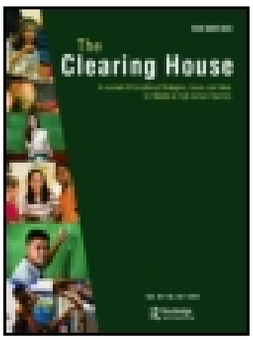

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Digital Portfolios in Action: Acknowledging Student Voice and Metacognitive Understanding in Art

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ABSTRACT

Students need a genuine voice in the content, process, outcome, and assessment of their learning so they can take ownership of their education (Jaquith and Hathaway 2012). Digital art portfolios allow students to research, document, and reflect on the development and assessment of their learning. Unlike traditional portfolios, which typically emphasize product, the use of digital portfolios as a *process portfolio for learning* has the potential to increase autonomy, experimentation, and allow the student to tell the story of their learning; to be metacognitive about their work (Berrett 2005). For the purposes of our research, we are defining metacognitive as awareness or analysis of one's own learning or thinking processes. The key elements of traditional paper portfolios include: collecting, selecting, reflecting, directing/goals, and presenting/celebrating. The use of technology adds to that list the processes of archiving, linking/thinking, storytelling, collaborating, sharing, and publishing (Barrett 2005). This paper examines how online digital portfolios provide a platform to promote students' metacognitive skills and direct their learning.

KEYWORDS

Digital; metacognitive; portfolio

Introduction

In May 2010, Senate Bill 191 was passed and signed into law in Colorado. This bill redefined the way teachers are evaluated in the state, with 50% of a teacher's evaluation now based on student growth. The guidelines stated in the bill gave each district the authority to determine how they would measure student growth in each content area. While areas such as math, science, and language arts have been tested for years, there were no established, formalized assessments for the arts to document learning. Some art educators were frustrated that the arts, the "unquantifiable", were now being asked to quantify students' art experiences; conversely, the situation also presented a way to validate learning in the art classroom. Senate Bill 191 opened the door for the arts to finally be considered more than just a peripheral part of the curriculum at all levels. In essence, Senate Bill 191 dictated that art had to be valued as core to a student's educational experience. Now the task turned to how to demonstrate visual art learning.

It was this "dilemma" that led the authors, a high school art educator and a university professor, to collaborate, explore, and develop the use of digital portfolios as a way to document and assess student learning. The pressure to demonstrate student learning, as part of the educator effectiveness movement is important but it is not the driving force of most art educators teaching practice. *Insightful art educators desire for their students' learning to be deep and powerful.* This article examines how (1) art teachers can shape experiences for students who wish to be reflective about their art making, and (2) how students make meaning and reflect on the *process* of their art making to inform future learning. The practice of using digital portfolios to achieve these goals, competently employed by art students in the art classroom, can serve as a possible approach for art educators everywhere.

Today we live in a technology and media-driven world marked by access to an abundance of information, rapid changes in technology tools, and the ability to collaborate and make individual contributions on an unprecedented scale. Educators must prepare students to understand how and when to use this

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Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/vtch.

knowledge effectively. The Partnership for 21st Century Skills has identified information literacy, collaboration, critical thinking, and creativity as knowledge and expertise students must master to succeed in work and life; it is a blend of content knowledge, specific skills, expertise and literacies (Framework for 21st Century Learning 2011).

With states across the country requiring students to use and understand a wide range of technology applications, the time is suitable for using digital portfolios in the art classroom. Professional artists are all but required to have an understanding of websites and the ability to create an online presence, so there is a direct curricular connection to the world outside the classroom; career and life skills can also be addressed in this approach. Digital portfolios allow students to document their own personal creative process and then reflect on that process, giving students a voice in the assessment of their learning. Students become more aware of their learning and therefore are intrinsically motivated to challenge themselves in new and engaging ways through digital portfolios.

Art educators often lament that students cannot "think on their own." They find themselves answering questions for students that the students should be answering themselves. It is through this "answering" that real learning is made visible. Students need to be directed to focus on thoughtfully considering and answering their own questions. They may have figured out how to pass the class; they have content information or knowledge, but do they have *understanding*? Can students make meaningful connections? Today's life and work environments require far more than content knowledge. Effective citizens and workers must be able to reflect on their creative and critical thinking and make the necessary adjustments pivotal to making cognitive leaps often identified as thinking outside the box. Unfortunately, this is not always demanded of students. Digital portfolios can serve as a platform to get students to work and think metacognitively; to be aware of and able to analyze one's own learning and thinking processes.

Portfolio documentation of the learning process, including planning and ideation, creating, and reflecting provides a concrete visual reference for students. This makes their learning visible and allows them to understand what they know (Yenawine 2013). Digital portfolios require more student involvement and reflection than traditional forms of assessment and create ownership in the process as students' "show and tell" what they are learning. In the following example one student explains the process of her own development of thinking about the concept of abstraction:

> I used to think abstraction was merely just stretching, shrinking, making the initial image larger, smaller, etc. I now believe that abstraction is taking an image and completely *rebooting the idea of it*. I now think you can change the image by distorting it, maybe reconsidering it and placing it in a new context. This creates a completely new image that may not ever represent the initial (one) in the slightest.

Sharing individual student portfolios on an ongoing basis with the larger class can also contribute to creating a community of learners, where students and their peers benefit from collective planning and ideation, problem-solving, and reflection. For example, class sessions can begin with students projecting in-progress project pages for two to three minutes. During this discussion, students present a problem or difficulty they encountered and describe their solution or solicit feedback for assistance from their peers. Students become teachers as well as learners; they are making their own educational decisions.

Setting and context

Rocky Mountain High School ("Rocky") is one of four comprehensive high schools in the Poudre School District. Residing in what is close to the center of Fort Collins, Colorado, the school houses just under 2,000 students and 118 teachers. Fort Collins sits approximately 50 miles north of Denver and is considered an urban area. Rocky offers 18 different Advanced Placement offerings and approximately 83% of students continue their education in an institute of higher learning.

In 1992, Rocky adopted the 4 × 4 block system, which means that there are four nine-week terms each year and four 90-min periods each day. Under this model, students are able to focus on fewer courses at one time, and ultimately take more courses throughout the year. All art classes at Rocky are one quarter, or about nine weeks in length, with the exception of A.P. Studio Art and Yearbook. With 5.8 full time art teachers, the school offers a wide range of art classes including: 2-D and 3-D foundations courses, drawing, painting, pottery, sculpture, photography, jewelry,

digital design, digital drawing and painting, 3-D animation, videography, short film, A.P. art studio and yearbook. Over a four-year period, a student may take one art class or as many as 12 to 15 art classes. Class sizes range from around 32 students in foundations classes to 25 in advanced classes. Historically, the administrations at Rocky have supported the visual arts program financially and philosophically, and have placed the program at the core of learning available to all students. The art studios are well-equipped and provide an environment for extensive studio exploration.

In 2010 the Fort Collins community passed a mill levy that included $6 million to improve instructional technology in schools. At the high school level this means a laptop for each student, creating a "one-on-one mobile learning environment." With this technology accessible to students at all times, the visual arts curriculum is positioned to integrate current practices of professional artists who use technology such as blogs, websites, and digital portfolios to reflect on and demonstrate the artistic process, as well as promote their art work.

The availability of technology and the demand of finding a way to document and measure student growth, combined with the large number of courses allowing for a true progression of learning for students, lead the authors to implement student-created digital portfolios as a way for students to tell the story of their learning.

Literature review

The most valuable experiences in an art classroom, and potentially any classroom, occur when students are motivated to push beyond the norm to create something that is personally meaningful and challenging to themselves on many levels. Often students come into the classroom expecting to be given content knowledge and experiences instead of becoming the creators of their own experiences in which learning becomes a benefit of the process. In *The Arts and the Creation of Mind*, Elliot Eisner (2002) identifies three reasons for doing something. First, he suggests that people do something for the quality of experience provided, as in play, or eating good food. Second, one values the outcome of the process, even though the process itself may not always be enjoyable. Some people may feel this way about exercise**;** though they do not enjoy running laps, they do enjoy the healthful benefits of being physically fit. Third, while the person may not enjoy the process or the outcome, they value the reward, such as a paycheck, or a grade "A" (Eisner 2002).

Educators have watched the value placed on assessment, particularly testing, rise as schools increasingly "instrumentalize educational activities" (Eisner 2002, 202). Also known as "teaching to the test," the hope is that the reward of a good score will motivate students. In his book *Drive*, Daniel Pink looks at what motivates people and generally found that most people fit into one of two categories: Type I or Type X. Those who fall into the Type I group tend to be "fueled more by intrinsic desires than extrinsic ones … concerning themselves less with the external rewards to which an activity leads and more with the inherent satisfaction of the activity itself" (Pink 2009, 75). They typically connect most closely with Eisner's description of someone who does something for the quality of the experience. On the flip side, Type X minded people are just the opposite, fueled more by extrinsic desires than intrinsic. It could be said then that Type X students usually only make an effort when they believe it will affect their grade. Once they have met the requirements necessary to reach their desired outcome they will stop exploring, leaving them with very little room to make discoveries, take risks, and reflect on their learning. Important to note, though, is that this attitude can be altered through work and learning environments that value Type I behaviors (Pink 2009, 75).

While current types of assessment used in education seem to have driven more and more schools and teachers to focus on teaching students to do well on tests, the ultimate goal of education is to produce a creatively thinking, intrinsically driven, community-oriented work force. There seems to be a disconnection in what we assess, how we assess, and what we want. Standardized tests generally examine specific content dictated as essential or important by some outside entity. This leaves little room for educators to facilitate opportunities for students to show skills that allow for experimentation, failure, and reconsideration; all of which have to take place over time. The arts provide an opportunity to go beyond the test and to foster an environment where cognitive development flourishes. "The tasks that the arts put forward – such as noticing subtleties among qualitative relationships, conceiving of imaginative possibilities, interpreting the metaphorical meanings the work displays, exploiting unanticipated

opportunities in the course of one's work – require complex modes of thought" (Eisner 2002, 35). The arts also give students the opportunity to be metacognitive about their learning; through interpretation and reflection in a process portfolio they show that "they know what they know" (Eisner 2002, 37). Through reflection and critique, students are able to take their existing knowledge and experience to another level, thus deepening their ability to see the world in multiple ways. Considering that a study by the Bureau of Labor Statistics found that individuals hold an average of 11.7 jobs between the ages of 18 and 46, this type of flexibility will be valuable (US Department of Labor 2015).

When we focus exclusively on assessment *of learning* (summative assessment; evaluation of the final product in art) rather than assessment *for learning* (formative assessment; ongoing feedback and reflection about the art making process), the environment created encourages "Type X" behaviors, as students are concerned more about the final grade than what they have learned throughout the process. An additional risk of this type of learning environment is how it affects the student who is not driven by a final grade. Recognition of their learning and growth may not be satisfied by the final reward of an "A" and so, where is the motivation for our students' continued engagement?

Digital portfolios

Portfolios have been used by artists for a long time, as have reflective sketchbooks. Most educators and students are familiar with the detailed, searching and reflective notebooks of Leonardo da Vinci dating to the 1500s. These notebooks became a record of his thought processes and gave insight into the mind of a genius. Clearly, however, they were not created for others to evaluate. They were a way for the artists to record their thoughts, ideas, and reflections. It is noteworthy to add that no one dictated what da Vinci included in the notebooks, and he certainly did not receive a letter grade for his efforts.

Portfolios are used today in all areas of education, and two types of portfolios seem to dominate. The first is the product portfolio, where only finished work is included, and the second is the process portfolio, which can include thoughts, ideas, reflections, self-assessments, experiments, inserted informational material, and notes on techniques and processes. While some may argue for one or the other, true benefits will be seen from utilizing both types. The key is to allow for student choice and voice in merging both types of portfolios (Barrett 2011).

Providing a structure for students to reflect systematically over time on their learning process improves students' learning and allows them to "develop the aptitudes, skills, and habits that come from critical reflection" (Zubizarreta and Millis 2004, 15). The use of a portfolio *for learning* or a process portfolio has the potential to increase learners' autonomy and allows learners to tell the story of their learning, and to be metacognitive about their work (Barrett 2005). Students use this venue as *a way to look at their growth over time and make decisions and choices about the direction in which they want to move forward.* This type of self-directed, formative assessment allows for them to be more aware of their growth.

Incorporating product portfolios can be equally valuable, and the two should not be considered mutually exclusive. When students have the opportunity to choose which pieces of their work to showcase, their product portfolios become a documentation of their understanding of their learning, a retrospective of sorts (Barrett 2011). Product portfolios as a summative assessment give teachers a true picture of their students learning at a specific designated end point, such as the end of a class or even as graduating seniors.

With the emphasis on technology as a twenty-first century skill, digital portfolios are growing in use. In 2010 the United States Department of Education published the US National Education Technology Plan, and it states (US Department of Education 2010, 12):

> Technology gives students opportunities for taking ownership of their learning. Student-managed digital learning portfolios can be a part of a persistent learning record and help students develop the self-awareness required to set their own learning goals, express their own views of their strengths, weaknesses, andachievements, and take responsibility for them. Educators can use them to gauge students' development, and they also can be shared with peers, parents, and others who are part of students' extended network.

Helen C. Barrett (2005, 5) identifies the key elements of paper portfolios as: collecting, selecting, reflecting, directing/goals, and presenting/celebrating. The use of technology adds to that list the processes of archiving, linking/thinking, storytelling, collaborating, sharing, and publishing.

Many visual arts educators already use some form of reflective sketchbook and/or portfolio. Students and educators will benefit from transitioning and/or expanding this use through the incorporation of digital portfolios. They allow for a much clearer picture of what our students are actually learning, and hopefully engage each student in a process that promotes self-directed learning; perhaps giving them that "drive" to imagine and create beyond what anyone thought possible.

Digital portfolios in action: Acknowledging student voice

Digital portfolios allow students to document each step of their art making, from idea generation to final product, using a digital camera. Prior to this, students had no documentation of the development of their projects. Digital portfolios also provide the opportunity for students to visit each other's sites and give peer feedback.

At the start of this research project the authors introduced the portfolio format during the first week of class. The students were required to create a page for each project assigned. They had a suggested list of items to include that acted as scaffolding to demonstrate their understanding of their art making process:

- Images of sketches, work in progress, and final product
- Text that documents thinking, inspiration, and research; linked to images
- Links to artists' websites, books, videos, etc.
- Reflection about ideation, process, and plans for future work.

A specific format style or choice of images was not required so that students had control over what they chose to include and use as a demonstration of their learning. The process moved their motivation for the portfolios from extrinsic or grade-driven to intrinsic, and increased self-motivation (Barrett 2005).

Once the use of the portfolios was well established, students began presenting their portfolios. Each day, one or two students presented at the beginning of class. At first they were nervous, but it soon became something they looked forward to, and it proved to be a great way to encourage students to keep their portfolios up to date; some wanted to present multiple times!

At the end of the course, students reflected on a series of questions presented by the authors:

- How do your digital portfolio entries reveal your personal strategies for thinking, learning, and solving a problem?
- How do your digital portfolio entries show research and study of a task or problem? Explain.
- What project or reflection in particular represents a significant change in direction or thinking? How have you grown as an artist or thinker?

In reading through the short answer responses; underlying themes were uncovered. These themes correlated directly with the "studio habits of mind" identified in *Studio Thinking, The Real Benefits of Art Education* (Hetland et al. 2007) and include: engage and persist, envision, express, develop craft, stretch and explore, reflect, and understand art world. Students responded while looking at their portfolios using specific examples. Their responses demonstrated evidence of metacognition. When a student describes, for example, that through a certain project they became better able to express personal meaning in their art they were actually stating that they "know what they know." If metacognition is an awareness or analysis of one's own learning or thinking processes, then ample proof was demonstrated through their responses. Evidence of student understanding of their learning can be seen in the following quotes taken from their responses and aligned with the "studio habits of mind."

- Develop craft

> "I thought I could layer the washes to make a darker color, so I wouldn't be so uneasy about painting with thick, dark colors."

- Engage and persist

> "At first I didn't know how I was going to make the picture I chose work because it was so simple so, I problem-solved by adding more layers of mountains."
> " …You can turn a mistake into a whole new thing, or you can cover it up."
> "I went from 'I can do this' to 'I'm ready to give up.' It was very frustrating. By the end though, I realized the art work didn't turn out too bad and I was proud of myself."

- Envision

> "I noticed that my original picture lacked a well-defined foreground, so I tried to invent foreground myself."

" … To solve that problem I just thought about what I wanted to see on my tile and pictured it in my mind and then did it."

- Express

"My portfolio shows a progression of ideas with how each piece is different and has different meaning, but they all tie back to who I am."
"I have learned to connect other passions or beliefs I have to the way I think about and create art."

- Reflect

"I actually think differently now that I saw what I did."
"It makes me think back to what I did and why I did it."
"My original projects had little thought deeper than what the end product would look like. However later I was able to appreciate my process and the meaning behind my art."
"I wasn't very confident and gave up quickly."

- Stretch and explore

"I think my imagination grew the most. At first, thinking of ideas for things to create was very hard. But by the end of it, I came up with good ideas fast and easy."
"One problem-solving strategy had to be just going for it and eliminating my doubts."
"As evident from the gallery and artist statement, this class was, for myself, centered around experimentation and pushing the limits of creativity."

- Understand art world

"How I have grown as an artist or thinker is by understanding more on how much work really goes on into making a simple piece of art."
"I think I have grown because the projects and website add to my collective knowledge of art and me as an artist."
"My appreciation of art has grown tenfold as I found out the difficulties and pitfalls of pottery that an artist must adjust to and the complex thought that is revealed."

The process of documenting work, describing working processes, and reflecting on creative choices allowed the students to better articulate what they had learned. Their responses demonstrated that they were able to identify difficulties experienced and how they overcame those difficulties.

Conclusion

By requiring students to document and reflect on their art making *process,* the instructor is able to better understand the students' creative process and how to provide the best feedback for each individual student. Quickly looking at a student's website gives an understanding of their thinking, technical skills, and ability to express. Digital portfolios provided a more organized way to document what was happening for each student in class and to assess their work. Students became more aware of their learning styles and creative processes. They learned to use technology to expand their knowledge and to create an online presence. They reflected on their work and the work of their peers, allowing them to adjust and change as they moved through each art making experience. They grew in their appreciation of art and artists, and their potential for impact on the world.

Student portfolio example

The following is a typical series of portfolio entries by a Rocky Mountain High School art student. In these entries the student describes how she conceived of her idea, worked through the development of her art work – providing insight into her thinking – and concludes with her analysis of the completed art work. It clearly exemplifies how process and product portfolios can be merged to have students reflect on their decisions and thinking before, during, and after making art to understand the creation of their art work.

Fragment of a shared experience

Juxtaposition is defined as "the fact of two things being seen or placed close together with contrasting effect." I used juxtaposition in my piece by putting together waves and the moon cycles. Normally the two things wouldn't have much in common, but in my piece together they tell a very important story.

My jewelry piece tells the story of a group of friends experiencing a once in a lifetime opportunity. A rare event, when the moon is at its closest approach to the Earth within its orbit, it is called a Super Moon (Figure 1). Also known as a full moon, however during August this last year (2014), the moon was closer than it has ever been to the Earth.

Figure 1. To the Supermoon and Back. Note this isn't actually a picture I took. This is just an example of a Super Moon.

A group of my friends and I decided to take a late night swim at Horsetooth Reservoir when the moon was high overhead. We swam out a good way until we could see the moon out of the tree line. It was a magnificent sight, and simply beautiful. Since it was late in the summer, it was one of the last times my friends and I got a chance to get together and do something spontaneous. In the group of friends was my significant other, and after this experience we started saying to the "Super Moon and back" to one another whenever we saw each other. I made this piece for my group of friends, in hopes we would never forget this special time we had together (Figure 2).

I liked the idea of having the moon phases and a big circle to represent the full moon. I had waves in the background to represent the waves at Horsetooth Reservoir.I used three different metals to show the contrast between the various objects and to enhance my juxtaposition. The first layer was silver, followed by copper and finally brass (Figure 3).

I started with my three cutouts. The silver has some of the moon phases the big circle on the right being the Supermoon. Later I would rivet between the moon cycles.

Once cutout, I stacked my pieces on one another and riveted between the moon cycles. The rivets are brass so they go with the back piece (Figure 4).

I wanted to spice up my chain and make it more interesting. I thought about it for a while, and wanted to add more from the story. I decided to add on stars because they seemed to be shining brighter than usual that night. However, I didn't want anything cliché. Therefore, I domed them to give them an extra "oomph" (Figure 5).

I decided to use an S clasp to hold the necklace together (Figure 6). I really wanted to make my own chain for this project, but I was on a time crunch so I bought my own. I got a chain that complemented the piece. I added the stars as well to the chain.

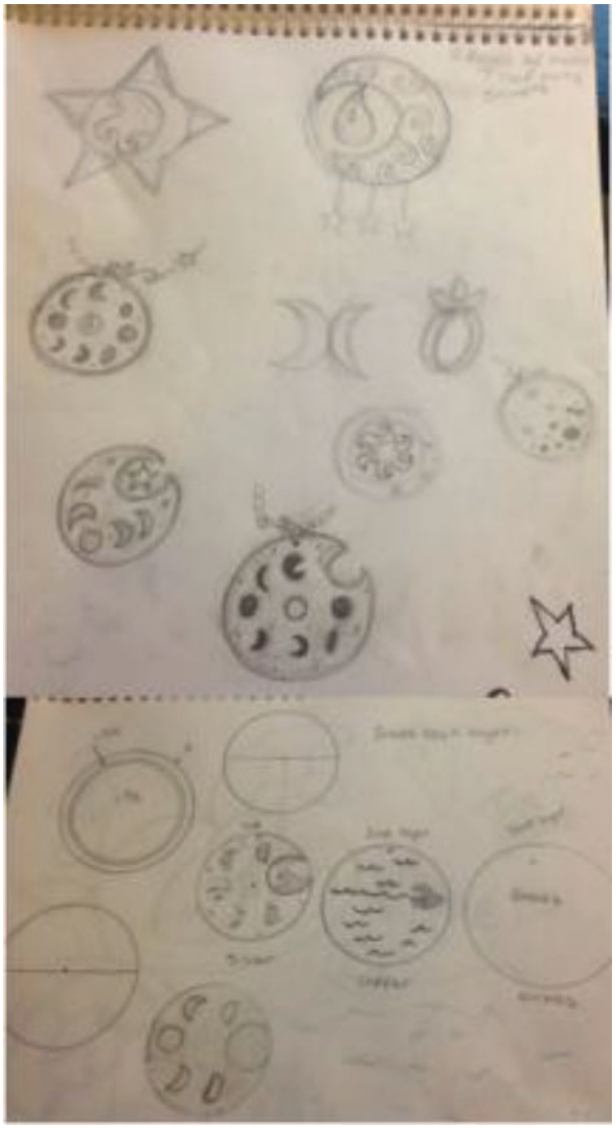

Figure 2. These were some my sketches of my idea of a pendent.

This was my finished pendent (Figure 7). (Note I didn't have time to finish sanding … Time crunch man … but I plan to finish up as soon as I get the opportunity.)

The hardest part of the piece was probably cutting out the tiny waves on the copper piece. They aren't as nice as I would like them and if I was to change the project I probably would have taken them out entirely. I do, however, like the big wave; but it was a pain to sand and file. I could have easily spent another two to seven hours making it the way I wanted it to look. I learned how to rivet which was actually pretty easy for me, and I like how my rivets look on this project. The circle size changed over time. Originally the brass piece wasn't as

Figure 3. Three cutouts in silver, copper and brass.

Figure 4. The riveted cutouts.

Figure 5. Stars.

Figure 6. S clasp.

Figure 7. Finished pendant.

Figure 8. Yea for the finished piece!

big as it ended up being, but I like the large contrast from the other two pieces that do have cutouts.

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