



**INTEGRATION OF DIGITAL TECHNOLOGY IN THE  
PLANNING OF ARTWORK**

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A Thesis Submitted in Partial Fulfillment  
of the Requirements for the Degree

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### **Abstract**

The discussion that follows provides additional research for the incorporation of digital technology in art education. As digital devices become commonplace in U.S. classrooms, contemporary art educators will continue to seek answers on the best methods for facilitating the creative process through planning methods, in either the physical, or the digital realm. This quasi-experimental study design aims to provide insight into which method of planning is superior for student-artists: traditional, or digital. The prevalence of digital notetaking, digital inking, and other modern applications offer teachers and their student-artists new resources which could aid—or distract—from the creative process. Student participants include suburban ninth graders, at a Bucks County middle school, in Pennsylvania. Investigation into these students' personal preferences for art media, students' work productivity, and ease of use of the available media follows. The quasi-experimental study provides data indicating that students' preferences vary, despite their experience and comfort level using technology. Participants demonstrated the impact of technology on student productivity, with the addition of technology proving to create challenges for students centered on technological issues and individual focus. Research data collected indicates that digital tools impact teaching, learning, engagement, and the artist's creative process.

*Keywords:* digital technology, creative process, art making, art education, originality, digital inking, digital stylus pen, planning artwork, sketching

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### **Integration of Digital Technology in the Planning of Artwork**

Artists challenge themselves within the creative process to construct, draw, build, and create new visual ideas in various art media. Regardless of the resulting final product, early stages of artistic creation often begin in the same place.

#### **Background**

The creative process typically involves “documentation and reflection,” and then one’s written description and visualization of an idea, through sketching and note-taking, or “first sketches” (Botella, et al., 2013, p. 166). In an attempt to pull an idea from the artist’s imagination, and form a plan for a final drawing, painting, sculpture, or other masterpiece, these methods of writing and sketching can be seen in the work of artists for generations. Whether creating in two or three-dimensions, artists often begin with a two-dimensional drawing or written notes. Historically, artists’ plans are generated on physical—often two-dimensional surfaces—such as stone, board, and paper. For artists moving beyond finger-paint and other hands-on media, and working with drawing and writing utensils, the use of pencils, pens, markers, and more have been utilized for writing and drawing, when planning a work of art (Mules, “The History of Drawing”).

The modern art educator can attempt to facilitate the process of artistic creation by promoting the use of paper, notebooks, and sketchbooks, which can act as a “repository of ideas, perceptions, inspirational imagery, and graphic experiments” in an artist’s creative process (Kirwin, 1987, p. 21). However, with access to digital media increasing through dissemination of newer technologies in one-to-one efforts of schools across the world, more student-artists are being given access to their own digital technologies (Thorsteinsson, 2014; Aboalgasm & Ward, 2012; Wang, 2018).

**Problem Statement**

As these devices, such as personal student laptops and tablets, enter more classrooms—and art studios—the planning space is able to shift from the physical realm of paper, to the digital world of word processing and screen sketching. The new writing and drawing utensil is a digital stylus pen, with which student-artists can work on planning through digital inking. The keyboard has become a tool for notetaking (Bui, et al., 2013; Mueller & Oppenheimer, 2014). Students can even record their voice and have digital programs convert their spoken thoughts onto the digital screen, through talk-to-text features (Martin, 2019). Now, if a student-artist can verbalize their plan for an artistic creation, it can be stored visually through text. With all of the tools available, the integration of technology in the art classroom and studio seems inevitable.

New digital devices and computer applications have changed the way artists can engage in the creative process, and the planning of an artwork no longer needs to exist solely in the physical realm. Should art educators embrace these technologies as new media for facilitating student idea generation and artwork planning? Or, are traditional planning and sketching methods still superior?

Educators need more research to determine the best methods for incorporating—or excluding—digital technologies in their classrooms and art studios.

**Research Questions**

As educational professionals consider the impact of digital technologies on student-artists, they may consider students' personal preferences for a planning medium, classroom productivity, and ease of use of the available media. Do art students prefer to work with digital technology, or with traditional, non-digital materials? This prior question requires research on student preferences within the creative process. Does one method of planning better support



artist focus and productivity in the classroom studio? Yet again, additional investigation into productivity is needed. Which types of materials—traditional or digital—are easier for art students to use when planning an artwork? As more art educators are encouraged to incorporate the digital devices that enter their studio spaces, all of these questions require answers. Therefore, they serve as a guide for this research in its entirety.

### **Action Research**

It was determined that a quasi-experimental study design would be the best way to explore the impact of technology integration in my art room. My own art students learned about this research opportunity in their art studio classroom. Students were informed that their participation could help with answering the above research questions.

During the first week of the study, all student participants took a survey to document their past experiences using both traditional and digital materials. This prior knowledge survey was employed as a way to better understand future results. After participants took the survey, the teacher-investigator instructed all students in basic skills with both traditional drawing materials and digital tools, for use in planning an artwork.

In the second week, students in the class were randomly placed in one of two groups. Students placed in the first group worked on an artwork planning guide with only traditional materials, and took a survey at the end of each class, to share their thoughts on their creative process. Students placed in the second group completed an artwork planning guide with only digital materials, and also took the same survey at the end of each class.

Finally, in the third week of the quasi-experimental study design, all students from both groups chose what materials they wanted to use to plan second, different artwork; they were able

to use a mix of digital and traditional, or chose one method over the other, exclusively. All participants, again, took the survey at the end of each class.

### **Definition of Terms**

*Art Studio* – an environment, often synonymous with “art classroom,” which implies access to a teacher facilitator and a higher level of creative and artistic freedom for its inhabitants. Media for the production of artwork is available, and may include materials for drawing, painting, sculpting, and other areas of art and design. In the present study, the art studio in use belongs to that of Alison Thompson, in her public-school building.

*Student* – an individual enrolled in an educational institution. In the present study, student refers to a school pupil between the ages of thirteen and fifteen, who attends a middle school in a Philadelphia suburb.

*Teacher* – an adult certified in the education of often minor pupils. In the present study, teacher referred to the instructor who led the study, and documented findings, as she facilitated student understanding and artwork ideation.

*Digital Technology* – modern technologies including—but not limited to—laptops, desktops, tablets, personal smartphones, and other devices, applications, and tools. In the present study, digital technology included digital stylus or digital inking pens, laptop computers, personal cell phone or smartphone devices with internet access, computer application programs, and learning management systems like Canvas.

*Traditional Media* – physical art materials, such as pencil, paper, paint, and pastel. In the present study, traditional media included charcoal, watercolors, and other media like those mentioned above.

### **Literature Review**

As one considers the impact of technology integration on student-artists, one may consider students' personal preferences for a planning medium, classroom productivity, and ease of use of the available media. Do students prefer digital planning options through digital inking and typed notes, or do they prefer traditional methods on physical paper? Does one method of planning better support artist focus and productivity in the classroom studio? Do student-artists' prior knowledge and skills make one medium easier than another to use, promoting the comfort with which students plan and create? As more art educators are encouraged to incorporate the digital devices that enter their studio spaces, these questions require answers.

Unfortunately, current research fails to fully address the questions above. When accessing research articles through Google Scholar and EBSCOHost, one will easily discover studies which analyze the impact of new digital technologies in the art room. Yet, found studies tend to disregard the affect these technologies have specifically on planning in the creative process. Some studies focus on handwriting on paper versus typing on a keyboard, but go no further. Even when specific populations studied may overlap, such as grade level, or school environment and socioeconomics, educators may become frustrated by the lack of research targeted on their exact population, and digital tools available. These gaps suggest the need for additional research.

Therefore, future studies can aim to provide data on the following: student preferences for a planning medium, student productivity with different media, and student ease of use of available media. Results may help art educators and administrators as they make decisions regarding the choice between traditional pencil and paper planning methods, and digital planning methods in an art studio.

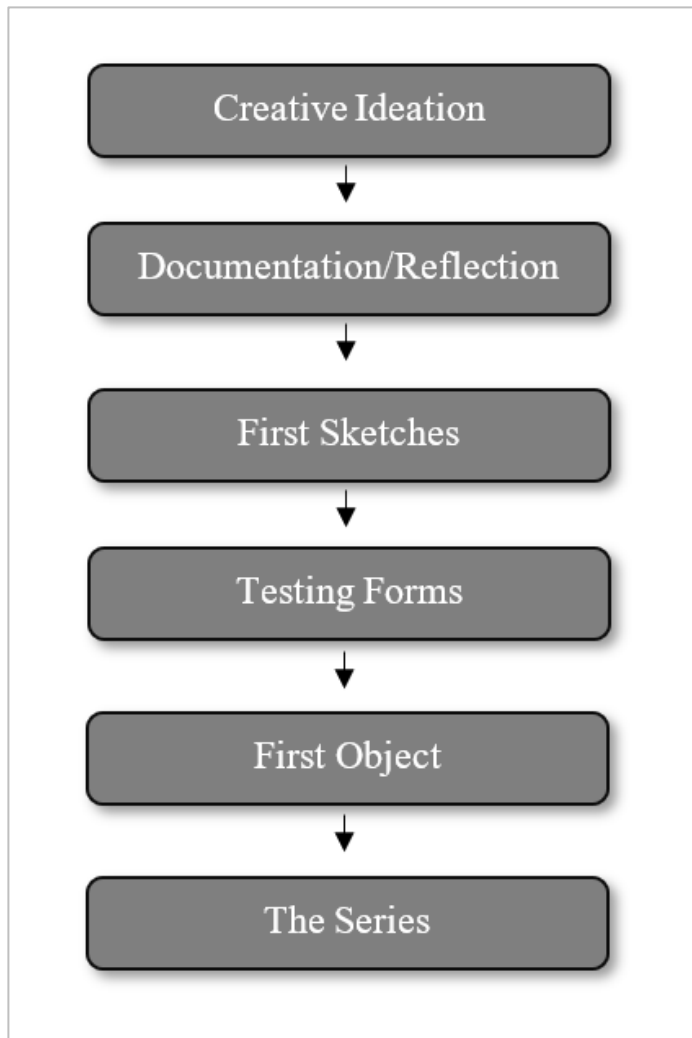
### **Technology in the Visual Arts**

Technology and art have long been intertwined, and as such, there is a large community of professional artists from around the globe, working with digital media (Wands, 2007). In this context, the use of digital technology in the classroom of student-artists seems justified. There may be a clear value in technologies like digital inking, as a means for working within the creative process, given the use of these technologies by professional artists. As a result, instructional texts for educators on the inclusion of tools like digital drawing have been available for over a decade (Ferres & Ferres, 1998). Overall, because computers are used to make famous works of art which are exhibited worldwide, computers could also be a helpful resource used by students, as they plan their own art pieces (Wands, 2007).

Theory on creativity from Botella, et al. in 2013, described the creative process as being influenced by environmental factors. Figure 1 depicts the "...phases involved in the production of artwork." Artists are believed to begin with "Creative Ideation," or the idea discovery and inspiration stage. After that point, the authors suggest an active and sequential movement through all stages. This is the creative process through which artists must travel, according to this theory (Botella, et al., 2013 p. 168). As an action framework, the planning stages precede the testing of forms, or actual creation stages.

**Figure 1**

*Botella, et al, Theory on Creative Process Stages*



*Note.* This action framework depicts the theory on the creative process.

Botella, et al., assert that there is an “interconnection between creative work and the material and social environment of the artist” (2013, p. 163). Thus, technology acts as a variable in the artist’s environment. It influences the creative process like any other environmental impact.

**Increased Technology Access in Schools**

Whether here in the United States of America, or anywhere from the United Kingdom to Iceland, more schools are incorporating digital technologies in their schools and classrooms (Thorsteinsson, 2014; Aboalgasm & Ward, 2012; Wang, 2018). From personal—or one-to-one—laptops to tablets, more students have access to complex computing devices than ever before. According to the National Center for Educational Statistics, in 2015, “eighty percent of eighth graders reported using a computer for schoolwork on a weekday” (Institute of Education Sciences). Students have become familiar with this technology, to the point where over seventy-five percent of eighth graders reported using a computer before they entered the fourth grade (Institute of Education Sciences). Some teachers integrate these devices because they have become available through their schools and districts, and because they see the digital technology as more relevant, and less “outdated” than other teaching resources (Wang, 2018, p. 52).

**Incorporation of Digital Devices in Teaching and Learning**

For whatever the reason for digital device incorporation in more classrooms, teacher use of this technology for instructional purposes, has had a perceived net-positive impact on student engagement in class, by those same teachers implementing the technology usage (Carver & Todd, 2016). In fact, fifty-nine percent of teachers in the 2016 Carver and Todd study believed that student engagement benefited from technology usage, and twenty-three percent thought that student understanding increased, as well (p.114). The perception of technology implementation as having a positive impact has led more teachers to feel the need to take advantage of these available technologies.

The result of increased student access to these devices has also brought about students’ improved ability to innovate (Corn, et al, 2010), which is a crucial element of the artist process.

In the Corn, Tingen, Argueta, Patel, and Stanhope study of 2010, research evaluating the one-to-one device initiative in eighteen North Carolina high schools, found that more classroom lessons included twenty-first century skills like innovation, and even career and life skills (p. 3).

When integrated with middle school curricula, laptop technology can produce some promising results, even beyond student innovation (Gulek & Demirtas, 2005, Sherman, 2001; Wang 2010). Data from the twelve teachers participating in Sherman's 2001 work—teachers in the arts and across disciplines—show that student achievement and learning outcomes were positive for students using laptops. Based on Sherman's interviews, she summarized that, "laptop usage in the classroom encouraged depth and breadth in student learning and teacher effectiveness" (p. 188). This collected interview data also revealed that "eighty-five percent of faculty surveyed felt that students' learning outcomes in online [laptop] education...were better than those found in face-to-face classrooms" (Sherman, 2001, p. 51). There was also an inverse relationship between teacher web use and the number of digital links and references found for their classroom use. In Sherman's studied population, both teacher and student participants had received training on the use of their laptop devices, and the student participants had digital laptop use organized for them. Over the time that research was completed, teacher participants had altered their classroom environment and teaching structures to facilitate laptop learning. Data from interviews collected revealed this intentional change in the way class routines were redesigned for laptop use. Overall, findings from teacher interviews and student artifacts collected demonstrate the net-positive impact of technology on students' ability to write, meet curricular standards, and use various student strategies for learning (Sherman, 2001, p. 189).

When 259 middle school students were studied by Gulet and Demirtas (2005), students demonstrate self-directed learning skills, "report a greater reliance on active learning strategies,"

“readily engage in problem solving and critical thinking,” and “...show deeper and more flexible uses of technology than students without individual laptops” (p. 3). The California sixth, seventh, and eighth graders involved in this particular laptop program showed a statistically significantly higher overall Grade Point Average (GPA). For instance, the overall GPA for students in the second cohort of laptop participants had an average GPA score of 3.48, whereas students who did not participate in this segment of the laptop program had a lower average of 3.15 (Gulek & Demirtas, 2005, p. 23). Overall, achievement results, including performance in math and writing, were statistically higher for digital device users than for those participants who did not use a laptop, in the study by Gulek and Demirtas (2005).

Digital technologies have also been reported to provide unique visual experiences for students, and assistance for students in the form of digital remediation access (Wang, 2018). In Wang’s 2018 study, seven teachers from across the United States were interviewed on their use of iPad technology in the art classroom, and analysis indicated the following themes of iPad integration: teaching digital art is facilitated, students are introduced to “unique aesthetic experiences,” teaching and learning is more “innovative,” and remediation for students is more accessible (pp. 52-53). Final findings suggested that educators can successfully use iPad technology as a tool within the art classroom to facilitate students’ work throughout the creative process, as “iPads can act as a notebook, textbook, and a digital learning medium all at the same time” (Wang, 2018, p. 55).

Meanwhile, evidence from Bebell and Kay’s 2010 work indicated that increased one-to-one computing device access resulted in “changes in student achievement, student engagement, and students’ research skills” (p. 4). Even the ways in which teachers facilitated lessons or delivered curricula was altered. In this study on one-to-one technology in five Massachusetts



middle schools, 1,762 survey responses from students and 163 survey responses from teachers indicated significant impacts of the integration of the devices on teaching and learning (Barbell & Kay, 2010, pp. 8-12). Study results revealed that "...eighty-three percent of teachers felt that engagement had improved for their traditional students, compared to 84% for at-risk/low achieving students, and 71% for high achieving students" (Barbell & Kay, 2010, p. 21).

### **Related Challenges in the Classroom**

However, changes to teaching strategies and classroom procedures can come with challenges (School Technology Branch of Alberta Education, 2010), and may lead teachers to reconsider student usage of new technologies. With the increased inclusion of digital technology in schools, classroom struggles have been reported. Potential distractions and increased multitasking behaviors that impact student understanding of course material, act as an obstacle for students and teachers. In an undergraduate university setting, findings revealed that when student environments weren't structured for computer use, and students weren't taught specific strategies for managing the technology, higher rates of laptop use in class resulted in lower class performance (Fried, 2008). In Sweeny's compilation of essays on education and technology, academic Ryan Shin suggests the potential pushback that students can initially give when being introduced to digital inking options, as well, which only adds to the list of potential challenges educators may face (2011).

Yet, schools often have a great stake in ensuring their technology infrastructure and device investments are optimized. Even with pushback, potential distractions, and other classroom routine and management concerns, there is a "power" that comes from allowing students to engage in this mode of creation (Sweeny, 2011, p. 49).

Therefore, schools who have invested in providing students with access to personal computing devices, one-to-one laptops, or tablets, often hope to maintain a successful and organized program in conjunction with teachers, students, families, and communities (School Technology Branch of Alberta Education, 2010). Thus, an increase in data on this topic would assist schools in managing the use of these devices.

### **Student Use of Digital Tools**

When given access to digital technologies, art educators and student-artists must navigate a world of various and changing digital tools and resources. Art educators are left with the challenge of facilitating student artwork planning and creation alongside these newer digital resources. As a result, research on the impact of these resources must be thorough, to support any integration of these tools.

Much has already been done to analyze the impact of digital tools and technology on test performance (Bui, et al, 2013; Fried, 2008; Mueller & Oppenheimer, 2014), but little research data has been produced on the impact of digital technologies on the creative process. Previous research on class notetaking done in a traditional longhand format, and by computers and laptops, like that of Bui, Myerson, & Hale in 2013, or Mueller and Oppenheimer in 2014, pinpoint notetaking for the purpose of improved recall of facts or conceptual knowledge as a research area. In fact, when students are transcribing notes, laptop notetaking can assist in creating greater equity between individual students (Bui, Myerson, & Hale, 2013, p. 1). Even medical students have benefited from the use of digital devices in their studies; Researchers revealed that digital notetaking—over handwritten notes—better allowed students to access and organize their materials in such a way as to aid in the retrieval of information for use in treating patients and studying for academic assessments with greater ease (Pyörälä, et al., 2019).

Likewise, the notetaking formats provided by educators can also assist in student learning. A theory suggested by Stacy and Cain proposes the use of notetaking resources that promote “active listening and notetaking,” where students can put information in their own words (2015). Yet, the same authors also refrain from suggesting that one format—digital or handwritten on paper—is superior to another (Stacy & Cain, 2015), demonstrating the need for more research.

Additionally, the notetaking that art students are involved in includes more visual notes, such as drawings, found images, and other references for planning purposes in the forming of an art piece, in combination with written notes. My proposed future research attempts to inform the educational community on the impact of different planning, notetaking, and sketching methods on the creation of artwork, beyond simple typed or handwritten notes for test-taking purposes or simple factual recall.

### **Creative Digital Applications**

Even when research attempts to delve into creative artmaking and digital technologies, one can still find some gaps. In a smaller study conducted by Aboalgasm and Ward in 2014, data revealed that participants perceived their creative ability to be improved with the use of digital tools. In this study including students ages nine and ten, only one of the sixteen participants did not believe this to be true. Among the sixteen participants, only three preferred traditional materials over digital materials (Aboalgasm & Ward, 2014). Researchers Aboalgasm and Ward collected data using mixed methods of research, while students attended an art workshop. The researchers’ initial goal was to prove that students could be just as creative with digital tools, as with traditional tools. Their method for quantifying participants’ level of creativity, however, was not explained, beyond students use of color, as being seen as a way in which students were demonstrating creative thought (Aboalgasm & Ward, 2014, p. 48). Yet, the participants did

provide data on their perception of the advantages and disadvantages of the different media from the art workshop. Additionally, participants' interest and ability to easily use the digital and traditional tools were documented in using qualitative methods. Interview questions asked of participants showed that researchers had a clear interest in the usefulness of digital tools, and asked very little about the traditional materials that could be used in the creation of student artwork. While this study focused on the use of digital tools in art making, one must ask, would these tools have also aided the planning stage of the creative process, more so than traditional pencil and paper? This study used these tools with younger children for short, simple drawing tasks. Would this digital medium be as helpful in the designing and planning of a more complex artwork, as well?

Regardless, students using digital inking tools should see an improvement in their digital drawings the more they use the tools, and they may be able to work more quickly with digital tools than with traditional pencil and paper methods in creating (Thorsteinsson, 2012). In the Thorsteinsson 2012 study, the researcher set out to understand how drawing tablets affected "...communication, learning performance and use of the drawing technology" (p. 204). Drawing tests were conducted in which participants were scored on the following categories: "Accuracy," "3D skill," "Detailed drawing," "Clarity," and "Realistic" (Thorsteinsson, 2012, p. 205). Participants completed the drawing tests using pencil and paper, digital stylus pens with Paint software, and digital Pegasus pens, "with specific software" (Thorsteinsson, 2012, p. 205). Results from the Thorsteinsson study's drawing test data—as graded by postgraduate students—revealed that pencil drawings were graded sixty-four cumulative points higher, for demonstrating three-dimensional skills than digital drawings, and realism of the pencil drawings also scored significantly higher, by fifty-two points (2012). The author summarizes by stating the following:

“Tests showed that the students were better at using pencils than the digital pen tablets”

(Thorsteinsson, 2012, p. 206). Perhaps in the planning process of creating a work of art, this potential downside to the quality of a digital drawing, can be overlooked, if the digital medium proves to still assist the student-artist with his/her overall creative endeavor.

### **Conclusion**

Significantly, drawing acts as “an important tool for ideation” (Thorsteinsson, 2012, 207). Through both digital and traditional methods, the sketching and brainstorming that student-artists complete contribute to their creative process. Yet, research requires a deeper look at which methods are superior in the art studio classroom. Future studies can aim to provide more insight into student preferences for planning media, student productivity with different media, and the ease of use of available media. It is perhaps only with the execution of future research, that the choice between traditional and digital planning methods in an art studio can be fully understood.

### **Methodology**

Gaps in research suggest the need for additional research studies in various populations. For instance, past studies fail to provide data on my own population of students in relation to their age, geographic location, and background. Methods including student-participant surveys, and direct instruction provide the art education field with additional insight when considering technology's impact on the creative process, indicating their use would be meaningful. Due to the nature of my class structure, the research moved forward as more of a quasi-experimental study design, because non-participants in class act as a control.

### **Participants**

As the researcher and teacher of the study's population, I recruited participants from my ninth grade Ceramics classes. Therefore, I did not have the ability to make the sample truly random. The target population consisted of 26 subjects from across my freshman art classes at a middle school in the Philadelphia suburbs. The subjects targeted were residents of Bucks County, in Pennsylvania.

I presented the Action Plan, seen in Appendix A, to students in class. This Action Plan outlined the research procedures and participation requirements. Interested students were required to complete the Student Assent form, and Parental Consent form (see Appendix B). These detailed that no risks would be involved in the study. Students were not provided with direct incentives for participating, but did understand that their classwork would be the same, whether they participated or not, and that their participation would give them a greater voice; students could feel as though they were being heard. Participation also made students feel that their opinions mattered more, because they would be counted toward an official, university research study.

Attrition was nonexistent, as not a single student withdrew from the class or was forced to stop participating due to health, or class attendance issues. The primary reason given for why potential student subjects chose not to participate was based on students' inability to return their parental consent forms; some students continually forgot to have it signed or lost their form. Others did not want to complete the extra work of having their form signed and returned.

### **Materials**

Subjects completed digital surveys using responses with varied formats (see Appendix C and D). Digital surveys collected data through Microsoft Forms. Surveys included a prior knowledge survey, seen in Appendix C, and an end-of-class survey, visible in Appendix D. Questions were open-ended, semi-structured, and structured. For example, question one in Appendix D from the end-of-class survey, gave subjects a suggestion of the type of responses that researchers were looking for (i.e. paper, laptop), but allowed for varied responses. At the same time, question seven from the end-of-class survey allowed students to respond openly (see Appendix D). For some questions, like question five, above, a Likert scale was used to allow subjects to respond across a range of possible beliefs.

While participating, subjects also completed digital and/or paper copy Artwork Planning guide (see Appendix E). Here, guided planning took place, and subjects were able to draw and write while planning their artwork in the study. Students moved through the planning stages that Botella, et al, referenced as "Creative Ideation," "First Sketches," and "Documentation/Reflection," in 2013 (p. 168). As students planned their artworks, the teacher-researcher observed students, documenting findings through notetaking.

**Ethical Considerations**

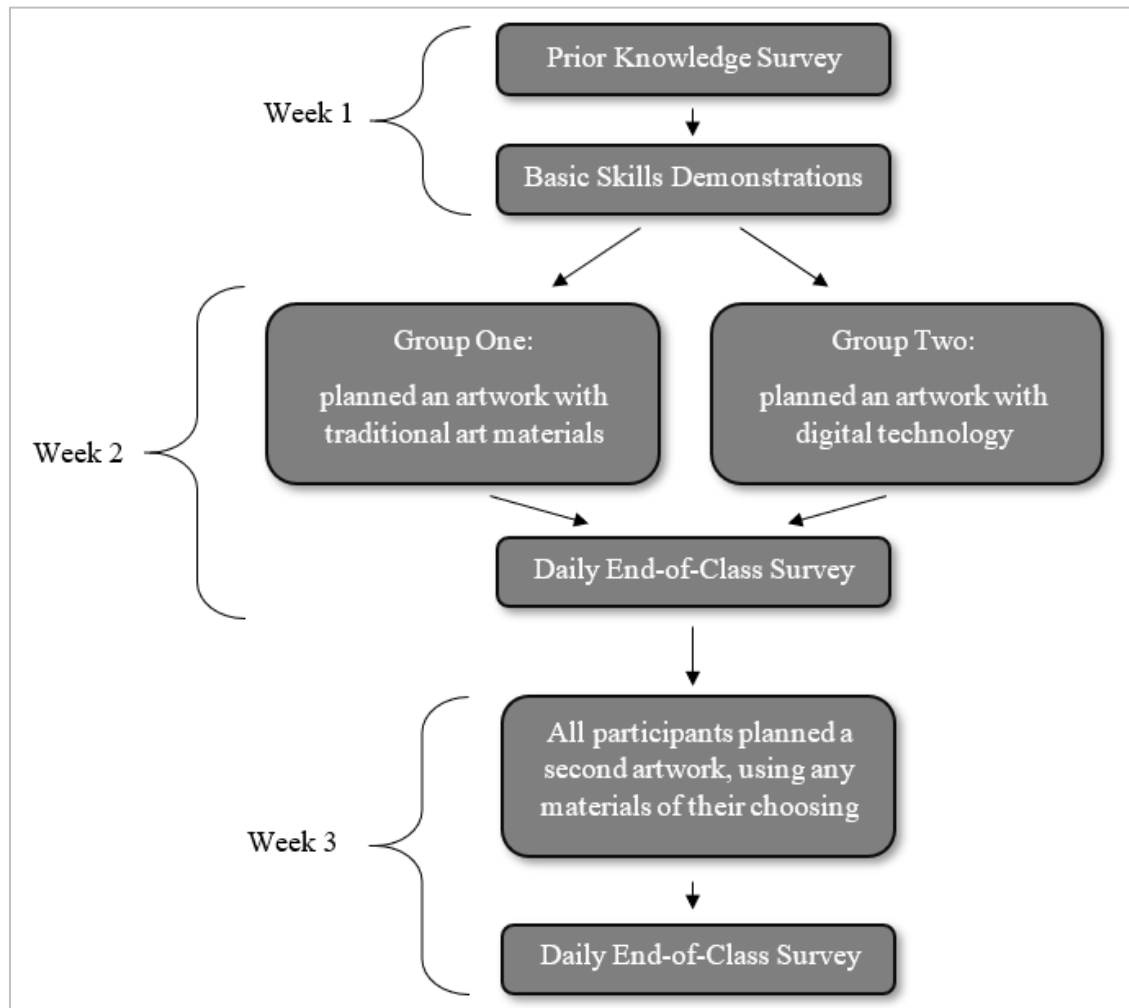
Despite being a relatively captive research population, participants were given several choices surrounding the study. Student participants did not have to take part, were able to leave at any time during the study, and were not expected to complete work any differently than their non-participating peers.

While working with minors, special precautions were taken to ensure that the participants understood the research, and their responsibilities. The reading level of assent forms were below a seventh-grade reading level, and participants' parents/guardians were informed of all research activities.

**Procedures**

This study followed the timeline depicted in Figure 2. First, students took a survey to reveal their prior knowledge about the materials they have used to make art (see Appendix C). Next, I led basics skills demonstrations with different art materials, and digital materials.



**Figure 2***Procedure Timeline*

*Note.* Study participants moved through these phases of the study over 3 weeks.

Then, students were randomly placed into either Group One, or Group Two. Group One planned an artwork using only traditional art materials, including paper, pencil, markers, and pastels; digital technology use was not permitted. Group Two used digital technology to plan an artwork; the use of traditional materials was not permitted. Then, all participants planned a second artwork, using any materials of their choosing. As a limitation to this final artwork planning, students were required to complete this during online, distance learning, as the

COVID-19 outbreak in Pennsylvania resulted in districts closing their building. Students did not have access to traditional materials typically found in their classroom art studio. Students did have access to their district-issued laptops, and some limited materials at their house, as they completed the third week of the study, remotely.

As students planned their work throughout the study, I observed and documented with written notes and photographs. At the end of artwork-planning each class, students took the survey (see Appendix D). Students only completed a daily end-of-class survey on the days they worked on planning an artwork. All work within the research study was completed during class time, within three weeks. Even when completed through distance learning, online, students were not required to exceed the typical class time to complete their work for the study.

### Data Analysis and Results

Data coding and analysis revealed a great deal of information surrounding the integration of technology in the art studio. This study provided insight surrounding these students' personal preferences for art media, students' work productivity, and ease of use of the available media.

#### What Types of Media or Materials Did Participants Use?

Based on student reporting in class surveys, and teacher observation, students used a variety of art media—or materials—during their planning process throughout the study (refer to Table 1). When students were provided with physical materials in the classroom, they were more likely to use more diverse media. When students were working remotely, they generally used less traditional materials, and more digital materials, indicating either a deliberate choice, or an uncontrollable lack of access to alternatives.

**Table 1**

*Materials Used in the Study*

Digital Tools	Traditional Materials
Cell Phone	Chalk Pastels
Digital Image Editing	Colored Pencils
Digital Inking	Glue
Digital Stylus Pen	Paper
Google	Pen
Laptop	Pencil
Microsoft Word	Magazines
Snipping Tool	Markers

*Note.* Students used a variety of digital and traditional materials across different timepoints.

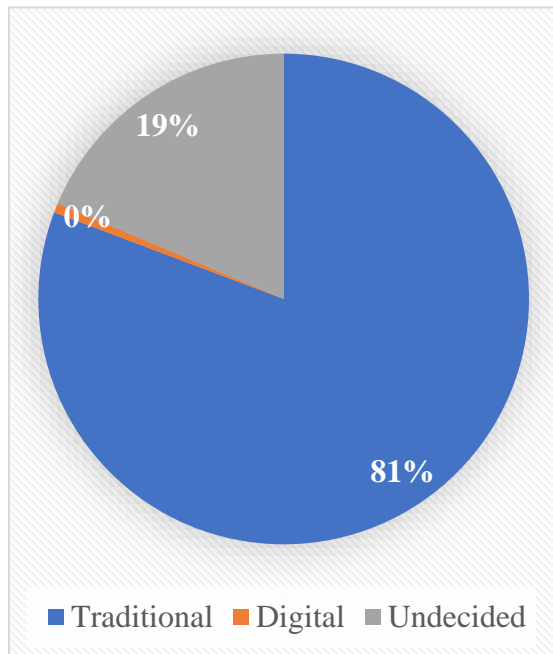
**Which Materials do Students Prefer to Use when Planning an Artwork?**

Regarding student preference, there was no consensus. Some students preferred to use non-digital materials, citing the ease of use and familiarity with such media. Other participants preferred to work with technology, referring to the immediate access of various types of helpful resources.

When students were forced to work remotely during their final week of the quasi-experimental research design, every student found it necessary to use technology to complete their work. An example of all-digital planning work can be seen in Appendix F. Without digital technology, students would not have been able to access their planning handout. Also, many did not have access to traditional art materials at home, and therefore found the use of technology necessary. That final week of the study was meant to determine which materials students might prefer, based on their choices. However, their choices were limited, and therefore do not necessarily demonstrate actual preference.

***The Impact of Prior Knowledge on Material Preferences***

There is no correlation between students' prior knowledge or confidence in planning materials, and their preference for material usage in the art studio. As seen in Figure 3 not a single student responded as being more confident in digital materials, than in traditional materials. While 3 students did respond as being "undecided," the clear majority felt more confident using traditional planning materials.

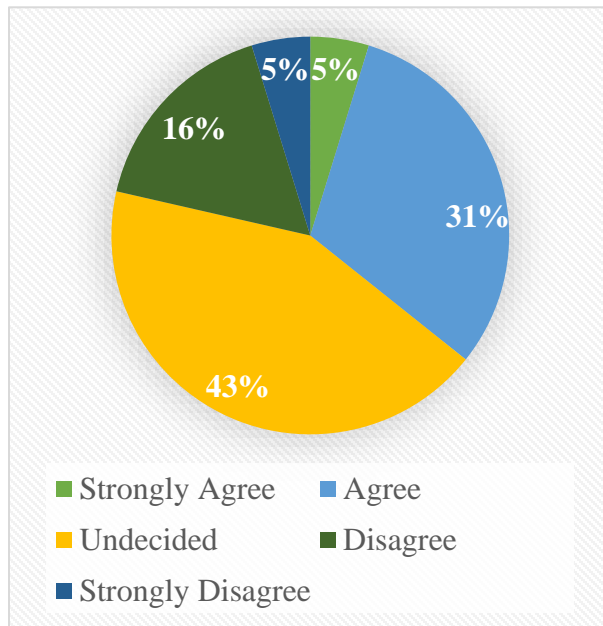
**Figure 3***Student Confidence in Planning Materials*

*Note.* All student participants reported either having more confidence in traditional materials, or being undecided. No students expressed feeling more confident in using digital resources to plan an artwork

Yet, when surveyed while creating their artwork plans, all combined responses painted a different picture than expected. When responding throughout the study to the statement, “I would prefer to work with digital technology to plan my artwork in the future,” 2 responses stated “strongly agree,” 13 “agree,” 7 “disagree,” “2 strongly disagree,” and 18 responses were “undecided,” as seen in Figure 4. Students had varied responses, despite reporting a lower level of confidence in using digital technology, initially.

**Figure 4**

*Student Responses to the Following Statement: “I would prefer to work with Digital Technology to Plan My Artwork”*



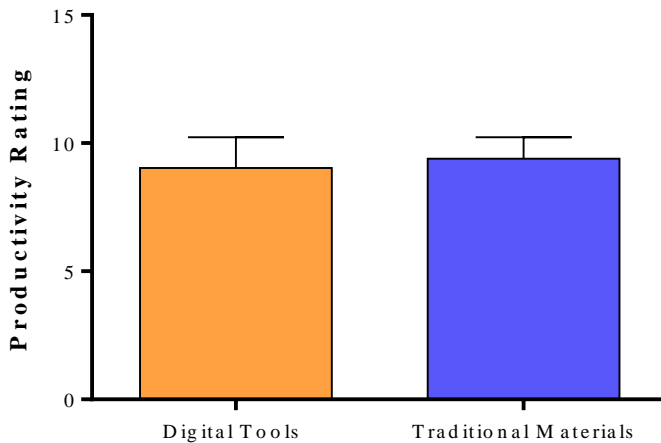
*Note.* Student participants’ varied responses demonstrated there was no consensus on preference.

### **Which Planning Method Better Supports Artist Productivity?**

Participants who did not use technology demonstrated higher levels of productivity, as documented by teacher observation and student-participants’ own survey responses. As seen in Figure 5, students using only traditional materials rated themselves at a higher productivity level. The statistical values here were determined by an independent T-test on students’ self-reported ratings. Yet, the difference between the groups is not statistically significant, as  $P > .05$  ( $p = 0.4484$ ). In Figure 5, data is representative of mean  $\pm$  SD of the participants’ self-reported productivity rating, where digital tools represents 27 student-reported ratings and traditional materials represents 15 student-reported ratings over the reported values across all 3 timepoints.

**Figure 5**

*Overall Student Productivity Ratings*



*Note.* Students using digital technology rated themselves slightly lower in productivity, and more students used technology, than traditional materials alone.

These results originated from those responses by students who had used technology during the day of reporting, in orange, and those participants' responses by students who had used only traditional materials during the day of reporting, indicated in blue. The standard deviation for the digital tools group pictured in Figure 5 is 1.192, with a standard error of mean at 0.2295; the standard deviation for the traditional materials data is .8281, with a standard error of mean at 0.2138.

The overall average student productivity rating across all groups was 9.098. Students using technology in their planning process rated an average score of 9.037, which falls slightly below the overall average. Students who did not use technology ranked themselves at an average score of 9.400, out of 10, as highlighted again in Figure 6.

**Figure 6**

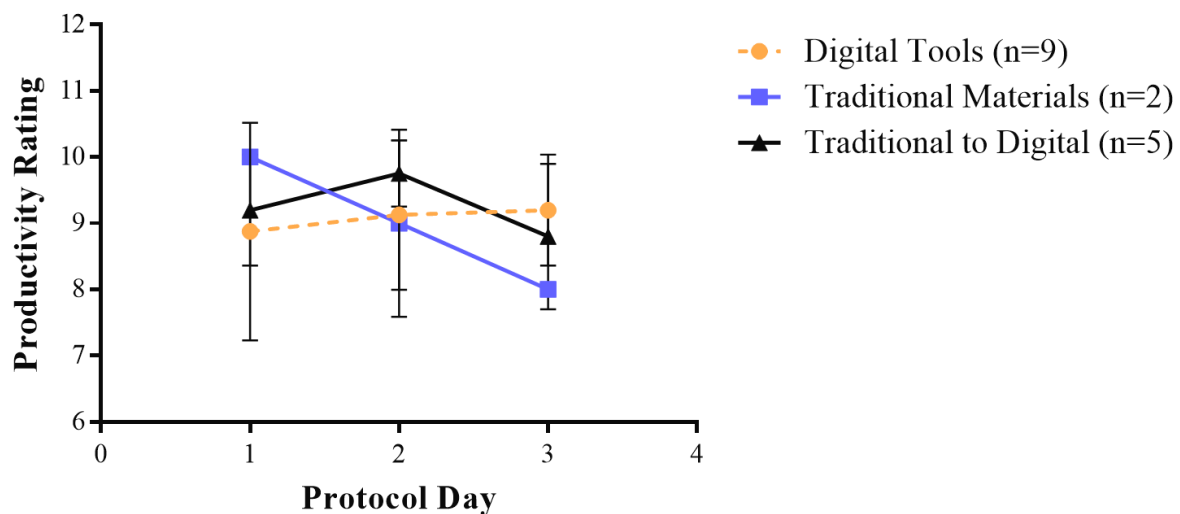
*Students' Productivity Rated at Its Highest—Scoring a 9.4—when Using Traditional Materials*



Over time, participants' average productivity scores fluctuated within their respective groups. As seen in Figure 7, students that were placed in the non-technology group at the beginning of the study and chose to continue working with only traditional materials rated themselves lower in productivity by the end of the process. Students who were selected to participate in the digital tools group and did not use traditional materials throughout the research saw a minimal increase in self-reported productivity over time. Students who were originally selected for the traditional materials group and later switched to using digital tools saw a slight drop in their perceived productivity.

**Figure 7**

*Participants Perceived Productivity Over Time*



*Note.* Data is representative of mean  $\pm$  SD of self-reported productivity rating across all 3 timepoints, where the digital tools represent 9 students, traditional materials represent 2 students, and traditional to digital represents the 5 students who transitioned from digital to traditional materials on protocol day 3. The difference between the curves was determined by ANOVA, and is not statistically significant, because  $P > .05$  ( $p = 0.889$ ).



In the digital tools group, 2 students—Participant 1 and Participant 2—chose not to rank themselves during the final protocol day completed at home during a COVID-19 school closure; their responses for that last data point for protocol day 3 therefore could not be included. Also in this group, Participant 3 failed to respond with a rank on protocol day 2 and 3. Yet another student—Participant 5—in this group did not respond during day one, when she was absent, and day 3, when she participated from home, and elected not to respond.

For the traditional to digital group, one student—Participant 15—was absent for protocol day 2, and did not submit a rating on that day; this was therefore excluded from the data in Figure 7, as well.

Notably, the measures taken by local and state officials to prevent the spread of COVID-19 acted as a confounding variable. Participants were largely forced to access planning materials digitally due to school closure. Only those students ( $n=2$ ) depicted in Figure 7 continued their use of traditional materials for the entire study. This variable may have impacted student productivity and material usage.

### **Technological Difficulties and Distractions**

Documentation from teacher observation noted the use of technology-related obstacles, we well. Some participants played distracting online games, and others even accessed digital coursework from other classes, during planning time. Students using only traditional materials did not demonstrate these behaviors, which indicated a higher level of productivity in this technology-free group.

Students using technology in their planning processes often combatted technological problems, including damaged or missing equipment (i.e. digital stylus pen), connectivity issues, battery depletion, and software glitches. In responding to the question of productivity regarding

their material usage, the only negative responses given by participants were centered around technological difficulties that students encountered.

### ***Avoiding Distractions***

By avoiding technology usage, students reported feeling more able to focus, and less likely to become distracted. Students in the technology-free group during the second week of the study expressed this sentiment through 5 different survey responses. One participant expressed this by claiming, “Not using technology made me more productive because it eliminated the distractions.”

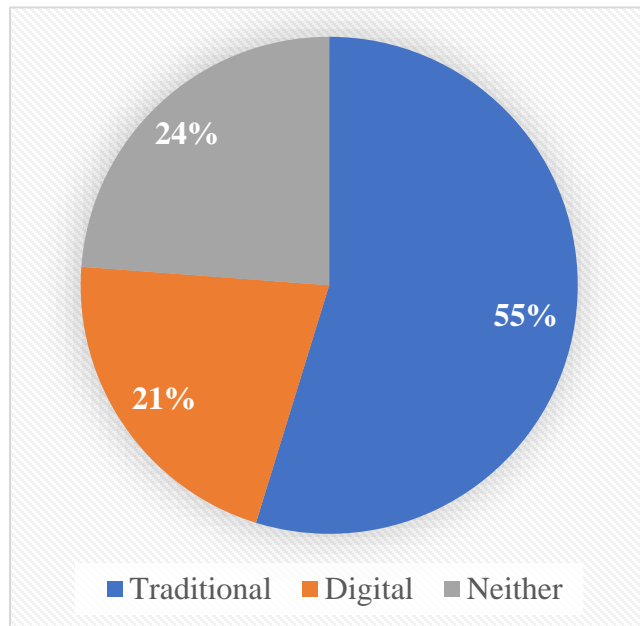
### **Which Types of Tools and Materials are More Helpful, or Easier to Use?**

When technology was used in the planning process, participants indicated that the internet and laptop applications—such as Word and digital inking—were helpful. Students who were not permitted to use digital technologies during their second week of planning found it difficult to avoid these tools. One student seemed to almost instinctually take out his laptop and begin searching for images and references online. Even when the student was reminded that he was in the group that was only meant to use traditional, non-digital materials, he found it hard to put the technology away; this participant instead chose to use the digital tools anyway, despite teacher prompting.

When analyzing all participants’ responses over the entire course of the study, 23 responses indicated that traditional materials were easiest to use, which equated to 55% of all responses from throughout the study (refer to Figure 8). This opinion was held by the majority of respondents, as only 9 responses indicated that technology was the “easier” material, and 10 responses claimed that “neither” traditional nor digital materials were any easier or more difficult with which to work.

**Figure 8**

*Student Responses to the Following Question: “Which Materials are Easier to Use?”*



### ***Access to Diverse Resources***

Student survey data revealed that the seemingly endless amount of content available through digital technologies and the internet, make these tools valuable. Students were able to access a wide range of visual materials with greater speed and ease, as they planned their work with technology. The theme of immediate access arose in many students’ survey responses, and lead to students finding reference images or inspiration more easily than those participants who did not use technology.

### ***Access to Specific Visuals***

Due to the vast quantity of materials students could access through digital technologies, many responses also indicated the appreciation for access to specific images. When using technology, students often could find exactly what they were looking for to aide in their planning. Meanwhile, documentation from the teacher indicated that students who were using

only traditional materials faced some frustration. An example of this was when students could not find an exact visual, or reference, they were looking for—by exploring print media, or magazines—they often lamented the lack of technology. Their tech-using counterparts, however, were able to find “exactly” what they wanted to reference for inspiration.

## **Discussion and Conclusion**

### **Introduction**

This study indicates that digital tools impact teaching, learning, engagement, understanding, and the creative process through the impacts on productivity and student-artist preference. The result may impact current theory and educational practices.

### **Discussion**

Consideration must be given to the theoretical and educational implications of the above research. Student-artists' progress through the stages of creativity and schools' current initiatives to implement one-to-one digital devices in schools are both questioned.

### ***Theoretical Implications***

The quasi-experimental study design findings outlined above offer a potential change to the way we theorize the creative process. Botella et al. (2013) describe stages of creativity, in which artists progress from one stage to the next. In this study, these stages seemed more fluid, with students reversing, and jumping between the first three stages, rather than progressing in order through them. This was demonstrated by the manner in which students completed their Artwork Planning documents. Some students skipped entire sections of Botella et al.'s (2013) process, and later returned to those stages, but in a different order. The use of technology in participants' planning stages resulted in quick movement between stages—with the occasional distraction built-in—and often, students needed to revisit stages that had been rushed, and not fully explored. The implications of technology integration into the creative process would likely fall under what Botella (2013) refers to as “work conditions.” Such work conditions certainly impacted the creative process.

### ***Educational Implications***

With one-to-one devices being distributed now more than ever, we must consider the impact of this technology on students. As children are being sent out of school buildings during this health threat, a laptop or other digital device is often thrust upon them. Remote learning relies heavily on the use of digital classrooms—and therefore digital technology—to complete schoolwork. Students may not prefer to work in this manner. Students may be more likely to face distractions while using digital technologies, than they would when working with traditional, non-digital materials, as they did in this research project. While art students will have access to more resources and visuals, the potential distraction poses a challenge.

### **Conclusions**

Student-artists' media preferences, productivity, and ease with which they utilize different materials impact their learning and artwork creation. While the COVID-19 confounding variable impacted data above, the findings nevertheless warrant continued research following a similar protocol.

### ***Media Preferences***

Students have varied preferences when it comes to using different planning media, or materials. A student may have a higher level of comfort and experience working with one material, over another, but that does not determine the student's material choice. Students had lower comfort levels using digital technology in the planning of an artwork, and yet, many students preferred to use the technology, anyway.

In the final week of the protocol, the students were meant to have choice in their selection of materials for planning. However, the COVID-19 pandemic—and subsequent school closures— meant that students could only participate in their artwork planning from home, and

often with limited materials. This confounding variable impacted student choice, and therefore its potential impact on the data collected cannot be ignored.

It is unknown whether students chose willingly to switch from traditional materials to digital tools as a result of personal preference, or if the circumstances dictated this for them. Additionally, no student switched from digital tools to traditional materials during this last timepoint. While it is possible that this suggests digital tools are preferable for this population of students, it is more likely that participants simply did not have access to the same types of traditional materials; had they been planning from the comfort of their classroom art studio, rather than their own living rooms, bedrooms, and other personal spaces at home, students may have had more traditional media available.

### ***Planning Methods and Productivity***

Despite the sample size and confounding variable resulting in data that was not statistically significant, students' chosen planning methods did impact their productivity levels. Overall, students believed that they were generally productive, but students using technology rated themselves lower, and the teacher observed distracting work habits from students; students using digital tools accessed digital games, and even class material for different courses during planning time in art class. Students that used only traditional materials during their planning process did not demonstrate these off-task behaviors.

Additionally, with increased technology usage came a higher level of distraction. This converse relationship was also recognized in previous studies, like that of Fried, in 2008, and therefore was not a surprising finding.

***Easiest Media to Use***

In terms of ease of use, traditional materials were reported as being easier to use in 55% of all survey responses, whereas only 21% of responses believed that technology was the easier resource to use. Nevertheless, digital technology access led to easier-to-find visual references and often more specific resources to assist in participants' planning processes.

***Originality of Artwork Plans***

Beyond student ease of use, the teacher reported an ease of teaching material preparation and distribution when using digital tools, herself. She even compiled digital materials and printed them for students to use as in traditional packets and paper handouts. Students used some of these materials to cut and glue onto their own plans as references, which can be seen in Appendix G. These traditional materials could not have assisted student planning if they had not been available in the digital realm first, for easier replication and distribution. This type of access to more digital references lead to the type of increased instructional effectiveness that Sherman mentions in 2001, and assisted students working in both digital and traditional media (p. 188).

Nevertheless, the ease of distribution and replication that digital tools point to a new issue. Originality in student planning, while often difficult to quantify, could be demonstrated in the level of similarity between student artwork plans, and existing artwork inspiration. As visible in student planning handouts, such as the example in Appendix H, students often created objects and visual designs that matched very closely to their original inspiration. In an example such as this, the form, color, and function of the original inspiration are so closely related, that the argument could be made that the student's planning sketch is a copy. While there are some minor differences, access to such vast amounts of media could make originality more difficult for students. Rather than selecting a theme in which they could pull ideas from while planning,



student participants found objects they liked, and closely copied those objects, often including only minor changes. Technology's impact on originality in students' creative process is blatant.

### **Limitations**

Some limitations of this study must be discussed, to fully understand the results.

Although the sample size was comparable to that of other small educational research studies including primary and secondary students (Aboalgasm & Ward, 2014; Thorsteinsson, 2012), a larger number of participants would be ideal. A drastic change in the local political and cultural environment impacted this school unexpectedly, which led to considerable challenges; In an attempt to keep students and staff safe from the unfolding COVID-19 health threat, students were forced to participate from home. This aforementioned confounding variable contributed to a lower rate of participation, and a modified execution of the final week of the protocol.

Additionally, the sample represented only a segment of our society, consisting of suburban students, who were generally high-achieving, without requiring academic accommodations, such as Individual Education Programs, 504 plans, or other services. All participants were also fluent in English.

One control for this study may be difficult to reproduce exactly, as well, because the teacher performed in-class demonstrations of material use for her students during the study. This instruction on basic skills with both traditional drawing materials and digital tools, for use in planning an artwork, would potentially vary if taught by a different teacher. Generalizing the results of this study across diverse populations outside of this particular setting may produce different results.

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## Appendix A

### Action Plan



1

<p><b>Who</b></p> <ul style="list-style-type: none"> <li>• Mrs. Thompson runs the study</li> <li>• The University of the Arts collaborates</li> <li>• You &amp; about 30 students can participate</li> </ul> <p><b>What</b></p> <ul style="list-style-type: none"> <li>• Class will run normally</li> <li>• Participants take surveys about their artwork planning</li> </ul> <p><b>Where</b></p> <ul style="list-style-type: none"> <li>• All research and data collection happens in-class</li> <li>• You don't need any out-of-class time</li> </ul> <p><b>When</b></p> <ul style="list-style-type: none"> <li>• March</li> <li>• 3 weeks to complete</li> </ul>	<p><b>Why</b></p> <ul style="list-style-type: none"> <li>• Mrs. Thompson wants to learn about technology &amp; art:             <ul style="list-style-type: none"> <li>• What are <i>your</i> preferences?</li> <li>• What's easier?</li> <li>• What's more efficient?</li> </ul> </li> <li>• This info could help:             <ul style="list-style-type: none"> <li>• Future classes</li> <li>• Other teachers</li> <li>• Other schools</li> </ul> </li> <li>• You get to share your opinions to help others</li> <li>• Risk-free:             <ul style="list-style-type: none"> <li>• You may stop participating at any time</li> <li>• No risk to your grade</li> <li>• Info will be private</li> </ul> </li> </ul>
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2

## STUDY DETAILS – WEEK ONE

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- Take a survey
  - 4 multiple choice questions
  - Digital or on paper
- Share about the materials with which *you* work & make art

3

## STUDY DETAILS – WEEK TWO

---


- You will be randomly placed into one of two groups
- Group One
  - Plan an artwork *without* digital technology
  - At the end of each class, you will take the survey
    - 8 questions
    - Digital or on paper
- Group Two
  - Plan an artwork *with* digital technology
  - At the end of each class, you will take the survey

4

## STUDY DETAILS – WEEK THREE

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- You will all plan a second, new artwork, using any materials that you choose
- At the end of each class, you will take the same survey from week two



5

## IF YOU *DON'T* PARTICIPATE...

---

- That's okay!
- Still do the same work as everyone else in class
- Your survey data just won't be used in the research study


- No impact on your grade
- You can stop participating at any time
  - Your data won't be used
  - You will still do the same surveys & work in class


6




# IF YOU WANT TO PARTICIPATE...

1. Sign the *Student Assent Form*
2. Guardian signs the *Parental Consent Form*








## 3. Hand the forms in by the end of the week

7



## STUDENTS COMPLETE THE ASSENT FOR VOLUNTARY PARTICIPATION SECTION:

**Assent for Voluntary Participation:**

Research Participant's Printed Name \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

8



# GUARDIANS COMPLETE

## PAGE 2, PARENTAL PERMISSION FOR CHILD'S PARTICIPATION IN RESEARCH:

**Parental Permission for Child's Participation in Research:**

Please indicate whether you wish to allow your child to participate in this project. Please check off one option below, sign your name, and return this form to Mrs. Thompson:

☐ I do grant permission for my child to participate in Mrs. Thompson's study on Technology use in the art room

☐ I do not grant permission for my child to participate in Mrs. Thompson's study on Technology use in the art room

Parent/Legal Guardian's Name (printed) \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

**Optional Study Elements:**

**Consent to Photography** - Your child's teacher may wish to photograph a student as he/she works in class during the research study. Your child may only be photographed for the study if you indicate below. He/she may still participate in the study, regardless.

Initial one of the following to indicate your choice:

☐ (initial) I agree to allow photography

☐ (initial) I do not agree to photography

9

# QUESTIONS? USE THE FOLLOWING

## CONTACT INFORMATION:

**Mrs. Alison R. Thompson**

Art Teacher & Researcher

Tohickon Middle School

[athompson@cbsd.org](mailto:athompson@cbsd.org)

(267) 893-3300

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## Appendix B

### *Student Assent Form & Parental Consent Form*



#### STUDENT RESEARCH SUBJECT ASSENT FORM

Dear Art Student,

Your art teacher is asking for your help in a research study. Please read the following information about the project. If you would like to participate, please sign below.

Your teacher wants to learn more about how students use technology when planning an artwork. In the study, you will not notice a big change in how the class runs. First, you will take a survey about the materials you use to make art. Next, you will learn some basics skills with different art materials, and digital materials. Then, you will be randomly placed into one of two groups. One group will plan an artwork without digital technology. The other group will use digital technology. Then, you will plan a second artwork, using any materials that you choose. Your teacher will observe as you work. This may include taking photographs. At the end of each class, you will take a survey. All work will be completed in class, over three weeks' time.

You, and about fifty other students, can be a part of this study because you are in Mrs. Thompson's class! There will be no risk to your grade. If you do not want to be a part of the study, you will still do the same work in class. Your information and survey responses will not be used in the study if you do not take part. The information learned in this project could help future classes. It is also a great way to share your opinions on technology and art!

Your information will be private; your name will be taken off; all surveys will be kept with a password or in a locked cabinet. There are no costs involved in the study. You may stop participating at any time. If you want to take part, you will not be removed from the study unless you are unable to participate for four or more classes.

You can get more information using the following contact information:

Mrs. Alison R. Thompson  
Tohickon Art Teacher  
[athompson@cbsd.org](mailto:athompson@cbsd.org)  
(267) 893-3300

Dr. Sarah Eckert  
UArts Research Advisor  
[seckert@uarts.edu](mailto:seckert@uarts.edu)  
(215) 717-6432

If you have questions about your rights, you may use this contact information:  
[irb@usciences.edu](mailto:irb@usciences.edu) or 215-596-7490.

#### Assent for Voluntary Participation:

\_\_\_\_\_  
Research Participant's Printed Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

#### Investigator's Affidavit:

I, Mrs. Thompson, have explained the research project to the subject. I certify that to the best of my knowledge the person who is signing this form clearly understands the nature, demands, benefits, and risks involved in his/her participation and his/her signature is legally valid. A medical problem or language or educational barrier has not precluded this understanding.

\_\_\_\_\_  
Signature of Teacher/Research Investigator

\_\_\_\_\_  
Date

**PARENTAL CONSENT FORM FOR CHILD RESEARCH PARTICIPATION**

February 1, 2020

Dear Parent or Guardian,

Your child's art teacher is asking for her students' help in a research study. Please read the following information about the project. If you would like to allow your child to participate, please sign and return page 2.

Your child's teacher wants to learn more about how students use technology when planning an artwork. If he/she is a part of the study, your child will not notice a big change in how the class runs. First, your child will take a survey about the materials he/she uses to make art. Next, your child will learn some basics skills with different art materials, and digital materials. Then, he/she will be randomly placed into one of two groups. One group will plan an artwork without digital technology. The other group will use digital technology. Then, your child will plan a second artwork; he/she will use any materials that he/she chooses. Your teacher will observe as the students work in class. At the end of each class, students will take a survey. All work will be completed during class time. The study will be completed in three weeks.

About fifty students from Mrs. Thompson's classes will have a chance to participate. There will be no risk to your child's grade or relationship with the school. If your child decides to withdraw from this study, the researchers will not use the information already collected. Your child will still get to complete the same work in class, even if he/she is not taking part in the study.

The information learned in this project could help future classes. It is also a great way for your child to share his/her thoughts on technology and art!

All personal information will be private; your child's name will be taken off; all surveys will be kept with a password or in a locked cabinet. There are no costs involved in the study. Your child may stop taking part at any time. If your child wishes to participate, he/she will not be taken out of the study unless he/she is unable to participate for four or more classes.

Should you have any questions or desire further information, please feel free to contact:

Mrs. Alison Thompson  
Researcher & Art Teacher  
Tohickon Middle School  
[athompson@cbsd.org](mailto:athompson@cbsd.org)  
(267) 893-3300

Dr. Sarah Eckert  
Research Advisor  
University of the Arts  
[seckert@uarts.edu](mailto:seckert@uarts.edu)  
(215) 717-6432

If you have questions about your rights, you may contact the USciences Institutional Review Board (IRB): [irb@usciences.edu](mailto:irb@usciences.edu) or 215-596-7490.

*You may keep this page for your records. Please sign and return the following page, if you would like to grant your child permission to participate.*



**Parental Permission for Child's Participation in Research:**

Please indicate whether you wish to allow your child to participate in this project. Please check off one option below, sign your name, and return this form to Mrs. Thompson:

\_\_\_\_\_ I do grant permission for my child to participate in Mrs. Thompson's study on Technology use in the art room

\_\_\_\_\_ I do not grant permission for my child to participate in Mrs. Thompson's study on Technology use in the art room

\_\_\_\_\_  
Parent/Legal Guardian's Name (printed)      Signature      Date

*Alison R. Thompson*

*02/01/2020*

\_\_\_\_\_  
Name of Person Obtaining Parental Permission      Date

***Optional Study Element:***

Consent to Photography - Your child's teacher may wish to photograph a student as he/she works in class during the research study. Your child may only be photographed for the study if you indicate below. He/she may still participate in the study, regardless.

Initial one of the following to indicate your choice:

\_\_\_\_\_ (initial) I agree to allow photography

\_\_\_\_\_ (initial) I do not agree to photography

*Parents, please be aware that under the Protection of Pupils Rights Act (20 U.S.C. Section 1232(c)(1)(A)), you have the right to review a copy of the questions asked of or materials that will be used with students. If you would like to do so, you should contact Sarah Eckert to obtain a copy of the questions or materials.*

## Appendix C

### *Prior Knowledge Survey*

**1**

When did you FIRST start using basic art materials (pencils, crayons, markers, paint, etc.) ?

- ☐ Before elementary school
- ☐ During elementary school
- ☐ During middle school
- ☐ "I don't remember"
- ☐ "I have never used basic art materials"

**2**

When did you FIRST start using digital technology (tablets, laptops, phones, etc.) ?

- ☐ Before elementary school
- ☐ During elementary school
- ☐ During middle school
- ☐ "I don't remember"
- ☐ "I have never used digital technology"

3



Have you used a digital inking pen, or drawing stylus, before?

- ☐ Yes
- ☐ No
- ☐ Unsure

4

When planning an artwork, which types of materials are you more confident in using?

- ☐ Digital Technology (laptop, tablet, digital stylus pen, etc.)
- ☐ Traditional Materials (paper, pen, pencil, etc.)
- ☐ Undecided

☐ Send me an email receipt of my responses

Submit

## Appendix D

### *End-of-Class Survey*

1. List ALL materials you used in your creative process today (i.e. paper, pencils, colored pencils, digital inking pen, laptop, cell phone): \*

Enter your answer

2. What type(s) of digital technology did you use in class today? (You may select multiple answers) \*

- ☐ Laptop App/s (Word, Paint, Digital Inking/Sketchpad, PowerPoint, etc.)
- ☐ Internet (Canvas, Google, Office 365, etc.)
- ☐ Camera (Laptop Camera, Cell Phone Camera, etc.)
- ☐ N/A or None ("I did not use any digital technology in class today")

3. Which kind of digital technology was the most helpful when you used it? \*

- ☐ Laptop App/s (Word, Paint, Digital Inking/Sketchpad, PowerPoint, etc.)
- ☐ Internet (Canvas, Google, Office 365, etc.)
- ☐ Camera (Laptop Camera, Cell Phone Camera, etc.)
- ☐ N/A or None ("I did not use any digital technology in class today")

4. Based on how you worked in class today, respond with your level of agreement to the following statement:

"I would prefer to use digital technology to plan my artwork in the future." \*

- ☐ Strongly Agree
- ☐ Agree
- ☐ Undecided
- ☐ Disagree
- ☐ Strongly Disagree

5. Respond with your level of agreement to the following statement:

"I would prefer to use pencil, paper, markers, and other traditional, non-digital materials to plan my artwork in the future." \*

- ☐ Strongly Agree
- ☐ Agree
- ☐ Undecided
- ☐ Disagree
- ☐ Strongly Disagree

6. Give yourself a rating for how productive you were today:

(10-star rating = the most productive you can be; 0-star rating = you were completely unproductive or off-task). \*



7. Explain how using (or not using) technology contributed to how productive you were today: \*

Enter your answer

8. In general, which materials do you think are easier to work with? \*

- ☐ Traditional materials, like paper and pencil
- ☐ Digital materials, like computer and digital inking pen
- ☐ Neither - "I think both have the same level of ease/difficulty when I work with them"



**Appendix E***Artwork Planning Guide*

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Class Period: \_\_\_\_\_

**ARTWORK PLANNING****Directions:** Use art studio resources to plan your artwork. Complete each area below.**INSPIRATION**

**1. Find a visual reference, famous artwork, or photo that shows inspiration for your artwork.**

**Include it here →**

*Examples:*

-cut out an image from a magazine with a design you like, and glue it in the box

-digitally copy and paste an image from the internet with an interesting design

**2. Explain what inspired you about this visual reference.**

**NOTES**

**3. Explain how you will make your work a creative, original artwork, and not a copy.**

## SKETCHES

4. **S k e t c h**  
your artwork  
plan here →

Examples:

-show your plan in  
the space to the  
right using  
traditional  
materials, like  
pencils, markers,  
or pastels

-use your digital  
inking pen/stylus  
to draw in the box  
on your laptop

5. **A d d c o l o r, t e x t u r e, o r o t h e r d e s i g n d e t a i l s** to your sketch, above ↑

**SUBMIT YOUR FINISHED WORK TO YOUR TEACHER**

## Appendix F

### Digital Example of a Student-Participant's Completed Artwork Planning Guide

## ARTWORK PLANNING

**Directions:** Use art studio resources to plan your artwork. Complete each area below.

### INSPIRATION

1. Find a visual reference, famous artwork, or photo that shows inspiration for your artwork.

Include it here →

Examples:

-cut out an image from a magazine with a design you like, and glue it in the box

-digitally copy and paste an image from the internet with an interesting design



2. Explain what inspired you about this visual reference.

I love the gold and white color theme. Plus, I always thought elephants were such beautiful animals. Though a full body of an Elephant may be a bit much, the face of an elephant is the part that tells the story.

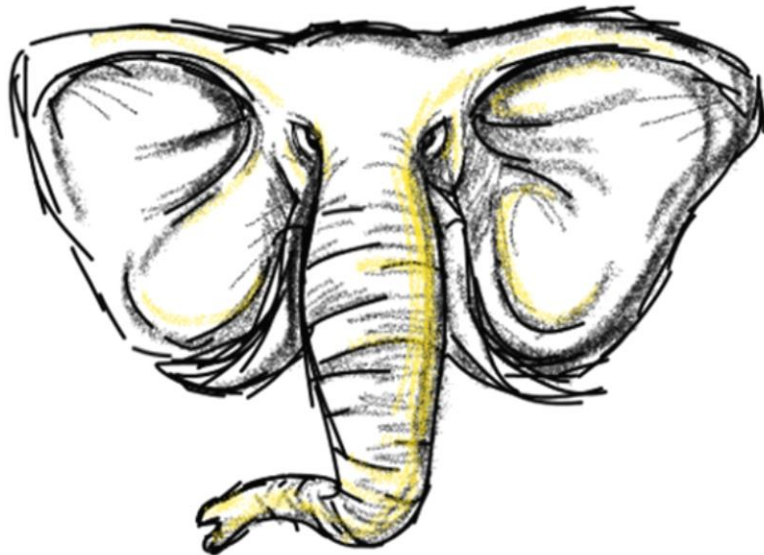
### NOTES

3. Explain how you will make your work a creative, original artwork, and not a copy.

I'm adding gold accents to the elephant face, and positioning the face in a random position.

## SKETCHES

4. Sketch  
your artwork  
plan here →



Examples:

-show your plan in  
the space to the  
right using  
traditional  
materials, like  
pencils, markers,  
or pastels

-use your digital  
inking pen/stylus  
to draw in the box  
on your laptop

5. Add color, texture, or other design details to your sketch, above ↑

## Appendix G

### Traditional Materials Example of a Student-Participant's Completed Artwork Planning Guide

## ARTWORK PLANNING

**Directions:** Use art studio resources to plan your artwork. Complete each area below.

### INSPIRATION

**1. Find a visual reference, famous artwork, or photo that shows inspiration for your artwork.**

Include it here →

*Examples:*

- cut out an image from a magazine with a design you like, and glue it in the box
- digitally copy and paste an image from the internet with an interesting design




**2. Explain what inspired you about this visual reference.**

I like the colors that this artist used in her pieces, and the simple designs that fill the outside. Even though they are one shape or a few shapes they are still creative and add detail to the pieces.

### NOTES

**3. Explain how you will make your work a creative, original artwork, and not a copy.**

I will make my work my own and creative because I want to use similar colors this artist used, but different shapes. Also I want to make a bowl that has more rounded edges than the square or rectangular design this artist chose to do.

1



## SKETCHES

4. Sketch  
your artwork  
plan here →

Examples:

-show your plan in  
the space to the  
right using  
traditional  
materials, like  
pencils, markers,  
or pastels

-use your digital  
inking pen/stylus  
to draw in the box  
on your laptop



5. Add color, texture, or other design details to your sketch, above ↑

SUBMIT YOUR FINISHED WORK TO YOUR TEACHER

**Appendix H***Traditional Materials Student Artwork Planning Guide Artifact with Originality Concerns***ARTWORK PLANNING**

**Directions:** Use art studio resources to plan your artwork. Complete each area below.

**INSPIRATION**

1. Find a visual reference, famous artwork, or photo that shows inspiration for your artwork.

Include it here →

Examples:

-cut out an image from a magazine with a design you like, and glue it in the box

-digitally copy and paste an image from the internet with an interesting design



2. Explain what inspired you about this visual reference.

I just really liked the idea of making a dog bowl. I have two dogs so it could go to use. The examples above are adorable.

**NOTES**

3. Explain how you will make your work a creative, original artwork, and not a copy.

I am going to change the color of the bowl and personalize it to my dogs.

## SKETCHES

4. Sketch  
your artwork  
plan here →

Examples:

-show your plan in  
the space to the  
right using  
traditional  
materials, like  
pencils, markers,  
or pastels

-use your digital  
inking pen/stylus  
to draw in the box  
on your laptop

CEELI

For Koda

FAVORITE

MY FAVORITE

← probably  
choosing  
this one

5. Add color, texture, or other design details to your sketch, above ↑

SUBMIT YOUR FINISHED WORK TO YOUR TEACHER



## Curriculum Vitae

# Alison R. Thompson

Artist & Educator

### Personal Statement

Passionate Artist and Educator seeking to provide critical arts engagement to students of varying needs & backgrounds, through a research-based approach.

### Education

#### **The University of the Arts, Philadelphia, PA** 2014-Present

- In-progress Master of Education degree for Educational Program Design in the arts
- Matriculated graduate coursework in art education, studio arts, & research, 4.0 GPA

#### **Penn State University, University Park, PA** 2009-2013

- *Bachelor of Science in Art Education*, K-12 teaching certificate, *Political Science minor*
- Graduated with Distinction, 3.99 in major, 3.79 cumulative GPA, Dean's List

### Professional Experience

#### **Central Bucks School District, Doylestown, PA** Aug. 2015 - Present

##### **Tohickon Middle School Art Teacher & Gifted Case Manager**

- Implements curriculum and writes GIEPs for Gifted learners
- Instructs students in 7<sup>th</sup> & 8<sup>th</sup> grade general arts, and 9<sup>th</sup> grade 3D Design and Ceramics
- Coaches and sponsors afterschool activities: Girls Lacrosse and Field Hockey

#### **The Center on Central, Paoli, PA** Aug. 2013 – Aug. 2016

##### **Studio Art Teacher**

- Instructed children and adults in ceramics, drawing, and other art media in the studio and offsite, select weeknights, weekends, and summers

#### **Collegium Charter School, Exton, PA** Aug. 2014 – June 2015

##### **Middle School Art Teacher**

- Incorporated 2D, 3D, and digital portfolio building in rigorous 7<sup>th</sup> and 8<sup>th</sup> courses