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The Effects of Digital Portfolios and Flipgrid on Student Engagement and Communication in a Connected Learning Secondary Visual Arts Classroom

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Abstract

Visual art education is advancing through digital media (text, audio, video, and graphics) and technologies (digital devices, software, and learning platforms that offer options to each student) in ways that impact student engagement and communication. Through the practice of connected learning in a secondary art classroom environment, individual students can bring their strengths and ideas into a community of peers to create a better understanding of complex concepts that individuals could not have reached alone (Cantrill et al., 2014). The purpose of this research study was to understand what effects digital portfolios and Flipgrid have on student engagement and communication. Digital portfolios were introduced using a Google Slides format and Flipgrid as an online connected learning community. The sample study included 50 art students in total; 25 middle school students in grade six and 25 high school students in grades 10-12. Data was collected using the following tools: pre and post-assessments, teacher observation logs and reflection journals, student artifacts with scoring rubrics, and student conference questions. The study, conducted over a six week period in early 2018, contained both qualitative and quantitative data. The data sources revealed an increase in student engagement and communication with the added benefit of connected learning in the secondary art classroom. As a result of this study, researchers recommend that digital tools, such as digital portfolios and communication platforms like Flipgrid, continue to be implemented in the secondary art classroom.

Keywords: technology, technologies, digital tools, digital media, new media, engagement, communication, connected learning, visual art education
Art is transformative, innovative, cultural, engaging and a way of communicating that promotes dialogue. Therefore, art contributes to a well-rounded education. Information and communication technologies (ICT) are redefining art in ways that are causing visual art educators to: consider new technology-mediated pedagogy; develop new strategies and teaching practices; and create technology platforms that engage students and keep them current on new media (how students learn with new technologies). The intersection of visual art and technology provides fast access to new information and ways of learning. While some educators are off-put by the fast pace of technology implementation, others are embracing it and utilizing it to support student learning.

Dr. Alexandra Cutcher, the founder and lead researcher of the Creativity, Arts and Education Research group at the University of Melbourne, along with scholars Dr. Judith Wilks and Dr. Susan Wilks, found that technology is not being utilized to its full potential in the art classroom (Wilks, Cutcher, & Wilks, 2012). If a connected learning environment was created, it could offer a wealth of knowledge to youth today and allow them to share, create, and collaborate with like-minded peers. New approaches to the integration of technology in the art classroom should benefit students by giving them an extended means of communicating as well as engaging the students in using new media during the process of reflection (Bryant 2010). The National Arts Education Association (NAEA) has built a professional community that supports art educators by providing resources and ways to network and collaborate. Recent studies captured by the NAEA publications have validated effective technology integration strategies, such as student-led reflection and having students learn technology specifically to enable them to develop their communication skills in diverse ways (Bequette & Brennan, 2008; Black &
Browning, 2011; Coleman & Cramer, 2015; Gregory, 2009; Roland, 2010; Tillander, 2011; Wilks, Cutcher & Wilks, 2012). Allowing visual art teachers autonomy to develop and shape their curricula in the area of new media leads to greater pedagogical success. Technology plays a secondary role in creative pedagogy, which enables teachers to find the best way to engage their students’ learning in the visual arts (Black & Browning, 2011).

It is evident that there is a need to blend the traditional teaching techniques with new media to remain current and relevant in teaching practices and instruction. Integrating technology (methods, systems, and devices which are the result of scientific knowledge) takes a willingness to move beyond what many teachers are comfortable within education. The challenge is to think of technology as a tool to deepen and expand aspects of visual art education that are currently not being addressed such as relevance within the visual arts classroom, time and crowded curriculum, inadequate resources, professional and technical support, and access and restrictions (Wilks et al., 2012).

Visual arts are essential to high quality, well-rounded, education. The implementation of digital tools (used to convey information visually and make persuasive arguments and allow for collaborative opportunities) and resources could enhance educators’ abilities to respond to an increasingly complex and fast-moving world. At the same time, visual arts standards are now pushing for the inclusion of technology. This tension between the lack of support and the push to use technology creates a wide-spread struggle that affects districts, administrators, educators, and most of all, students. Currently, there is a need for effective implementation of a variety of digital media tools and technologies in the art classroom. Specifically, to increase student engagement and communication, art educators need to create a classroom environment that
merges new technology practices with contemporary art curriculum. Therefore, the purpose of this action research study is to implement connected learning through the use of Google Slides as digital portfolios and a video discussion platform called Flipgrid to determine their effects on student engagement and communication, along with how connected learning has an impact on the secondary art classroom environment.

**Review of Literature**

Visual art educators are finding new media technologies and techniques that translate into effective curriculum strategies (Wilks, Cutcher, & Wilks, 2012). New approaches to the implementation of technology in the art classroom, as described by Bequette and Brennan (2008), are used to “attract attention, organize ideas, evoke responses through imagery and narrow the meaning perceivers are likely to attribute to an experience” (p. 331). The research examines how information and communication technologies (ICT) are redefining visual arts as a discipline, calling on visual art educators to consider utilizing new technology-mediated pedagogies while developing new teaching strategies and practices and creating platforms that engage students.

**Rethinking Teacher Training and Resources**

Information and communication technologies (ICT) pose new problems for visual art educators that require new contexts and pedagogies (Wilks et al., 2012). The visual arts are ever-changing as a result of cultural climate, rapid global technological changes, and developments in new digital media (Choi & Piro, 2009). According to Choi and Piro (2009), because the globalization of technology is becoming a driving force in educational policy development within the United States, many school systems are altering their curriculum and
instructional policies to adjust how technology is used in the classroom. Wilks et al. (2012) explain, “Despite the ease with which many art educators have embraced technologies and tools for artistic practice in their classrooms in the past, maximizing the Internet and information communications technology usage in the visual arts classroom has been somewhat problematic” (p. 54). Wood (2004) argued that visual art teachers are under-resourced when it comes to technology and there is an inadequacy of professional and technical support resulting in a lack of training. She goes on to state that, “The need for art-specific ICT training is intensified by the fact that technology is redefining art itself—its themes, tools, and vocabulary” (Wood, 2004, p. 180). Black and Browning (2011) provided additional problematic factors such as software difficulties, time constraints, and a full curriculum. Visual art teachers and their students engage with technology in a variety of ways, some fully immersing themselves, but most “fold technology into their broader repertoire of tools” (Wood, 2004, p. 182). Therefore, there is a need to reform the visual arts curriculum, pedagogies, and policies.

**Integrating Technology With a Purpose**

Students today are immersed in a technological culture and are now, more than ever, surrounded by visual imagery. To effectively reach these students, visual art teachers must adjust their artistic pedagogical technologies and start to embrace a connected learning environment. Connected learning is a framework for understanding and supporting learning, as well as a theory of intervention that involves today’s changing social, economic, technological, and cultural contexts (Cantrill et al., 2014). It also addresses the gap between in-school and out-of-school learning and becomes a highly resourceful and interest-driven facet for young
people to find social and informational support for specialized interests such as art (Ito et al., 2013).

Visual art education is evolving and now is a vital time to create new strategies and policies that support the vision of technology integration with the visual arts (Jagodzinski, 2015; Janzen, Perry, & Edwards, 2017; Quinteros, 2014). Wilks et al. (2012) suggested that technologies offer a platform through which art educators can scaffold content and expand learning in their classrooms. They continued to say that “Technology directed pedagogy is more concerned with what to do with technology, and for what purpose, rather than using and exploring it for its own sake” (p. 56). Janzen et al. (2017) explained that artistic pedagogical technologies help provide a real and authentic medium for instructors and students to engage with one another. By incorporating technology and specific educational content, an inviting learning environment is developed, which enhances and sustains a connected learning community.

Strides have been made to provide technical support to assist art teachers in improving outcomes for learners with disabilities (Coleman & Cramer, 2015). High assistive technology, such as personal learning devices or computers in the classroom, allows for students with hearing, visual, and physical disabilities to engage in the practice of art and learning (Coleman & Cramer, 2015). Gouzouasis (2006) suggested that “Creative, artistic applications of new learning and teaching technologies hold the future of content development in all forms of new media” (p. 3). Visual art educators need to create a curriculum that extends beyond the classroom and relates to students’ everyday lives (Tillander, 2011). Empowering students to be in charge of their learning, with access to computer learning technologies, is vital to the creative
process of constructing personal meaning. Resolving the complexities of integrating technology into the art classroom requires visual art educators to consider new technology-mediated pedagogy and develop both new strategies and teaching practices. Revision of these practices creates a technological platform that engages students and keeps them current on new media (Black & Browing, 2011). The striving goal of a visual arts educator is to aid in developing students that are technologically literate global citizens that can make informed decisions and be reflective about their artwork (Litowitz & Warner, 2008).

**Effective Technology Implementation in the Visual Arts Curriculum**

Students in K-12 media arts education need a balance between technological skills, aesthetic valuing, and artistic process (Bequette & Brennan, 2008). New digital media and technologies are continually emerging. Art teachers must strive to assist their students to become aware of the “layered contexts of the art world and its evolving relationship with technology” (Wilks, Cutcher, & Wilks, 2012, p. 55). In a research study of 25 technically savvy art teachers, Gregory (2009) reflected on how teachers effectively integrate technology into their classrooms by facilitating students’ creative thinking and reflection, collaboration and communication, and higher-order learning. Gregory (2009) concluded that integrating technology in a student-centered learning environment helps students understand the unique capabilities of technology. When it comes to different types of learning, students are immersed in communication networking technologies that they have used to communicate with each other in the past, so they are already knowledgeable and comfortable. The National Endowment for the Arts (NEA) also recognizes the need to integrate technology into classrooms, so they are proposing start-up grants to develop workshops for K-12 educators seeking to use digital
resources to strengthen their teaching (Choi & Piro, 2009). The National Educational Technology Standards (NETS) for teachers intended to bring needed changes into visual arts teaching practices by facilitating student learning, creating and developing digital learning assessments, promoting and modeling digital citizenship and responsibility, and lastly engaging in professional growth (Roland, 2010). To achieve this passion-based learning through arts integration, art teachers need to use technology to introduce, upgrade, and augment learning in the arts (Choi & Piro, 2009).

When designing curriculum, Tillander (2011) suggested looking into the engagement of the students with new media beyond the basic framework to gain insights on what motivates self-guided learning and peer-based learning. Sir Ken Robinson, a teacher, an author, a researcher, an advisor, and a speaker, agrees with Tillander by stating:

Teenagers and younger children speak digital as their native tongue. Most adults speak it as a second language. Young people’s minds are constantly engaged with the digital world: they are multitasking, connecting and creating content at a precipitous rate. The pervasiveness of digital technology changes the whole equation for education and the roles of teachers. (p. 76)

A narrative from Teaching in the Connected Learning Classroom highlights students’ natural desire to connect over shared interests-both with peers and others they encounter in online spaces (Cantrill et al., 2014). Through the practice of connected learning, individuals can bring their strengths and ideas to a community of peers (Cantrill et al., 2014). For example, an online discussion platform increases communication skills by encouraging them to make contact online with their peers, parents, community and even practicing artists that they admire (Wood, 2004).
The Internet allows students to exhibit their work to wide audiences on a global scale through online portfolios. As visual art teachers have gained experience with the Internet, they have begun to explore the communication and publishing potential of this medium (Bryant, 2010). Delacruz (2009) also elaborated on the many ways art teachers are engaging students with electronic media. Electronic media includes but is not limited to virtual museums, electronic teaching portfolios, and digital videos. Choi and Piro (2009) talked about the “Rembrandt Project” which incorporates both audio and video resources such as the “e-docent” which is an audio narration podcast by museum educators that offers in-depth explanations of works of art digitized on the site and suggestions for teaching them. “Resources such as these allow a successful reinvention of the arts through the creative use of technology, resulting in new dimensions of pedagogical innovation in a digitally enabled environment” (Choi & Piro, 2009, p. 31). Teachers who integrate technology into their classrooms are aware that it provides an opportunity to differentiate instruction and has the potential to change their classrooms into dynamic learning environments (Pitler, Hubbell, Kuhn, & Malenoski, 2007). Wood (2004) promotes that as one gradually uses technology and starts to unpack it’s potential, it unleashes endless possibilities and opportunities.

Conclusions from the Literature Review

Teachers need to merge new technology practices with the entirety of the visual arts to increase student engagement and communication to create an informative and productive classroom environment. Despite the lack of technical training and support of technology integration, visual art teachers are continuing to change and improve their curriculum by adding digital media and technology tools (Delacruz, 2009). There is a significance to incorporating
interactive media arts, such as software and hardware, into the art curriculum (Bequette & Brennan, 2008). Tillander (2011) imagines “pedagogical experiences with technology as a creative works-in-progress” and encourages visual art educators to “continue exploring how processes and artifacts of contemporary culture motivates creativity” (p. 46). The process of integrating technology into the visual arts classroom will always be evolving, therefore restructuring and enhancing creativity, technology, and pedagogy in visual art education is perhaps the best way to prepare the next generations for what lies ahead. Student engagement and communication will benefit from the integration of meaningful and effective curriculum strategies and new approaches to the implementation of technology.

**Methodology**

This study employs an exploratory design with qualitative data analysis. Exploratory research design provides a way to explore the details of integrating specific digital tools, such as digital portfolios and Flipgrid, into the secondary visual arts classroom. Pre- and post-assessments were administered by the researchers in a Google Form survey to capture the students’ knowledge and use of digital tools. Digital portfolios through Google Slides, along with Flipgrid videos, served as student artifacts and were accompanied by a scoring rubric and assessed according to the objectives. In addition to the student artifacts, classroom observations, student conference questions, and teacher reflection journals are tools that have been used to gather data.

The population for this action research consists of sixth-grade art students from a Midwestern middle school and 10th through 12th-grade art students from a Midwestern high school. The middle and high school student population combined breaks down according to
ethnicity with 72% Caucasian, 14% African American, 7% Asian, and 6% other. In the middle and high school populations, 9% are English Language Learners, 14% are Special Needs or have an IEP, and 43% are in the Free or Reduced Lunch Program. The middle school classroom is composed of 25 middle school art students, ranging from 11 to 12 years of age. The high school classroom is composed of 25 high school art students, ranging from 15 to 18 years of age. The courses in question are representative of students in a secondary visual art setting.

**Pre- and Post- Assessment**

A pre-assessment was given to the students before the implementation of the digital portfolios and Flipgrid to gauge the students’ initial understanding of digital tools in an educational setting. The purpose of the pre-assessment data was to collect and compare information to gauge the students’ previous classroom experience with digital tools. With this information, the researchers were able to gain insight on how to go about effectively implementing the digital portfolios and Flipgrid. The post-assessment provided information directly from the students after the implementation, as they reflected on their experiences with the digital portfolios and Flipgrid. Students were able to describe the positives and negatives of their experience and if they felt the use of these digital tools were beneficial or not.

Post-assessment data was gathered by the researchers and compared in graph format to assess how effective the digital tools were in the class. Specifically, these pre- and post- assessments helped determine if the implementation of these digital tools were effective and served a purpose in the art classroom.


Student Artifacts & Scoring Rubrics

Digital portfolios were used to evaluate the performance task. These digital portfolios kept student artifacts (artwork) organized and available to analyze. After every art project, students were expected to photograph their artwork and upload it to their digital portfolio, as well as answer reflection questions in the digital portfolio. There was a set scoring rubric (Appendix E), with five primary objectives, which were used to evaluate the finished digital portfolios for a letter grade. The digital portfolio rubrics were used to evaluate students for the following five objectives: 1) reflection questions, 2) photographs of artwork, 3) presentation, 4) craftsmanship, and 5) time management. Numbers were used as codes to evaluate students (1 = novice, 2 = partially proficient, 3 = proficient, 4 = advanced). The total numbers of the middle and high school scores were graphed according to each objective so researchers were able to see in what areas students were proficient. The Flipgrid videos served as student artifacts and automatically collected data as part of the software program. Flipgrid works as a communication platform, showcasing student artifacts, introductions, and critiques. The Flipgrid video rubric (Appendix F) was used to evaluate students on the following five objectives: 1) question prompts, 2) communication, 3) presentation, 4) three responses, and 5) engagement. The Flipgrid videos overall show whether or not communication skills were developed in a connected learning setting and if the videos thoroughly engaged the students.

Observational Logs

Researchers recorded in the observational logs during class time for the duration of both the digital portfolio and Flipgrid assignments. The observational logs for the digital portfolios and Flipgrid videos provided qualitative data that showed how well students acclimated to using
these digital tools and if they understood the process. These observational logs also helped
monitor student engagement and communication and provided information on whether or not
these digital tools are implemented effectively.

**Conference Questions**

From the middle school, three out of the 25 students were selected to answer conference
questions. From the high school, three out of the 25 students were selected to answer conference
questions. Researchers conducted conferences with a total of six out of 50 students. This
qualitative data helped gain valuable insights and probed student feedback on the effectiveness
of the digital portfolios and Flipgrid in the art classroom. These one-on-one, in-depth
conversations with students explained whether or not these digital tools were meaningful, useful,
and beneficial to the students learning.

**Teacher Reflection Journals**

The teacher reflection journals were kept during the class time for the duration of both
the digital portfolio and Flipgrid assignments. The teacher reflection journals, logged via Google
Spreadsheet, allowed reflection and revision of the implementation of these digital tools to take
place. This teacher reflection journal exhibited positives and negatives as well as challenges and
successes during the process of implementation. This reflection helped to create stronger lesson
plans for the next time these digital tools are to be implemented.

**Implementation of the Digital Portfolio**

The first digital tool implemented was the digital portfolio. To provide the students with
the link to the digital portfolio, Google Classrooms had already been set up for the middle and
high school visual arts courses and served as a platform to provide links to the students. The first
Implementation of Flipgrid

The second digital tool implemented was Flipgrid. Flipgrid is an online community that facilitates connected learning. As with the previous digital tool, the document camera helped demonstrate the instructions on how to create the Flipgrid video. Sample videos were produced live in front of the students so they could visually see and listen to instruction. The requirement for this lesson was for each student to create one video along with responding to three classmates’ videos. The only difference between the requirements for the middle and high school students were the video prompts. The middle school lesson revolved around creating a self-introduction video at the beginning of the semester with specific questions they had to answer about themselves. Then they responded to at least three other classmates’ videos with positive comments and questions. The high school lesson required students to introduce and talk
about their artwork. They then analyzed and critiqued at least three other classmate’s artwork using the “tell, ask, and give” feedback protocol. They commented on what they liked about the piece of artwork, asked a question about the artwork, and gave a suggestion on how the student might improve their artwork. An observational log was kept by the researchers during the time the Flipgrid lesson was implemented. This provided detailed information about the implementation of the intervention and student responses. The digital portfolios and Flipgrid videos archived student artifacts, allowing for assessment and evaluation.

A teacher reflection journal was kept so that positive and negative aspects of the process of implementing the digital tools could be reflected upon. This journal kept track of what worked and what didn’t work. The teacher reflection journal allowed teachers to improve their instruction and create new implementation strategies. These teacher reflection journals were analyzed, discussed, and coded by a specific set of questions based on how it affected the classroom environment.

After both the digital portfolios and Flipgrid lessons were completed, the post-assessment was distributed via a survey. The post-assessment questions focused on student reflection of the digital tools used. Through the survey, data was collected and organized into a graph. This qualitative data provided the researcher with information about whether or not student engagement and communication increased or decreased.

Finally, student conference questions were conducted. Three students from each the middle level and high school level participated, totaling six students. These conference questions and student answers were voice recorded, then transcribed by the researchers, so the researchers could analyze and find key phrases and commonalities. The conference questions
were geared towards the implementation process and its effect on student engagement and communication.

This exploratory research design provided qualitative data which allowed the researchers to evaluate and analyze the implementation of digital portfolios and Flipgrid and their effects on student engagement and communication in the secondary visual arts classroom.

**Analysis of Data**

A portion of the raw data was comprised of qualitative information in the form of simple sentences and short statements. Teacher journals and observational logs were kept by the researchers. Teacher journals were organized in a table format and coded using the following categories 1) technology implemented, 2) the challenges of implementation, 3) the successes of implementation and 4) their reflections on the process of implementation and what changes need to be made in the future to make implementation more effective. From this information, a conclusive narrative was written. The observational logs were organized in table format and coded according to evidence of engagement and communication. The findings were then synthesized in a narrative. Out of the 50 total art students, six students were chosen to answer conference questions about the implemented digital tools. These student conference questions were recorded and transcribed to capture the students’ own words and thoughts. The transcribed student conferences were cross-referenced, and similarities were found. Then all commonalities were summarized through a written narrative.

The quantitative data consisted of student artifacts collected by the digital portfolios and within the Flipgrid videos. The five subsections of the scoring rubric are based on specific objectives for the implemented digital tools. The percentages of student responses to specific
questions about the digital portfolios and Flipgrid were organized in pie graphs. Data was collected in the same way for the post-assessment, which was given to the students after implementation of the digital tools. Finally, all the data results were organized and reviewed to ensure triangulation.

Findings

The purpose of this action research study was to implement connected learning through the use of digital portfolios and Flipgrid and to discover its effects on student engagement and communication in the secondary art classroom. The research design was exploratory, and the study included the integration of specific digital tools; Flipgrid, and digital portfolios. The data was both qualitatively and quantitatively collected and included pre- and post-assessments, observational logs, teacher reflection journals, student artifacts, and conference questions with various students. These data tools were used to gather information about student engagement and communication during the implementation of the digital tools.

The subjects for this action research came from two separate classrooms, six grade students and 10th through 12th-grade students, enrolled at a Midwestern middle and high school. The middle school art class consisted of 25 students with 14 females and 11 males. The high school art class consisted of 25 students with 17 females and eight males. Table 1 below shows the breakdown of gender according to grade level.
Table 1

Breakdown of Gender According to Grade Level

<table>
<thead>
<tr>
<th>Grade</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sixth Grade</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Tenth Grade</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Eleventh Grade</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Twelfth Grade</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Totals</td>
<td>19</td>
<td>31</td>
</tr>
</tbody>
</table>

Note. Middle and high school demographics, totaling 50 students, sorted by grade level and gender.

The middle school art class consisted of 25 students with 14 females and 11 males. The high school art class consisted of 25 students with 17 females and eight males.

Effects on Student Engagement

The first research question of this study addressed identifying how the implementation of the digital portfolios and Flipgrid affected student engagement. To answer this question, the researchers analyzed the following data sources: post-assessment, observational logs, and data collected through Flipgrid.

Post-Assessment

The post-assessment data provided information directly from the students, as they reflected upon this survey question, “Do you think digital portfolios increased or decreased your engagement with your artwork?” (Figure 1). Forty-six percent of the students’ engagement stayed the same during and after the implementation of the digital portfolio, and 54% said there was an increase in engagement (Figure 1).
Responses from 25 middle and 25 high school art students on engagement with digital Portfolios.

**Observational Logs**

The data collected from the observational notes, during the implementation of the digital portfolios, showed that the engagement factor increased because they were allowed to use their cell phones to take pictures of the artwork, a tool that they use daily. Several students went above and beyond expectations because they were invested in the digital portfolios and wanted something nice to showcase their artwork. However, frustration arose when technical difficulties occurred with the cameras and the digital portfolio format. The researchers observed that when these frustrations transpired, student engagement decreased.

The data collected from the observational notes during the implementation of Flipgrid, and later supported by the responses during student conferencing, showed strong engagement...
because it was a digital alternative to traditional introductions and critiques. Instead of standing up in front of a class and voicing their opinions live, they instead felt like they were “You-Tubers,” which prompted them to use props and have fun with it. The students had to answer certain question prompts, but they were also given creative freedom on how they wanted to present and make their video either in school or outside of school. The variety of choice provoked an increase in student engagement.

**Data Collected Through Flipgrid**

Flipgrid works as a platform for connected learning, letting the students create introductions and critiques and allowing them to respond to each other digitally. Flipgrid keeps track of responses, replies, views, and engagement. Through the data collected in Figure 2 and Figure 3 below, it became clear that the students put in time and effort and were engaged in the process of creating and responding.

**Figure 2.** Total middle school responses, replies, views, and hours of engagement during the implementation of the Flipgrid assignment.

<table>
<thead>
<tr>
<th>Responses</th>
<th>Replies</th>
<th>Views</th>
<th>Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>78</td>
<td>1402</td>
<td>18.0h</td>
</tr>
</tbody>
</table>

**Figure 3.** Total high school responses, replies, views, and hours of engagement during the implementation of the Flipgrid assignment.

<table>
<thead>
<tr>
<th>Responses</th>
<th>Replies</th>
<th>Views</th>
<th>Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>53</td>
<td>568</td>
<td>9.6h</td>
</tr>
</tbody>
</table>

**Effects on Student Communication**

The second research question of this study addressed identifying how the implementation of the digital portfolios and Flipgrid affected student communication. To answer this question,
the researchers analyzed the following data sources: post-assessment, student artifacts, and observational logs.

**Post-Assessment**

The post-assessment data provided information directly from the students, as they reflected upon this survey question, “Do you think Flipgrid increased or decreased communication with your classmates?” (Figure 4). According to Figure 4, 6% of the student’s communication decreased, whereas 68% of the students’ engagement increased during and after the implementation of Flipgrid and 26% of students said their communication stayed the same.

*Figure 4. Responses from 25 middle and 25 high school art students on communication with Flipgrid.*
Student Artifacts

In Figure 5 below stills were taken from a Flipgrid video (student artifact), to show that communication was occurring through Flipgrid because they were required to create, listen, and respond. Also, the stills show the number of peer responses each student received by the number of small circles. After viewing and listening to peer responses, students then engaged in a digital dialogue creating a connected online learning community.

![Figure 5. Stills of Flipgrid videos from one middle school and one high school student showing the date and number of responses to the initial video.](image)

In Figure 6 below the graphs show how many of the middle and high school students combined scored in each objective on the rubric. According to the graphs, the majority of middle and high school students scored advanced in the five objectives on the Flipgrid rubric.
For the digital portfolio student artifacts, communication was demonstrated by the
student inserting a photograph of their artwork and then answering reflection questions based on
the project criteria given (Figures 7 & 8). The students reflected on their creative process, concepts, and techniques which allowed the students to communicate about their artwork to an audience.

![Keep Calm Poster](image)

**Keep Calm Poster**

**What** did you learn about the Keep Calm Posters that you didn’t know before?
That they originated during World War II and most of them were destroyed after the war.

**Why** did you choose your keep calm saying?
Because smiling is contagious and the poster can make people’s day better.

**Explain** an art technique that you learned during this project.
How to use value and coloring layering.

*Figure 7. Snapshot of a slide from a middle school student’s digital portfolio.*
**Jim Dine Inspired Assignment**

*What medium did you choose to use on your Jim Dine Assignment? Why?*

I chose a graphite pencil for the outlines, then used color pencil. I wanted to try practice the shading techniques with this particular medium.

*What were the reasons why you chose the imagery for the Jim Dine Inspired assignment?*

It was the best household item to draw at my house, because it had multiple objects to focus on.

- I was successful with ...
  Shading with the colored pencils. Creating a nice range of value.

- A skill I improved was ...
  The order I layered the colored pencil.

- If I were to change anything about my art project, it would be ...
  The composition to have a better overall image.

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*Figure 8. Snapshot of a slide from a high school student’s digital portfolio.*

In Figure 9 below the graphs show how many of the middle and high school students combined scored in each objective on the rubric. According to the graphs, the majority of middle and high school students scored advanced in the five objectives on the digital portfolio rubric.
Figure 9. Scores broken down by each objective on the digital portfolio rubric, of both the middle and high school students combined (50 students total).
**Observational Logs**

The data collected from the observational notes, during the implementation of the digital portfolios, showed an increase in communication because students had to reflect on art processes and techniques, the meaning behind their imagery, and the way they present their artwork to an audience. The secondary students also voiced that they were excited they could have a condensed version of their artwork that they could show to friends, family, colleges, and potentially on a connected learning platform. This kind of exposure would increase communication because of the interaction with others and would help them to express their thoughts about their creative process.

The data collected from the observational notes, during the implementation of the Flipgrid, demonstrated that this digital online community was an effective way to get students to converse in a new way. Confidence was more evident in students that have a shy demeanor therefore, they could more easily communicate through Flipgrid. The students had to demonstrate quality communication skills when replying to their classmates and then had to learn how to communicate back and forth through a meaningful digital conversation.

**Effects on Classroom Environment**

The third research question of this study addressed identifying how the implementation of the digital portfolios and Flipgrid affected the art classroom environment. To answer this question, the researchers analyzed the following data sources: pre- and post- assessments, student conference questions, and teacher reflection journals.
Pre- and Post-Assessments

In both the pre-assessment and post-assessment the researchers asked this question, “Do you feel digital tools would be helpful in the art room?” (Figure 10). According to Figure 8, there was a 6% increase in students feeling digital tools would be helpful in the art classroom, whereas there was only a 2% decrease of students saying digital tools would not be helpful. Also, there was a 4% decrease believing that maybe digital tools are helpful.

Figure 10. Comparative data collected from pre- and post- assessments.
Post-Assessment

In the post-assessment, researchers asked, “Would you like to continue using digital portfolios and Flipgrid in the future? Why, or why not?” According to the post-assessment responses, 76% of students said they would like to continue using the digital portfolios and Flipgrid in the future, while only 10% of students said no to using both digital tools. There was 14% of students who felt they should only continue with the digital portfolios or the Flipgrid, not both, mainly because they wanted to do more art projects instead. Within the 14%, 6% of students said that they would not want to continue using digital portfolios because it’s too much additional work. The other 8% of students said they did not want to continue using Flipgrid because they still felt shy about the process and did not like making videos of themselves and their artwork.

Student Conference Questions

Through data collection during the student conferences, it was determined that students felt using Google Slides as the format for the digital portfolios was clear, easy, and organized. One middle school student voiced, “Google Slides made the portfolio easier because it was really easy to access and go back and look at what I’ve done and how I responded to each question and what I learned from that project.” The secondary art students also said that having a digital portfolio was a nice change from previous years using a physical art portfolio. They liked how they could see the progression of their artwork and have a place to store not only images of their artwork, but their thoughts and reflections on it as well. A high school student stated, “It’s
given me a really good idea of what my artistic style is. I started to think of it as a collection.

It’s so interesting to see what your style is like over the course of a few art projects.”

Through data collection during the student conferences, there was an overwhelming
response that creating a Flipgrid video versus presenting in front of the classroom was less
intimidating and scary, especially for the introverted students. Flipgrid was described by one
high school student as “all-inclusive and enjoyable because it allowed me to talk to my peers and
give them honest answers about their work or receive honest opinions on mine.” Others felt the
same because it gave the students multiple chances to create the video they wanted by allowing
them to re-do the video over and over again until they felt comfortable with it. The students also
said this factor helped contribute to more thought-out and honest responses to their peer’s video
because they could pre-think about how they wanted to respond.

Teacher Reflection Journals

Teacher reflection journals were kept for the researchers to reflect on the process and
effectiveness of the implementation of the digital portfolios and Flipgrid. The researchers
focused on noting the successes and challenges of creating a connected learning environment in
the art classroom. Reflecting on these successes and challenges lead researchers to understand
better how to integrate these digital tools in the future.

The researchers discovered students were initially excited about trying new digital tools
in the art room and were curious about how they would relate these digital tools to the class.
The digital portfolio implementation began with technical difficulties, for example, the cameras
on the student’s laptops were all not working properly. Therefore frustration occurred, and
engagement was lost. Here are some reflection thoughts from the researcher’s journal about
what to do in the future, “Be prepared for some student's laptops to not work and check out extra laptops from the library for students to use. Another solution is to check out webcams from the library as well, so they have an alternative camera option.” The teacher reflection journals assisted the researchers in figuring out solutions to problems and brainstorming plans for future implementation.

There were challenges, but there were more successes, such as students liked to see the progression of their artwork through the organizational aspect of the digital portfolio. Another success was when two visually impaired students from the middle school classroom figured out how to sync their ipad with their student laptop, so the photographs of their artwork could be transferred. The middle school researcher writes, “Today after meeting with my school tech coach, we finally figured out the best digital tool for the visually impaired twins to be able to read large text on their laptop, but take photos from their iPads.” Also, the majority of students successfully engaged and communicated through Flipgrid and enjoyed creating the videos because it was new and exciting. The researcher from the high school commented in her teacher reflection journal that “I was able to witness students laughing and actually enjoying the process of filming and showing off their latest artwork.” The researchers were able to reflect on what worked and didn’t work, allowing them to adjust and make improvements for future implementation.

**Conclusions and Recommendations**

There is a need to train art educators on how to use these strategies so they can utilize new technology skills for their classroom teaching. The purpose of the research was to determine the effects of connected learning through the use of digital portfolios and Flipgrid on
student engagement and communication in the secondary art classroom. The data sources used were pre- and post- assessments, student artifacts, scoring rubrics, observational logs, teaching reflection journals, and student conference questions. These data tools helped to conclude that the implementation of digital portfolios and Flipgrid increased student engagement and communication in the secondary art room. As seen in figures 6 and 9 above, the majority of middle and high school students were proficient or advanced in every objective on the Flipgrid and digital portfolio rubrics. These scores proved the implementation of the digital portfolios and Flipgrid were effective, resulting in relevant learning. If art teachers are expected to use technology in the classroom, it needs to be purposeful, meaningful, and relevant (Gouzouasis, 2006; Tillander, 2011). By adding these relevant digital tools to art curriculum, students were given a chance to engage in communication in a different way that was still purposeful and meaningful.

First, the pre-assessment gave insight into what digital tools students had previously used in a classroom setting and how comfortable they felt using them. The pre-assessment showed most students had experience with using digital tools in the classroom and their comfort levels were high. When the pre- and post- assessments were compared, data showed that the majority of students felt digital tools are helpful in the art classroom and they would like to continue using them in the future. One of the reasons we will continue to implement digital tools is not only because over half the students said they wanted to continue using them, but also because we want to be the most effective teachers that we can. The post-assessment helped solidify that the implementation of the digital portfolios and Flipgrid increased engagement by allowing the students to reflect. Flipgrid was an outlet for more introverted students to be able to engage in
discussion with their peers. The students voiced that they would prefer to introduce or critique digitally, instead of standing up in front of the class because it is less intimidating. This proves that Flipgrid affected student engagement and communication along with the overall art classroom environment in a positive way.

Second, through the observational logs, we saw most students had fun creating the videos. Knowing how much time students spend online, creating videos was relatable and easy for them to understand. Students today are more immersed in a technological culture and are now, more than ever, surrounded by visual imagery. To effectively reach these students, visual art teachers must adjust their artistic pedagogical technologies and start to embrace a connected learning environment. Connected learning is a framework for understanding and supporting learning, as well as a theory of intervention that involves today’s changing social, economic, technological, and cultural contexts (Cantrill et al., 2014). The Flipgrid program is a great example of a user-friendly connected learning environment. This environment is enjoyable for students because they can articulate how they feel and what they have created in a comfortable setting.

Third, student artifacts allowed us to see the students’ final product and assess the effectiveness of the implemented digital tools. Students felt very comfortable giving their peers honest feedback and positive comments through Flipgrid. Students were able to engage in discussion and conversation, creating a compelling online learning community. It was evident that the students put in time and effort to make their portfolios meaningful and purposeful. Because of this, they can accurately display their artwork and connect it to external audiences such as friends, family, teachers, even colleges. To expand this audience even further, students
could make their portfolio available to a broader online audience, such as putting their digital portfolios on school art department websites or even online global student art galleries such as Artsonia.com.

Fourth, through student conferencing, we gained useful feedback about continuing the use of digital tools in the art room. We found that most students suggested making the digital portfolio format more personable by letting them change fonts, design, layout, colors, background, etc. They would rather be able to format the photos and resize them to the shape they want, allowing them to showcase their collection of artwork better. Google Slides was used because other art teachers in the district were using the same layout. Also, Google Slides are readily accessible to the students because they use it in other classes. But moving forward, adjustments can be made by allowing more flexibility with the format or even changing the program itself. Also, through student conferencing, we were given feedback about the response options available in Flipgrid. Flipgrid has only a video response option, and students would also like to have a text option. We wanted to consider their suggestions because there is a need for effective implementation of a variety of digital tools and technologies in the art classroom (Choi & Piro, 2009). To effectively implement a digital communication tool, we could try using a different program called VoiceThread. This program would allow students to create videos and respond to videos, audio recordings or text. This is a program that would meet all of the students’ requests for a better online connected learning community.

Lastly, through the teacher reflection journals, researchers found better ways to implement the digital tools. For example, when introducing digital portfolios, having a student learning guide available would help students through the steps of creating the digital portfolio
and would also give the students something to reference back to. The digital portfolios are for students to have a place to collect and organize their artwork and also to showcase the time, effort, and talent of these students. Digital portfolios are also important to the creative reflection process and engage the student in their artwork. Through the teacher reflection journals, researchers also realized how beneficial it is to have a connected online learning environment for students who are communicating and interacting in a global digital world. Having an online platform such as Flipgrid, allows all levels of students to feel comfortable with engaging in discussion with their peers. An additional way to use the Flipgrid program in a visual art education setting would be to invite local, regional, or even global artists to engage in discussion about art with students. For example, the artist would create an initial video, and the students would be able to ask questions and interact with that artist. This opportunity would allow students to connect with working artists and gain insight, inspiration, and advice from them.

In conclusion, researchers found that the implementation of the digital portfolios and Flipgrid created an online learning community. This increased student engagement and communication, allowing for a positive connected learning environment. New approaches to the implementation of technology into the art classroom should benefit students by giving them an extended means of communication as well as engaging the students in using new digital media in the process of creation (Bryant 2010). Due to the increase in engagement and communication, continuing to use the digital portfolios and a connected online learning community, such as Flipgrid, will be beneficial to student learning in a secondary art classroom.
References


Appendix A
Pre-Assessment Questions

What digital tools have you used in the classroom?

Short answer text

Do you feel digital tools would be helpful in the art room? *

☐ Yes

☐ No

☐ Maybe

What types of digital tools do you see yourself using to increase your engagement and communication?

Short answer text

On a scale of 1-10 how comfortable do you feel creating a Digital Portfolio? *

Least Comfortable

Incredibly Comfortable

On a scale of 1-10 how comfortable do you feel using FlipGrid? *

Least Comfortable

Incredibly Comfortable
Appendix B
Post-Assessment Questions

Would you like to continue using digital portfolios and Flipgrid in the future? Why or why not?

Short answer text

Do you feel digital tools would be helpful in the art room?

☐ Yes

☐ No

☐ Maybe

Do you think digital portfolios increased or decreased your engagement with your artwork?

☐ Increased

☐ Decreased

☐ Or stayed the same.

☐ Other...

Do you think Flipgrid increased or decreased communication with your classmates?

☐ Increased

☐ Decreased

☐ Or stayed the same.

☐ Other...
On a scale of 1-10 how comfortable do you feel creating Digital Portfolio? *

Least Comfortable

Incredibly Comfortable

On a scale of 1-10 how comfortable do you feel using FlipGrid?

Least Comfortable

Incredibly Comfortable
Appendix C  
Digital Portfolio and Flipgrid Observational Logs

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<td>Checking Effectiveness of Communication Tools</td>
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Appendix D
Teacher Reflection Journal

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<td>1</td>
<td>Date</td>
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<td>What were some challenges?</td>
<td>What were some successes?</td>
<td>What can I do better next time?</td>
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## Middle School Digital Portfolio Rubric

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<th>Period:</th>
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<tbody>
<tr>
<td>0 · Not Observed (not done)</td>
<td>3 · Proficient (mastered, all requirements met)</td>
<td>4 · Advanced (above and beyond requirements)</td>
</tr>
<tr>
<td>1 · Novice (minimal work done)</td>
<td>2 · Partially Proficient (missing some requirements)</td>
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### Teacher Assessment

- VA:Cr2.1.6a: I can experiment with new ideas, new approaches and new methods.
- VA:Cr2.3.6a: I can design objects or places for a specific need and audience.
- VA:Cr3.1.6a: I can improve my artwork through critique, reflection and revision.
- VA:Pr4.1.6a: I can explain how to take care of and present two-dimensional, and digital artwork.
- VA:Re8.1.6a: I can use art vocabulary in my critique.
- VA:Re9.1.6a: I can evaluate a work of art by applying specific criteria.

### Reflection Questions
- Reflection questions have been thoughtfully filled in.
- Complete sentences were used to answer questions.
- All reflection questions are answered.

### Photograph of Artwork
- Photographs are sized well, clear, and centered.
- Photographs are cropped if necessary to focus solely on artwork.
- Each slide has a photo of the artwork being reflected upon.

### Presentation
- Photos were placed in specific sections.
- Questions were answered in specific sections.
- Adjustments were made when more room was needed.
- The layout of everything is organized, clear, and easy to read.

### Craftsmanship
- Photographs are detailed and showcase artwork appropriately.
- Sentences were re-read and grammar and spelling has been checked.
- The digital portfolio has a nice flow and is easy to view.

### Time Management
- You invested time and put in maximum effort.
- You stayed focused and on task.
- You were respectful to your classmates and teacher.
- You used all digital materials appropriately.

### Comments: Total: __ /20
## High School Digital Portfolio Rubric

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<td></td>
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<tr>
<td>4 - Advanced (above and beyond requirements)</td>
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</table>

**VA:Cr3.1.IIa:** Reflect on, re-engage, revise, and refine works of art or design considering relevant traditional and contemporary criteria as well as personal artistic vision.

**VA:Pr4.1.IIa:** Analyze, select, and critique personal artwork for a collection or portfolio presentation.

**VA:Cn10.1.8a:** Document the process of developing ideas from early stages to fully elaborated ideas.

### Teacher Assessment

<table>
<thead>
<tr>
<th>Reflection Questions</th>
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<th>4</th>
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</thead>
</table>
- Reflection questions have been thoughtfully filled in. |
- Complete sentences were used to answer questions. |
- All reflection questions are answered. |

<table>
<thead>
<tr>
<th>Photograph of Artwork</th>
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<th>4</th>
</tr>
</thead>
</table>
- Photographs are clear and easily readable. |
- Photographs are cropped if necessary to focus solely on artwork. |
- Each box has been filled with photos of artwork. |
- Close up photographs were taken, when detail photo was requested. |

<table>
<thead>
<tr>
<th>Presentation</th>
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<th>1</th>
<th>2</th>
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<th>4</th>
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</thead>
</table>
- Photos were placed in specific sections. |
- Questions were answered in specific sections. |
- Adjustments were made and extra slides were created when more room was needed. |

<table>
<thead>
<tr>
<th>Craftsmanship</th>
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<th>1</th>
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</thead>
</table>
- Photographs are detailed and showcase artwork appropriately. |
- Sentences were re-read and grammar and spelling has been checked. |
- The digital portfolio has a nice flow and is easy to view. |

<table>
<thead>
<tr>
<th>Time Management</th>
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</table>
- You invested time and put in maximum effort. |
- You stayed focused and on task. |
- You were respectful to your classmates and teacher. |
- You used all digital materials appropriately. |

<table>
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<th>Comments:</th>
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### Appendix F
Middle School Flipgrid Rubric

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**0** - Not Observed (not done)  
**1** - Novice (minimal work done)  
**2** - Partially Proficient  
**3** - Proficient (mastered, all requirements met)  
**4** - Advanced (above and beyond requirements)

**VA:Cr1.1.6a:** I can generate ideas by collaborating with others.  
**VA:Cr2.1.6a:** I can experiment with new ideas, new approaches and new methods.  
**VA:Re.7.1.6a:** I understand how art or design reveals how people live around the world and what they value.

**Prompt Questions**
- First & Last Name  
- What are 3 things you love?  
- What is 1 unique thing about you?  
- What is 1 goal you have for your future?  
- What makes you excited for art?  

**Communication**
- Voice on video was clear and easy to understand.  
- Engaged in conversation over a digital platform.  
- Effort was made to create an interesting and engaging video.

**Presentation**
- Script was written out prior to making the video.  
- Presentation was well thought out and practiced.  
- Introduction was presented in an appropriate manner.

**3 Responses**
- Replied to 3 or more classmates' introduction videos.  
- Voice in responses were clear and easy to understand.  
- Responses were respectful and considerate.

**Engagement**
- You invested time and put in maximum effort.  
- You stayed focused and on task.  
- You were respectful to your classmates and teacher.  
- You used digital tools appropriately.

**Comments:**  
**Total:** ____ /20
### High School Flipgrid Rubric

<table>
<thead>
<tr>
<th><strong>Flipgrid</strong></th>
<th><strong>Name:</strong></th>
<th><strong>Period:</strong></th>
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</thead>
</table>

- 0 - Not Observed (not done)
- 1 - Novice (minimal work done)
- 2 - Partially Proficient (missing some requirements)
- 3 - Proficient (mastered, all requirements met)
- 4 - Advanced (above and beyond requirements)

**Teacher Assessment**

**Prompt Questions**
- You used prompts to create your initial video. (art media used, concept of piece, successes, and challenges).

**Communication**
- Voice on video was clear and easy to understand.
- Engaged in conversation with classmates. (Responding to Ask portion of responses).
- Effort was made to create an interesting and engaging video.

**Presentation**
- Classmates could easily view your artwork.
- Presentation was well thought out and practiced.
- Artwork and thoughts were presented in an appropriate manner.

**3 Responses**
- Responded to three classmates.
- Voice in responses were clear and easy to understand.
- Responses were well thought out and constructive.
- Responses were based on prompts, Tell, Ask, Give.

**Engagement**
- You invested time and put in maximum effort.
- You stayed focused and on task.
- You were respectful to your classmates and teacher.
- You used digital tools appropriately.

**Comments:**

**Total:**  ___ /20
Appendix G
Student Conference Questions

1. **Implementation**: How was your learning experience with the digital tools?

2. **Engagement**: What did you think of FlipGrid? Do you want to engage in discussion over this platform in the future? How did this affect your communication with others?

   How did you feel about the organizational aspect of the digital portfolio? Would you like to continue using it?

3. **Communication**: How do you feel about the critiques conducted on Flipgrid? Was the peer feedback and comments helpful?

   Would you consider sharing your digital portfolio with others when it’s done? Why or why not?

4. **Creativity**: Does Flipgrid help you redefine your artwork with the peer critiques? Why or why not? Do the artist presentations on Flipgrid help to inspire you? Why or why not?

   Are you able to see a progression of your work that will help you continue to develop ideas when you look through your digital portfolio? Why or why not?

5. **Suggestions**: Do you have any suggestions to make the digital tools more effective, or serve you better?