.

Integrating art-driven technology will open our students to exploring the relationship between art and science. Özdemir (2022) talks about the “art of technology” (p. 121), which is described as the blossoming union between both technologist and artist. The relationship between technologist and artist creates a sense of curiosity in art, leading students to explore, experiment, and experience a new form of visual art (Özdemir, 2022). WCPSS PLC need to continue integrating art technology into its PLC meeting agendas and curriculum. Visual artists have transformed modern technology into an art medium that accurately reflects the direction of

contemporary art (Cunningham, 2020). If art educators are not staying current in their comprehension of the utilization of technology, it could ultimately impact the quality of art education delivered to their 21st-century learners.

Therefore, in this research study, I used qualitative research methods such as surveys and interviews to examine the factors influencing the understanding, use, access, obstacles, and overall integration of technology within the Wake County middle school art classrooms. I generated baseline data on the PLC's current use of art technology and then used this data to explore the trajectory of emerging technology use as a community.

Personal Justification

Art educators were forced to rely on technology the most during the COVID-19 pandemic. We were then responsible for thinking of intentional and influential ways to teach the art through our new virtual reality. Specifically, as a middle school art teacher in the Wake County Public School System, I was tasked with packaging art supplies, leading live demonstrations online, watching my students create via a webcam, requesting students to take pictures of their artwork, hosting virtual discussions, and providing online creative experiences for my students. The lack of professional development needed to integrate technology so quickly proved challenging. I was overwhelmed.

Before experiencing the COVID-19 pandemic, I understood that technology was an option for creating artwork; however, the pandemic made me, and other art educators realize just how important technology can be to the art classroom. During these uncertain times, the middle school professional learning community (PLC) became a resource for teaching art teachers how to navigate the difficulties of using technology to create an enriching and engaging visual art experience for our students within their homes. As a community, we meet monthly, exchanging

ideas, navigating online resources, and helping each other adapt to our new technology-driven normal. Now that we are no longer at the height of the COVID-19 pandemic, the middle school art teachers within Wake County have transitioned back into the classroom and to teaching a more traditional art education curriculum. Our PLC still has monthly meetings; however, the conversations have shifted away from technology-driven topics. My justification for exploring emerging technology stems from its initial impact on my teaching career at the start of the pandemic and how I have since learned of the importance of continuing the push for technology integration and its implications on the future of art education. I am interested in learning how my fellow professional learning community feels about the intentional use of emerging technology. Ultimately, I aim to use this survey research study to provide data to help further the professional learning community expand their comprehension of technology when it is intentionally used as a visual art medium. Therefore, I became interested in emerging technology in art education and, more specifically, how art educators in my professional learning community within the Wake County Public School System view technology integration in art education.

Research Questions

The overarching research question is: How do the middle school art teachers in the Wake County public school system view technology usage, and what factors influence their perspective? I propose that factors such as individual educational and professional background, access, understanding of technology integration, and potential obstacles affect the communities' drive to integrate emerging technology.

I designed a set of sub-questions to answer the overarching research question: (1) Does the art teachers' background or professional experience influence their perspective on emerging technology use? (2) What are the art teachers' general attitudes toward technology use in their

current teaching practices? (3) Regarding technology access, what products are available to the art teacher and their students? (4) What specific technologies have these art teachers integrated into their teaching practices, and how often does this integration happen? (5) What potential obstacles may hinder emerging technology use? By participating in this survey research, each teacher within the professional learning community had an opportunity to reflect on their perspective on the use of emerging technology and how that perspective affects the use of technology within their classrooms.

Throughout the remainder of this thesis, I will uncover the use of emerging technology in the middle school art classroom by analyzing literature to examine the role of technology and the 21st-century teacher, technology as a visual art medium, and the intentional integration of technology. I will then describe the research methodology and design, followed by the results of the data analysis, which will aid in determining implications and future research.

Chapter 2: Literature Review

The Effects of the COVID-19 Pandemic on Art Education

Technology has been a significant component of the overall advancement of education. In our current society, Technology has aided us all through the difficulties of teaching during the COVID-19 pandemic. Like all education sectors, this virtual teaching and learning trend directly affected the field of art education. Technology for remote learning became the primary means of communication between art teachers and art students. Art teachers worldwide had to quickly learn how to transform their approach to delivering instruction to our students.

Teaching and learning through technology has become necessary for all students, and the COVID-19 pandemic has consequently shed light on the gaps in access to technology. Lamm (2020) states, "While COVID-19 has highlighted the growing digital divide that permeates our state, digital inequality has been a massive issue in North Carolina far before the pandemic" (para. 2). Lawmakers and administrators were called to action. Wake County Public School System decided to close the equity gap by allocating funds to ensure each student had a laptop and access to wireless internet.

Having guaranteed access to technology such as laptops and wireless internet made it easier for teachers within the county to communicate with their students; however, learning how to deliver hands-on instruction virtually proved challenging. The art teachers in WCPSS were responsible for creating small bags of art supplies to send home to each student. Sometimes, their parents needed help getting the supply bags, or the students would use the art supplies before the designated class time—the standard art supplies quickly became a massive inconvenience in providing a basic level of art instruction. There was no blueprint on the most appropriate ways to keep students engaged, connected to the curriculum, and interested in art during virtual learning.

There was also no prior professional development in viewing and using technology as an art medium, which can discourage teachers from integrating new skills. Johnson states that “If teachers feel they do not have the necessary competencies when using technology, they may feel less in control of the class, use less technology, and be unlikely to explore new possibilities that utilize technology when designing their classes” (Johnson et al., 2016, p. 12). Art teachers experienced an extreme learning curve during virtual learning when connecting technology use to their teaching practices. A general lack of understanding then became an obstacle to technological integration.

Because of these obstacles, art teachers in WCPSS knew they had to find a better way to use technology. Sabol (2022) highlights the importance of technology integration during the COVID-19 pandemic by stating that modern technology has enabled art educators to connect, create, and challenge students during unprecedented times. The art education Professional Learning Community (PLC) had to prioritize discussions that focused on technology integration. The COVID-19 pandemic transformed the role of art teachers, which encouraged the PLC to look at the technology we had access to and how it could be used as an art medium to further connect, create, and challenge our student body.

Now that we are no longer at the height of the COVID-19 pandemic, many teachers, including myself, have taken a break from encouraging our students to use technology as a creative medium. Teachers use technology to support basic applications instead of centering emerging technology that supports creativity (Tusiime et al., 2022). Technology can be helpful in the art classroom post-COVID-19 (Dias & Victor, 2022). Integrating technology as an art medium expands on art education's power. Art education provides a place for our students to communicate intentionally and expressively, reflecting on our diversity, feelings, morals, and

cultures. With the addition of emerging technology, art teachers can challenge students innovatively and rigorously.

Technology and the 21st Century Teacher

In our current society, teachers have far more responsibilities when leading our students to academic success. Teachers are expected to deliver instruction that enriches the skills students need to become comprehensive members of our society. The desired 21st-century learning outcomes revolve around life and career skills, learning and innovation skills, and information, media, and technology skills (Alismail & McGuire, 2015). It is the responsibility of all educators to foster these skills through their curriculum instruction, professional development, and learning environments.

Art educators should focus on developing information media and technology skills because they are a core component of developing 21st-century learners. Technology integration is rooted in understanding, teaching, and exposing our students to contemporary art practices (Winner, 2022). Emerging technology is now a vital aspect of teaching art students. Dias and Victor (2022) describe the importance of technology integration by stating, “In recent times, the increase in the use of technology is shifting traditional teaching methods in the classroom by facilitating learning in new ways. Mobile learning is using mobile technology to facilitate learning anytime and anywhere” (p. 26). Emerging technology integration makes it possible for teachers to deliver creative learning experiences that transcend the physical reality of our classroom.

Basic tasks such as displaying teaching content, sharing resources, generating lesson plans, and grading are connected to technology use. However, emerging technology can be more than a primary instructional tool. Emerging technology encompasses many devices such as

laptops, tablets, cell phones, iPods, cameras, and artificial intelligence software. Art educators can use these technologies to expose students to digital artmaking, which expands their creative capabilities beyond traditional artmaking skills, tools, and media. Art teachers can do this by developing a learning environment encouraging students to participate in lectures, projects, and assignments that prioritize digital literacy (Song et al., 2021). For example, art teachers can invite students to view emerging technology as research. Winner (2022) describes contemporary art as being multimodal, meaning that contemporary artists often create works connected to research. To uncover the meanings of these contemporary artworks, the audience must not rely on the work's formal properties but on the thinking and research that influence the artist's intentions. Teaching art students how to view art as research will give students the skill to investigate creative processes and uncover big ideas; therefore, emerging technology in art education can and should aid art teachers, just as any other medium.

Technology can also expose 21st-century learners to a world beyond the classroom and connect art education with other disciplinary topics. As explained by Freedman and Stuhr (2004), "Computer technology is not only a medium but also a means that has enabled people to see things previously unimagined and to cross borders of form from the fine arts to the mass media to scientific visualization" (p. 818). With this statement, it is clear that emerging technology can aid in expanding the content delivered in the art classroom. Teachers are responsible for cultivating their students' curiosity; emerging technology can stimulate that process. Exploring digital artmaking can give students an enriching experience in conjunction with traditional art media.

Technology as a Visual Art Medium

The National Art Education Association believes that visual art includes traditional fine art like painting, sculpture, and photography and media art such as animation and emerging technologies (NAEA, n.d.). The materials that artists use to create visuals are called visual art media. Visual art media include, but are not limited to, ceramics, fibers, jewelry, glass, paper, paint, and wood. These materials are typically used to create traditional fine art; however, the NAEA defines emerging technology as fine art. This inclusion allows art teachers to rediscover technology as a visual art medium. 3D printers, artificial intelligence, design software, and extended reality are all technologies that can be used as a visual art medium.

When used intentionally, emerging technology can become an extension of the traditional visual art media more commonly used in the art classroom. Art educators exploring the relationship between technology and art aim to enrich their students' creative design process. Tetikci et al. (2021) best support this by stating that:

Technology and art have a special relationship, focused on the idea that rather than being merely about application, new technologies may serve as a language in the form of replicating and presenting resources that will support the learning processes of students.
(p. 1090)

Exploring the relationship between art media and emerging technology provides students with new materials for creating exemplary art, expanding their core perception of visual art, traditional visual art media, and the learning process.

Technology as an art medium allows art educators to create lesson plans and creative experiences for our students that challenge the integration of traditional artmaking and digital art media. Holtje (2019) expresses that artists should not ignore the existence of digital media but

should “. . . instead embrace the new tools for artmaking and incorporate them into their processes in a way that preserves the integrity and traditional nature of the artwork while advancing and simplifying their creative process” (p. 23). Technology in art education can also expose students to lucrative careers in art education that are connected to technology sectors and digital art (Discover the Power of Pairing Technology with Art Education, n.d). As the relationship between art and technology grows, it will be irresponsible for art educators not to acknowledge the positive impacts of technology in the art classroom. As mentioned in TIME magazine, the merriment of art education and technology can be a more liberating way to achieve creative catharsis (Gehry & Feruzzi Shriver, 2020). Teaching art education in our modern society requires both a traditional and contemporary approach to the course content and creative media; therefore, applying modern art-driven technology in art education can make teaching art in the 21st century intentional since the expansion of emerging technology has impacted how we work, live, communicate, and think.

Even though technology use is prominent in our culture, art educators may need help knowing where to start. The expectations of learning about digital media can strain educators when incorporating new skills into any teaching environment. In conjunction with that, emerging technology media are also in a constant state of evolution, which means that as soon as some educators get used to using one form of technology, something new and improved is on the market, which makes it difficult for art educators to feel like they are adequately utilizing technology such as laptops, cell phones, and iPads in its most current state (Wang, 2022).

There are also potential pitfalls to using technology in the classroom. The mobile devices, laptops, and internet that our students have access to are not explicitly made for educational use. Dias and Victor (2022) go as far as to say that standard technology devices are "sedentary

pastimes" (p. 30). To avoid the passive use of emerging technology, it is the responsibility of the educator to set boundaries and reestablish the purpose, expectations, and intended outcomes for utilizing technology in the classroom.

Integrating emerging technology into the art education curriculum has far more positives than negatives. Art education and emerging technology have in common that within both fields, there are not many rigid categories, which makes way for non-stop exploration. Papadopoulou (2019) argues that:

Art as a catalyst becomes the ideal medium for thinking. The play between the visible and the invisible, focusing on conception rather than perception, the technical thinking background enables artists to experiment with images and reality, exaggeration of forms, have set in motion of visual imagery revealing mutual relations that are inherent in things, but also 'extending' the physical world, looking at one thing and seeing. (p. 2)

Emerging technology integration in art education gives art students access to art education without boundaries. Using technology as a visual art medium allows students to explore, experiment, reimagine, and reengage with their creative design process. Margo Cunningham (2020) expresses that the overall use of technology should be addressed, as it can also be used to increase participation and engagement. When using digital media, students may feel more comfortable creating multiple drafts, experimenting with trial and error, and having the flexibility to start over without wasting materials. Our students' increased exposure to technology allows art educators to play a crucial role in guiding them through the integration process, using their shared knowledge and everyday experiences to introduce students to emerging technology and art media.

Intentionally Integrating Emerging Technology

Integrating emerging technology into art education teaching practices should be more than just copying the curriculum in an online platform such as Canvas or Google Classroom. Teachers can reflect on the intent behind emerging arts integration by examining their teaching practice. Gulbahar (2008) suggests: “Effective integration requires the existence of the necessary hardware and software, effective usage of resources, adequate in-service training opportunities, well-prepared professors, and innovative implementation strategies for facilities” (p. 4). Investigating the competency levels, perception, and preparedness surrounding emerging technology integration will aid teachers in developing appropriate strategies for effective technology integration.

Art educators can leverage digital mediums media such as 3D printers, digital cameras, design software, and coding/gaming websites to challenge their students to think differently about creative processes. The integration of emerging technology should not only reflect the teacher’s student population but also empower them. By understanding the general interest in emerging technology, students' background, and relationship with technology, art teachers can feel confident in their ability to adapt to the changing landscape of art education. Cunningham (2020) explains, "In fact, many young students are seeking out art and gamification on their own time, as our culture becomes increasingly immersed with technology, the need for arts integration along those platforms has reached a new high" (para. 3). Ultimately, art educators who take advantage of this surge in creative technology that already exists within their student population will enhance their curriculum to support our 21st-century learners. Art educators can consciously make this integration happen when we align emerging technology use with art

education standards. Students can then create new original work, share, interpret, respond to, and connect their ideas with the projected standards and new technological experiences.

If students have the proper guidance and instruction, technology can be a valuable tool in the art classroom; when used as an art medium, emerging technology expands the scope of possibility for art education. Art education provides a place for our students to communicate intentionally and expressively, reflecting on our diversity, feelings, morals, and cultures. Song and Koo (2022) emphasize the need for digital integration, particularly involving the use of artificial intelligence (AI) technology, explaining the ways that we can challenge our gifted and talented students by suggesting that “. . . AI use in creative activities can push the boundaries of artistic practices and can challenge our traditional notion of what constitutes good art” (p. 6). However, many students have been exposed to the negatives of artificial intelligence, such as Chat GPT, which was once banned in Wake County Public Schools. Because of the educational benefits presented by appropriate and intentional AI use, teachers within WCPSS are now encouraged to utilize emerging AI, such as Chat GPT, to facilitate student learning (Tallhelm, 2023). The adaptability and resilience of art educators in the face of emerging technology is a testament to their flexibility and open-mindedness. Emerging technology and AI can be highly intimidating. However, it is constantly growing and changing, and regardless of our personal feelings, Artificial intelligence will have a lasting impact on our society. Art educators should feel comfortable experimenting with new technologies within their curriculum. In doing this, art educators ensure their students feel comfortable exploring, creating, and developing positive relationships with digital media in the art classroom.

Integrating emerging technology requires a willingness to reflect, learn, and grow within the art education field. Several factors can contribute to an art teacher’s ability to prioritize

effective integration. Therefore, the next chapter will uncover the research method and design used to explore the current use of technology among middle school art teachers in Wake County Public School System and the driving factors that contribute to their perspective on emerging technology integration.

Chapter 3: Methodology

This chapter discusses the research methodology used for this mixed methods study regarding the emerging technology use among the Wake County Public School System middle school art education Professional Learning Community (PLC). The explanatory sequential mixed methods design was used to collect quantitative data through a survey during the first phase of the research. The survey results helped identify several factors influencing art teachers' perspectives on emerging technology use. This led to the development of qualitative interview questions that encouraged participants to explain and elaborate on the survey responses.

Using a mixed methods approach while collecting qualitative and quantitative data from the survey and interviews, a set of data was delivered that described how the PLC views technology in art education. The survey data and a detailed account of the art teachers' experiences and thoughts during the interviews allowed the participating art teachers to express their views on emerging technology beyond their survey responses.

Research Questions

The present study explored the research question: How do the middle school art teachers in the Wake County Public School System view technology use, and what factors influence their perspectives? To answer the overarching question for this study, sub-research questions (SRQ) were developed to aid teachers in describing the factors that have the most influence over their view on technology use:

SRQ1: Does the art teachers' background or professional experience influence their perspective on emerging technology use?

SRQ2: What are the art teachers' general attitudes toward technology use in their teaching practices?

SRQ3: Regarding technology access, what products are available to the art teacher and their students?

SRQ4: What specific technologies have these art teachers integrated into their teaching practices, and how often does this integration happen?

SRQ5: What potential obstacles may hinder emerging technology use?

Research Design

Mixed Methods Research

A mixed methods research design is deemed appropriate when the research seeks to fully understand a phenomenon that cannot be understood by using quantitative or qualitative methods alone; therefore, this research design was used to build a comprehensive understanding of emerging technology use in the WCPSS middle school art classrooms by using quantitative and qualitative research methods. Dawadi et al. (2021) describe the advantages of using a mixed methods research design by stating that “Mixing two methods might be superior to a single method as it is likely to prove rich insights into the research phenomena that cannot be fully understood by using only qualitative or quantitative methods” (p. 27). Therefore, a mixed-method research design was used in this study to explore quantitative and qualitative data to analyze emerging technology in middle school art classrooms.

Explanatory Sequential Design

An explanatory sequential mixed methods research design was implemented to organize the data collection process. Toyon (2021) explains that when using that explanatory sequential design, the researcher emphasizes the quantitative phase of research first, followed by the second phase of research, which is qualitative. Within this research study, quantitative survey data

uncovered the factors that may or may not influence emerging technology access, integration, obstacles, and attitude. The results of quantitative survey data then helped determine the questions for the qualitative interview, which allowed educators to participate in guided dialog that encouraged open-ended discussion between the interviewer and interviewee. Combining quantitative and qualitative research design methods helped to provide an in-depth understanding of the proposed research question.

The Setting and Participants

This study occurs within the Wake County Public School System (WCPSS) in Raleigh, North Carolina. WCPSS comprises 198 schools serving 159,00 students and 38 middle schools that house the 50 art educators who are members of the middle school art education Professional Learning Community (PLC). WCPSS's mission prioritizes providing engaging and relevant educational experiences that create students who are collaborative, communicative, and creative thinkers. The art education PLC is responsible for upholding that shared mission.

To initiate data collection, a research proposal for the WCPSS data and research committee had to be conducted. Then, participants were recruited via email and during a brief presentation during a monthly professional learning community meeting. During the first research phase of the explanatory sequential design, the participating art teachers were asked to respond to a survey delivered via email using Qualtrics. Qualtrics is a web-based software that helps create, distribute, and analyze survey data. Within that survey, participants could sign up for optional interviews during the second phase of the data collection. Fifty art teachers were invited to participate in the study, 22 participated in the survey, and two participated in the optional interview.

Data Collection and Management

Quantitative

This survey took place from March 2024 to May 2024. Creating a survey based on the overarching research question was the starting point of the quantitative phase of data collection. This approach created measurable features that provided quantitative findings that aimed to understand the teachers involved and the factors affecting emerging technology use in their classrooms. According to Gay and Mills (2019), quantitative research aims to deeply examine the research participants to gain an in-depth understanding of the “. . . way things are, why they are that way, and how the participants in the context perceive them” (p. 15). Therefore, the survey delivered numerical data that explains the general attitudes surrounding PLC technology usage and integration.

Teachers and researchers engaged in quantitative research are committed to investigating and reflecting on the common understanding and experiences of the research participants; therefore, a survey was used to examine the current ways emerging technologies are used. Survey research collects data and answers research questions about opinions, problems, or issues (Gay & Mills, 2019). Multiple factors can influence the participant's answers and opinions of emerging technology; therefore, the survey broke down and explored the reasons behind the answers. The survey used in this research was divided into four sections to organize the responses, each encouraging the educators to think critically about all the components that influence their emerging technology use. Section one focuses on background information. In this portion of the survey, I was interested in creating a profile of the educator based on their current level of education, type of teaching license, age range, years working in WCPSS, professional organization involvement, and national board certification holders amongst the group. The

second section seeks to understand the general attitude of the individual art teacher by using Likert scale-modeled questions that explored enthusiasm and enjoyment, anxiety or lack of understanding, avoidance, and usefulness, and lastly, productivity and professional development surrounding emerging technology use. The third section aimed to discover the access teachers and their students have to emerging technology, which ranges from computers to extended reality. The fourth section focuses on specific technology use and integration and how often the teacher prioritizes emerging technology use. Lastly, the fifth section challenges the educator to think about the potential obstacles that hinder the utilization of emerging technology.

Qualitative

Interviews are a qualitative research method that involves direct communication between the researcher and the participant. Interviews are most appropriate when “there is a need to collect in-depth information on people’s opinions, thoughts, experiences and feelings” (Easwar, et al., 2006, para. 2). This explanation directly aligned with the objective of this interview, which was to generate complex questions that encouraged the participants to expand on their experiences, opinions, and perspectives of the emerging technology use in their classroom.

A semi-structured qualitative interview was chosen to gather supporting data that assisted in answering the initial interview question and corroborating the quantitative research data. A semi-structured interview requires the researcher to preplan interview questions and follow-up questions related to the research topic (Universidad et al., 2022). To organize the interview questions and responses, the semi-structured interview was created to guide the interviewee through open-ended questions that promoted anecdotal conversations. The interview questions followed the same sections as the survey; therefore, each set of questions was connected to the overarching themes: (1) background information, (2) general attitude, (3)

access, (4) usage and integration, and (5) potential obstacles. Planning, conducting, and analyzing interviews took place between May 2024 and June 2024. Art teachers volunteered to participate in the interview through the survey. Participants were interviewed virtually using a WebEx online meeting. Virtual interviews were conducted in a personal WebEx room where the interview was recorded online and transcribed using Microsoft's dictate function. Each interview lasted 45 minutes to an hour in a single interview session. A total of five teachers volunteered to be interviewed, and two teachers completed the interview.

Chapter 4: Results

This chapter provides the present study's findings based on the data analysis of the Explanatory Sequential Research Design method used to collect quantitative and qualitative data. The survey was structured into four sections, each focusing on specific factors contributing to the teacher's perspective on technology use within their art classrooms. Interview data was collected to follow up with selective participating teachers to retrieve anecdotal evidence of their personal experiences with emerging technology. In this chapter, I will describe (1) the quantitative data findings based on the survey outcomes and (2) the qualitative data findings drawing upon interview data.

Survey Findings

The participating middle school art teachers accessed the survey questions through a web-based questionnaire. The survey was divided into four sections, and each participant was encouraged to answer the survey questions according to their authentic thoughts, teaching circumstances, and responses related to the use of emerging technologies.

Each section focused on factors that contribute to, influence, or hinder technology use in the middle school art classroom. The survey sections explored (1) the background of the participating middle school art teachers, (2) general attitudes toward emerging technologies, (3) the teacher's and students' access to emerging technologies, and (4) potential obstacles to technology use in the art classroom.

The Background of the Participating Middle School Art Teachers

Teachers' background, such as age, education level, and years of teaching experience, did not significantly influence their interest in and use of emerging technology. Several studies have looked closely at factors such as teacher age (Inan & Lowther, 2010) and years of teaching

experience (Smarkola, 2007) to help determine if they influence teacher technology integration. However, this study did not uncover conclusive evidence on the relationship between age, years of teaching experience, level of education, and implementation of emerging technology in the middle school art classroom. This finding aligns with Tweed's study (2013). Figures 1 and 2 provide an overview of the background information for each participating art teacher, including their level of education and age range. The data also highlights the relationship between the teachers' years of experience and educational qualifications.

Figure 1

Level of Education and Age Range

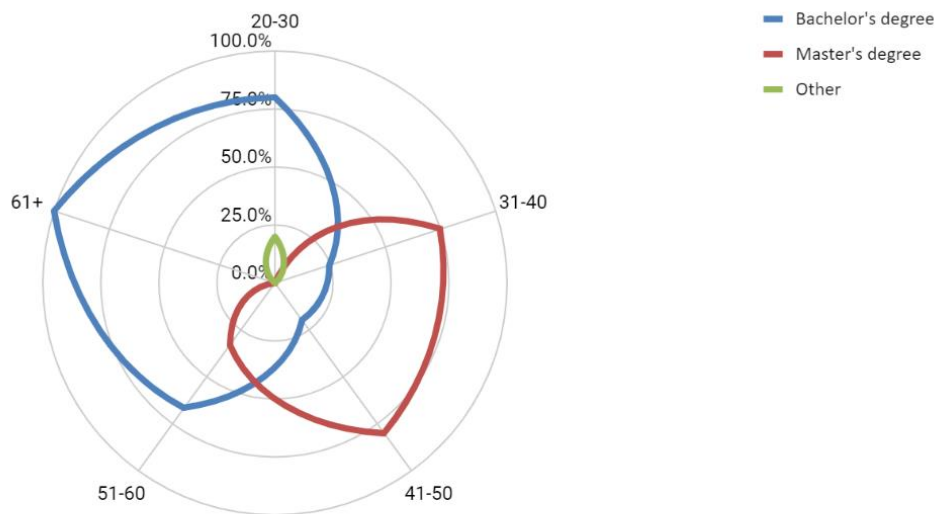
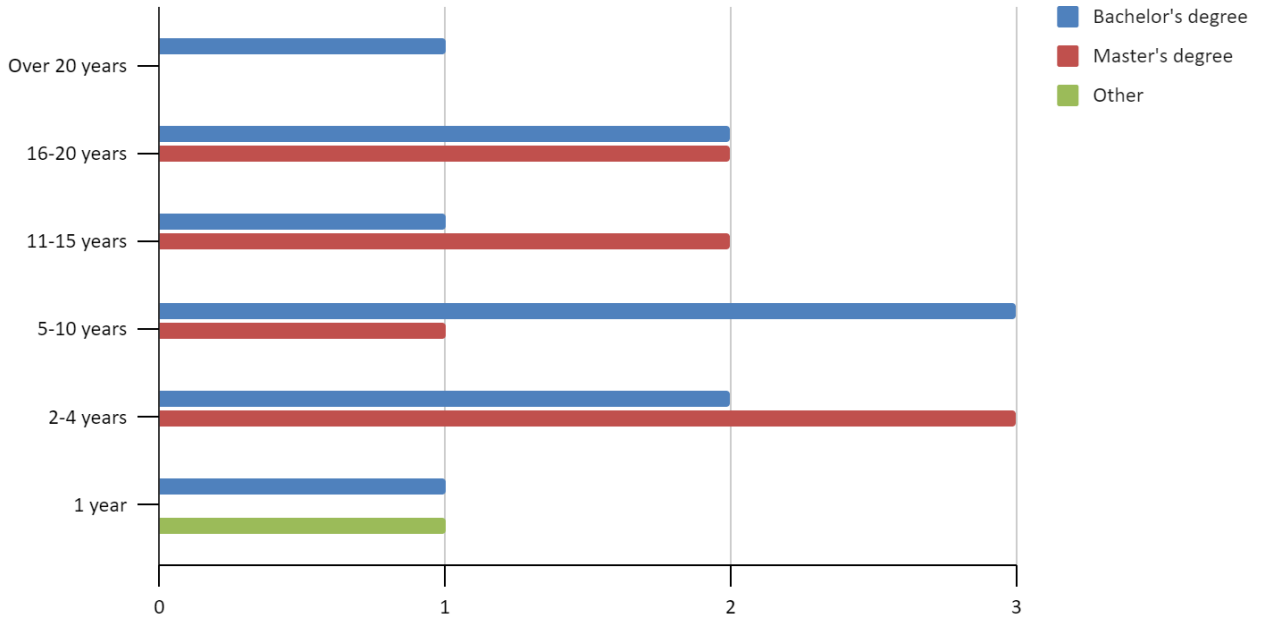


Figure 2

Level of Education and Years of Teacher Experience



According to the data, there were more participating art teachers with bachelor's degrees than master's degrees because there are fewer master's degree holders in general and in this population. The age of the teachers with bachelor's degrees spans from 20-61+ years compared to the smaller population of the participating teachers with a master's degree, whose ages only span from 31-60 years old. Of those with bachelor's degrees, 100% of the art teachers fall into the 61+ age range, 80% are 20-30, 66.7% are 51-60, 25% are 31-40, and 20% are 41-50. There were no teachers who have master's degrees and fall into either the 61+ and or 20-30 age range, but 33% of those with master's degrees are 51-60, 75% are 31-40, and 80% are 41-50. More middle school art teachers hold a bachelor's degree as their highest level of education, and the larger population of participating teachers is between 20-30 and 41-50 years old. Regardless of their final degree, teachers who fall between the ages of 20-30 years old presumably have the

most experience with utilizing technology both in and out of the classroom, whereas teachers who fall between the ages of 41-50 years old may have generational learning curves that are associated with technology integration.

The background information data also uncovered a relationship between education level and years of teaching experience. Because there are multiple approaches to becoming an educator, such as earning a bachelor's degree, completing a teacher preparation program, or obtaining state licensure, I expected to find an inverse correlation between the level of education and years of teaching experience. However, as shown in Figure 2, there is no significant relationship between the level of education and years of teaching experience. Teachers who solely have a bachelor's degree range from one year of teaching experience to over 20 years of teaching experience, showing a broad age range represented in Figure 1, which shows teachers who have a bachelor's degree span from the youngest age group of 20-30 years old to the oldest age group of 61+ years. Figure 2 displays that a maximum of three teachers with bachelor's degrees have indicated that they have been teaching for between 5-10 years. The participating teachers who have earned their master's degree span from 2-4 years to 16-20 years, with a maximum of three teachers indicating they have been teaching for at least 2-4 years. Ultimately, fewer middle school art educators sought a master's degree, which does not directly impact the teacher's age or years of teaching experience. The participating teachers whose highest level of education is a bachelor's degree have the most years of teaching experience and diversity in age groups. A master's degree in art education aids in developing a deeper understanding of research methods, advanced teaching practices, and the most current topics in art education. A bachelor's degree in art education prioritizes foundational teaching practices, art skills, and pedagogy.

Despite the smaller number of art educators within WCPSS who chose to obtain their master's degree, the data suggests that years of teaching experience provide a level of comfort that promotes the exploration of new media, skills, and techniques. This dedication to the profession and the willingness to adapt and learn is a testament to the commitment of art educators to their students and the field of art education.

The General Attitudes Towards Emerging Technologies

In the context of this section, a general attitude refers to the art teachers' behavior, mindset, and approach to teaching their students. Understanding the general attitude surrounding emerging technology among the participating teachers is essential because it impacts the seriousness and purpose of generating lessons that maximize student capabilities (American Board, n.d.). Therefore, this section examines the art teacher's: (1) comfort level, (2) emotional responses to the usefulness of emerging technology, (3) art teacher's access and technology integration, and (4) student-specific obstacles associated with technology use.

Comfort Level. Art teachers who become comfortable with utilizing emerging technology as an extension of their teaching practices and curriculum enrich the creative learning experience for their students. Emerging technology is a resource that supports students' learning. When feeling comfortable, art teachers who integrate emerging technology can extend beyond the mere application of technology and begin to explore the relationship between the visual art and technology as a visual art medium (Tetikci, 2021). The participating art teachers expressed their comfort with emerging technology by examining their confidence, anxiousness, and frustrations.

Figures 3, 4, and 5 describe how the participating art teachers agree or disagree with their frustrations, anxiousness, and confidence related to emerging technology comprehension,

understanding, and integration. Twenty-two percent of art teachers agree that they have frustrations when trying to comprehend and keep up with emerging technology. These frustrations are related to the 44% of art teachers who are neutral in their confidence when working with emerging technology and 40% of art teachers who feel anxious when trying to incorporate technology into their lesson plans. Anxiety, frustration, and lack of confidence impact participating teachers' comfort levels when exploring and integrating emerging technology.

Figure 3

Comfort Level: Confidence

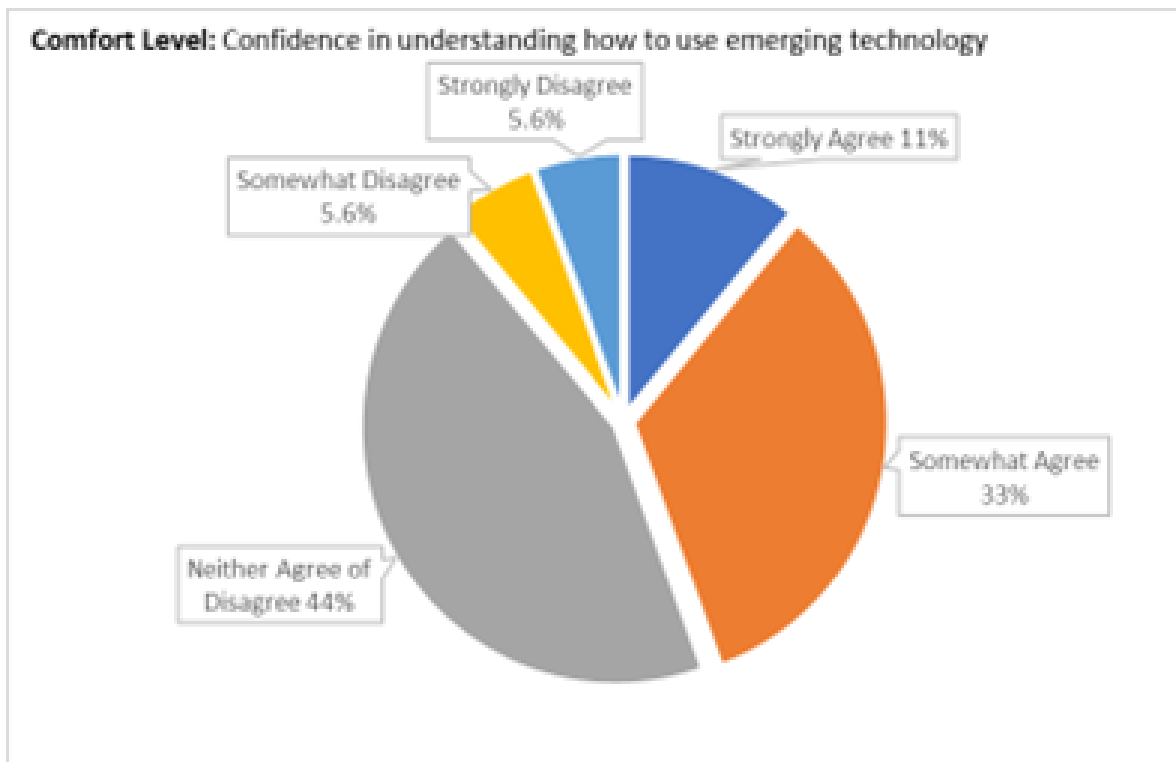


Figure 4

Comfort Level: Frustrations

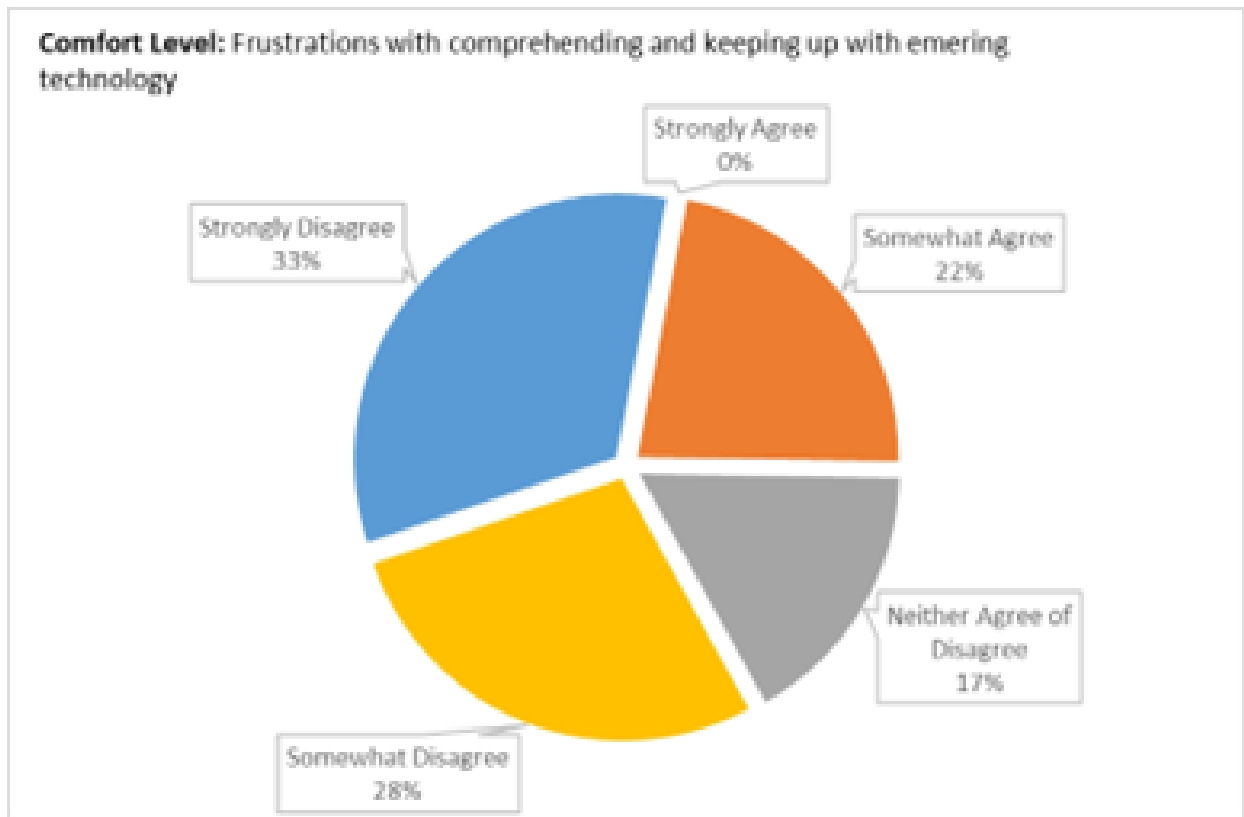
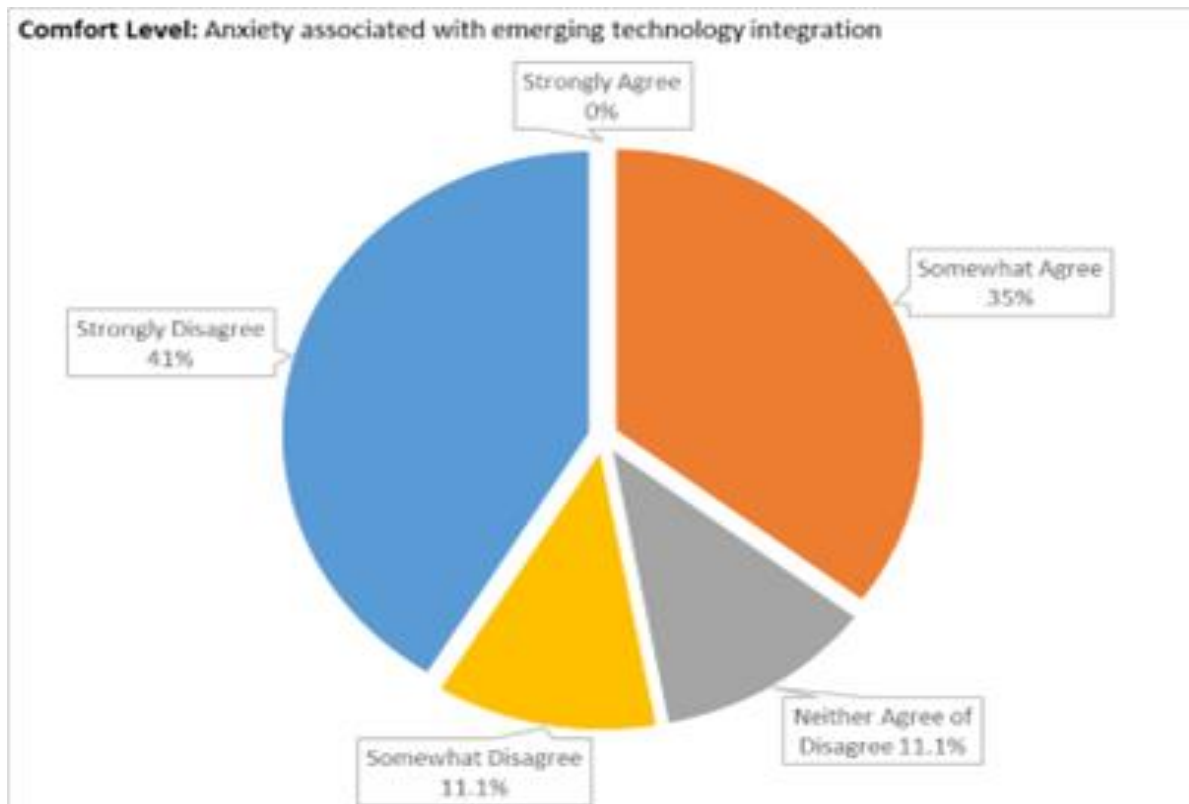


Figure 5

Comfort Level: Anxiety



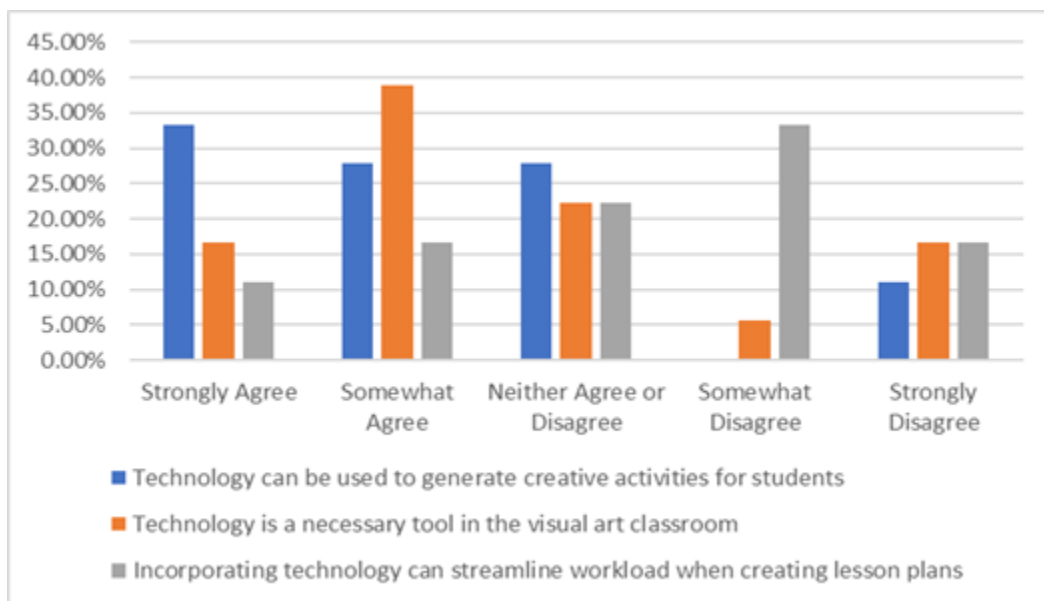
Even though a population of teachers expressed low levels of comfort in their technology use, the data in Figure 3 also reveals that 33% of the participating art teachers strongly disagree with having any frustrations when comprehending and keeping up with new technology, and 39% of teachers strongly disagree with feeling anxious about emerging technology integration. These findings suggest that middle school art teachers may be more willing to challenge their comfort level with emerging technology integration despite feeling frustrated and anxious.

Emotional Responses to the Usefulness of Emerging Technology. Technology has proven to be a helpful aid in the public-school classroom by boosting engagement, encouraging collaboration, creating personalized learning experiences, and increasing access to information. To successfully reap the benefits of what emerging technology can add to the middle school art

classroom, it is essential to understand the participating teachers' perspectives on how useful emerging technology can be as an asset to their classrooms. Figure 6 gauges how participating teachers agree or disagree with (1) technology being a necessary tool in the art classroom, (2) technology used to streamline workload when creating lesson plans, and (3) using technology to generate different creative activities for students.

Figure 6

Emerging Technology Usefulness



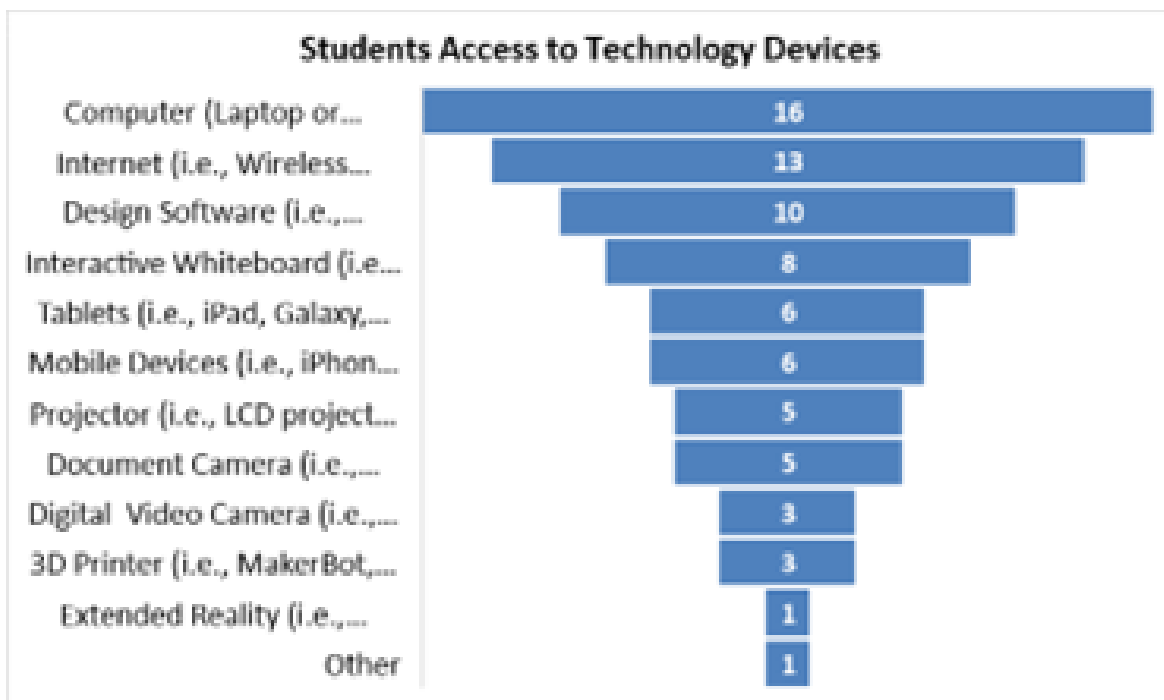
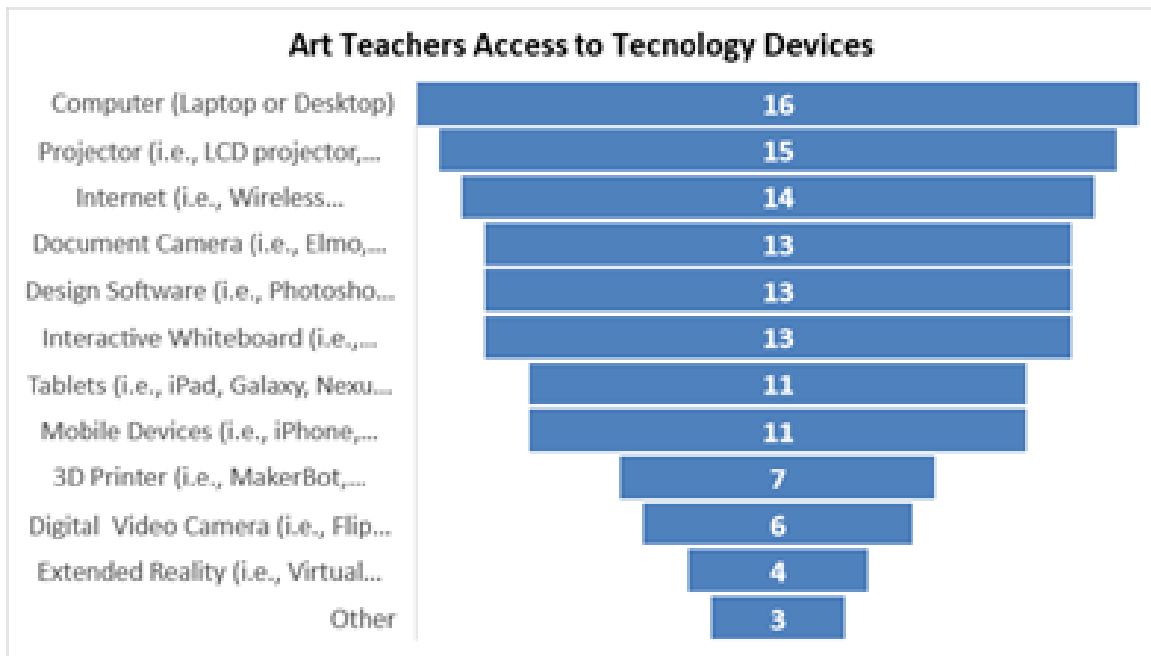
The data set shows that 33% of participating teachers strongly agree that technology can generate creative activities for their students. While 27% of teachers only somewhat agree or neither agree nor disagree, more teachers see the usefulness of using emerging technology to generate creative experiences for their students. However, 49% of participating teachers somewhat and strongly disagree that incorporating technology can streamline their workload. In comparison, only about 27% of all participating teachers agree that technology is less helpful in creating lesson plans. This means that more teachers are willing to see the usefulness of emerging technology as a

creative tool rather than a tool for simply writing lesson plans. It is also shown that almost 40% of art teachers believe that technology is a necessary tool for the art education classroom compared to the 22% of art teachers who are neutral and the 16% who disagree that technology is essential. Although a small population of participants disagrees with the usefulness of emerging technology, the use of technology as a necessity and creative tool has a positive trend amongst the participating art teachers. This should encourage the PLC to continue to propose meeting topics that recenter emerging technology integration. Topics such as generating creative activities prioritizing technology and understanding how to use technology as a creative tool will give PLC members a renewed perspective on the value of emerging technology integration.

Art Teachers' Access and Technology Integration. The middle school art teachers expressed that emerging technology is helpful when generating creative lesson plans, and they also describe technology as a necessary tool for the art classroom (see Figure 6); however, it is crucial to investigate participants' access to emerging technology and the frequency in which they use the accessible emerging technologies amongst themselves and with their students. Analyzing this information will generate a broader perspective of the current uses of technology in the professional learning community. Figure 7 displays the specific types of technology that participating teachers and their students can access within the art classroom.

Figure 7

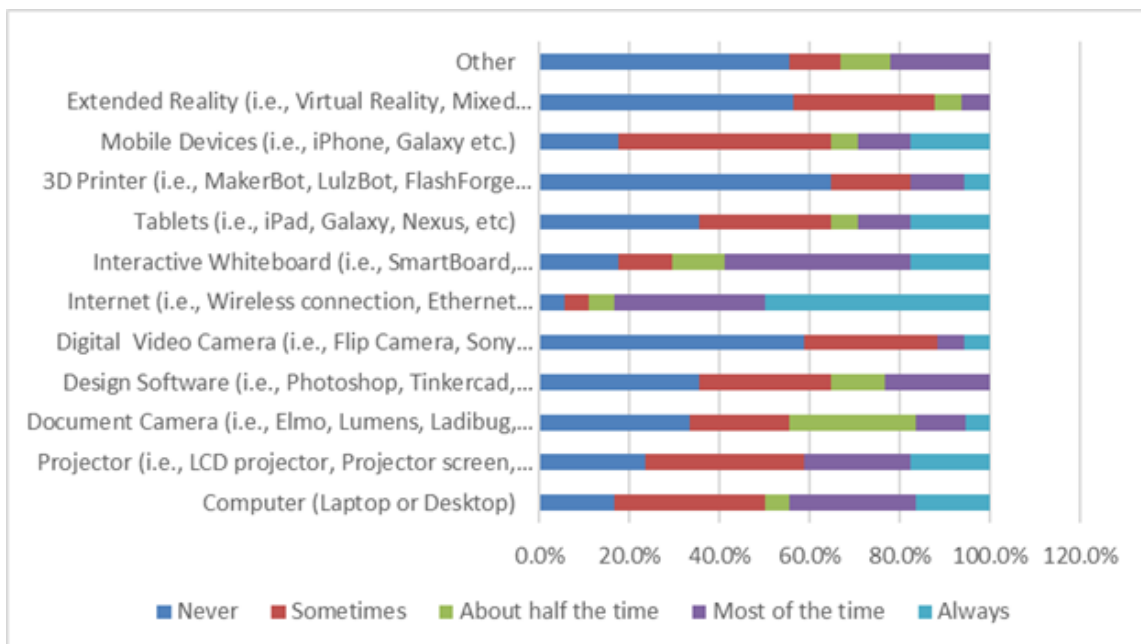
Art Teachers' and Students' Access to Technology



Computers, projectors, and the Internet are among the top three technologies to which art teachers have access. Computers, the Internet, and design software are among the top three technologies students can access in their art classrooms. WCPSS provides the top three devices that teachers and students can access. In contrast, emerging technologies, such as 3D printers, extended reality, tablets, and digital video cameras, are less likely to be accessible to either students or their teachers. Art teachers can only properly utilize or integrate emerging technology if they can access technology outside of what has been mandated by the county, especially considering that students have far less access to technology than their teachers. For example, 11 art teachers reported that they had access to tablets, which can be used for curating creative activities, taking videos and pictures, documenting artwork, and even digital drawings. In comparison, only six art teachers shared that their students also had tablet access, as indicated in Figure 7. This gap in technology access may impact how participating art teachers approach emerging technology integration and the frequency with which they use the available devices.

Figure 8

Integration Frequency of Accessible Emerging Technology

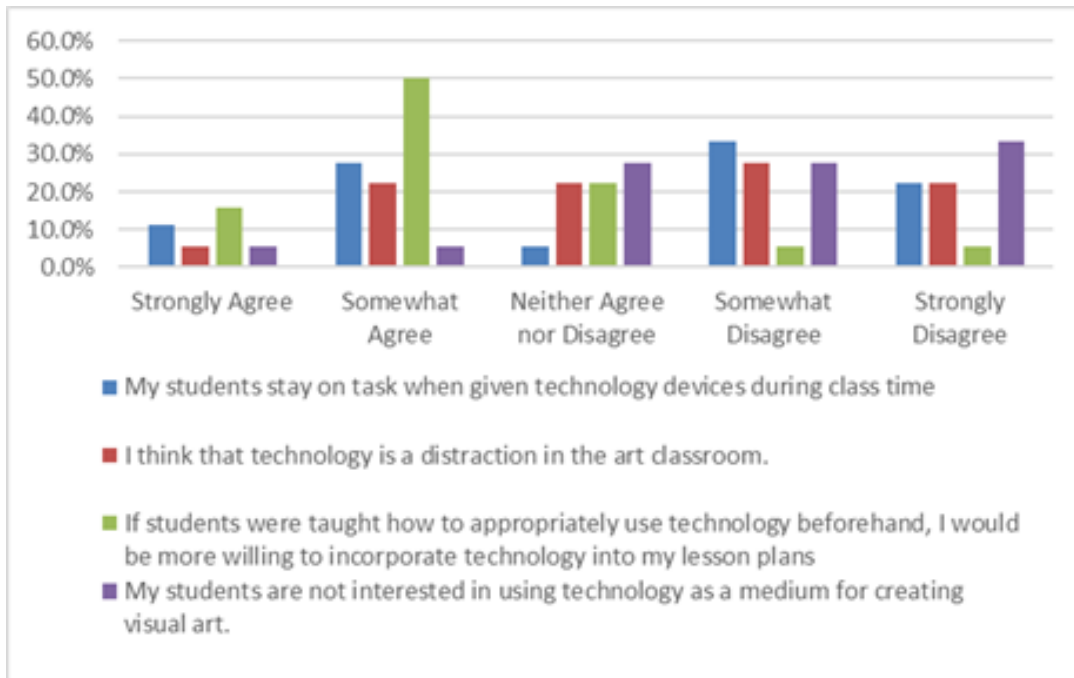


As predicted, the participating art teachers spend most of their time using technology devices provided by the school system, such as interactive whiteboards, projectors, internet, and computers. In contrast, never or sometimes-used technology refers to extended reality, 3D printers, tablets, digital video cameras, design software, and mobile devices. All the listed devices can be used to develop creative lesson plans that prioritize digital literacy and artmaking; however, the participating teachers are not prioritizing emerging technology that can be explicitly used as a visual art medium due to lack of access, as demonstrated in Figures 5 and 6. This data set exposes the reality of technological integration within the PLC, which depends on access to technology.

Student-Specific Obstacles Associated with Technology Use. Drawing upon the data, student engagement, risk of distraction, and lack of student training are potential obstacles for art teachers and their approaches to emerging technology use and integration. Figure 7 presents how the participating art teachers feel about student-specific obstacles associated with emerging technology use by asking teachers how to scale how much they agree or disagree with statements about student engagement, training, distractions, and overall interest.

Figure 9

Student-specific obstacles associated with technology use



The data shows that 33% of teachers say students do not stay on task when using technology. However, 50% of art teachers believe that if students learn to use emerging technology appropriately, they will be more willing to incorporate technology into their lesson plans because 34% of art teachers believe their students would be interested in emerging technology-integrated lesson plans. As shown in the data set, student-specific obstacles do not significantly threaten integrating emerging technology. Moreover, teachers' belief in the potential benefits of student training in technology is a source of optimism for the future of technology integration in art education. Ultimately, participating art teachers do not let factors such as comfort level, emotional responses to the usefulness of emerging technology, and access to emerging technologies negatively affect their general attitudes surrounding emerging technology use and integration. Art teachers show a positive trend of being willing to work around obstacles and make the most of the emerging technologies available to them. Therefore, the next section will examine the experiences of art teachers on a more personal level through the interview findings.

Interview Findings

This mixed methods research study aimed to gain a new perspective on the existing art education topic of emerging technology use amongst art teachers interested in voicing their direct experience with emerging technology within WCPSS. Specifically, interviews were used to explore how emerging technology is used in middle school art classrooms. Out of the entire professional learning community, two teachers voluntarily participated in this interview research. Each interview was conducted virtually and individually. Art teachers were asked to recount their authentic experiences with technology use in the art classroom. They were encouraged to speak freely and answer the interview questions as candidly as possible, which created a relaxed and comfortable environment. The teachers were also told to talk organically because their names and teaching assignments were coded. Participating teachers will be described as using pseudonyms. The first interviewee will be referred to as Ms. Collins. The second interviewee will be referred to as Ms. Green. A secure, consensual, and comfortable environment encouraged art teachers to vocalize their unfiltered experience. The interviews aim to accurately represent the art teacher's experience utilizing technology in their art classroom.

Each interviewee shared constructive, reflective, and insightful feedback, which uncovered common themes. These themes were centered around: (1) the influence of educational backgrounds and years of teaching experience, (2) willingness to learn and adapt to emerging technology, (3) common uses of technology and obstacles, and (4) suggestions for technology use in the art classroom. This section will discuss the interview results as they relate to the themes presented by the participating teachers.

The Influence of Educational Backgrounds and Years of Teaching Experience

The participating teachers shared past experiences, such as education level and years of teaching experience, that shaped their perspective on using emerging technology within their classrooms today. It was common for the participants to express how their level of education had a minor impact on their view of emerging technology, while their years of teaching experience had a significant impact. For example, Ms. Collins explained that although she has two fine art degrees, they have yet to influence her use of technology in the classroom. She stated:

I don't think that has [level of education] influenced my use of technology. I think that my use of technology is very limited in the art room . . . I think the classes and educational experiences that have had the most impact will be any kind of training we receive for the technology. (April 2024)

Ms. Collins also indicated that teacher training and professional development on the technology teachers have access to prove more beneficial than educational training outside the technology they directly access in their immediate teaching environment. Ms. Green shared a similar experience with having both a bachelor's and master's degree that did not prioritize emerging technology. Ms. Green explained that while obtaining her undergraduate degree, the use of email had just become prevalent, further explaining that technology was not a prominent component of her undergraduate career. Furthermore, while pursuing her master's degree, she majored in ceramics, which did not have a strong technology focus. Ms. Green goes further to say that:

My technology learning came through 20 years of teaching. Having to use updated software in every district and every new school you work for is constantly asking you to upgrade your technology and giving you PD [professional development] on your technology, which causes you to learn new things. (May 2024)

Both teaching professionals have a higher education background, which does not contribute to how they approach technology use in their current teaching positions. However, the participants stressed how their years of teaching experience and professional development provided by the school district have taught them more about emerging technology and how to use updated technology in their classrooms.

Willingness to Learn and Adapt to Emerging Technology

Participating art teachers shared anecdotes about how fear and time impacted their willingness to learn and adapt to emerging technology. Both positive and negative experiences of art teacher' personal and professional outlooks on technology integration within their classroom. For example, Ms. Collins expressed their fear of AI as a visual art medium by sharing a negative experience outside the classroom, creating a bias against that specific emerging technology. Ms. Collins illustrated:

There's a whole lot going on with that [AI]. It scares me because I know all too well about fraud because I was in banking for 30 years, and I know the flip side, or should I say, I am aware of what can happen on the dark side of AI, and that makes me afraid for the kids. (May 2024)

Although integrating emerging technology into the classroom has many benefits, it also has uncontrollable components that can create bias, lack of transparency, malicious use, and dependency (Božić, 2023). Because of personal negative experiences, Ms. Collins is less willing to learn or adapt to emerging technology powered by AI. Educators have professional and social-emotional demands that can create a high-pressure work environment. Lack of recovery time and exhaustion contribute to the teachers' overall capacity to maintain high teaching quality, student achievement, and professional longevity (Maas et al., 2021).

It has become the art teacher's responsibility to find the time to create enriching experiences that prioritize emerging technology as an art medium. Ms. Green reported that it is difficult to find the time to conduct thorough research on emerging technology, which causes a lapse in learning and no room for trial and error for educators to feel comfortable enough to integrate emerging technology into their lesson plans. Ms. Green described a time-pressure situation, which can cause teachers to burn out or become exhausted while trying to learn and adapt to emerging technology. However, as technology continues to reshape art education, art teachers work through their fears and time constraints to deliver instruction focusing on emerging technology. Ms. Green said they had to go above and beyond for their students for intentional technology integration.

We were making little robots. . . I had to call the company I bought devices from probably 40 times. Every step of the way, [I asked] how do I do this? How do I code that? It was just a lot of groundwork to figure out how to do it myself before I taught it to the kids. And the same goes with all the photography. . . I wanted to do that [photography] with the kids, and so I went back to school for digital art part and then I revived the photography dark room. (May 2024)

Despite fears or a lack of time, Ms. Green displays a willingness to learn and adapt to emerging technology even though Ms. Green experienced obstacles, they still went out of their way to ask questions, further their education to add rigor to their student's learning experiences.

Common Uses of Technology and Obstacles

Since the two participating teachers work in the same school district, they share common uses and obstacles associated with emerging technology use. Their standard technology uses were portfolio building using Google Slides or Google Sites, Promethean Boards with webcam

projection, and websites such as Canvas, PowerSchool, and Outlook. Interviewees voiced their comfort in using technology such as the Promethean board, Canvas, PowerSchool, Outlook, Google Sites, and PowerPoint because of the county-wide professional development that has been offered, which aids teachers in learning how to incorporate those technologies into their everyday teaching practices adequately. Both teachers then use their shared knowledge to find ways to integrate accessible technology into their curriculum intentionally. One-way participating teachers do this is by using Google Slides and Google Sites to guide their students in creating a visual art portfolio. Ms. Collins challenges students to fully re-design their portfolios without using the default templates provided by the software. Ms. Collins explained this instructional process:

There are so many things we talk about there [on Google Slide or Google Sites]. You know, websites that they go to that are really hard to navigate. . . So, we talk about the colors of their font, what the backgrounds are and things like that. (April 2024).

The portfolio-making process allows students to connect emerging technology, photography, and handmade projects to generate a digital portfolio that organizes their learning (Fahey & Cronen, 2016). Similarly, Ms. Green uses technology such as a Promethean board, webcam projectors, Canvas, and Google Docs in their classroom (May 2024). Despite the lack of emerging technology used explicitly for designing digital art, participating teachers make the best use of the technology they and their students are most comfortable with.

There are also common obstacles shared between both participants. These obstacles include a need for more professional development and budget constraints. Professional development is used to help improve teaching skills and enhance student learning outcomes; however, there is a lack of professional development focusing on emerging technology within

Wake County. Ms. Green shares a need for more comprehensive and relevant professional development on technology integration within the district. The participant described these obstacles:

Whenever a district switches you to a new platform like from Google Classroom to Canvas, they give some form of PD [professional development], but in my opinion, it is always just like a really basic framework. . . and they expect you to kind of figure out the rest by helping each other. So, I don't feel like there is enough PD. For tech, I feel like teachers really have to flounder for a while when we have to do something new, which is quite stressful. (May 2024)

Professional development is integral to integrating emerging technology in the art classroom. Without proper professional development, emerging technology becomes a burden. Ms. Collins also says they “would be interested in professional development, as long as I get to use what I learned in the classroom” (April 2024). Ms. Collins continued to explain the need for relevant and applicable professional development to integrate technology in their classroom effectively.

Intentional professional development should be used to support the technology teachers can access. However, the county provides and mandates the most common technologies that participating teachers use. Even though art teachers make the best out of the technology given to them, there are technologies, such as Photoshop, 3D printers, and even digital cameras, that would provide art teachers with the tools to use technology as the primary art medium. Emerging technology can be expensive, impeding participating teachers' access to specific technologies. When participating teachers were asked if they had a budget for advancing the technology in their classroom, Ms. Green explained how, for the past two years, her department has been lucky; however, they do not believe that will last due to the maintenance associated with

emerging technologies like software updates, filaments for 3D printers or maintenance issues, which are not accounted for in the art teachers' budget (May 2024). Ms. Collins shared that the budget for emerging technology, such as 3D printers, is used for Career and Technical Education programs (April 2024). Because of the demand for emerging technology in other subject areas, Ms. Collins has decided not to focus on advocating for expensive technologies such as 3D printers or updated design software.

Suggestions for Technology Use in the Art Classroom

Teachers and students use technology in both their academic and daily lives. Due to this increase in technology use, educators cannot ignore technology's influence on their teaching career and students' learning experience. Therefore, the participants were asked to convey their thoughts on technology and its implications for the future of art education. Ms. Collins shared that even though they believe that traditional 2D and 3D art forms will remain prominent, technology such as graphic design and filmmaking, are just as important as traditional art media. Emerging technologies will continue to redefine how we teach and lead our students. Although both teachers have expressed concerns about emerging technology integration, there is immense potential for fostering positive student experiences. Ms. Green illustrated:

There is so much potential for tech [technology] and the visual arts. . . You go to museums or a gallery, and you're going to see tech. You are going see artists using tech in new, interesting, and innovative ways. (May 2024)

Ms. Green encouraged educators not to become archaic in expanding technology in education. Neglecting technology use and integration does not reflect the learning projection of our students (Barton & Dexter, 2020). Due to the positive implications suggested by the participating teachers, the professional learning community should take the initiative to recenter technology

integration to maximize the potential of technology use in the art classroom for our current and future students; therefore, within the next section of this thesis, I will discuss the overall findings and how their relationship created key findings that support the need for emerging technology support.

Chapter 5: Discussion

The results of this mixed-methods research presented a distinct relationship between participating art teachers and the personal and professional factors that contribute to their conceptions of technology use in the middle school art classroom. The survey findings suggested that the teachers' age and level of education have less of an impact on their decisions to integrate emerging technology. In contrast, factors such as professional development, access to emerging technology, and student training prove to have a greater influence on the ways the participating teachers integrate emerging technologies. Moreover, they exhibited an overall positive attitude towards the use of emerging technologies. The number of teachers who pointed out the negative factors associated with technology use was outnumbered by the ones who considered the potential of new technology in the art classroom.

This indicates that the Professional Learning Community should refocus on creating meeting topics that focus on supporting art teachers with emerging technology integration. The PLC is responsible for peer-to-peer instruction that aids in the overall development of all participating members. The findings suggest that even though teachers have a positive outlook on technology integration, they cannot impact their students' learning without proper support for their teaching practice. To examine what kind of support middle school art teachers need, I have formulated four suggestions based on the study outcomes: (1) technology-oriented professional development opportunities for art teachers, (2) facilitating technology training promoting students' digital citizenship, (3) collaborations between art and career and technical education departments, and (4) funding for both installations and maintenance of technologies.

Technology-Oriented Professional Development Opportunities for Art Teachers

Art teachers need professional development that focuses on current topics in art education, contemporary art techniques, art history, new educational strategies, and the ability to integrate emerging technologies (The Artsy Teacher, 2024); however, the participating art teachers reported that their school districts do not provide emerging technology-driven professional development opportunities that help them develop comprehensive lesson plans to utilize emerging technology as a primary art medium. This leaves the burden of finding, researching, and implementing emerging technology up to the teacher.

As shown through the results of this study, if teachers have positive self-efficacy towards technology, they will put forth the effort to outsource information, have trial and error, and become innovative in how they utilize the technology available to them. Some teachers might be willing to do this, but according to the data, 40% of art teachers feel anxious when trying to incorporate modern technology, and another 22% of art teachers agree with experiencing frustrations when trying to comprehend and stay relevant with emerging technology.

Professional development should be used to alleviate the anxiety and frustrations associated with learning and adapting to new technologies. Teachers receive professional development through online modules, state-mandated training, courses, workshops, and peer-to-peer instruction. These can be intentionally utilized to build teacher self-efficacy related to emerging technology integration within the middle school art classroom.

Intentional professional development can be described as quality teacher training that benefits the school, students, and teachers and enhances the importance of a continuous learning culture for students and teachers (Tweed, 2013). To prioritize emerging technology-centered professional development, the professional learning community should first evaluate the technology teachers and their students have access to and then create teacher training that can be

applied directly to the existing classroom. Since the county provides the most common devices, art teachers can learn about web-based software, such as AI, that forces students to seek various ways to provoke influence and exploration within art education (Leonard, 2023). Art teachers would be able to use devices that are accessible to all students when using web-based emerging technologies.

However, the data also uncovered that personal fears and biases affect teachers' willingness to learn and adapt to AI. Interviewee IT voiced their concerns with artificial intelligence integration due to personal experience within a different profession. With the proper professional development, art teachers can learn a new perspective of advanced emerging technology that may seem daunting and dangerous for our students. Student learning is negatively affected when teachers do not receive the professional development needed to utilize emerging technologies safely and intentionally for creative learning outcomes.

One of the tasks teachers are responsible for as a professional learning community is identifying common issues with instruction and professional development; therefore, teachers within the professional learning community must demand professional development that is relevant to learning about emerging technology that can benefit their students' learning outcomes. The professional learning committee can begin advocating for emerging technology professional development by identifying gaps in emerging technology access, which became very apparent through the survey findings. WCPSS students do not have the same access to devices such as 3D printers, Digital cameras, or even iPads. This gap in access creates a barrier to emerging technology integration outside of devices and services provided by the county.

However, the professional learning community should help teachers mend this gap by finding resources that can fit into the professional development deliverables, such as being taught

in a workshop, through peer-to-peer instruction, or online courses that intentionally reflect the technology that art teachers and their students access daily. If art teachers are not adequately trained in using the technology around them, they risk producing dormant and inactive 21st-century learners (Mwamakula, 2024). This should encourage the professional learning community to create topics of discussion that encourage art teachers to stay up to date with emerging technologies and share how they are utilizing emerging technology and the positives and negatives associated with student outcomes. By implementing the following steps, the professional learning community will drive the need for professional development that intentionally enhances how participating teachers feel about emerging technology PD and its effects on their classrooms. With the help of meaningful professional development, art educators will gain the tools needed to properly engage their students with emerging technology; they will also need support in sufficiently instructing their students on the most appropriate ways to utilize the technology.

Facilitating Technology Training Promoting Students' Digital Citizenship

Due to the current technology focus within our society, our students often encounter daily technology use at home and school, significantly increasing screen time (Strom, 2021). Although some of the screen time is structured, the data shows that 33% of teachers have concerns about students staying on task when they can use their devices. Ms. Green also expressed how they have witnessed students losing, manhandling, and misusing the county-mandated Chromebooks, discouraging them from providing expensive or advanced emerging technology to their students due to the risk of damage or waste.

However, 50% of art teachers believe that if students learn to use emerging technology appropriately, they will be more willing to incorporate technology into their lesson plans.

Teachers are responsible for teaching their students the appropriate use of emerging technologies, which creates a sense of digital citizenship. “Digital citizenship describes the appropriate use of technology by the learners, regarding factors such as safety while using the technology literacy by the learners. . .” (Sahito et al., 2024. p. 9). Building digital citizenship among students should be included in the process of technology integration because it will teach students how to be safe on the internet, protect their data, and give them practical experiences on how to appropriately use emerging technologies that are accessible (Sahito, 2024). Teaching students how to be responsible for emerging technology within the art classroom will ultimately benefit the art teachers on their journey with emerging technology integration.

Promoting positive digital citizenship will take complete understanding and the teacher's commitment. For example, interviewee Ms. Collins teaches students how to appropriately utilize Google Sites to generate a digital portfolio of their visual artwork. The art teacher shared how they take the time to walk their students through every tool offered on the site and how to creatively design the site, which helps their students feel comfortable with navigating the emerging technology independently. Teachers who actively train their students on how to maintain a positive relationship with emerging technologies will create 21st-century learners “. . .who look at digital art making as a creative process that generates innovative, critical, conceptually sound and skillful media production” (Bae-Dimitriadis & Ivashkevich, 2023, p. 1). As art teachers within the professional learning community begin to reprioritize their personal development, they must also consider the development given to their students for the emerging technology they are expected to utilize.

Collaborations Between Art and Career and Technical Education Departments

Due to limited access to emerging technologies in the art classroom, art teachers can only foster digital citizenship with the available tools. To expand students' familiarity with these technologies, teachers must be willing to collaborate with other programs within the school. According to the survey data, three out of 22 participating teachers share that their students have access to 3D printers, meaning that only about 13% of students can learn to use or experience that type of emerging technology and its design software.

Even though emerging technologies, such as 3D printers, extended reality, tablets, and digital video cameras, are less likely to be accessible to teachers and their students (see Figure 7), both Ms. Collins and Ms. Green revealed that the Career and Technical Education (CTE) programs at their respective schools have access to emerging technology such as studio production equipment, 3D printers, and even modern design software such as Adobe Photoshop.

Within middle schools, Career and Technical Education programs are responsible for exposing students to diverse career paths, developing employability skills, and implementing digital-first learning that prioritizes the realities of the middle school mind (Keeney, 2024). Art teachers can collaborate with these programs to gain access to emerging technologies they cannot access within their classroom and help their students broaden the scope of the creative possibilities of integrating visual art, emerging technology innovation, and unique learning opportunities. Dell'Erba and Wolff (2019) express that:

Arts education develops thinking skills and capacities that are key to success in the 21st-century workforce by equipping students with creative, problem-solving abilities, building collaboration and communications skills, and developing leadership skills and capacity. These skills aren't just for traditional K -12 classroom learning; districts

incorporate these skills into CTE opportunities through growing industries, including graphic design, media, and film production. (para. 2)

Bridging the gap between the CTE and art classroom would allow teachers to combat access to more advanced technology while providing students with an enriching experience that promotes art integration across disciplines. Although collaboration is an option, art teachers already have so much to conquer with their curriculum that they need more time. Ms. Collins admitted they would sacrifice collaboration with the CTE department because the emerging technology available is not in their wheelhouse of skills to teach their students. Ms. Green has sought collaboration but would prefer to be able to afford similar emerging technologies for their program.

Funding for Both Installations and Maintenance of Technologies

The teachers and students had the most access to technology, such as computers, the internet, free design software, and projectors. Besides the access to free design software, such as Canva, the other listed devices are provided by WCPSS. This ensures that all teachers and students have an essential supply of technology devices; however, emerging technologies that can be specifically used to create digital art, such as 3D printers, extended reality, tablets, and digital video cameras, are less likely to be accessible to both students and their teachers (see Figure 7). Due to a lack of access to emerging technology, participating art educators are forced to become innovative with the technology provided by the county. Allocating more funds to the art department around the county will give art teachers the flexibility to purchase or update emerging technology.

Funding school technology is a conversation that has been around for decades and is often left in the hands of lawmakers who do not spend one-on-one time with students in their

learning environments with the technology they are providing. School districts allocate their financial resources to provide hardware, software, consistent connection with the internet, and wiring through the building to ensure the adequate use of the technology supplied. “School leaders should be able to estimate the total cost of purchasing and maintaining an adequate technology network in the classroom and throughout the district, including cost related to support, professional development, hardware, software replacement, connectivity and retrofitting” (Ireh, 2010, p. 18). However, in the context of this research, participating art teachers are interested in acquiring emerging technology specific to the content area and the intentional professional development needed to integrate emerging technology successfully. To increase access to emerging technologies, the school district must revise the funding allocated to art teachers and the emerging technologies they need.

As a professional learning community, reprioritizing digital literacy topics can encourage the way participating teachers approach and integrate emerging technologies by tackling the key concerns presented by the survey and interview data. However, this data only portrays the perspective of 40% of the middle school art teachers within the county, which proved to be one of the limitations of this research study. In the following sections, I will explore the limitations and recommendations for follow-up research.

Chapter 6: Conclusion

This study aimed to uncover how middle school art teachers use emerging technology in their classrooms by unveiling the influence of factors such as educational background, teaching experience, general attitudes toward emerging technology use, teacher and student access to technology, and the potential obstacles associated with emerging technology integration. In this section, I will conclude the research study based on the data presented by summarizing the key points made through the data findings and discussing the implications of emerging technology use on the professional learning community. The key findings of this study are relevant to the field of art education because it takes data analysis from a mixed methods research design, which produced actual suggestions for the improvement of emerging technology integration among the PLC members of the WCPSS middle school art teachers. This research found that participating art teachers require support from the professional learning community that helps mitigate the learning process and obstacles to utilizing emerging technology. The data revealed that participating art teachers need support in obtaining intentional professional development that prioritizes emerging technology utilization directly related to the technology teachers and their students can access. Teachers also described the negligence they have witnessed from students regarding the upkeep and appropriate use of emerging technology; however, Despite the lack of professional development for themselves and technology training for their students, the data presented a positive relationship towards wanting to learn more about how to redefine the ways they use the emerging technology they can access and emerging technology they are interested in integrating as a visual art medium.

This research also found that participating art teachers require better funding, which would allow them to purchase and maintain emerging technology within their art program. Without the proper funding to obtain emerging technology accessible to all students, teachers can collaborate with other programs within their schools, such as the Career and Technical Education departments. Although there is room for enriching students through multi-disciplinary integration, participating teachers recognize that they need access before integrating or using other departments' supplies. These key findings give the professional learning community a unique opportunity to use this research study's direct concerns and needs to enhance the instruction delivered to participating members that recenter appropriate emerging technology use amongst the community.

This study also has some limitations. It is limited due to the inability to fully generalize findings to a broader population due to the study's design and scope. This research solely focused on the middle school art teachers within the Wake County Public School System, which excluded elementary and high school art teachers, creating a smaller sample size. A larger sample size of art teachers, including other art teachers within the county, would have provided a more accurate description of the plight of emerging technology integration amongst a diverse population of professional learning communities within the same school system. There were also limitations in participation. Out of 50 middle school art teachers, only 22 teachers participated in completing the survey, which is less than half of the overall number of participating teachers. Of the 22 survey participants, only two teachers could dedicate the time for a completed interview. The study only shares the perspective of a few Professional Learning Community members that cannot be used to generalize or benefit the broader population of art teachers within the WCPSS.

Although there are limitations to this research, the study's results still reflect the experiences and voices of 44% of the participating teachers. This made it possible to outline key findings that would help the participating art teachers improve the overall use of technology among the Middle School art teachers. Future research could seek to include Elementary and High-School art teachers within WCPSS. These inclusions would force each professional learning community to reevaluate how they approach emerging technology integration and potentially shed light on the common factors that influence, affect, and hinder intentional technology integration. Further research that includes a larger population of teachers may encourage the school system to redesign and refine the quality of emerging technology-focused professional development and the financial resources given to art teachers to enhance technology access and use.

Emerging technology affects every aspect of modern society. Technologies influence how art is made, understood, consumed, and distributed to students. Therefore, art teachers should capitalize on technology's impact on art education (Sweeny, 2023). In the context of the implications of this research, the data shows that participating teachers need support from the PLC to make the most of connecting the digital trend and the direct instruction given to students. The key findings presented in this research provide the professional learning community a unique opportunity to use the participating teachers' direct concerns, recommendations, and needs to enhance the instruction delivered to participating members and the recentering of appropriate emerging technology use amongst the community. Intentional technology-focused instruction delivered by the professional would promote accountability amongst the group to better align teaching practices with the positive effects of incorporating emerging technology.

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APPENDIX A: IRB APPROVAL LETTER



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
Willis Building · Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office 252-744-2914 · Fax 252-744-
2284 · rede.ecu.edu/umcirb/

Notification of Exempt Certification

From: Social/Behavioral IRB
To: [Aleix Murphy](#)
CC: [Robert Quinn](#)
Date: 12/21/2023
Re: [UMCIRB 23-002182](#)
Emerging Technology

I am pleased to inform you that your research submission has been certified as exempt on 12/21/2023. This study is eligible for Exempt Certification under category # 1,2 AB.

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

Document	Description
Informed-Consent-Documents-Template-No-More-Than-Minimal-Risk_Revised-5-31-23 (1) (1).doc(0.03)	Consent Forms
Interview Protocol (2).docx(0.02)	Interview/Focus Group Scripts/Questions
Recruitment Script(0.03)	Recruitment Documents/Scripts

Research Protocol(1).docx(0.02)

Survey .docx(0.01)

Study Protocol or Grant
Application
Surveys and Questionnaires

For research studies where a waiver or alteration of HIPAA Authorization has been approved, the IRB states that each of the waiver criteria in 45 CFR 164.512(i)(1)(i)(A) and (2)(i) through (v) have been met. Additionally, the elements of PHI to be collected as described in items 1 and 2 of the Application for Waiver of Authorization have been determined to be the minimal necessary for the specified research.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

APPENDIX B: WAKE COUNTY SURVEY APPROVAL

RE: survey process (approval)From

Bradley McMillen _ Staff - Data Accountability <bmcmillen@wcpss.net>**Date**

Mon 12/11/2023 12:22 PM **To** Aleix Murphy _ Staff - LigonMS akmurphy@wcpss.net **Cc**

Roger Regan _ Staff - School Accountability <rregan@wcpss.net>; Jeremy Tucker _ Staff -

MiddleSchoolPrograms <jtucker5@wcpss.net>

Dear Aleix:

Your survey was approved at the leadership team this morning. CCing Jeremy Tucker as well for his awareness.

Good luck,

Brad

Brad McMillen

Data, Research & Accountability Department

Wake County Public School System

5625 Dillard Drive

Cary, NC 27518

P: (919) 533-7136

Fax: (919) 694-7768

APPENDIX C: SURVEY

Emerging Technology

To the Educator: This survey comprises well-validated portions of several past attitudinal surveys that have been used with teachers. **I will use the combined information to help develop a profile of how middle school art teachers view the uses of technology in their classrooms.** Please complete all items even if you feel that some are redundant. This may require 10-15 minutes of your time. Usually, it is best to respond with your first impression without giving a question much thought. Your answers will remain confidential. In this survey, technology refers to various hardware, software, and devices used in educational activities.

Background Information: Please select all applicable answers for your current teaching position and academic and professional background.

Please indicate the highest level of education you have completed.

- Bachelor's degree
 - Master's degree
 - Doctoral degree
 - Other _____
-

Please specify the area of licensure you hold.

- Standard Professional I (SP1)
 - Standard Professional (SP2)
 - Lateral Entry
 - Provisional
 - Career-Technical
 - Validation
-

Please select your age range.

- 20-30
 - 31-40
 - 41-50
 - 51-60
 - 61+
-

Including this year, please indicate how many years you have been teaching Middle School Visual Arts.

- 1 year
 - 2-4 years
 - 5-10 years
 - 11-15 years
 - 16-20 years
 - Over 20 years
-

Can you please specify the type of school where you are currently teaching?

- Rural
- Urban
- Suburban
- Other

Which professional organizations are you a member of? Please select all that apply.

- North Carolina Art Education Association (NCAEA)
 - North Carolina Technology in Society (NCTIES)
 - National Council on Education for the Ceramic Arts (NCECA)
 - Other _____
-

Are you National Board certified?

- No
- Yes

General Attitude about technology: Please read each statement and choose the answer that best describes your attitude towards each statement.

Factor 1 (Enthusiasm/Enjoyment)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Learning about technology is exciting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I want to learn more about the latest technology being used in the field of art education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The use of technology in the art classroom is not exciting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Factor 2 (Anxiety/Lack of Understanding)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I feel anxious when trying to incorporate technology into my lesson plans.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find it frustrating to comprehend and keep up with new technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a lot of self-confidence when it comes to working with technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that technology can be difficult to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Factor 4 (Avoidance/Usefulness)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
It's not necessary to learn about new technologies because they change frequent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The more you learn about technology the better you become	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowing how to use technology is a worthwhile skill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not wish to use technology in the visual art classroom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The use of emerging technology will enhance my students overall learning experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I feel that the use of technology is a necessary tool in the visual arts classroom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I were to incorporate technology in my lesson plans, it would likely streamline my workload.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Different technologies can be used to generate creative activities for my students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teacher training should incorporate emerging technologies to enhance teaching in specific content areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A general understanding of technology is necessary for my future as an art teacher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Factor 6 (Development)

Technology Access: Please indicate the technology available to you or your students in the visual arts classroom.

In your opinion, has the county-wide switch from Google Classroom to Canvas created a more accessible experience for both teachers and students?

- Strongly disagree
 - Somewhat disagree
 - Neither agree nor disagree
 - Somewhat agree
 - Strongly agree
-

In my current teaching position, I, the art teacher, can access the following technology. Select all that apply:

- Computer (Laptop or Desktop)
 - Projector (i.e., LCD projector, Projector screen, etc)
 - Document Camera (i.e., Elmo, Lumens, Ladibug, etc.)
 - Design Software (i.e., Photoshop, Tinkercad, Canva, etc.)
 - Digital Video Camera (i.e., Flip Camera, Sony Handycam, etc.)
 - Internet (i.e., Wireless connection, Ethernet connection, etc.)
 - Interactive Whiteboard (i.e., SmartBoard, Promethean, ActivInspire, etc)
 - Tablets (i.e., iPad, Galaxy, Nexus, etc)
 - 3D Printer (i.e., MakerBot, LulzBot, FlashForge Adventurer, etc.)
 - Mobile Devices (i.e., iPhone, Galaxy etc.)
 - Extended Reality (i.e., Virtual Reality, Mixed Reality, Augmented Reality, etc.)
 - Other _____
-

In my current teaching position, my students have access to the following technology. Select all that apply:

- Computer (Laptop or Desktop)
- Projector (i.e., LCD projector, Projector screen, etc)
- Document Camera (i.e., Elmo, Lumens, Ladibug, etc.)
- Design Software (i.e., Photoshop, Tinkercad, Canva, etc.)
- Digital Video Camera (i.e., Flip Camera, Sony Handycam, etc.)
- Internet (i.e., Wireless connection, Ethernet connection, etc.)
- Interactive Whiteboard (i.e., SmartBoard, Promethean, ActivInspire, etc)
- Tablets (i.e., iPad, Galaxy, Nexus, etc)
- 3D Printer (i.e., MakerBot, LulzBot, FlashForge Adventurer, etc.)
- Mobile Devices (i.e., iPhone, Galaxy etc.)
- Extended Reality (i.e., Virtual Reality, Mixed Reality, Augmented Reality, etc.)
- Other _____

Technology Usage and Integration: Please select the answer choices that explain the different types of technology you have incorporated into your lesson plans and teaching practices.

Please select the technologies that you have integrated into your teaching practices:

- Displaying digital images of artworks
- Online museum tour
- Educational PowerPoints/Presentations
- Sketchup
- iMovie
- Procreate
- Adobe Express
- PhotoShop
- Artificial intelligence software
- Exploring extended reality
- 3D Printing Hardware
- Canva
- Design software (i.e., procreate, photoshop)
- Digital drawing software (i.e., corelDRAW, figma, adobe illustrator draw)
- Google Arts & Culture
- Others _____

	Never	Sometimes	About half the time	Most of the time	Always
Computer (Laptop or Desktop)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Projector (i.e., LCD projector, Projector screen, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Document Camera (i.e., Elmo, Lumens, Ladibug, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Design Software (i.e., Photoshop, Tinkercad, Canva, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Digital Video Camera (i.e., Flip Camera, Sony Handycam, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet (i.e., Wireless connection, Ethernet connection, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interactive Whiteboard (i.e.,	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

SmartBoard, Promethean, ActivInspire, etc)					
Tablets (i.e., iPad, Galaxy, Nexus, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3D Printer (i.e., MakerBot, LulzBot, FlashForge Adventurer, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mobile Devices (i.e., iPhone, Galaxy etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extended Reality (i.e., Virtual Reality, Mixed Reality, Augmented Reality, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How often are the following technologies integrated into your lesson plans

Potential Obstacles to Technology Usage: Please select the answer choices that describe any potential obstacles or personal preferences as they relate to the ways you use technology.

Factor 1: Students access to devices (i.e., Laptop or Desktop)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
All of my students have been provided with a device mandated by the county	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students are not required to have a device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Many of my students are missing or waiting on a device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The devices at my school are not reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not all students can use the available devices due to large class sizes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Factor 2: Time and Understanding

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I don't have time to develop technology-driven lesson plans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am unsure how to incorporate technology effectively into my lesson plans.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would prefer to spend my time teaching my students about mediums that I already understand.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy taking out time to learn about integrating technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Factor 3: Productivity versus Distraction

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
My students stay on task when given technology devices during class time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I prefer to teach my lesson plans without the use of technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that technology is a distraction in the art classroom.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If students were taught how to appropriately use technology beforehand, I would be more willing to incorporate technology into my lesson plans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students are not interested in using technology as a medium for creating visual art.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Emerging Technology Survey Feedback and Follow-Up: Please use this section to provide feedback and indicate if you are willing to participate in an interview.

Please enter any comments or feedback that you have for this survey

Would you like to share a more detailed account of your thoughts on the use of emerging technology in art education? If so, please indicate if you are interested in participating in an interview.

Yes, I would like to participate in an interview. Please provide your email below

No, I do not wish to participate in a case study interview

APPENDIX D: INTERVIEW QUESTIONS

Interview Questions for Participants: Semi-Structured Interview

Interview time: 45mins-1hr

The main objective of these interview questions is to get teachers to explain how their background, general attitude, access, usage, and obstacles impact their view of technology use in the classroom.

While participating in this interview, please do not focus on a perfect answer. I want to hear about your real-life examples, experiences, and stories about emerging technology in your classroom.

Interview Questions

Background Information:

1. Has your education level influenced technology use in your classroom?
 1. If so, what classes or educational experiences most impact your use of technology?
2. During your time as a WCPSS employee, how much has the use of technology expectations changed for your teaching position?

General Attitude about technology:

1. Describe your current approach to the use of technology in the field of art education.
 1. Thank you for sharing your attitude about the uses of technology within your classroom through the survey. For the sake of this interview, is there anything else you would like to explain or share through examples, stories, or experiences?

Technology access:

1. In detail, please describe the technology you and your students have access to.

1. How often are these technologies available for use?
- b. Is there new or current technology that you would like to have access to in your classroom?
- c. At your current teaching position, do you have a budget that could give you access to more or updated technology?

Technology Usage and Integration:

2. What forms of technology do you feel most comfortable using within your visual arts classroom?
 - a. Please explain the types of technology in detail.
 - b. include technology such as Canvas, Google Classroom, Outlook Calendar etc.
 - c. Could you explain where and how you use the technology that you have listed?
- i. I am interested in art history, STEAM, interdisciplinary studies, design software, etc.
3. Where do you find the resources for your technology-driven lesson plans?

Potential Obstacles to Technology Use:

1. What are your challenges or potential obstacles as an interested art teacher in technology use?
2. What are your thoughts on technology and its implications for the future of Art Education? Please explain.
3. Have you received any professional development on technology integration in the visual arts?
 1. If so, do you feel prepared/capable of teaching a comprehensive lesson using technology as a visual art medium?

2. If not, would you be interested in this type of professional development?