

CARRYING DIGITAL INNOVATION FORWARD:
BENEFITS OF AND BARRIERS TO DIGITAL PORTFOLIO USE IN ART EDUCATION

by

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ABSTRACT

Digital art portfolios meet the developing technological needs of art teachers while retaining historical benefits. The purpose of this study was to examine the gravity of the benefits and solutions to barriers to digital portfolio use for North Carolina teachers. The results may inform professional development needs addressed by digital art portfolio training and use.

An online survey and interviews of teachers currently using digital art portfolios was conducted to understand what efforts teachers had to make to be successful and what solutions became best practices. It was hypothesized that once the initial barriers were addressed, art teachers would value digital art portfolio as a vital tool for student learning and engagement. Results revealed that teachers valued the benefits of organization, assessment, reaching a bigger or wider audience, parent and guardian involvement and technology integration. These benefits resoundingly outweighed the barriers. Notable barriers included difficulty in accurately

representing 3D art and texture, and the large amount of training and ongoing support necessary to implement digital portfolios.

This research shares the benefits of digital art portfolios with art teachers that are often the sole art educator for their school. It also prepares them for limited technology access and other barriers they would face to incorporate digital art portfolios into their classroom.

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BENEFITS AND BARRIERS OF DIGITAL PORTFOLIOS IN ART EDUCATION

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CHAPTER 1: INTRODUCTION

As North Carolina teachers were thrust overnight into the realm of virtual learning due to the virus that causes COVID-19, some were more prepared than others for the challenges of digital learning. Merriam-Webster (n.d.) defines the *digital divide* as, “the economic, educational, and social inequalities between those who have computers and online access and those who do not.” This digital divide became an even sharper obstacle to teacher instruction and student learning (Morris, 2020). During this time of compulsory digital instruction, digital art portfolios provided a means of sharing artwork during isolated times and witnessing student progress.

This research was designed to evaluate whether the benefits outweigh the barriers to digital portfolios in the art classroom. North Carolina teachers provided a diverse sample population as they represent urban, suburban, and rural school systems that the digital divide impacts (Manns, 2020). The distinct benefits that attracted art teachers to consistently use digital art portfolios will be identified and judged for importance. The barriers to reliable digital portfolio use will also be explored with practical solutions offered. It is expected that this research will highlight benefits that appeal to art teachers seeking professional development in those relevant areas. It will also provide insight into establishing and sustaining digital art portfolios in the face of digital divide difficulties.

Historically, the learning section of the National Art Education Association’s research agenda (NAEA Research Commission, 1994) encapsulated many ambitious goals, including widening the educational setting and global context of students. The updated national standards (National Coalition for Core Arts Standards, 2014) carry this mission forward by having students analyze digital formats and explore virtual spaces. Art students can seek and receive feedback

from the greater community and their global counterparts. Logistic constraints that once limited the amount and kind of artwork displayed for the community are ameliorated with digital art portfolios. Teachers and students are primed to interact with and gain experience from global society by widening their audience to the online community.

Statement of the Problem

This research sought to understand the importance of digital art portfolios at a time when various kinds of technology were seen as solutions for pandemic-induced and traditional curricular needs. The national visual art standards call for students to analyze and consider digital art and formats and how the display of art in virtual spaces impacts communities (National Core Arts Standards, 2015). Digital art portfolios can address these standards, but their use remains constrained by barriers to implementation and maintenance that teachers find daunting. Are there one or more enduring barriers that hinder digital portfolio use? Which aspects do art teachers find most beneficial in their classes? Are the benefits worth overcoming the barriers that accompany digital art portfolios? The insight of active teachers can inform neophyte educators of the feasibility of digital art portfolios in their own instruction.

CHAPTER 2: REVIEW OF THE LITERATURE

Digital versions of portfolios in the art classroom began as a solution to the organizational logistics and limited longevity of traditional portfolios. Historically, a portfolio consisted of several sheets bound together to make carrying the materials easier and more organized. It was a practice begun by artistically perceptive scientists to record and organize their thoughts and observational research. Leonardo Da Vinci and Charles Darwin present early, and exemplary examples of scientific observations and sketches assembled in precursors to portfolios. These portfolios are now just as highly valued and coveted as finished works because they act as a glimpse into the inner workings of artistic genius (Dorn et al., 2003).

Portfolios as Alternative Assessment

Access to technology and earmarking instructional time for creating and maintaining portfolios is a prevalent barrier. An increasing number of teachers agree that the valid assessments and improved critical thinking reflected in alternative assessments make up for that redirected time (Fitzsimmons, 2008). Teachers aim to retain the assets of traditional portfolios that provide their students with the ability to explore artistic problems, support distinctive processes, and increase motivation. Digital portfolios retain essential benefits of traditional portfolios with a marked increase in efficiency in sequencing and organization of student work (Eisner & Day, 2004). The time and technology invested help update portfolios to tackle modern issues. The educational implications of portfolios came as a relief to teachers that needed an assessment rooted in the arts to represent their value among standardized curricula. Before the 1970s, assessment of art students was of minimal concern. This concern increased as schools came under accountability scrutiny, then accelerated as high-stakes testing became the deciding factor of educational operation. Before this focus, American schools enjoyed the relative privacy

of educational practices and assessment. Witnessing the inadequacies of standardized testing to capture students' learning in other subjects, let alone appreciate the nuanced and idiosyncratic characteristics of art education, portfolios were seen as a viable authentic assessment. True assessment of the arts is based on evaluating the process and product of real-life applications. Judging art education on base memorization cheapens both the value of students' artistic merit and of art education (Eisner & Day, 2004).

Portfolio Case Studies

In a study of an elementary school portfolio program, Weldin & Tumarkin (1998) found success by prioritizing parent involvement and allowing multiple avenues for interaction between families and portfolio team members. Early morning coffee information sessions and making recorded sessions available to parents and guardians with tight schedules reached participants that could not commit to events during the typical class day schedule. The portfolios were seen as an assessment tool that documented both the process and product of student educational activities. Portfolio assessment that precludes parent support and active involvement leaves out a critical element to student achievement. By educating and involving parents and guardians in the process, they became more invested in the educational opportunities that helped the student succeed. Instead of a bystander to their child's education, families became another proactive agent that reinforces the educational process. Students appreciated the portfolio as not only a display of exceptional work, but evidence of their growth. The autonomy and self-reliance developed through the course of the process was appreciated by student, teacher, parents, and guardians alike (Weldin & Tumarkin, 1998). Similar appreciation for the glimpse into the classroom and their students' learning was appreciated by a middle school in Canada. Student-led conferences illuminated students' development within the school setting (Wade et al., 2005).

Noakes (2019) observed reaching a wider audience using digital portfolios in a case study in Cape Town, South Africa. One student's prior experience with digital portfolios included using the Deviant Art online community and soon expanded to other platforms that allow public comment. By engaging in multiple platforms, the student reached a wider audience and benefited from constructive criticism provided by the community. The student was intrigued and encouraged by the feedback received beyond the confines of her school. Teachers worried about public comments devolving into immature or harassing speech. Nevertheless, the student persisted and navigated the pitfalls and benefits of reaching a wider audience (Noakes, 2019). Unmoderated commenting features are more appropriate for older students on the cusp of interacting with the adult world.

In conjunction with reaching a wider audience, students effectively reached supporters of niche subjects through digital portfolio use. Various popular culture and fan-made artwork, which are crucial for teenagers to develop a sense of identity, are often not supported by formal art instructors. The wide range and context-dependent nature of teen culture makes it difficult for teachers to address each individual student's interest. Concerns about copyright infringement also preoccupy teachers. Noakes (2019) found that by finding support and affirmation in these niche communities, students expanded their reach to a wider audience, but more importantly they connected to a relatable audience that shares their investment in and dedication to their personal talents.

In a Turkish study of preservice art teachers (Dikici, 2009), digital art portfolios brought a level of accountability and transparency to assessment that was lacking from the previous one-sided grading system. For a culture that values authority figures, the added responsibility of contributing as an assessor of one's own work was an uncomfortable experience. This revelation

reinforces the idea that portfolio use is a process that needs to be scaffolded to properly function. For further reliability, portfolios should be assessed with clear rubrics that support students during the process of creating their portfolio.

Portfolios in North Carolina

Digital portfolios are a familiar educational pursuit in North Carolina. Awarded with a three-year grant to improve assessment in the mid-1990s, the Wake County Public School System (2015) of North Carolina invested in digital portfolios. Senior administrator and program evaluator Penta (1998) noted that despite tremendous technological difficulties that hampered teachers from fully realizing their goals, the portfolios were an effective assessment method. Methodical planning and training supported teachers during the process. Technology complications included software training, computer access, data storage, and virtual security.

The partially successful digital portfolio initiative provided crucial lessons. Penta (1999) found that teachers' buy-in increased by implementing portfolios in small groups; those informed and empowered groups in turn provided support during expansion. Student learning was prioritized over technological flourish. Appropriate software and accessible storage became a burgeoning need. Ongoing technology support was needed to sustain teachers through all steps of implementation.

Barnhill (2020) recognized an increased commitment to digital infrastructure at both the county and state level. Legislation in 2013 redirected textbook funding to digital materials as a first step towards modernization. To ensure relevant, effectual, and curricular-driven materials, funding was also awarded to the Friday Institute for Educational Innovation to create the North Carolina Digital Learning Plan (2015). This plan recognized that schools need increased

connectivity to form a technological backbone. Retaining personalized learning while shifting students from mere spectator to empowered creator was emphasized.

The North Carolina Digital Learning Plan created by the Friday Institute for Educational Innovation (2015) addressed the technology issues that hampered the original portfolio implementation. With renewed passion, digital portfolios were added to the balanced assessment section of Wake County's strategic plan (Wake County Public School System, 2015). The prior experience in the 1990s deeply informed implementation. The instructional project manager worked with a think tank of 50 educators to harness their digital portfolio expertise and hands-on experience. Teich (2019) reported on the 2017-2018 school year pilot program that trained four teachers from each of the 187 schools to provide immediate site-specific support for portfolio creation and maintenance.

Benefits of Digital Portfolios

The impact of digital portfolios as worthy investment reaches beyond North Carolina. The educational foundation Edutopia released several articles detailing the benefits and considerations of digital portfolios. Holland (2017) found that portfolios encompass more than recording and organizing student work. The propensity for reflection inspires students to understand the substance, process, and purpose of their learning. The enduring understandings and content connections become apparent through proper digital portfolio use. Smart (2009) sees portfolios as a gateway to a student's future college or career. A digital portfolio can house traditional school and extracurricular activities as well as artifacts of activism and community service. Students present a comprehensive display of their abilities and interests in a portfolio without diluting their worth to a simple grade. Smart's vision is the epitome of digital portfolio achievement. While plausible, this vision requires immense investment and support of students

as developing professionals whose work and process are prioritized. Digital art portfolios are currently in a period of development where their true potential remains to be seen. Progress is being made at different rates among different students. Hiles (2013) encourages students with stronger digital skills to mentor inexperienced students to motivate peer-to-peer learning. To be equitable, the portfolio must be accessible for all levels of learners while appealing to advanced students.

The Art of Education University tracked the unique successes of digital portfolios in the art classroom. Both elementary and high school teacher perspectives were offered in an interview by cofounder Jessica Balsley (2013). An elementary teacher found digital art portfolios to be an interactive introduction to the Internet for young learners. A greater connection forms between students, the Internet, and the world when they can view themselves as both consumer and creator. Connection was the major theme for both teachers, as the bonds between school, home, and classroom community were all encouraged to prosper through ease of sharing and communication. A high school teacher used digital art portfolios to gradually increase literacy skills in artist statements and commenting functions. The benefits were adaptable to varied classrooms across grades.

English language learners significantly benefit from this scaffolded literacy practice. Hanh (2019) found empowering families to communicate in their native language was possible when teachers used translation software to respond. Families that were often left disconnected due to language barriers appreciated the new avenue of communication that digital art portfolios created. Established linguistic communities feel acknowledged when accommodated with translated resources.

From the middle school viewpoint, Carlisle (2015) finds the transferable nature of digital portfolios from one grade or school to the next invaluable. This consistency grants a clearer picture of the student's artistic K-12 progress. The system promotes sharing and collaboration in class, while also allowing students to practice responsible digital citizenship and safety. With regular portfolio use, Hahn (2019) noted that the art process becomes one that parents can follow along with and more thoroughly understand. Students benefit from different points of engagement during their process. Contributing artifacts through images, audio recordings, writings, and other personalized ways more fully reflects the students' learning styles and individual contributions.

Traditional portfolios provide the adaptability to present a genuine record of student learning and accomplishment in visual art. The arts' specific traits of exploration, risk-taking, reflection, and performance are harnessed in a sequential testimony of student learning. The portfolio's role can shift from a working portfolio that gives an expansive look into student process and decision-making to an exhibition portfolio that is edited and displayed in context to leave the student's desired impression on assessors. This flexibility that more accurately captures a student's verve creates a sense of ownership that, according to Eisner and Day (2004), is seldom shown outside of other assessment techniques' numerical or letter value.

Teachers recognize that portfolio artifacts collected over months will supply a more complete picture of student learning than a singular project. Written student self-evaluations provide evidence of conceptual understanding where technical execution may be lacking. The onus is on the teacher to introduce students to portfolios as a sustainable and meaningful pursuit (Dorn et al., 2003) that can handle multiple modes of communication and points of reference. Teachers aim to retain the assets of traditional portfolios in their flexibility for students to

explore artistic problems, adaptability to support distinctive processes, and increased motivation in students (Eisner & Day, 2004) while becoming an extension of the student's efforts and identity.

For art teachers, artwork organization is a managerial nightmare. The sheer number of students make physical ordering and storage of artworks cumbersome. Artworks are periodically relocated for display in the school or community. Accidental or malicious damage and loss are real concerns during physical display. Digital formats alleviate these concerns by providing accessible recordkeeping that exists anywhere with an internet connection. This organization is especially helpful for student and teacher analysis of works, as they can be easily arranged and viewed in a grid that allows for a holistic view of the portfolio (Eisner & Day, 2004). The organizational boost of portfolios helps quell the challenges of increasing class sizes and demand for individualized assessment.

The task of collecting and organizing student artwork ordinarily falls on the teacher or the parent or guardian once the artwork returns home. In a demonstrated and structured manner, the task of maintaining the portfolio can be shared with and handed over to the student. This autonomy develops a sense of ownership of the portfolio and its components for the student. Instead of a task to be completed and forgotten, Carlisle (2015) asserts that the portfolio becomes a source of pride and accomplishment. A well-kept portfolio can follow a student through his or her entire K-12 experience and can even be adapted into a professional portfolio for higher education and employment opportunities.

Maintaining and regularly updating a portfolio is important to stay competitive as a working artist. Quickly assembling and tweaking former work to meet the expectations of new clients is a skill best learned through direct experience (Keller, 2010). Having a mental grasp of

digital organization makes visual analysis and editing easier and more efficient. Practice in manipulating their own digital artifacts prepares students to confidently control their own image for colleges and careers (Fitzsimmons, 2008).

Used in the service of parent-teacher conferences, digital portfolios provide a visual representation of the student's educational experiences and production in the classroom. Parents and guardians see the bigger picture of the child's development in the culmination of his or her portfolio. Transparency and communication are heightened between the art classroom and the student's family. The portfolio provides an observable educational gauge with which a family can help hold their student accountable. Clear instructions and appropriate scaffolding must support portfolio creation. Creation of portfolios without clear purpose led to their discontinuation after the class ended. Personal investment, through incorporating student needs and goals, must be an ongoing process that grows with the student. Benson & Barnett (2005) argue that digital portfolio use merely as an instrument of assessment is deleterious to student motivation and dissuades their continued use.

A child is motivated and psychologically supported when his or her artwork is publicly displayed. A sense of competition is ignited, not only between classmates, but within students to outdo their last displayed artwork. Increasing the amount of positive feedback that parents and other adults give to a student's artwork leads to increased quality and effort from the student. The self-esteem and self-worth of students is enhanced when an artwork is presented to the community as a manifestation of student effort (Dray, 2014). Physical space for presentation is limited while a virtual space is infinite. A library that cannot fit every child's artwork on their shelves can display a rotating slide show of artwork on their website.

Portfolios provide the necessary structure to help support and sustain student motivation. The documentation, submission, and reflection cycle that many portfolios use establishes a routine that helps students feel more responsible for their work (Hahn, 2019). Digital portfolios allow teachers to structure reflection into their students' artmaking by explicitly designating a step that requires students to think over their submission. Students direct their learning by focusing on the process of their art making instead of obsessing over the finality of a project. Fahey and Cronen (2016) found that increasing student-autonomy in the assessment process used in digital portfolios increased intrinsic motivation across all levels of students.

Critical thinking is so commonly delegated to class discussions and lectures that its use in art portfolios is often overlooked. Teachers' growth analysis of student portfolios provided more evidence of critical thinking skills than in the student portfolios (Strycker, 2020). Stevenson (2006) proposes anonymous peer assessment to develop critical thinking skills. In this model, a teacher requires students to review classmates' submissions and give written electronic feedback. Putting students in charge of the evaluation process elicits reflective and objective responses. To be effective, the teacher must provide support by modeling constructive feedback. Scaffolding evaluative criteria during the process reinforces critical thinking skills (Stevenson, 2006). A portfolio takes advantage of the peer-review process to harness the same critical thinking skills achieved in discussions and lectures.

Barrett (2005) asserts that comprehensive reflection using digital art portfolios cannot happen simultaneously with artmaking. Teachers must provide the proper time and space to allow for the higher-level thinking skills needed for reflection. For students new to reflecting on their artwork, a capable facilitator must lead the process until students are able to advocate for their own goals and interpretations. A supportive instructional environment must be established

where the process of becoming a better artist is valued over endpoint accolades. Additionally, Barrett (2005) recommends an emotionally supportive environment must be cultivated because of the deep impact and influence of emotions on reflection.

Students are aware of the progressive nature of their education, but rarely feel empowered to have an impact on its direction or quality. When teachers exploit the reflective nature of portfolios, students can accurately practice self-regulation of time, attention, and effort. Teachers can help students identify strengths and weaknesses in their own record to build on or alter their personal goals. Practicing self-reflection and accepting peer feedback are lifelong skills that serve to help a student continue progressing beyond their foundational education. Reflection helps students identify their own status and recalibrate to adapt to evolving conditions. Resiliency and adaptability are natural attributes that develop from this repeated process (Wade et al., 2005). Establishing a process to meet new challenges empowers students to take control of their education.

In a more literal sense, portfolios help students reflect on their artwork by providing alternative views. Memory simplifies complicated visual perceptions into symbols which can hinder students from accurately rendering their subject. A digital portfolio can provide a second viewpoint that would ordinarily be provided by the teacher. While not a complete replacement of the experience and refined knowledge of the teacher, the digital portfolio frees up the teacher to deliver substantial feedback without having to address issues that the student can preemptively identify using an alternative view. This practice prepares students for life beyond the classroom, where objective and growth-oriented feedback may be more difficult to elicit from coworkers or competitors (Fitzsimmons, 2008).

Students view traditional assessment as a disconnected consequence of their work in a classroom setting. They are often unaware of the criteria or processes used by teachers that go into assessing their work. By using digital portfolios, students can effectively reflect on their work and peers' work using skills and processes that can serve them both in and beyond the classroom. Stashing work in a digital format is insufficient to achieve the reflective benefits of digital portfolios. The artworks or artifacts presented must provide evidence of student learning and reaching personal and overarching goals. Because of the individuality of student artifacts, portfolios provide complicated and nuanced insight into student learning. Instead of a single assessment that designates correct or incorrect, a portfolio supports a dynamic presentation and reflection of student work (Barrett, 2005). The discipline of art embraces ambiguity and rarely depends on a definitive answer; the multifaceted evidence of portfolios permits answers as diverse as the students that create them.

While many digital portfolios follow a basic template for easy user interface, there remain many aspects that students have control over by learning and applying technology skills. As documented by O'Rourke (2004), these skills begin with the process of students taking quality images of their art and post-production editing. This process can be as simple as the cropping feature on a smart phone or as complicated as animated image files. As students' work progresses, advanced technology skills are needed to reorganize, update, and adjust the overall appearance of their portfolio to match their changing needs. Students effectively communicate their intention using a mix of web design principles and other adaptive technology skills.

Peppler and Keune (2019) found portfolios carry value beyond the space in which they are created; successful work is shown recognition by outside communities. Recognizing their own role in the community, students acted as both empathetic leaders that encouraged others

after failure and in-process contributors that sought advice from the community. Students understand portfolios as both representing their own brand to promote toward targeted audiences and tribes of interest in which they can find belonging. Consistent engagement with an audience encouraged higher output which translated into a self-fulfilling prophecy of wider reach.

By fostering these portfolios in educational settings, Pepler and Keune (2019) also found that students expanded their concept of community while retaining structure and security. Through emulation, students borrow the ideas and skills of established creators. Students mimic the traits of role models that resonate with their own goals and ideals. Exploration sees portfolios as channels of knowledge through which students can move, manipulate, and collaborate. The status of group and individual accounts can capture the multiplicity of identities that a student maintains. Just as an adult may have to maneuver the responsibilities of being a worker, artist, mother, and activist, for example, a student can shift from a collaborative project to a personal activity. Students are not delegated to only one persona but can negotiate the venues through which they are perceived.

Students crave to be part of a community as a part of their social and mental development. If the boundaries between art portfolio and social media are blurred, students feel a resonating connection to their digital peers. Online websites such as Deviant Art host digital art portfolios, tutorials, in-progress snapshots, and other resources. Smaller pods of communities can be formed based on common interests in styles, medium or other aspects (Strycker, 2020). The anonymity and age appropriateness of the site –users must be at least 13 years or older to use Deviant Art– limit its use as an educational tool.

Digital portfolios offer an expansive range of ways to interact with digital communities. “The use of multiple online tools for capturing and sharing projects allows youth to explore

boundaries among communities and disciplines and to see how their projects speak to, disrupt, or intersect these boundaries” (Peppler & Keune, 2019, p. 242). Students establish connections based on shared values instead of depending on proximity to their audience. The way they interact is dictated by the student; image, text, and video are valid interactions. To be successful, portfolio users learn from the design features of popular platforms, support visualized feedback from other users and the community, and connect with others through shared and meaningful interests.

Despite all these positive attributes, portfolio use comes with caveats. Underprivileged students find it difficult and sometimes impossible to maintain a digital portfolio outside of school due to lack of internet access. Platforms with rigid formats and limited functionality impede student expression; artists feel misrepresented when they lack control in the editing and display of their images. Students fear cultural exclusion if they share artwork with morally ambiguous content. Privacy issues, especially for female students, are a concern because of identity theft and online harassment (Noakes, 2019). As these issues also occur outside the classroom, teachers can proactively use these potential pitfalls as opportunities to prepare students to encounter them in the real world. Teachers provide students with a monitored environment to practice respectfully engaging with others and reciprocating feedback on artworks. Capitalizing alternative means of internet access from public libraries to community centers is practical. Protecting privacy and having autonomy over public image is an ongoing process. Digital citizenship requires hands-on experience for proper execution (Strycker, 2020).

Portfolios provide a reliable and continuous way to measure student learning (NAEA Research Commission, 1994). Holistic evaluations of students are feasible, as portfolios offer teachers a comprehensive view of their students’ abilities and growth. Teacher-made benchmark

examples help students understand the various levels of accomplishment. The teacher helps students identify where they are in their development and concretely points out steps to advance their work to the next level. When viewed on a whole-class scale, curriculum can be evaluated and adjusted. Benefits were not limited to one age group, but organically grew in complexity (Fitzsimmons, 2008). Assessment clarity with parents is enhanced by having readily available examples. Teachers can monitor student progress over longer stretches of time, allowing evidence of accountability within the art program (Eisner & Day, 2004). Dorn and Sabol (2006) contend digital portfolios evaluated by teachers reliably show comparable results to evaluation of physical artworks.

As with any form of assessment, the impact on the student must be considered. Portfolios must be maintained for the sake of learning and not for the sake of assessment alone. Students must be involved in the process of reviewing and judging their artwork or the portfolio loses its power as a means of motivation. Disconnected or frivolous submissions quickly turn portfolios into dumping grounds (Dorn & Sabol, 2006). Outside judgements without context are interpreted as arbitrary and can dissuade students from continuing their portfolio beyond their formal education. By disregarding the inherent engaging qualities of portfolios, they can become yet another metaphorical bubble for students to fill in and will quickly be forgotten. The underlying power of portfolios is that they allow students to construct the meaning of their work. By debasing portfolio use into merely a standardized instrument to gauge student success, Barrett (2005) argues that students lose their trust in the portfolio process to accurately tell the story of their artistic journey.

Drawbacks of Portfolios

Barriers to digital portfolio implementation involve redirecting instructional time and access to appropriate and affordable technology. To effectively use portfolios as an assessment strategy that records developmental progress at the elementary level, analyzes growth in the middle school level, and critically interprets student progress at the high school level, teachers and students require adequate time to plan, execute, and reflect on portfolios. Dorn et al. (2003) attest that, at the high school level, it is vital to have user-friendly portfolio software with the ability to add written notes and display work to the entire class using a projector. Access to technology varies by school. Whether it appears in the form of computer labs, computer carts, or computers stationed in general classrooms, access will determine the feasibility of digital portfolio use. Affordability is also a concern for all teachers, with free programs or ones already purchased and utilized by school districts being the optimal choice.

In Elissa Dray's (2014) research study on using technology to display student work, she introduced teachers to the Artsonia digital art portfolio in a workshop. The participating teachers of various fields of study encountered the same challenges that art teachers must navigate to successfully incorporate digital art portfolios into their classroom. Innovative technology is intimidating. Teachers fear an inaccurate depiction of the artwork because of low quality photography or dimensional aspects that are flattened or lost in photos. Diminished funding for the art department or technology in the school can limit technology availability. Computer labs and technology carts are prioritized for core curriculum teachers and their tested subjects. Parents or students may prioritize their privacy and withhold consent to publicly display their artwork, especially with the possibility of derogatory feedback.

Earmarking precious instructional time for creating and maintaining portfolios is a prevalent barrier, but there is an increasing number of teachers who agree that valid assessments and improved critical thinking make up for that redirected time. Previously, students completed projects for the sake of a grade and would not put in further thought or attention. With the influence of the digital portfolios, "...students demonstrated increased thoughtfulness and responsibility toward their learning" (Fitzsimmons, 2008, p. 52). The efficiency of the digital portfolios also meant that teachers streamlined time used for assessment and grading.

Digital art portfolios can increase student motivation, but only if students are given clear directions and appropriate scaffolding. Without this support, students will not understand the purpose of a portfolio as a life-long learning device and will discontinue use after teacher expectations expire. Teachers can introduce portfolios with curricular content, purpose and process but must incrementally increase student needs and goals into the portfolio. As the portfolio progresses, teachers must demand student ownership of increasing components of the portfolio until the student feels confident in leading the composition, direction, and development of the portfolio with minimal assistance. "If the goal is to move toward learners' intrinsic motivation to develop and maintain their portfolios, then there needs to be learner ownership of the content, purpose and process" (Barrett, 2005, p. 15).

Involving the student in data collection not only relieves the teacher of laborious record-keeping but also encourages introspective habits in students. Introducing portfolio maintenance near the beginning of a semester helps students develop the process into a natural routine. With a user-friendly format, students feel empowered to be self-directed in their activities. By embracing their work as part of a presentable manifestation for others to observe and react to, a sense of pride, ownership, and importance increased among students. Dorn et al. (2003) observe

that the appropriate pacing of documentation and maintenance of a digital portfolio should mimic the natural rhythm of a classroom such as curricular units as opposed to standard delineations of weeks or months. Written reflections allow a teacher direct discernment of student learning and process, which is often logistically impossible in the confines of instructional time.

Technological innovations have long been touted as an educational panacea. Experienced art teachers witness the repeated mythologizing of administration-backed fads that only value their impact on subjects deemed important in standardized testing. Delacruz (2004) found that skepticism in the practicality and sustainability of technology is widespread among art teachers. As monetary investment in technology increases, resources for other areas are often decreased.

Art teachers, who are often the lone practitioners of their subject in their school, benefit from other art teachers' displayed student artwork online. Teachers and students using digital technology for resources and references of artists and artworks is the most prevalent use. To effectively use technology in the classroom, teachers must have relevant training, appropriate technology access, and legitimate impact on student learning. The material quality of the tools and media of art invoking tradition and history may hold prominence for traditionally trained art teachers. Patton and Buffington (2016) argue that art teachers who cling to traditional artmaking and displaying resources without incorporating technology can lose their relevance; this outdated and inflexible attitude can lead to cuts in funding and curricular extinction.

Support in the form of administrative and technical personnel is vital. Without the relevant and ongoing support these professionals can provide, the technological infrastructure of a school or district can quickly break down. Scheduling conflicts, outdated software, damaged hardware, downed servers, and lack of procedural knowledge are roadblocks created by a lack of

adequate technology support staff. Previous district-supported training often followed a one-size-fits all model, which left invested teachers disillusioned. Teachers expect the same developmentally appropriate lessons that use “prior knowledge... relevant models, meaningful guidance, and reliable feedback” (Delacruz, 2004, p. 12) in their technology training as found in their own teaching. Technology access between districts and even schools can vastly vary. Teachers are adaptable and often seek out additional technological support of their own volition. As Strycker (2020) reported, if given the proper time and space, teachers reassuming the learner role helps facilitate learning for students.

The barriers to digital portfolio use have decreased as general technology access and training has become a priority for school districts and teachers, but there remain distinctive hurdles to address. External barriers that enthusiastic teachers will encounter include access, training, and support. Without proper equipment, teachers are limited to student-owned devices, which creates an equity issue in many schools. Training is especially important for more convoluted technology or hesitant teachers. Support is most naturally established by teachers with the same goals. For art teachers that are often the only teacher of their subject in the school, reaching out to other art teachers in their district can provide relevant support. Internal barriers that may need to be dealt with first include teacher attitudes and beliefs, resistance to change, and skills and knowledge. Johnson et al. (2016) list of several viable solutions including non-traditional fundraising, utilizing local teachers for professional development, training in student-centered education, and involving teachers in recent technology selection on the school and district level.

Taking on limited technology access as a school community is also an empowering option. Johnson (2015) suggests adjusting resources and assignments, expanding access at

school, working with the community, and informing parents about low-cost access. Teachers that view the materiality of art as vital and irreplaceable in a digital format will offer more resistance to acceptance. Once the foundational barriers are addressed, students and teachers can be energized by embracing modern technology. Cooperative learning of teacher and student about innovative technology is productive and reassuring when venturing into unfamiliar territory (Strycker, 2020).

In a study of a southern state, Jesse Strycker (2020) identified digital portfolios as an emerging theme in technology use at the secondary level. Teachers in the study had mixed reviews of digital portfolios. Some teachers enthusiastically pursued portfolios as progress monitoring, while other teachers were dismayed by frequent technology accessibility issues. With the high turnover rate of computer applications and other technological advances, the teachers in the study were apprehensive about the durability and practicality of technology in the classroom. Further research in educational technology focusing on the art teacher perspective is needed for a deeper understanding of current impact. Digital art portfolios are uniquely qualified to meet the technological needs of art education and are a worthwhile direction to pursue. Technology use by art teachers mirrors general education teachers' use and challenges but with the added curiosity and personal pursuit due to technology lending itself as a naturally visual interface. This research seeks to expand our understanding of digital art portfolios as a technology tool that is used by and for art student learning.

Elizabeth Delacruz (2004) warned that the discrepancy between the promises of what technology could bring to the art room and the reality of the disparate technology working conditions undermined the art teacher's interest and investment in technology. She saw a high interest in technology integration while recognizing that impracticality, loss of autonomy, and

intimidation were barriers that art teachers faced. Some schools were equipped with state-of-the-art technology while others lacked basic infrastructure. Educational literature tended to glamorize and idealize technology in a manner that minimized these obstacles. Delacruz (2004) further emphasized training, ongoing support, accessibility, and time as necessary supports that could help technology reach its full potential in the art classroom.

Statement of Hypothesis

Are there barriers that dissuade art teachers from implementing digital art portfolios? Which benefits of digital art portfolios do art teachers find most valuable for their classes? Are the benefits worth overcoming the barriers associated with digital art portfolios? This research hypothesizes that the barriers to reliable digital portfolio use are minor and manageable for basic application. These barriers will be assessed with pragmatic solutions offered. The practical benefits that attracted and retained art teachers to consistently use digital art portfolios will be identified and ranked for importance. Optimistic trends of teachers in various community settings and career length are anticipated. Organization is proposed as the most valuable benefit for art teachers. It is hypothesized that the benefits of digital art portfolios outweigh the associated barriers. It is expected that this research will highlight benefits that appeal to art teachers seeking professional development regarding digital portfolio use. This research aims to provide educators with the information necessary to integrate digital art portfolios into the classroom.

CHAPTER 3: METHOD

Research Design

The design used in this study was a cross-sectional survey supplemented with a semi-structured qualitative interview. This design allowed for prevalent benefits and barriers to be identified for a specific population and time. The survey provided the overall perceptions of digital art portfolios at a time when North Carolina art teachers were inundated with technology options. A follow-up semi-structured interview allowed for elaboration and clarification of survey responses. This mixed methods approach was chosen to capture data that more accurately reflects teachers' difficulties and successes. The survey and interview data revealed teachers' current hurdles and accomplishments using digital art portfolios.

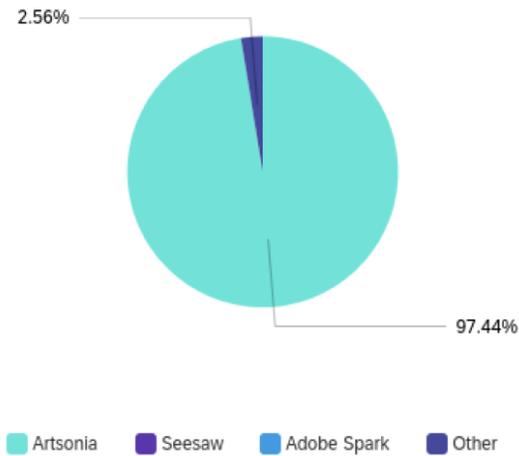
Participants

This research was conducted under the auspices of the East Carolina University's Institutional Review Board (Appendix A). Thirty-nine active art teachers participated in the survey (Appendix B). The researcher contacted the art director or supervisor of counties across North Carolina, asking for the online survey to be shared with their art teachers with digital art portfolio experience. Each art teacher opted to take the online survey with questions that ranked benefits and barriers associated with digital art portfolios. At the end of the survey, participants were invited to participate in a virtual interview to expand upon their answers with further feedback or insight. One elementary and two middle school art teachers opted to participate in a virtual interview.

The participants were asked to identify which digital art portfolio they used and how many years they had taught art. Thirty-eight respondents used Artsonia as their digital art portfolio and one respondent used Google Sites as the digital art portfolio (See Figure 1).

Figure 1

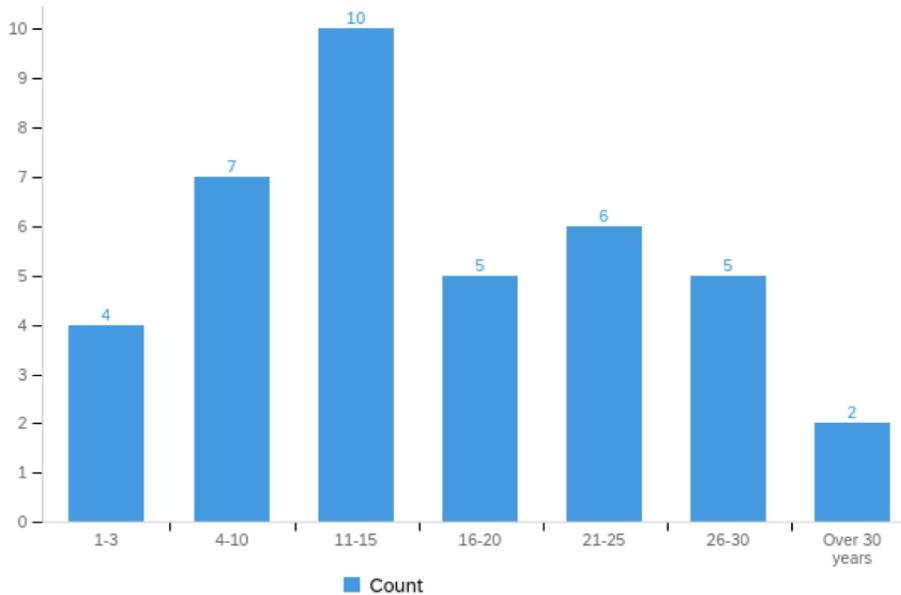
Which Digital Art Portfolio do you use?



Respondents represented experience in years as an art teacher with each category between one to over 30 years of art teaching experience represented by at least two teachers each. The most represented group was four to fifteen years of art teaching experience with 17 total respondents. The least represented group was over 30 years of art teaching experience with two respondents and one to three years of art teaching experience with four respondents (See Figure 2).

Figure 2

How many years have you taught art?

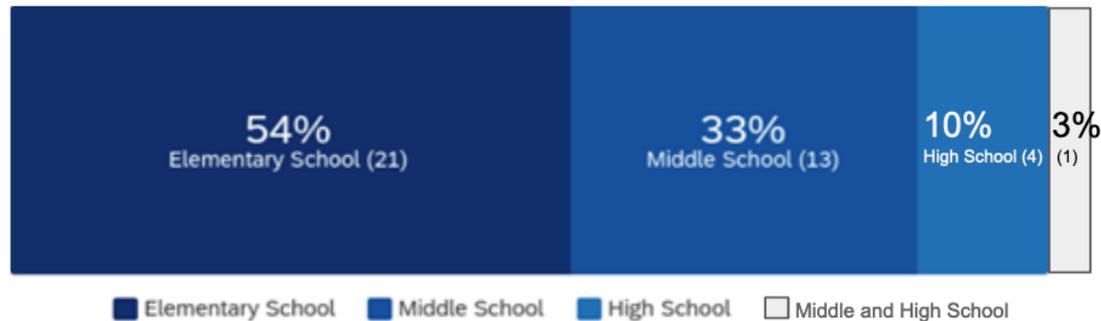


Participants were also asked if they taught elementary, middle, or high school level and if their school was urban, suburban, or rural. The survey data presented a wide range of North Carolina teacher demographics. Twenty-one respondents (54%) teach at an elementary school, thirteen respondents (33%) teach at a middle school, four respondents (10%) teach at a high school, and one respondent (3%) teaches at both a middle and high school (See Figure 3).

This sample representation was selected to represent the varied experiences of North Carolina teachers. Variance among the demographics was expected. An elementary school teacher that serves an entire school views instructional time as more limited than a high school teacher that instructs only three classes. Large class size in elementary schools also increases the need for organizational support of materials and data. Digital portfolios can meet the needs of assessing and recording the grades of hundreds of students. The strong representation of elementary teachers in the survey provides insight into their sizable concerns.

Figure 3

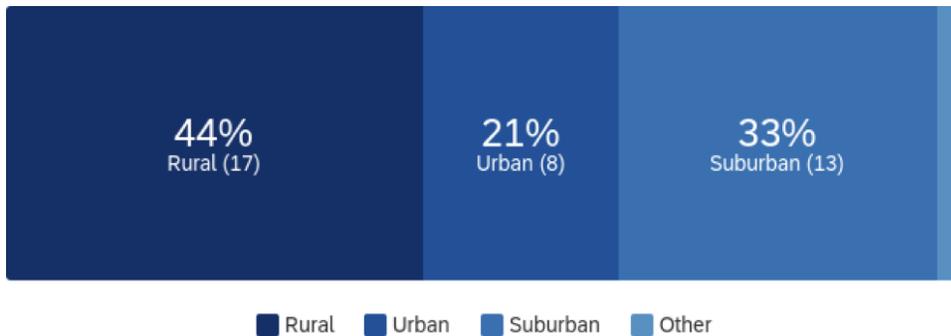
What school level do you teach?



The National Center for Education Statistics (NCES) categorizes school locales into city, suburban, town, and rural designations (Keaton, 2014). Regarding school locales, participants indicated the following school locale demographics: 21% urban schools, 33% suburban schools, 44% rural schools, and 2% other (See Figure 4). “Town” was not a designation provided on this item. These percentages are within 10 percentage points of the 2013-2014 North Carolina statistics of 27.9% city or urban schools, 23.9% suburban schools, and 37.4% rural schools (Keaton, 2014). While providing participants with the opportunity to select the designation of “town” for their school locale would create a data set better aligned with NCES designations, the data set is representative of teachers in North Carolina.

Figure 4

What type of school do you teach at?



Surveys and Interviews

Quantitative data was provided by a Likert scale statements on benefits and barriers based on a survey by Bushman & Schnitker (1994) on teacher attitudes on portfolio assessment, implementation, and practicability. The survey comprised of nine Likert scale questions regarding benefits and six Likert scale questions regarding barriers. The survey was designed to highlight the benefits and barriers that most impacted art teachers. Survey topics included: motivation, organization, reflection, parent/guardian involvement, critical thinking, technology integration, assessment, instructional time, training, hands-on learning, and student privacy (Appendix B). A five-point scale to measure level of agreement with the statements using these qualifiers: strongly agree, agree, neutral, disagree, and strongly disagree.

Short-response questions asked for optional feedback on the benefit or barrier following each Likert scale question to reduce misinterpretation. If a respondent was unclear or ambiguous towards a question, the optional feedback allowed for clarification. The optional feedback also provided an opportunity for respondents to provide information that the researcher missed. The qualitative data gathered from the free-response portion contributed to a deeper understanding of

the quantitative data gathered from the ranked question A short-response question asked for additional benefits not mentioned, and a short-response question asked for additional barriers not mentioned. To summarize the overall tone of the survey, a Likert scale question asked if the benefits of digital art portfolios outweigh the barriers.

The online format was used to ensure confidentiality, increase accessibility, and conserve participants' time and effort. Art teachers from across North Carolina were included in the data collection. The survey was sent through email in a familiar Likert scale format with basic demographic information requested and only required 10-15 minutes to complete. The consent letter at the preface of the survey invited the participant to complete the survey as part of a research study on digital art portfolios. The types of questions, objectives of the research, and participants' confidentiality rights were conveyed in the letter. Personally identifiable information was excluded, and all survey and interview participants' responses remain confidential.

As an optional second step to the research study, participants were presented with the option of giving qualitative responses in a virtual interview using the video-conferencing software called Zoom. This method was chosen because many teachers have received training and have personal or school accounts with Zoom. When this option was selected, the survey asked for an email contact for the researcher to follow up to schedule a Zoom video conference. During the interview, the researcher asked for elaboration on each of the qualitative questions that had previously been posed by the survey. The video conference was recorded with a transcript autogenerated by the Zoom software. The audio or video record was deleted upon transcription, with only the transcript retained for research data. Each interview required 30-45 minutes to complete.

Data Analysis

The interview allowed for additional qualitative data to be collected about teachers' experiences with digital art portfolios. At the bottom of the survey, teachers could opt to complete a virtual interview by submitting an email address as contact information. The researcher led the interview with a copy of each survey item posed as a conversational question (Appendix C). As North Carolina has such a diverse range of schools and teachers, the interviews were intended to capture anecdotal and nuanced challenges and benefits that the survey could not accurately capture.

After the data from the survey and interview was collected, statistical analysis was performed using Qualtrics online software. The data was presented in visual bar graphs and written analysis to encourage a holistic understanding of the data. The grade level, school community type, teacher experience in years, and digital portfolio type were recorded as influential demographic data. The quantitative sections of the survey gauged participants' agreeableness to several aspects of digital art portfolios. The free-response questions of the survey and the interview were coded for frequency and relevance. Analysis of this coded data revealed recurring and pertinent expressions and concerns. The positive, neutral, or negative tone of these responses were grouped and connections to relevant quantitative questions were noted.

CHAPTER 4: RESULTS

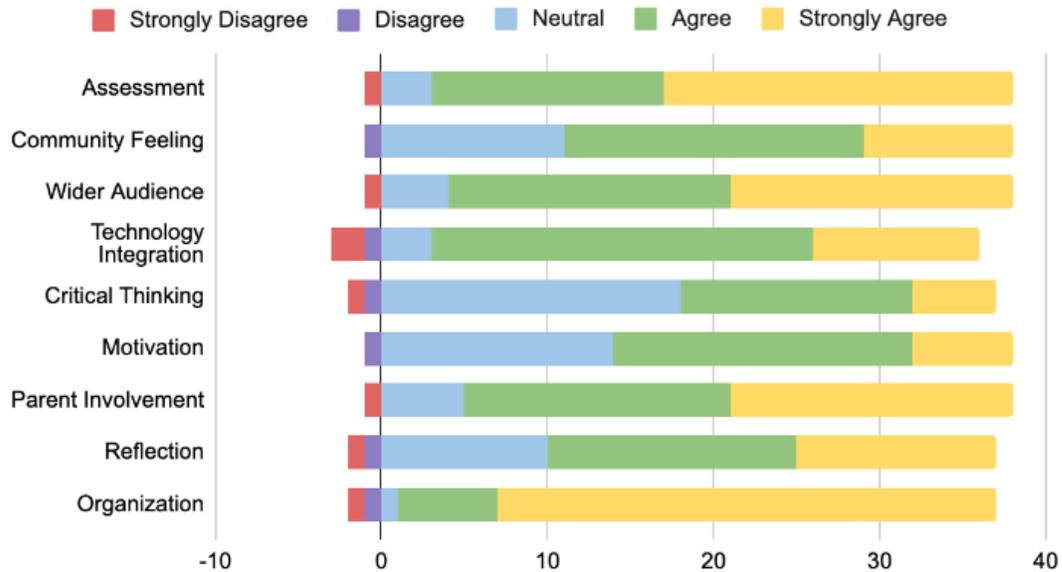
Survey Results

Viewing the benefits section as a conglomerate data set of thirty-nine teachers providing responses to nine questions provided a total of 351 responses to interpret overall trends for benefits. Of the 351 responses for benefits, 76% were positive as marked by agree or strongly agree, 20% were neutral as marked by neutral, and 4% were negative as marked by disagree or strongly disagree (See Figure 5).

Figure 5

The benefits section of the digital art portfolio survey

Benefits



The barriers section provided a conglomerate data set of thirty-nine teachers reporting responses to six questions produced a total of 234 responses to interpret overall trends for barriers (See Figure 6). Of the 234 responses for barriers, 80% were positive as marked by

disagree or strongly disagree, 13% were neutral as marked by neutral, and 7% were negative as marked by agree or strongly agree. These overwhelmingly positive results about digital art portfolio benefits and positive results about barriers align with the 92.4% of respondents that believe the benefits of digital art portfolios outweigh the barriers (See Figure 7).

Figure 6

The barriers section of the digital art portfolio survey

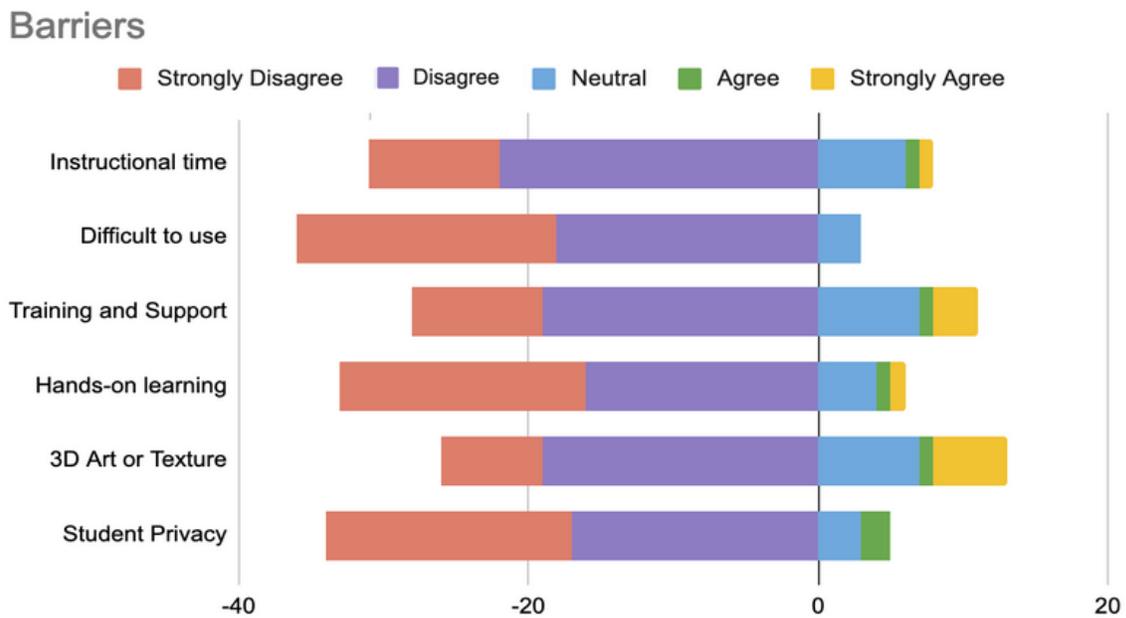
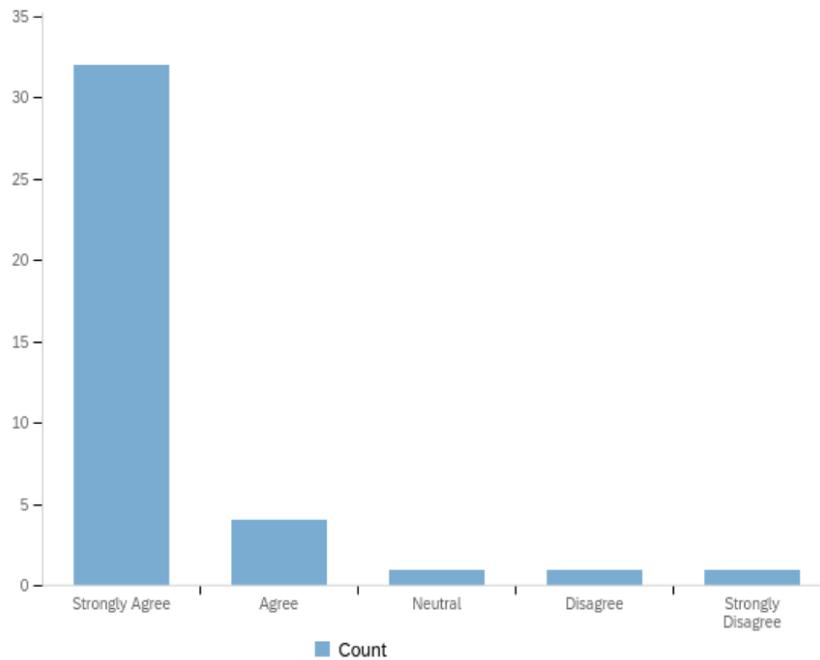


Figure 7

The benefits of digital art portfolios outweigh the barriers



Benefits

The strongest positive relationships of benefits were among digital art portfolios helping with organization, assessment, and reaching a bigger or wider audience. Teachers see a strong and consistent correlation between digital portfolios and these three benefits as shown by results that heavily favor the strongly agree category. Respondents agreed or strongly agreed 92.3% of the time that digital art portfolios help with organization (See Figure 8). Respondents agreed 89.7% of the time that digital art portfolios help with assessment; the division between strongly agree and agree was more divided as 53.8% and 35.9% respectively (See Figure 9). Respondents agreed 87.2% of the time that digital art portfolios help with reaching a bigger or wider audience with the division split evenly between strongly agree and agree (See Figure 10).

Figure 8

Digital art portfolios help with organization

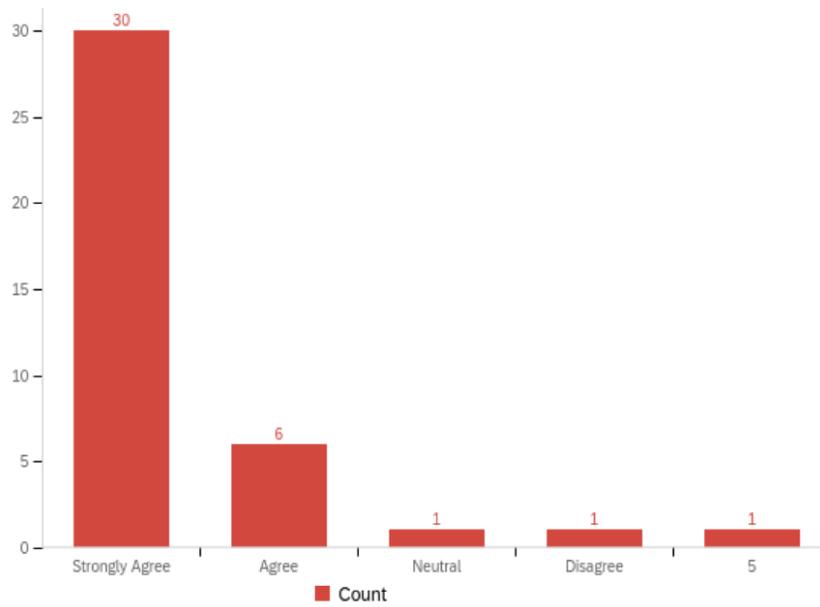


Figure 9

Digital art portfolios help with assessment

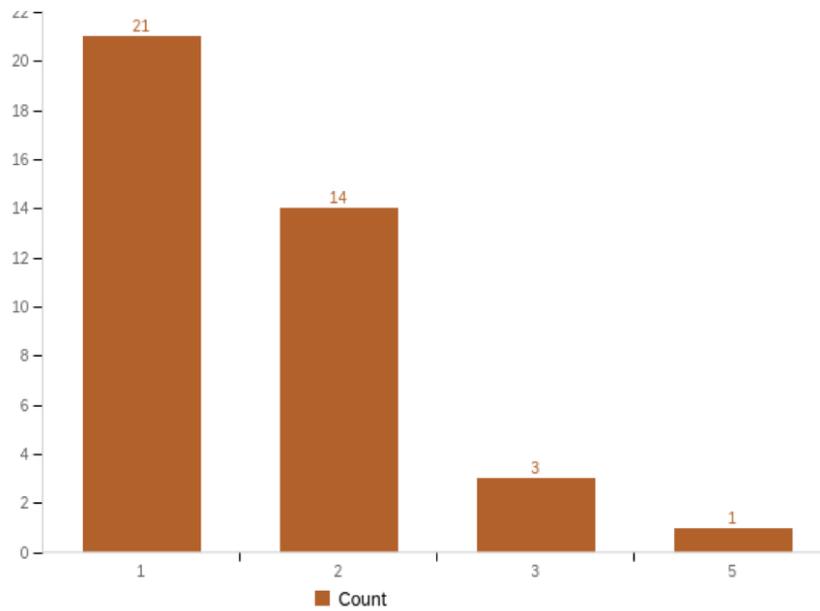
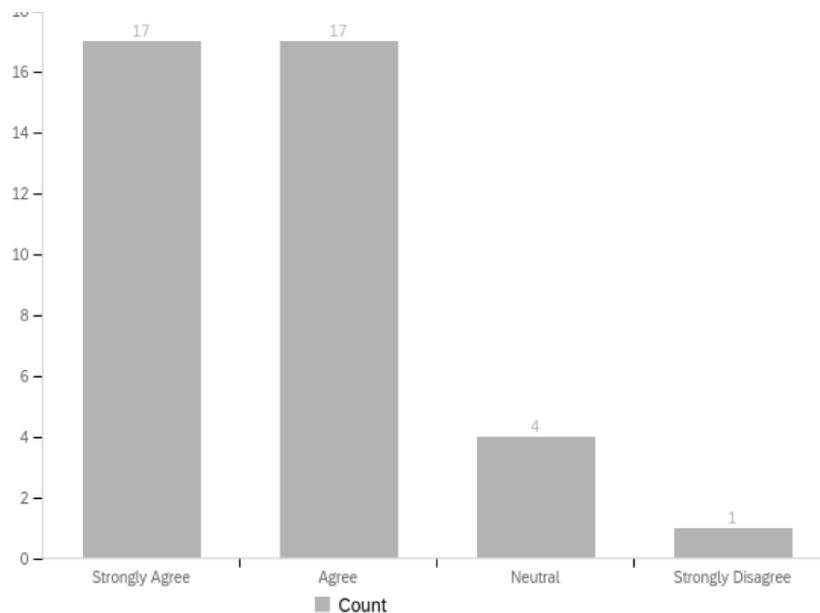


Figure 10

Digital art portfolios help reach a bigger or wider audience



The seven short-responses for optional feedback on organization highlighted the rewards of immediately sending physical artworks home while retaining a digital copy of artworks for grading, project tracking, and administrative needs. The digital copy provided quick and accessible data on both the individual student level and more holistically across classes, projects, and grade levels. By utilizing the archival system of the digital art portfolio, students contributed to an organized and linear record of their work.

Optional short-response feedback on assessment centered on digital art portfolios allowing teachers to perform more focused and thorough assessments outside the constraints of a busy classroom. The portability and convenience of reviewing student work in a digital format streamlined feedback. Student growth and improvement was made visible over time.

The optional short-response feedback for a bigger or wider audience encapsulated both improved connections between immediate family and newfound opportunities to connect with a global audience. Immediate family was able to view artwork the same day it was finished instead of waiting for the transit back home. Even if the physical artwork is lost or damaged, a pristine image of the artwork can be saved and shared indefinitely.

Parental and guardian involvement reported comparable results to technology integration with each having 84.6% positive responses. Technology integration exhibited a majority agree response (See Figure 11) while parental and guardian involvement was more evenly split between strongly agree and agree (See Figure 12). This shows more consistency in the experience of technology integration while a more varied experience in parental and guardian involvement.

Figure 11

Digital art portfolios help with parent/guardian involvement

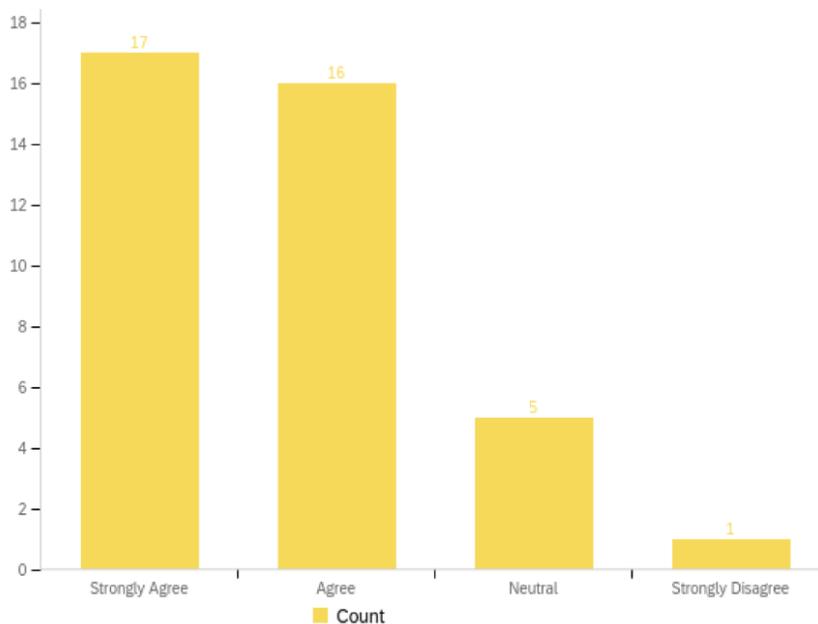
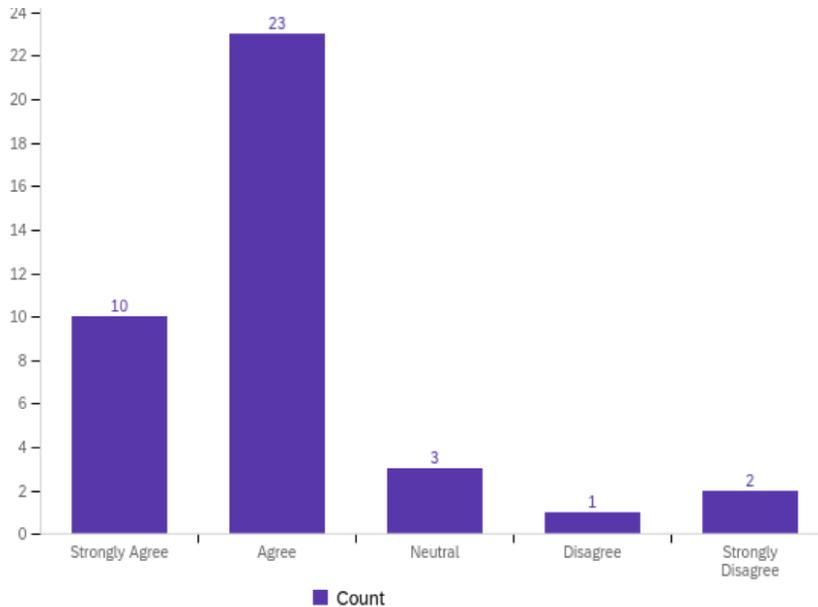


Figure 12

Digital art portfolios help with technology integration



The 10 short-responses for optional feedback on parent or guardian involvement revealed a dichotomy of parents that opted to accept notifications from the digital art portfolios and parents that did not want or know how to accept notifications from the digital art portfolio. The notified parents had a current and ongoing report of their child’s work. For younger students, parents used the portfolio to help monitor their child’s progress in class. Accompanying lesson plan descriptions acted as an advocacy tool to display the range of skills and knowledge a student developed in their art class. One respondent noted a disconnect in communication when parents either cannot or chose not to look at their student’s digital art portfolio.

Respondents positively agreed 69.2% of the time that digital art portfolios help with feeling like part of a community, reflecting on student work, and motivation. The neutral values of 11 responses for community feeling (See Figure 13), 10 responses for reflecting on student work (See Figure 14), 14 responses for motivation (See Figure 15) are a doubling and near

tripling of the previous neutral record of five responses for parental and guardian involvement. This steady positive response with a rise in neutral responses suggests that these categories provide some value but are not as germane as the previous categories.

Figure 13

Digital art portfolios help with feeling like part of a community

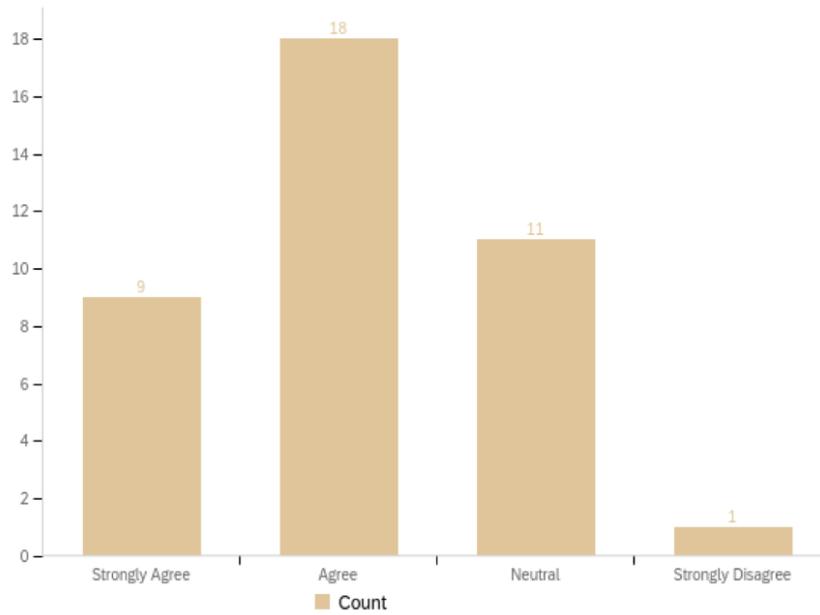


Figure 14

Digital art portfolios help reflect on student work

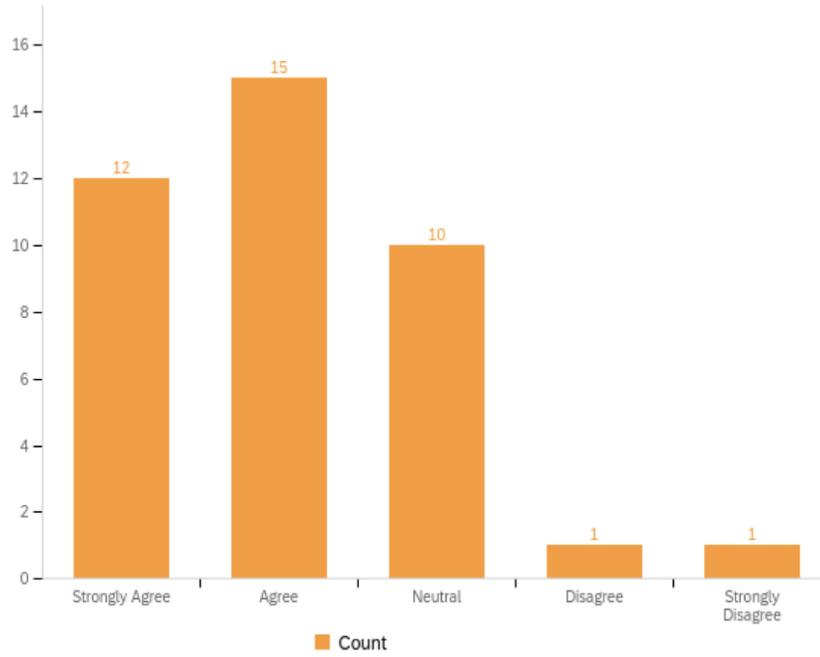
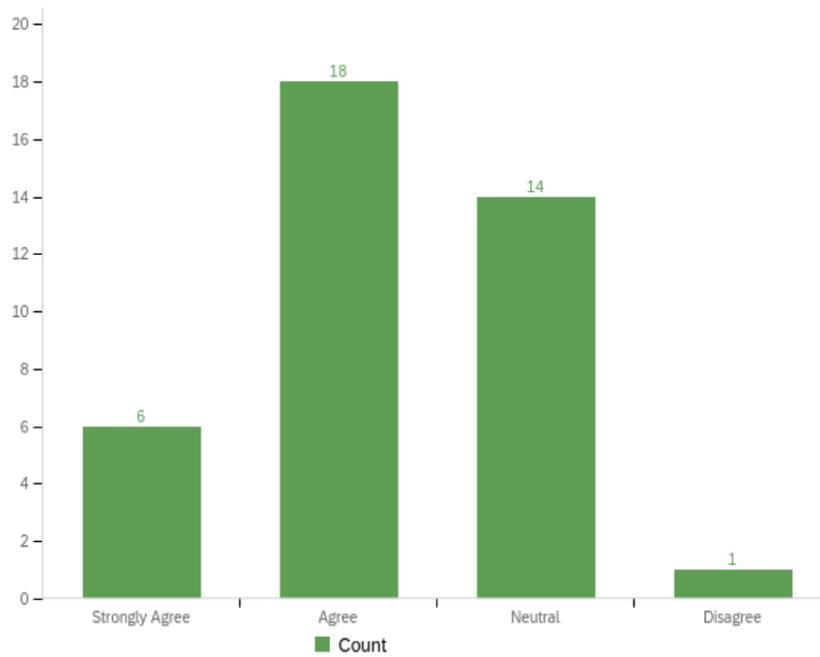


Figure 15

Digital art portfolios help with motivation



The only respondent to provide optional feedback on “Digital art portfolios help with feeling like part of a community” saw digital art portfolios as means for building art teacher community through shared lesson plans, ideas, and adjustments. Using portfolios to build community between students remains an untapped resource.

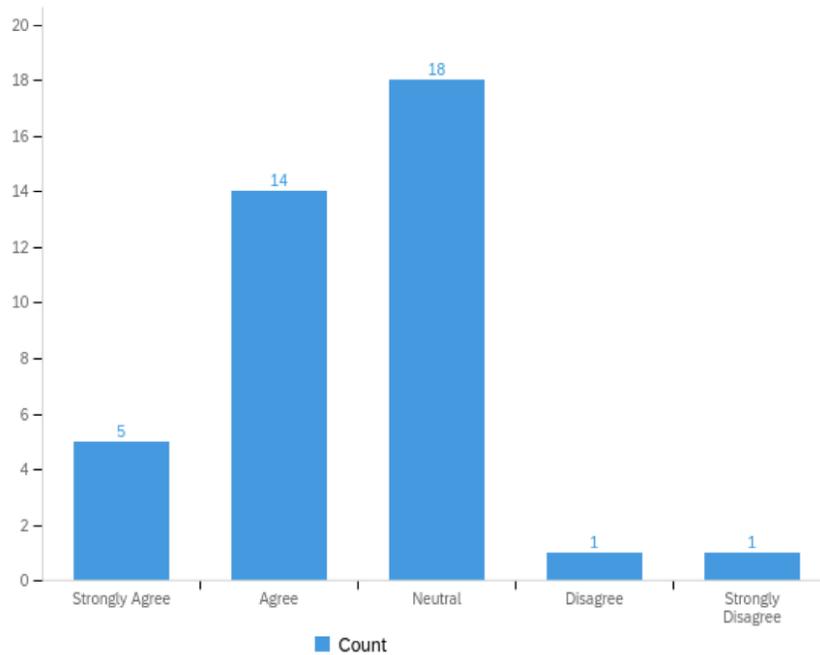
The nine respondents providing optional feedback on reflection posit two distinct opportunities: a written reflection submitted with the image of the artwork at its completion and a more informal reflection in viewing past student work. The written reflection gave students a further chance to explain what they attempted or accomplished in their artwork. Using this supportive written expression, students’ knowledge was communicated better to the teacher. The informal reflection gave teachers insight into trends at the student and class level that they used to adjust and improve instruction.

The seven respondents providing optional feedback on motivation revealed minor to more substantial impacts on student motivation. In some settings, only upper elementary or smaller groups of school students showed increased motivation because younger or less engaged students were not as invested in their portfolio. Putting students in charge of their portfolio as opposed to an adult helper increased the likelihood of motivation. Students felt visible, inspired, and special when fully involved in their digital art portfolio.

As the benefit of least concern to art teachers for this survey, 46.2% of respondents felt neutral towards the use of digital art portfolios to impact critical thinking (See Figure 16). As 48.7% of respondents felt positive towards the impact of digital art portfolio use on critical thinking, it remains a pertinent category with potential for improvement.

Figure 16

Digital art portfolios help with critical thinking



The nine short-responses for optional feedback on critical thinking views the digital art portfolio as a potential tool for critical thinking that is often impeded by lack of technology access. Critical thinking is seen as a skill used after the artmaking and submission process with direct interactions between students and the teacher required for proper execution.

Barriers

The next section of the survey addressed barriers to using digital art portfolios in the art classroom. As the barriers were presented in negative statements, positive responses show the more significant barriers while negative responses show barriers that are of less concern. The most concerning barrier was that digital art portfolios cannot capture 3D art or texture accurately with 15.4% agreeing or strongly agreeing (See Figure 17). Slightly less concerning, 10.3% agree

or strongly agree that digital art portfolios require a lot of training and ongoing support to be successful (See Figure 18).

A successful portfolio requires quality photos of artwork. Some artworks depend on qualities that can be difficult to capture in photography. Three-dimensional art that is made to be viewed from multiple angles is diminished if only represented by one viewpoint. Certain textures that depend on changing light or viewpoint can also suffer. While these concerns were the most prevalent in this study, their overall significance was minor.

School districts and administrators offer professional development to keep teachers updated on emerging and best practices. Initial training is typically offered in-person or virtually. Ongoing support through resources, contact information, and professional research is occasionally provided based on availability and demand. Some professional developments are intuitive and require minimal assistance while others are complex and require extensive training and support for the teacher to be successful. In the survey, digital portfolios proved to be the former with minor support needed for their introduction and maintenance.

Figure 17

Digital art portfolios can't capture 3D art or texture accurately

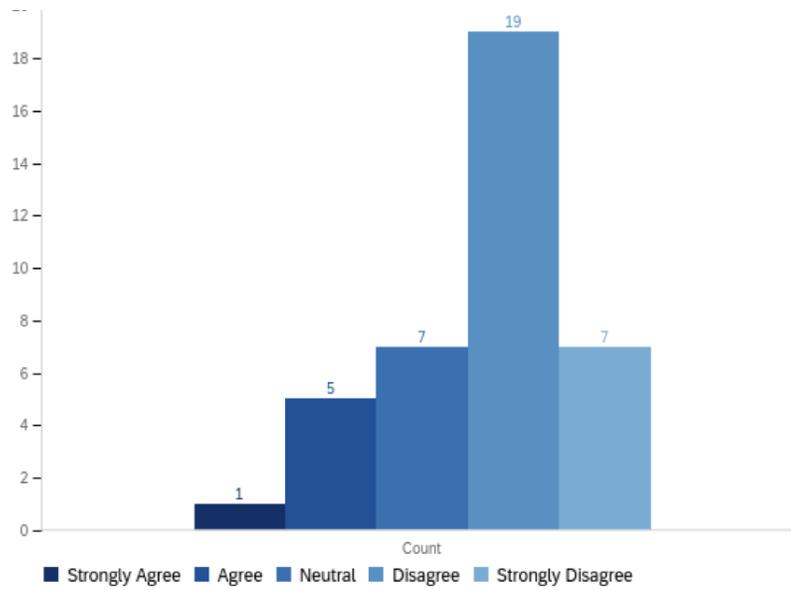
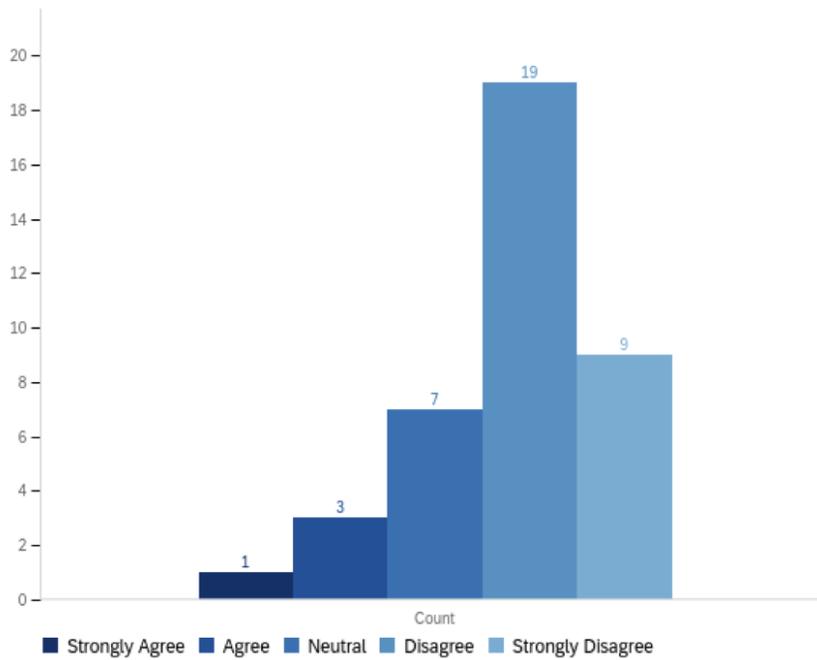


Figure 18

Digital art portfolios require a lot of training and ongoing support to be successful



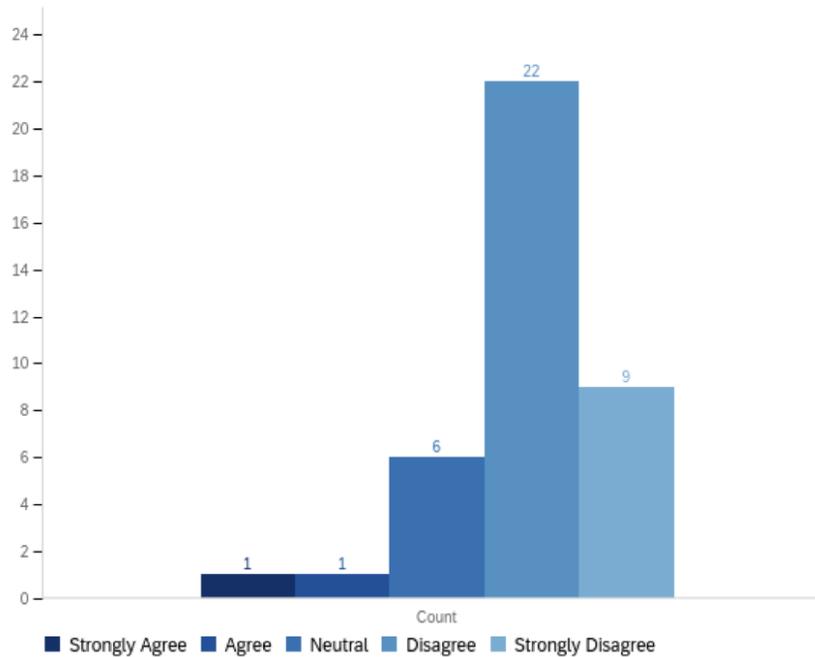
The six short-responses for optional feedback on capturing three-dimensional art or texture accurately focused on needing high resolution photos or videos to accurately portray artwork. Young students often take shaky images with low lighting that does not accurately represent their artwork. Sculpture and other dimensional artwork lose their full impact with a singular snapshot as representation. Since 2019, Artsonia has allowed video uploads no longer than one minute in length that expanded the precision of three-dimensional art and texture representations. One participant taught photography skills to students to ensure accurate pictures. Another participant yearned for more expansive photography editing options in Artsonia. Overall, the participants noted that the technology was catching up with digital art portfolios, but still had room for improvement.

The six respondents providing optional feedback on training and ongoing support noted the success of digital art portfolios increased with the variety of support provided. One participant found teaching peer teachers to use a digital art portfolio easy and quick. The customer service features of the digital art portfolio helped another participant. One teacher used routines to train students to use their portfolios. Another teacher believed parents and guardians were the most important support system for successful digital art portfolios.

Respondents indicated that there are three lesser concerns with digital portfolio use. First, digital art portfolios take up too much instructional time was agreed or strongly agreed by 5.2% of respondents (See Figure 19). Among the three lesser concerns, this concern appears to have the most consistency with 56.4% of respondents disagreeing with taking up instructional time.

Figure 19

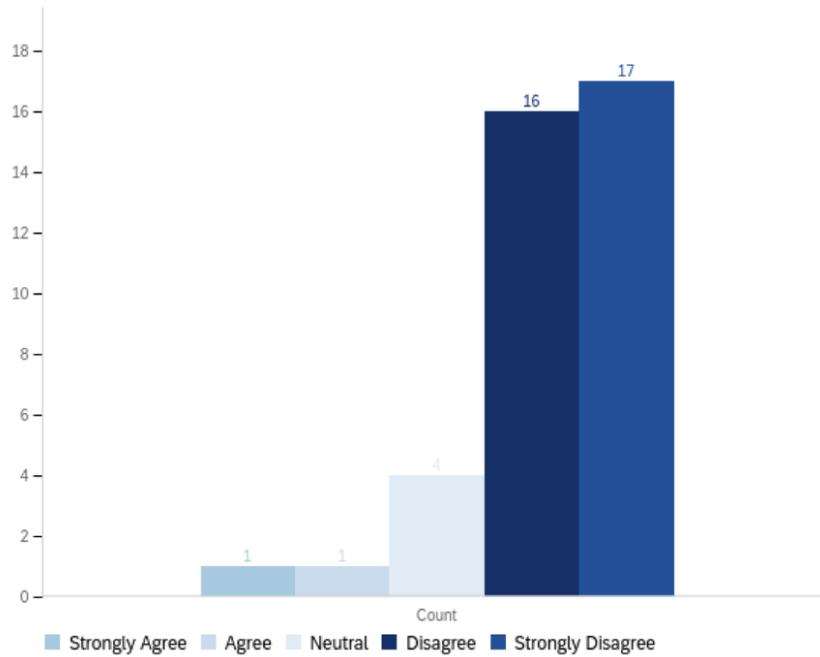
Digital art portfolios take up too much instructional time



Second, only 5.2% of respondents indicated agreement that digital art portfolios do not put enough emphasis on hands-on learning (See Figure 20). Teachers thought of portfolios as encouragement and documentation of hands-on learning instead of a barrier. Disagreement and strong disagreement were more evenly divided among lack of hands-on learning, further conveying that hands-on learning and digital portfolios are not seen as mutually exclusive practices.

Figure 20

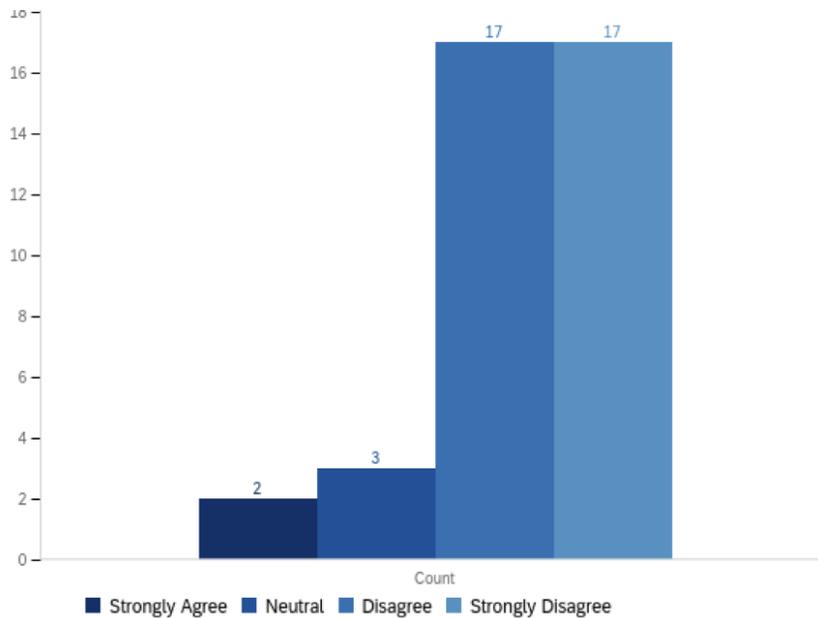
Digital art portfolios don't put enough emphasis on hands-on learning



Third, only 5.2% of respondents indicated agreement that student privacy is difficult to maintain with digital art portfolios (See Figure 21). Outside of exceptional privacy concerns such as the enhanced privacy foster children, privacy is easy to maintain with parents and guardians in control of the degree of privacy given each student. Disagreement and strong disagreement were more evenly divided among student privacy difficulties, as most teachers rarely or never had privacy issues associated with digital art portfolios.

Figure 21

Student privacy is difficult to maintain with digital art portfolios



The eight short-responses for optional feedback on instructional time found that with some preliminary set-up, reasonable instructional time, and basic training of students, digital art portfolios do not take up too much instructional time. Documentation by a teacher created an overwhelming logistical burden; a teacher limited to only 90 minutes of instructional minutes per month with students was overwhelmed from completing the task alone. When teachers gave that responsibility to students, the entire process took minimal instructional time. Preliminary set-up of organizing rosters and lesson descriptions proved a minimal burden, as it mirrored established and required processes of gradebook preparation.

The short responses for hands-on learning see digital art portfolios as documentation and celebration of hands-on learning through art making. One participant believed that the

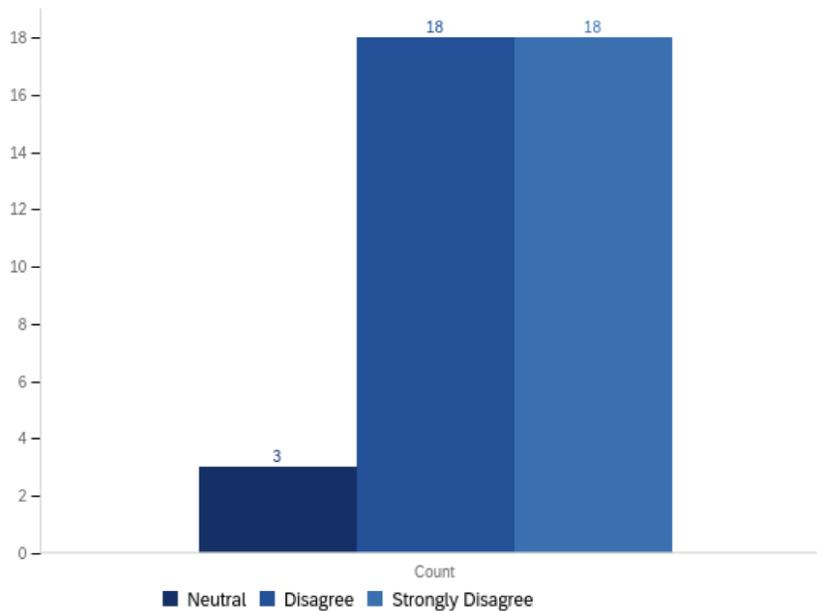
documentation of digital art portfolios encouraged further hands-on learning. Using the portfolio does not occupy time for hands-on learning but encourages it as a reminder of past successes.

The short responses for optional feedback on student privacy found no issues, as Artsonia retains a strict privacy setting that allowed viewing only for teachers, students, parents, and guardians. Privacy settings were only reduced with parent or guardian permission and further privacy settings are available for teacher and student use.

A resounding 92.4% of respondents did not see digital art portfolios as difficult to use with only three respondents neutral about their difficulty (See Figure 22).

Figure 22

Digital art portfolios are difficult to use



Respondents shared that appropriate technology and parent participation helped alleviate common difficulties. A slight learning curve with the occasional issue was easily resolved.

Pronounced difficulties included tasking the teacher as sole portfolio documenter for all students and a lack of parental involvement.

Interview Results

Interviews were conducted by the researcher to gain insight into the digital art portfolio experience that was not captured by the survey. Of the 39 teachers that completed the survey, three agreed to a virtual interview to further explain their responses. One elementary teacher and two middle school teachers responded to prompts that mirrored the survey. All three teachers used Artsonia as their digital art portfolios. The interviewees had five years, 14 years, and 26 years of experience as an art teacher. Two suburban schools and one rural school were represented.

Deductive coding was used to identify the more prominent themes in the interviews. These codes were drawn from the survey questions. Using Qualtrics software, the researcher sorted and analyzed the relevant themes. Organization and wider audience were deductive codes that reinforced the survey findings. Community feeling and motivation had somewhat stronger impacts in the survey findings than the interviews. While a neutral category for the surveys, reflection emerged as a prominent code in the interviews. Overall, the interview analysis supported the survey findings while calling attention to further research in reflection for its discrepancy in results.

Benefits

Reflection

Reflection was a strong theme shared among all three interviews. One of the middle school art teachers found an increase in the number of artist statements completed through the digital art portfolio compared to traditional handwritten artist statements. Dorn et al. (2003)

suggest this comprehensive reflection as students see their own growth through middle school as well as the duration of a school year. At the end of their middle school career, students could see their artistic growth of the past three years presented in the portfolio and potentially continue it in high school.

The digital portfolios also allow the elementary teacher to reflect on student work outside the hubbub of instructional time where his attention is dedicated to his students. Submitting a written reflection with the artwork image, known as an artist statement, helped students further express their intentions of their artwork. In turn, the teacher left written feedback to help students understand the project and their level of accomplishment. This opened a new line of communication between the teacher and students that was sustained beyond the normal class time.

The other middle school art teacher appreciated the personalization of the portfolio that allows her students to reflect on the ongoing process of their education. The artist statement provided for either quick generic prompts or more involved and critical reflections. The teacher relied on questions during submission to guide students through a critical and analytical reflection of their work. Dorn et al.'s (2003) proposed written reflections supported the lackluster responses students provided for the sake of finishing a response quickly and easily. A dictation feature also allowed student's spoken responses to be recorded as written text. This feature helped students that are stronger in oral responses than written or typed remarks to properly convey their purpose.

Organization

Sending artwork home with each child posed a logistical problem; damaged or lost artwork was a frequent problem. The digital portfolio ensured that parents and guardians always

had access to a digital copy. The elementary interviewee was impressed at the benefits from only a few years of using a digital art portfolio. The organizational abilities of the portfolio allowed the teacher to monitor the progress of his students. An icon for each project shows a small image of the submitted work and would appear blank if the project was left unsubmitted. The teacher more easily identified and assisted students that had yet to submit projects. The traditional organizational benefits were retained (Eisner & Day, 2004), while digital aspects streamlined burdensome logistics.

Wider Audience

While communication with parents and guardians is usually established at the elementary level, the digital portfolio expanded the audience to include extended family members and friends. Any interested member that regularly checked an email was able to receive updates about when the students posted new artwork to their portfolio. This consistency aligned with Pepler and Keune's (2019) goal of increased engagement. To reach a wider audience, the digital format made sharing images with local magazines and newspapers easier.

Community Feeling

An elementary art teacher interviewee found the community-building aspect of portfolios valuable. As an unintended consequence, the expansion of sharing artwork with extended family and friends also produced encouraging comments from this wider audience. The teacher periodically sent out links and images from the digital art portfolio to advocate for her students and art program. Pepler and Keune (2019) endorsed administrative control over portfolios and comments to ensure structure and security. Electronic invitations and automatic updates streamlined and increased involvement with school staff and community members.

Motivation

Benson and Barnett (2005) advocated personal investment in digital portfolios to increase motivation. Students used the portfolio as an exploration tool to view artwork by other classmates and the work of students in other grades. Students were motivated by seeing the examples of their classmates and schoolmates. The visibility of peer artwork imbued students with a sense of accomplishment in their work by friendly competition and peer modeling. They were intrinsically motivated to put in their full effort—not as a competition—but as a source of pride in the work they created.

Barriers

Internet Access

The biggest barrier to digital art portfolios for an elementary art teacher was internet access for her students that used the portfolio at home. The teacher's district actively provided support through technology loans, but connectivity consistency remained an ongoing issue. Anticipating a future return to classrooms after the COVID-19 pandemic subsides, the teacher focused on increasing access within his classroom. His plans for the next school year included pursuing grants to secure more technology for the students to be self-directed in updating their portfolios. Strycker (2020) also encourages exploring community sources of internet access to increase connectivity.

Training and Support

Patton and Buffington (2016) stressed relevant training and ongoing support to meet teacher needs. The teacher experienced a typical learning curve to fully use the digital art portfolio and all its capabilities. The core features of setting the portfolios up and helping students use them were relatively intuitive. She found that simply engaging with the portfolio

was the easiest way to gain the experience she needed to successfully use the portfolio. Adequate time and practice with the portfolio were more important than outside training and ongoing support.

Instructional Time

Minimal time and effort were used to teach foundational skills for sixth grade students to use their portfolios. For younger grades, their skills in technology increased from learning basic image documentation and editing. Otherwise, no perceivable instructional time was lost for the sake of digital art portfolios. As the supportive environment that Barrett (2005) encourages was established, instructional efficiency was optimized. In a normal school year, the teacher has adequate technology and time to support her students maintaining their portfolios.

Inductive Coding

A word cloud was generated to highlight common phrases in the three interviews (See Figure 23). As a data analysis tool, the frequency word visualization highlights terms that are important enough to the interviewer that they are repeated through the course of the interview, even as the topic changes. The survey gave equal standing to each benefit and barrier while the word visualization allows for focus on subjects that personally matter for the interviewee's situation. This allowed for inductive coding of additional themes that were not looked for in the survey. In general, these codes align with the benefits of digital art portfolios that were highlighted in the survey.

Kids

Kids was a common thread that personified the kid-centered and kid-friendly nature of a digital art portfolio. The three interviewees expressed that while there are barriers to be addressed, the benefits to their students were significant and complementary to their established practices. The variety of benefits and customization to their students' needs meets Fahey and Cronen's (2016) requirements in student-autonomy to cement portfolios as a mainstay in art classrooms.

Artsonia

Artsonia was the favored software due to its ease-of-use and affordability as a free program. Other programs, such as Canvas and Adobe products, require a subscription or district-wide commitment to use. The interviewees shared similar appreciation of its customization and connectivity to adapt to various grades as the teachers highlighted in Balsley's (2013) article on Artsonia. Students add artist statements and descriptive text that support and enhance their artwork. Parents, grandparents, and friends are digitally invited to view and comment on student portfolios.

Parents

Hahn (2019) encouraged proactive parent communication with parents through digital portfolios. The digital portfolios increased parent and extended family involvement through email notifications and comment functions. Elementary students were particularly eager to share their work with their parents. The interviewees also enjoyed support for reactive parent communication. When grades or curriculum were questioned by parents, teachers supplied exemplars and peer work to clearly communicate expectations.

Portfolio

The interviews stressed portfolios not only as a physical product, but as an integral part of the process. “The process of what you're doing is more important than that final product. It’s not like a competition. This is your portfolio. You need to be able to be proud of what you’ve done (Art Teacher Interviewee 2).” Barrett (2005) agrees that successful portfolios represent both the journey and the destination.

CHAPTER 5: DISCUSSION, LIMITATIONS, AND FUTURE DIRECTIONS

Discussion

The results of this study supported the original hypothesis of the benefits of digital art portfolios outweighing the barriers in the art education classroom. Art teachers consistently enjoyed a variety of benefits that supported or complemented their instruction. A singular dissenting teacher with negative views of digital art portfolios reported teaching at both a middle and high school. Due to this taxing situation, this teacher suffered the lack of training, ongoing support, accessibility, and time that technology in the classroom needs to be successful (Delacruz, 2004).

The most valuable benefits rated were organization, assessment, reaching a bigger or wider audience, parent and guardian involvement and technology integration. These categories required to sustain and grow an art program appealed to all types of art teachers. The digital portfolios streamlined processes that art teachers depend on to run a smooth and engaging classroom. As class sizes increased and diverted the teachers' attention to more students, the organization and communication capabilities were able to match that exponential growth in responsibilities. The full organizational potential of portfolios as analytical resources that Eisner and Day (2004) envisioned was realized by the teachers but had yet to significantly impact student use. As with any system, a breaking point was reached with one teacher who became too overwhelmed with student numbers and responsibilities to use digital portfolios.

The more neutral results were feeling like part of a community, reflecting on student work, and motivation. These were interpreted as auxiliary rewards that could be attained if art teachers had more time and resources to invest in their students. Some teachers only saw their students weekly or quarterly, while others were more successful with these aspects as daily

interactions. These limitations kept the benefits of the portfolios confined to the classroom. A fuller realization among the community and within the students that Pepler and Keune (2019) achieved was only attained by teachers that were adequately supported by administrators and technology infrastructure. A teacher with updated and sufficient technology provided by the school found more success than a teacher who was dependent on devices that were loaned out across classrooms and subjects.

For the purposes of this research, critical thinking was defined as making reasoned judgments that are logical and well-thought out. Art teachers misconstrue critical thinking as the antithesis of creativity. Miller (2011) argues that the arts are an exceptional mode to teach and practice critical thinking skills. He believes the historical connection between critical thinking and core curriculum inadvertently discourages art teachers from incorporating critical thinking skills in their teaching. In the survey, critical thinking was an overwhelming neutral category. Teachers believed that critical thinking skills were developed through explicit modeling by the teacher during a project (Stevenson, 2006); they were unaware of ways for students to use critical thinking skills at the end of the project. There is untapped potential for professional development in critical thinking skills to encourage open-ended questions and appreciating ambiguity towards student work. Stevenson's peer-review process is one potential avenue that could be further explored in this setting. By encouraging peer perspectives and feedback in discussing art, critical thinking skills develop between students that are not dependent on teacher modeling.

The most pressing barrier was representing three-dimensional art or texture accurately. This barrier was addressed by most participants with recent advancements in cameras and technology and some basic photography training of students. Participants also noted that a

variety of training and ongoing support was more beneficial than quantity. Training suited to the teacher's needs translated into better support for their students (Strycker, 2020). Through peers, customer service, and family support, teachers overcame the learning curve of using innovative technology in their classrooms.

Teachers that put the responsibility of maintaining the portfolio on their students found the use of instructional time to be a long-term investment. This supported Benson and Barnett's (2005) findings that a portfolio that grows with the student will be successful. A routine (Hahn, 2019) and student autonomy (Fahey & Cronen, 2016) both increase student motivation. Unreasonable time constraints that already negatively impacted instruction likewise made digital art portfolio implementation difficult or impossible. A teacher who floated between classrooms and schools at breakneck speed understandably cannot divert his or her time to anything but survival.

The results of this study suggest an optimistic trend among teachers in various community settings and career length regarding digital art portfolios. This technology is seen as a practical tool that is custom tailored to art teacher and student needs. The extent of the portfolio's usefulness depends on the time and resources the teacher has available to allocate. Benefits were perceivable and appreciated by most participants. As schools invest in more technology to benefit all students, the arts are a paradigm to illustrate the full potential of digital student portfolios.

Limitations

The results of this survey cannot be used to express the experience of all North Carolina teachers as only those that extensively use their school email and agreed to the online survey were represented. A larger sample size that also includes private and charter schools would

provide a more accurate representation. The survey was conducted over a period of months and would benefit from a longitudinal study to identify trends. Demographic data was limited and did not include the sex or race of participants. A more thorough profile of the participants could provide deeper insights. Despite these limitations, this research provides a helpful snapshot of North Carolina art teachers' experiences with digital art portfolios.

Future Directions

This study revealed that teachers gleaned the immediate benefits of digital art portfolios but could expand further if given the time and resources. Critical thinking is a skill that is pivotal to a student's development yet often lacks explicit instruction. More research into critical thinking instruction through digital art portfolios would be valuable in both the visual arts discipline but also across curricula.

Conclusion

The results of this study found the benefits of digital art portfolios outweigh the barriers that art teachers face when integrating them into their classroom instruction. Integrating digital art portfolios into the art classroom is not a cure-all. There are prerequisite technology resources and other barriers to consider. Nevertheless, we are at a time when technology is seen as a driving force for the future of education. Capitalizing on digital art portfolios as a technology already steeped in art education will help art teachers assert their relevance and lineage in twenty-first century technology skills.

Art teachers seeking professional development in organization, assessment, reaching a bigger or wider audience, parent and guardian involvement and technology integration can benefit from training and support in digital art portfolios. Digital organization relieves the teacher of managerial tasks outside of the current project. Once a project is finished and

submitted to the portfolio, it can be sent home barring any originals kept for art shows or other purposes. The portfolios provide ample documentation of pre- and post-assessment materials as relevant images and reflections. The controlled digital distribution of student artworks reaches family, friends, and community members in a safe and reliable manner. Students' presentation skills are enhanced by technology integration that mirrors professional artists' websites.

To equitably integrate digital art portfolios, technology access and basic training must be provided during class time. Many art teachers compete with core subject teachers for technology resources. Depending on a Bring Your Own Device (BYOD) policy of students using their personal devices at school leaves out students from lower socioeconomic backgrounds. The ease and accessibility of digital art portfolios allows for even a singular device to accommodate an entire classroom if used at the base level of organization and assessment. By starting small, with one device and one classroom, the results can be used to advocate greater support from administration, Parent Teacher Associations, and fundraising organizations.

Updating technology addresses the barrier of accurately representing three-dimensional art or texture from this study. While photographic technology is catching up to the needs of art classrooms, internet connectivity and durable devices will remain necessary components to a successful and continuing program. The digital art platforms also adapt to user feedback, such as incorporating video functionality. Teachers continue to provide platforms with suggestions and insights to inspire innovation and resolve issues.

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APPENDICES

APPENDIX A IRB Approval Letter

APPENDIX B Digital Art Portfolio Survey

APPENDIX C Interview Script

APPENDIX A: IRB APPROVAL LETTER



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences 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: [Nicolette Johnson](#)
CC: [Robert Quinn](#)
Date: 4/27/2021
Re: [UMCIRB 21-000770](#)
Benefits and barriers of digital portfolios in art education

I am pleased to inform you that your research submission has been certified as exempt on 4/27/2021. This study is eligible for Exempt Certification under category # 2b.

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
benefits barriers recruitment script 4-8.pdf(0.02)	Recruitment Documents/Scripts
Consent Paragraph for Exempt Research benefits barriers 4-7.pdf(0.03)	Consent Forms
Interview questions for benefits and barriers 4-7.pdf(0.02)	Interview/Focus Group Scripts/Questions
NJProspectus_updated_3-28.pdf(0.01)	Study Protocol or Grant Application
Survey exempt Benefits and Barriers of Digital Art Portfolios 4-7.pdf(0.03)	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.

APPENDIX B: DIGITAL ART PORTFOLIO SURVEY

Benefits and Barriers of Digital Art Portfolios

Dear Participant,

My name is Nicolette Johnson, and I am a graduate student at East Carolina University in the Art and Design department. I am asking you to take part in my research study entitled, "Carrying Digital Innovation Forward: The Benefits and Barriers of Digital Art Portfolios for Art Educators." The purpose of this research is to better understand the benefits that outweigh the barriers to digital portfolios in the art classroom. By doing this research, I hope to learn and rank the distinct benefits that attracted and retained art teachers to consistently use digital art portfolios. The barriers to reliable digital portfolio use will also be explored and ranked. Your participation is completely voluntary.

You are being invited to take part in this research because you are a public school art teacher that your local arts supervisor or director recommended for this survey. The goal is to digitally survey 100 individuals in North Carolina public schools. The amount of time it will take you to complete this survey is 10 to 15 minutes.

If you agree to take part in this survey, you will be asked questions that relate to motivation, organization, reflection, parent/guardian involvement, critical thinking, technology integration, assessment, instructional time, training, hands-on learning, and student privacy.

This research is overseen by the University and Medical Center Institutional Review Board (UMCIRB) at ECU. Therefore, some of the UMCIRB members or the UMCIRB staff may need to review your research data. However, the survey information you provide will not be linked to you. Therefore, your responses cannot be traced back to you by anyone, including me. Your identity, by submitting your email address for an interview, will be evident to those individuals who see this information. However, I will take precautions to ensure that anyone not authorized to see your identity will not be given that information.

!

If you choose to participate in the optional interview mentioned at the bottom of the survey to expand upon the answers you provided, you will submit your email. By email, the principal investigator will arrange an interview time and send a Zoom digital conference link that can be joined with an alias. The participant has the option to complete a video or audio interview. The video recording of the interview will be deleted and only the auto-generated audio transcript will be retained for research data. The transcript will be immediately coded, such as "Teacher Interviewee # 1" to protect confidentiality. The estimated amount of time it will take you to complete the interview is 30 to 45 minutes.

Please call Nicolette Johnson at 910-322-3639 for any research related questions. If you have questions about your rights when taking part in this research, call the University and Medical Center Institutional Review Board (UMCIRB) at 252-744-2914 (days, 8:00 am-5:00 pm). If you would like to report a complaint or concern about this research study, call the Director of Human Research Protections, at 252-744-2914

Your information collected as part of the research, even if identifiers are removed, will not be used or distributed for future studies. Your responses will be kept confidential and no data will be released or used with your identification attached. Your participation in the research is voluntary. You may choose not to answer any or all questions, and you may stop at any time. We will not be able to pay you for the time you volunteer while being in this study. There is no penalty for not taking part in this research study. If you decide you are willing to take part in this study, continue with the survey below.

Thank you for taking the time to participate in my research.

Sincerely,
Nicolette Johnson,
Principal Investigator
Johnsonnic19@students.ecu.edu

Which Digital Art Portfolio do you use? *

- Artsonia
- Seesaw
- Adobe Spark
- Other:

Please answer the following questions using this scale:

1 Strongly Agree 2 Agree 3 Neutral 4 Disagree 5 Strongly Disagree

Below each question is an optional space to provide feedback or explanation for each question.

Digital art portfolios help with organization: *

- | | | | | | | |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------|
| | 1 | 2 | 3 | 4 | 5 | |
| Strongly Agree | <input type="radio"/> | Strongly Disagree |

Optional feedback about organization:

Your answer

Digital art portfolios help reflect on student work: *

1 2 3 4 5

Strongly Agree Strongly Disagree

Optional feedback about reflection:

Your answer

Digital art portfolios help with parent/guardian involvement. *

1 2 3 4 5

Strongly Agree Strongly Disagree

Optional feedback about parent/guardian involvement:

Your answer

Digital art portfolios help with motivation: *

1 2 3 4 5

Strongly Agree Strongly Disagree

Optional feedback about motivation:

Your answer

Digital art portfolios help with critical thinking: *

(Critical thinking means making reasoned judgments that are logical and well-thought out.)

1 2 3 4 5

Strongly Agree Strongly Disagree

Optional feedback about critical thinking:

Your answer

Digital art portfolios help with technology integration: *

1 2 3 4 5

Strongly Agree Strongly Disagree

Optional feedback about technology integration:

Your answer



Digital art portfolios help reach a bigger or wider audience: *

1 2 3 4 5

Strongly Agree Strongly Disagree

Optional feedback about audience:

Your answer

Digital art portfolios help with feeling like part of a community: *

1 2 3 4 5

Strongly Agree Strongly Disagree

Optional feedback about community feeling:

Your answer

Digital art portfolios help with assessment: *

1 2 3 4 5

Strongly Agree Strongly Disagree



Optional feedback about assessment:

Your answer

Are there any benefits about using your digital Art portfolio that were not mentioned?

Your answer

Digital art portfolios take up too much instructional time. *

	1	2	3	4	5	
Strongly Agree	<input type="radio"/>	Strongly Disagree				

Optional feedback about instructional time:

Your answer

Digital art portfolios are difficult to use. *

	1	2	3	4	5	
Strongly Agree	<input type="radio"/>	Strongly Disagree				



Optional feedback about difficulty:

Your answer

Digital art portfolios require a lot of training and ongoing support to be successful. *

1 2 3 4 5

Strongly Agree Strongly Disagree

Optional feedback about training and ongoing support:

Your answer

Digital art portfolios don't put enough emphasis on hands-on learning. *

1 2 3 4 5

Strongly Agree Strongly Disagree

Optional feedback about hands-on learning:

Your answer



Digital art portfolios can't capture 3D art or texture accurately: *

1 2 3 4 5

Strongly Agree Strongly Disagree

Optional feedback about capturing 3D art or texture:

Your answer

Student privacy is difficult to maintain with digital art portfolios : *

1 2 3 4 5

Strongly Agree Strongly Disagree

Optional feedback about student privacy:

Your answer

Are there any barriers about using your digital Art portfolio that were not mentioned?

Your answer



The benefits of digital art portfolios outweigh the barriers: *

1 2 3 4 5

Strongly Agree Strongly Disagree

What type of school do you teach at? *

- Rural
- Urban
- Suburban
- Other:

What school level do you teach? *

- Elementary School
- Middle School
- High School

How many years have you taught art: *

Choose ▼

***OPTIONAL* Email for interview**

If you are interested in being interviewed over a recorded video or audio session of Zoom to give further feedback and insight into your answers, please provide your email here. The researcher will follow up over email to schedule an interview. Your information will remain confidential. If you do not want to participate in an interview, please leave this spot blank.

Your answer

Click "submit" at the bottom of this survey if you give consent to use your responses in the research study as detailed at the top of this survey. If you choose to withdraw your consent, you may exit out of the survey without submitting.

Submit

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APPENDIX C: INTERVIEW SCRIPT FOR DIGITAL ART PORTFOLIO SURVEY

Interview Questions for Carrying Digital Innovation Forward: Benefits and Barriers of Digital Art Portfolios.

Script to read before beginning interview:

“You are being invited to participate in a research study titled “Carrying Digital Innovation Forward: The Benefits and Barriers of Digital Art Portfolios for Art Educators” being conducted by Nicolette Johnson, a graduate student pursuing my Master of Arts in Education in art education at East Carolina University in the Art and Design department. The goal is to digitally interview individuals in North Carolina public schools.

As the participant, you have the option to complete a video or audio interview. The video recording of the interview will be deleted and only the auto-generated audio transcript will be retained for research data. The transcript will be immediately coded, such as “Teacher Interviewee # 1” to protect confidentiality. The interview will take approximately 30-45 minutes to complete.

It is hoped that this information will assist us to better understand the benefits that outweigh the barriers to digital portfolios in the art classroom. Your responses will be kept confidential and no data will be released or used with your identification attached. Your participation in the research is voluntary. You may choose not to answer any or all questions, and you may stop at any time. We will not be able to pay you for the time you volunteer while being in this study. There is no penalty for not taking part in this research study. Please call Nicolette Johnson at 910-322-3639 for any research related questions or the University & Medical Center Institutional Review Board (UMCIRB) at 252-744-2914 for questions about your rights as a research participant.”

Interview questions:

1. Which Digital Art Portfolio do you use?
2. Would you like to elaborate on how digital art portfolios help with organization?
3. Would you like to elaborate on how digital art portfolios help reflect on student work:
4. Would you like to elaborate on how digital art portfolios help with parent/guardian involvement?
5. Would you like to elaborate on how digital art portfolios help with motivation?
6. Would you like to elaborate on how digital art portfolios help with critical thinking?
7. Would you like to elaborate on how digital art portfolios help with technology integration?
8. Would you like to elaborate on how digital art portfolios help reach a bigger or wider audience?

9. Would you like to elaborate on how digital art portfolios help with feeling like part of a community?
10. Would you like to elaborate on how digital art portfolios help with assessment?
11. Would you like to elaborate on any benefits about using your digital art portfolio that were not mentioned?
12. Would you like to elaborate on how digital art portfolios take up too much instructional time?
13. Would you like to elaborate on how digital art portfolios are difficult to use?
14. Would you like to elaborate on how digital art portfolios require a lot of training and ongoing support to be successful?
15. Would you like to elaborate on how digital art portfolios don't put enough emphasis on hands-on learning?
16. Would you like to elaborate on how digital art portfolios can't capture 3D art or texture accurately?
17. Would you like to elaborate on how student privacy is difficult to maintain with digital art portfolios?
18. Would you like to elaborate on any barriers about using your digital art portfolio that were not mentioned?
19. Would you like to elaborate on the benefits of digital art portfolios outweighing the barriers?
20. What type of school do you teach at? (Rural, Urban, Suburban)
21. What school level do you teach? (Elementary, Middle, High)
22. How many years have you taught art?

Thank you for your participation in this interview.

