Postsecondary Artist Teachers’ Responses to Computer Technology in Their Drawing Pedagogy

Charlotte Mikolajewski, B.F.A.

Department of Graduate and Undergraduate Studies in Education

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Faculty of Education, Brock University

St. Catharines, Ontario

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Abstract

While the influence of computer technology has been widely studied in a variety of contexts, the drawing teaching studio is a particularly interesting context because of the juxtaposition of traditional medium and computer technology. For this study, 5 Canadian postsecondary teachers engaged in a 2-round Delphi interview process to discuss their responses to computer technology on their drawing pedagogy. Data sources included transcribed interviews. Findings indicated that artist teachers are both cautious to embrace and curious to explore appropriate use of computer technology on their drawing pedagogy. Artist teachers are both critical and optimistic about the influence of computer technology.
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With these thanks, I dedicate this work to my future students. It is possible—because “a word after a word after a word is power” (Atwood, 1981, p. 63).
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CHAPTER ONE: INTRODUCTION

The impact of computer technology is experienced in many aspects of Canadian life, including visual art, the studio in which art is made, and the way art is taught. This is a study of how Canadian postsecondary artist teachers respond to computer technology in their drawing pedagogy.

Research Focus

Dusk had fallen and the glass roof of the drawing studio reflected blue light in the dim room, where a stage light glowed warmly, flooding an empty, carpet-covered box stage. The light cast long shadows crisscrossing from the forest of easels placed around the stage in a Stonehenge ring.

I rolled up my drawing, leaving dusty black fingerprint marks as I secured an elastic band around the paper tube. Perched on a tall metal stool beside last week’s unclaimed graded assignments, my professor chatted about the critique that had just ended. He lamented the change in the quality of assignments since students began to use digital photographs as source material for their drawings instead of using a live model. During class he could effortlessly pick out digitally sourced drawings from the pack of homework assignments displayed like a gallery for our class critique, pointing out the unfortunate flatness and distortion he attributed to the limited visual information that a pixelized source image offered. He sighed and excused himself. “I’ll be documenting these assignments in my office.” He patted the digital camera clipped to his belt. “At least I don’t have to carry these home with me.” He loaded the stack of cumbersome drawing assignments onto the bottom of his slide projector caddy, grumbled at the orange extension chord that snagged the wheels and then rumbled down the echoing hallway. I
stood in the empty room considering the tension caused by computer technology in the traditional teaching studio.

With the introduction of the personal computer in the 1980s there has been much academic debate about the role of computer technology in the classroom (Flew, 2004). Inspired by new mediums, artists experiment with computer technology to create artwork (Robertson, 1998). This experimental curiosity leads many artist teachers to further integrate computers in their teaching studios. Pedagogy in the classroom and teaching studio is enhanced by computer technology (Everett & Caldwell, 2003; Gregory, 1997; Heywood, 2009; Kelly, McCain, & Jukes, 2009). The focus of this study is how Canadian postsecondary artist teachers respond to computer technology in their drawing pedagogy.

The Context of the Research Focus

Artist teachers educate in the teaching studio. The context of this study is the teaching studio environment where artist teachers shape aspiring artists (Heywood, 2009). Drawing is considered a traditional way of making art (Gaudelius & Speirs, 2002; Heywood, 2009) and many scholars consider drawing to be one of the foundations of visual art making (Schenk, 2005). As both foundational and traditional, the drawing studio is a particularly interesting context in which to study the influence of computer technology both as a medium of art making and art instruction.

My personal experience of the teaching drawing studio during the early 2000s was fairly traditional, implying that it was almost untouched by computer technology. The traditional studio in which I studied was spacious, whitewashed, and bright with a skylight ceiling that provided an ambiance of natural light. Equipped with a ventilation
fan and a sink for washing, the studio boasted a small stage to enshrine the live, figure model in the centre of the room. Easels, drawing benches, and drawing boards were set around the stage and the room was littered with stools which students used to rest and keep their drawing materials close at hand. The furniture was densely situated around the model as students vied for the most interesting vantage point. Darting between easels and stools the instructor spent time with each student in turn. During the break the students wandered about the studio peeking at their classmates’ artwork, mingling and stretching to refresh themselves. When the model posed again, work resumed until the end of the session when artwork was stored away and students packed up their belongings with ink stained hands and charcoal dust smeared brows.

In the senior years of my undergraduate degree at the Ontario College of Art and Design (OCAD), my classmates would come to the teaching studio session wearing headphones. Eventually more students came with cell phones and other technological devices. I noticed that this changed my experience of the teaching studio. Often students would not even notice the professor approach nor did they benefit from hearing the critique given to their peers. It seemed to me that technology isolated them from the studio and they drifted through class anonymously.

However, computer technology also has the power to connect us. Considering what the future computer technology enhanced teaching drawing studio might look like, I imagine a clean, well-lit space where P2 (the typical size of life drawing paper), touch screens cluster around the model’s plinth. Students settle into their places by connecting their earplugs. When the model poses, their hands move silently across the air to create smudges and lines as they render the model not on paper but in cyberspace. The professor
observes the progress of each student simultaneously on a computer screen. Images of students’ work evolve in “real time.” The professor assists the students by drawing over their work like a transparency, directly assisting them and answering their questions as they arise, without physically darting between heavy furniture. Able to save and track changes as the artworks evolve, the professor sees technical struggles of individual students. Students may work privately or as a group. At the break, students may rest or mingle or speak to the professor in person. At the end of the session there is no need for cumbersome storage space as there is no ink to dry, nor do students need to carry home heavy or dirty supplies. Their hands and clothes are clean. Their work is securely digitally stored. The instructor reviews the class work anywhere and at any time, making the marking process convenient and justification for grading well documented.

**Justification for the Research Problem**

The juxtaposition between the so-called traditional teaching studio and a hypothetical computer-enhanced teaching studio space is an exaggeration of how computer technology is changing learning environments and shifting teaching practices. Computer technology is constantly changing (Lister, Dovey, Giddings, Grant, & Kelly, 2003). This research provides a snapshot of how Canadian postsecondary artist teachers are responding to the influence of computer technology in their drawing pedagogy. It is my hope that this research encourages educators and researchers to look at variations of this theme; for example, considering how artist teachers in different countries respond to computer technology in the teaching drawing studio. Perhaps artist teachers of different kinds of teaching studios could be inspired by what the artist teachers in this study have shared. Perhaps the insights of these artist teacher participants may be helpful to teachers
using the studio method, whether they teach art or something else. I hope that this research furthers responsible and creative use of computer technology in creative learning environments, particularly the drawing studio, as artist teachers share their pedagogical responses to computer technology.

**Purpose of the Study and Research Questions**

The purpose of this research is to explore how Canadian, postsecondary artist teachers respond to computer technology in their drawing pedagogy. The following three research questions further develop the central research question:

1. How, if at all, is computer technology used in the teaching of drawing?
2. How, if at all, is computer technology used for teacher administrative tasks?
3. How, if at all, is computer technology being used to encourage motivation, productivity and creativity in the drawing class?

**Theoretical Framework**

In this study I asked five Canadian postsecondary artist teachers how they respond to computer technology in their drawing pedagogy. Together, the artist teachers and I (as the researcher) co-constructed knowledge through a reflective and interpretive process. This research is approached through constructivist and critical pedagogy theoretical frameworks.

**Constructivism**

Qualitative research supports the constructivist paradigm by which the individual experiences of each participant are respected in the process of co-constructing knowledge (Mason, 2002). Constructivists believe that truth is “created, not discovered” (Schwandt, 1994, p. 125). The constructivist inquirer constructs truth by interpreting individual and
collective understandings, reasoning processes and social norms (Mason, 2002; Schwandt, 1994). Constructivists seek to understand “the complex world of lived experience from the point of view of those who live in it” (Schwandt, 1994, p. 118). In this study, five artist teacher participants and I co-constructed knowledge as “patterns, themes and interrelationships” (Patton, 2002, p. 41) emerged from our conversations. As artist teachers shared their experiences, which are rooted in unique though similar contexts, they provided a snapshot of how artist teachers respond to computer technology in their drawing pedagogy. Constructivist methodology is appropriate for this study because the views of the participants are central to this study (Creswell, 2008). Additionally, a constructivist approach is fitting for this study since artist teachers are already part of a community of knowers engaged in co-constructing knowledge (Greene, 2005).

**Critical Pedagogy**

Critical pedagogy is a philosophy of education founded by Freire (1921-1997) which recognizes the value of teaching to empower students. By analyzing their beliefs and how their beliefs are carried out in practice, teachers recognize the power differential between themselves and students. Reflecting on their pedagogy, teachers examine behaviours that delimit students’ opportunities for growth. Making art and teaching art are reflective activities. Schon’s (1987) work about reflection-in-action and reflection-on action is put to practice in this study. These ideas are built on Dewey’s (1933) work on reflection. Reflection-in-action occurs when teachers make decisions while teaching (Schon, 1987). Reflection-on-action is when teachers make decisions after thinking about what happened in the classroom (Schon, 1987). Artist teachers make decisions about the
use of computer technology when they are confronted with new forms of technology and new challenges or possibilities that the use of computer technology creates. This practice is a form of reflection-on-action that will be investigated in this study. As well, artist teachers’ responses to the use of computer technology involve sensitivity toward how computer technology can empower students, which is a form of reflection-in-action that will be highlighted by the artist teachers participating in this study.

**Importance of the Study**

Although the experiences of the five Canadian artist teacher participants in this study does not reflect the experiences of all artist teachers, their voices will provide insight into how computer technology is influencing the pedagogical approaches and teaching experiences of artist teachers. These insights may be used by other artist teachers who are also dealing with the challenges and opportunities of teaching and making art within the technology-enhanced drawing studios of today.

**Outline of the Remainder of the Document**

Chapter 2 is presented in three parts. In the first part I review literature regarding the evolution of computer technology in visual art. The changing role of the art object impacts the process of how visual art is being made and taught to aspiring artists. While the first part of chapter 2 examines the external environment within which the art studio is situated, the second part distinguishes the teaching drawing studio from both the art classroom and the professional studio. The teaching studio is established as the environment in which artist teachers teach with the purpose of shaping artists. By acknowledging the influence of visual culture in general and the visual art studio in particular, this literature review provides context for the third part, which considers the
unique role of the artist teacher and how they teach drawing in the teaching studio.

Chapter 3 presents a discussion of method and methodology. For this study the structure for data collection is formed using a two-round Delphi method research design. The methodologies used in the analysis of this study include constructivism, hermeneutic interpretation and critical pedagogy. This chapter also details the process of both the data collection and interpretation. Selection of participants as well as ethical considerations and limitations of this study are explained.

In chapter 4, the collected data is analyzed and presented in three layers of depth: “making the obvious, obvious,” “making the obvious, dubious,” and “making the hidden, obvious” (Schlety and Noblit, 1982). In the first layer of analysis, I present artist teachers’ responses to specific computer technologies used in the teaching studio. This was based on a priori categories of computer technology, which include: computer hardware, computer software, and the Internet. In the second layer of analysis, I present three controversies which address the integrity of the digital image, the experience of art making, and teaching with computer technology. The third layer of analysis is based on a personal interpretation of the data that is supported by peer debriefing from a knowledgeable other (my thesis supervisor) and member-checking by study participants. In these ways the resulting knowledge is co-constructed by participants, my supervisor and me in order to represent the multiple perspectives and viewpoints of all contributors. This interpretation is guided by artist teachers’ responses to the three key research questions listed above.

Chapter 5 concludes this study with a summary of the research and a discussion of key findings and recommendations for furthering this research study.
CHAPTER TWO: LITERATURE REVIEW

This chapter presents a review of literature relevant to the influence of computer technology on the teaching of drawing in higher education. It discusses the influence of computer technology on the making of visual art, the postsecondary teaching studio and the artist-teacher. Thus, this literature review provides context to the question of how postsecondary artist teachers respond to computer technology in the teaching drawing studio and how it may have affected their pedagogy.

Art is one way of expressing human experience and exploring our world, relationships, and belief systems. Understanding the process of how art is made, how it is consumed, and how it both shapes and is shaped by culture provides the context to understand the discipline in which artist teachers work. Art includes dance, drama, literature, music, and visual arts; this literature review will focus on visual art.

This chapter is presented in three parts. The first part includes published literature about the process of making visual art and how it is consumed, including the influence of computer technology in these areas. Part two outlines the traditional art classroom, stressing the uniqueness of the teaching studio environment including the use of technology in the environment in which artist teachers instruct. Finally, part three addresses the impact of computer technology on pedagogy.

Visual Art and the Influence of Computer Technology

Visual art is influenced by visual culture which is steeped with the influence of computer technology. Mass media, the computer-enhanced vehicle of visual culture that bombards us in western culture, influences artist teachers and students in daily life. Artist
teachers and art students bring their experience of encounters with culture into the teaching studio space.

Visual art is influenced by visual culture which is disseminated to us through mass media. These are all influenced by computer technology. Computer technology makes the dissemination of visual information easy and rampant. In order to make sense of visual culture, we learn to make meaning out of visual images. This “reading” and “writing” (or “visual language”) is how visual artists communicate meaning. Computer technology, in the form of the mass media and medium are changing how artists communicate. New media is a genre of visual art which is highly influenced by computer technology. In new media art, computer technology not only changes the materials with which art is made but the fundamental process of how art is made. Computer technology influences traditional processes of art making because computer technology is now advancing in haptic capability. This new frontier of computer technology development challenges the way we think about physical experience and is of special importance to visual artists, especially in traditional drawing practice since traditional drawing has, until now, been produced with physical materials and produced physical art objects.

Computer technology also influences the art world in how art is made and disseminated. Artists have increasing agency as they are able to self-publish on the Internet. This agency disrupts relationships of power within the art world, which is relevant to artist teachers and art students since the teaching studio is a transitory space between learning and the art world with the purpose of preparing students to become artists. A new generation of students who live in a computer-saturated world are changing the dynamics of the teaching studio even as the world they are being prepared for
changes as a result of computer technology. This new generation of students has new demands and requires new skills in order to succeed in the changing art world and culture for which they are being prepared.

**Visual Art in Visual Culture**

Visual art is part of visual culture (Rampley, 2005; Silvers, 2004). Visual culture includes all forms of visual imagery that surround us, including the Internet, magazines, advertising, cartoons, comics, and product packaging (Freedman & Stuhr, 2004; Gaudelius & Speirs, 2002). Visual culture and visual art were once very separate. While visual art was valued as “high class” and in “good taste,” visual culture was undervalued as “tasteless,” “low class” commercialism (Rampley, 2005). However, visual culture and visual art reciprocally fuel each other. Visual art is one way of criticizing the culture in which we live out our lives. Visual art is “a form of social production; it plays an important role in the construction of social life…it influences the way people think about the world, visualize, and live in it” (Freedman, 2003, p. 54). Artists such as Marcel Duchamp, Andy Warhol, and Keith Haring introduced visual culture into the art gallery, and conversely, brought visual art to visual culture, blurring the lines between them. Computer technology further blurs the distinction between high (visual art) and low (visual culture) art, in the way art is made, shared, and consumed. The Internet is a particularly powerful arena where visual culture and visual art tangle.

**Visual Language**

Unlike text, visual language empowers viewers to organize and appraise the messages found in visual culture and visual art. In turn, visual culture and visual art shape the cultural meaning of visual language. Visual culture informs not only how artists make
art, but also how their art is perceived or “read” by viewers. Visual language enables us to navigate visual culture and visual art (Lister et al., 2003). Artist teachers shape and guide aspiring artists to become keen observers and clear, effective communicators in the language of art, preparing students to contribute to a visual conversation where “[educators, artists, and students] construct their [image and text] meaning as they in turn work to construct us” (Freedman, 2003, p. 95). Although text is very important in the exchange of information, the evolution of computer technology is leading us to become a visually communicating society (Freedman & Stuhr, 2004; Silvers, 2004). Duncum (1999) notes a visual turn where society is based on images rather than text. O’Gorman (2006) writes that “It has become tiresome and redundant to reiterate the notion that we are on the verge of a highly pictorial, electronic, post-print culture” (p. 8). A command of visual language is particularly critical “in a culture that is bombarded with visual imagery on a daily basis, it is important for [students] to learn how to critically negotiate a visually saturated world” (Gaudelius & Speirs, 2002, p. 15).

Visual language is very powerful. It can dictate politics through propaganda, define social order, make or break stereotypes, and drive the economy through advertisement (Howes, 2008). Today “the picture has replaced the word as the commonplace vehicle for expressing ideas dynamically and promoting values and standards” (Silvers, 2004, p. 19). For example, advertisements in early newspapers were columns of printed text. Today, advertisements are carefully constructed images, made meaningful by encoded (how the image is constructed by the artist) and decoded (how the image is read by the viewer) visual language.
Visual language is constructed in two ways; through the principles of art and design that allow our eye to determine what we see and secondly, through the way we interpret the symbols and signs that we see. The first case is based on the science of perception, while the second relies on meaning making within a cultural context. The later is a complex system of visual language called semiotics (Mick, 1986, p. 197).

Images and Meaning

Semiotic theory is based on the premise that visual images have meaning much like verbal language (Hall, 2005; Mick, 1986). Freedman (2003) suggests “the assumption that image can and should be considered text is an oversimplification of imagery” (p. 95). However, images are similar to text in some technical ways. For example, both image and text depend on metaphor and symbolism (Freedman, 2003).

A semiotic reading of visual images is different from art which is labelled by words. Artwork that uses literal words in its construction often subscribes to an aesthetic that celebrates the art of language. In the Museum of Modern Art in New York, a 2012 exhibition titled “Ecstatic Alphabets/Heaps of Language” presented a collection of artwork that celebrates the aesthetic value of text, a literal interpretation of language in art. It is important not to confuse the language of visual art with the art of visual language since seeing art in language is different than the language of art. Magritte’s 1928 oil painting _Ceci n’est pas une pipe_ (This is not a pipe) is an example of both the language of art while expressing the art of language. The cursive text written under the painted image of a pipe adds a compositional grace to the painting that is visually pleasing: this is the art of language. The text exposes the language of art, reminding us that the painted pipe is not actually a pipe that can be picked up and smoked. The painting of the pipe is merely a
representation, a symbol, and an image of a pipe: this is the language of art. Hall (2005) emphasizes the importance of representation in the process of meaning making. Hall suggests that since there is no one interpretation of an object or event, it follows that there is no fixed meaning since an event or object cannot exist without someone's interpretation of it. For this reason representation is not an after-the-fact occurrence, rather, it is “within the event itself” (Hall, 2005, p. 8). One aspect of relaying meaning is language, which “gives sign to meaning” (Hall, 2005, p. 11). As a result of “the global explosion in communication systems... [has] become the prevalent sign of late-modern culture (Hall, 2005, p. 5).

Medium

Art medium is the material used to create artwork. Traditionally mediums include graphite, ink, charcoal, and paint for example. The artist’s choice of mediums used to convey meaning is sometimes overlooked by semioticians (Noland & Ness, 2008). The artist’s choice of mediums is an element of the artwork, which conveys meaning (Kress & van Leeuwen, 2006). The artist’s choice of mediums dictates the process, and thus, the movements and actions used when creating the artwork. The artist’s experience of interacting with and manipulating art materials when making an artwork, influences how meaning is embedded into the artwork (Noland & Ness, 2008). The manner in which an artwork is made, or the experience of art making is another way that meaning is embedded into an artwork: “drawings are produced through the selection and combination of particular surfaces, drawing tools and the marks resulting from their interaction” (Roberts & Riley, 2012, p. 67). Schon (1987) explains that as artists make artwork they engage in “reflective conversation with the materials” (p. 42). For example,
if using a pencil on paper to write a poem, a writer has freedom to easily change the
composition by erasing it. The small scale of a pencil tip allows the writer to produce
many words with less effort than if the writer were to compose in the medium of spray-
paint on a brick wall. Spray-paint is not as easy to erase as pencil. Spray-paint mediums
dictate a scale that is very different from the pencil on paper which causes the writer to
use the whole body instead of only small finger movements. The artist’s body responds to
mediums, which impacts the finished artwork. For example, artist Jackson Pollock’s
(1912-1956) method of throwing paint across canvas on the floor demonstrates how the
act of art making affects the meaning of the artwork. Pollock’s paintings were made with
violent, energetic movement and the finished artwork captures and conveys energy. Had
Pollock meticulously painted a similar artwork with a tiny brush, the resulting artwork
may have been visually interesting, but it would not have communicated the energy that
Pollock was able to convey. Pollock’s artistry demonstrates that visual language is not
only embedded in the product or content of the visual image, but also in the process of its
making.

Roberts and Riley (2012) explain: “how the artist selects and combines the
compositional elements of the [artwork], and how the viewer relates to that [artwork] are
both functions of the social contexts in which the work is (re)produced” (p. 67). The
social context within which art is made is called “social semiotics” (Halliday, 1978). An
artwork “not only expresses the social context, but is also part of a more complex
dialectic in which [the artwork] actively symbolize the social system, thus producing as
well as being produced by it” (Roberts & Riley, 2012, p. 67).
Visual art is one mode of communicating. Visual art can be made with a combination of mediums, for example mixed media. Visual art can extend beyond the visual sense to include sound, tactility, and other sensate experiences. Multimodal artwork is when a variety of modes are used to communicating meaning (Kress & van Leeuwen, 2006). Computer technology is increasingly being used to create multimodal artwork. Art made with computers not only changes the nature and movements of the art making process, but introduces an altogether new dialect of visual grammar. This new visual grammar is explored in the genre of “New Media” art. In New Media art technology mediums are used to create artwork. The ever penetrating influence of computer technology and by extension Information Communication Technology (ICT) in both contemporary culture and the art world not only affects artists but also artist teachers; as they respond to their changing environment and the changing needs of their students.

**New Media**

New Media is a genre of art. Some scholars struggle with the words *new media* since all media, all technology, was once new (Flew, 2002; Gitelman & Pingree, 2003). Additionally, the definition of media and medium play a role in how this genre of art is defined. If a drawing is made with the medium of smudging paper with a charcoal dusted finger, it is “traditional visual art.” However, if a drawing is created with the marks made by the stroke of a finger across a computer touch screen, it is termed “visual art made with a new medium.” If the act of drawing is redefined by writing a computer program to generate an image, this is “new media” art. The term new media is used loosely in visual art to refer to art that is influenced by computer technology in some way. Although the
term new media is fairly vague, it will be understood in the remainder of this document that new media art is simply any art that is influenced by computer technology. The artists showcased at the Massachusetts Institute of Technology (MIT) exhibition Sensorium (Jones, 2006) explore the possibilities of new media art by using the computer as a new tool (medium) with which to create traditional art, but also as a way to create new art forms. Today artists and educators alike are using computers in ways that not only enhance the traditional ways of communicating, but also fundamentally change the way we communicate.

**New Media and the Traditional Art of Drawing**

New Media affects traditional art making in at least two fundamental ways. Computer technology can be used as a medium when making traditional art, or it can change the definition of traditional art altogether. There are at least two ways to define traditional art. In one view, the mediums with which an artwork is made defines it as traditional. Traditional mediums include drawing, painting, and materials-based sculpture (Heywood, 2009). As computer technology increasingly seeps into our culture and art making practice, these traditional forms are apt to evolve (Bowen, 2003; Welter, 1989). For decades, traditional mediums were considered the only respectable and tasteful forms of visual art, an attitude of Formalist art education (Gaudelius & Speirs, 2002). If a drawing is made with a pencil on paper, or computer touch screen, the first definition of traditional art favours the pencil drawing as traditional art. Another way to classify traditional art is to consider the act of drawing itself as traditional regardless of what tool is used to draw. In this view, drawing itself is traditional and all forms of drawing, whether marks made with a pencil on paper or a computer touch screen, are still
considered drawing. In this latter view, drawing in all of its variations is at root, a traditional art form. Contrasted by interactive installation and performance art, drawing is considered traditional art regardless of what mediums it is made. This tension between new media and traditional art makes the drawing studio a site of particular interest. The influence of computer technology is blatantly juxtaposed in the traditional drawing studio, a site where traditional art is traditionally made. Computer technology and ICT are redefining (both the mediums and the process of making) visual art (Bowen, 2003). The changing definition of visual art challenges the relevance of traditionally based art education. Further discussion of this point will be revisited in the second part of this chapter.

**Sensory Experience and Computer Technology**

Traditional art making such as drawing with charcoal is a highly sensual experience. Through the five senses: hearing, sight, smell, taste, and touch, our bodies translate our encounter with the world into an experience of human sensuality. The word “sense” can be used to refer to the way our bodies perceive, or the way our mind responds to the world. Both sensuality (body) and cognition (mind) are important facets of human experience, demanding special attention as computers begin to challenge our definition of humanness (Masters, 2005). New technologies continue to extend, enhance and mediate our bodily experience (Bowen, 2006; Fuery, 2009; Masters, 2005). As computer technology becomes increasingly integrated into our lifestyles (Negroponte, 1995), and attaches itself more seamlessly to our bodies (wearable technology), there is a renewed interest in human sensuality across many areas of study, including art and education (Bowen, 2006; Ladhani, 2014).
Artists’ notions about the sentient, human body are critically important in the process of artistry because of the artists’ relationship to traditional, sensual, art making materials. Furthermore, notions about the body are especially important since advancements in computer technology (new media) have penetrated visual art (Bowen, 2003, 2006).

**Humans and Computers**

As our relationship with computers grows more intimate, technology developers are structuring computer technology to be human-centred. For example, Facebook founder Mark Zuckerberg stresses that the newly released Facebook “home” is structured around “people, and not apps” (as cited in Boxall, 2013, para. 3). Human Computer Interaction (HCI) makes integrating technology into our lives more “natural, expressive, and efficient” (Raisamo et al., 2009, p. 38). For example, the word-gesture keyboard, or shorthand-aided rapid keyboarding (SHARK) allows users to draw words over the keyboard instead of striking each key individually (Zhai & Kristensson, 2012). This process of typing makes text communication efficient. SHARK is colloquially called “gesture … stroke, trace, swipe, sweep, slide, or glide keyboard” (Zhai & Kristensson, 2012, p. 92). These adjectives also describe drawing and dance movements. A renewed interest in touch makes sense in an effort to integrate humans and computer technology. Bigwood (1993) reminds us: “to dwell humanly, we must live in and through touch” (p. 73). Stemming from the Greek word *haptikos*, meaning the sense of touch, haptic research explores the interaction between humans and technology through touch (Raisamo et al., 2009; San Diego et al., 2011). As a perceptual system, the haptic allows us to experience “a sense of space and movement in relation to the environment”
Examples of haptic technology include game controllers, vibration alarms, and touch screens (Raisamo et al., 2009). Other forms of haptic technology include displays that simulate shape and texture as well as body suits that create sensations (Classen, 2005). Haptic technologies have recently been embraced by health sciences for students who gain valuable experience through simulated surgeries (Echegaray, Herrera, Aguinaga, Buchart, & Borro, 2014; San Diego et al., 2011; Jones, Minogue, Oppewal, Cook, & Broadwell, 2006). Traditionally, visual art making and learning are highly tactile experiences. Computer technology is influencing the tactile experience of artists and artist teachers in both the personal art studio and the teaching studio (Bowen, 2003). Drawing tablets, and software such as Photoshop, are engineered to emulate the experience of working with traditional mediums. For example, drawing tablet screens respond to the pressure applied by the user, pushing harder on the screen creates a darker, thicker line, while a soft touch creates a thinner lighter line. Photoshop enables artists to create visual texture. For example, the user may select different textures of paper “surfaces.” With these tools, artists, artist teachers and art students are enabled to create masterful artworks.

Some artists use haptic technology as a medium to create artwork and teach (Singh, 2004). Quantrill (2002) writes about using a softboard to make drawings: “the human physically drawing and the computer recoding the events, occur concurrently. In effect the processes are merged … the final [art] piece is thus an inseparable intertwining of human and machine” (p. 74). Some artist teachers use a SmartBoard, which is a computer enhanced white board, in the teaching studio to teach art students (Brandt et al., 2013).
The Sense of Touch

With haptic technology creeping into visual art making and consumption, the sense of touch is being revisited as a central part of “viewing” and experiencing visual art. Interactive artworks that encourage haptic responses are one example of this (Dekker & Saaze, 2005).

Since the ancient Greeks, vision has been regarded as the dominant human sense. Research regarding our relationship to arts through our senses has been dismissed as unscientific (Dekker & Saaze, 2005). The scientific method is one way of “separating knowledge from experience” (Franklin, 1999, p. 30). Reliable truth is often considered to be independent of bodily perception and subjective emotion (Duncum, 2011; Howes, 2005). During the period of Western Modernism, pure and controlled experience of senses was valued and celebrated by abstract painters who sought to purify experience by attempting to isolate the senses (Howes, 2005; Jones, 2006). Early computers were designed in this period of sensual segregation. Caught up in the excitement about visual and audio progress in computers, haptic capabilities were largely overlooked. However, as humans and machines merge through hand held devices, haptic technology is gaining attention, and the importance of touch is being revisited. From an evolutionary standpoint, touch is the oldest sense, and yet, it “is the least acknowledged of the senses by the modern world” (Sheldon & Arens, 2005, p. 426). Acknowledging a more holistic approach to human senses, computer technologies and new media art today seem to be evolving toward accommodating multimodal and interconnected sensuality. For example, contemporary smart phones have touch screens and some visual artists use computer
technology as an interactive tool. For example, Davies (2004) invites viewers to be participants by exploring an immersive, digitally rendered world.

Visual Art Consumption

The traditional art gallery reflects a Modernist set of values; it is a silent, sacred place where visitors dare not touch anything; where art is guarded and meant to be seen in a state of respectful reverence, not touched, nor heard (Jones, 2006). As computer technology changes the way we communicate and the accessibility of art, this stereotype is changing. Participatory art challenges viewers to act, not as passive consumers, but as active participants, co-constructing an artwork (Irish Museum of Modern Art, n.d.). Computer technology facilitates this genre of artistic practice. For example, artist David Rokeby’s (2002) installation artwork *Cheap Imitation* demonstrates that relational art does not fully exist until it is completed by the viewer’s participation. The changing relationship of viewers is redefining art practice and art teaching as artists “[part] from the traditions of object-making” (Kester, 2003).

A New Generation

Viewers of art today are increasingly living more closely with computer technology (Pink & Leder Mackley, 2013). As a result, art consumer expectations are evolving alongside computer technology advancements. One particularly interesting group of consumers is the generation that has never known life without the computer. Harvard University’s Berkman Center for Internet & Society (2013) discusses the term “digital natives,” people who have grown up “immersed in digital technologies, for whom a life fully integrated with digital devices is the norm” (para. 1). Tapscott (2009) calls this generation “net genners” (p. 3). Tapscott outlines eight demands that he calls
“net genner norms”: collaboration, customization, entertainment, freedom, innovation, integrity, security, and speed (p. 34). These net genner trends, driven by what the viewer, consumer, and investor today expects from art and how they respond to viewing art, also affects the art world. In order to prepare art students for the future economy, artist teachers must stay culturally current, aware of the demands of the market as well as cultural and political perspectives.

Collaboration and customization, speed and innovation play a key role in how art viewers “read” and respond to visual art and what the art consumer expects from the visual art market.

**The Teaching Studio and the Influence of Computer Technology**

In the following review, the uniqueness of the drawing teaching studio is established and the influence of computer technology in the teaching studio is explored. In order to understand the environment in which artist teachers teach, the following outlines a portrait of the teaching studio. The teaching studio space is facilitates the studio teaching approach of artist teachers which is based on an iterative cycle of art making. Mentorship is key in this hands-on, transitional learning environment that bridges education and practice. Art making is based on reflection and iteration. For this reason the teaching studio specific tradition of critique is especially important. The influence of computer technology on the experience of art making and learning as well as the impact of computer technology on the unique physical space of the teaching studio explain the context of drawing instruction.
The Teaching Studio Experience: A Portrait

The teaching studio is a “hands on,” experiential, practical learning space (Heywood, 2009). In a teaching studio, learning not only takes place through “books, online resources and lectures” but by employing techniques, having a historical awareness, a sense of responsibility and working with a purpose in order to make artwork (Heywood, 2009, p. 196). The teaching studio is both an incubator for creating artists and a “practice field” (Senge, 1994, p. 83). Although the teaching studio has been redefined over the years, one thing remains constant: that it is “an education in and through making” (Heywood, 2009, p. 199). Learning by doing, or “knowing-in-action” (Schon, 1987, p. 24) is one way that students learn art in the teaching studio. For example, learning how to use a medium requires tacit knowledge (Polanyi, 1967). Tacit knowledge is acquired kinaesthetically; feeling it for yourself. A student may see an image lecture showcasing a particular technique using a particular medium and the student may observe a demonstration of that technique in that medium by a skilled artist teacher. However, students must experience the medium for themselves if they are to master the technique.

The unique physical space of the teaching studio facilitates collaboration and discussion and a teaching structure that enables students to act like real artists while learning to become artists (Brandt et al., 2013; Cennamo & Brandt, 2012; Heywood, 2009). It is a space that is neither professional nor amateur since students are still learning while 'apprenticing' to becoming professionals (Brandt et al., 2013). As such, the teaching studio is therefore much like a bridge that spans the professional community of practice (practicing artists) and the academic community (Brandt et al., 2013).
The Teaching Studio Space

The teaching studio is a physically versatile teaching space that facilitates the teaching and learning of artistry (Brocato, 2009; Cennamo & Brandt, 2012). Furniture can be moved to accommodate the needs of both individual students and the class as a group as they make art and engage in different activities that take place during a typical studio class. Teaching studios activities include lectures, presentations, demonstrations, critiques and in-the-moment feedback (Brandt et al., 2013; Cennamo & Brandt, 2012; Schon, 1985). Typical teaching studios include group learning, independent learning, and mentorship (Brandt et al., 2013; Heywood, 2009; Schon, 1987). While there are times for group activities, students are “mostly engaged in private, parallel pursuit of the common design task” (Schon, 1985, p. 32). Sometimes teaching studios are set up in a way where students are assigned their own consistent workspace. In this case, students may personalize their studio workspace to accommodate their style of art making.

The Iterative Cycle of Art Making and Learning

Visual art is created and taught through an iterative process (Brandt et al., 2013; Brocato, 2009; Kuhn, 2001). This cycle is summarized by Brocato (2009) as “propose-critique-iterate” (p. 138). Brandt et al. (2013) details this iterative process. In the proposal phase students consider solutions to a problem by developing “a series of proposals” (p. 331). Secondly, students present their work and participate in critique. This process of presentation and feedback learning process is repeated until the work is refined. Brocato (2009) posits that artwork is “never complete, always on a pathway toward better iterations” (p. 142).
The unique physical space and teaching structure of the teaching studio is called the studio method which is summarized by Schon (1987) as “freedom to learn by doing in a setting relatively low in risk, with access to coaches who initiate students into the ‘traditions of the calling’ and help them, by ‘the right kind of telling’ to see on their own behalf and in their own way what they need most to see” (p. 17). Brocato (2009) adds that Studio Based Learning (SBL) builds on the studio method adding that SBL emphasizes a person-centered approach.

**Mentorship.** Mentorship is especially important for developing artists’ learning (Brandt et al., 2013). Artist teachers deliver information, demonstrate techniques and provide opportunities for artistic practice (Wenger, 1998). In these ways, artist teachers impart both the technical and conceptual skills of artistry as well as “what it is to be an artist, or at least to think and act like one” (Heywood, 2009 p. 196). Artist teachers sometimes teach to the collective but also teach students individually, thereby tailoring feedback to individual student needs at the appropriate time as artwork unfolds. Offering feedback is one critical part of mentorship. While feedback is offered on an individual basis, it is also sometimes a collective conversation. Both forms of feedback are known as a “critique.”

The teaching studio is unique in that it is a person-centered learning space (Brandt et al., 2013). One way that the teaching studio is person-centered is the emphasis on mentorship (Brocato, 2009). Another way that the teaching studio is person-centered is that mentoring artist teachers introduce students to artist networks. For example, artist teachers may invite expert guests into the studio class and students may be invited outside
of the studio on field trips to see performances, art galleries, museum exhibits and visit practicing artists' studios (Brandt et al. 2013; Brocato, 2009).

**Critique.** One of the most unique, person-centered traditions in the teaching studio is the “critique” which is a collective or personal review of artwork (Schon, 1987). These discussions among peers, artist teachers, and expert guests are intended to stimulate learning by reflection as students develop solutions to conceptual and technical problems or inconsistencies through the eyes of others (Brocato, 2009; Sagun & Demirkan, 2009).

There are different forms of critique culture in the teaching studio (Kuhn, 2001). Students may “pin-up” artwork to display for discussion, engage in “desk crits” where students discuss in small groups, or be evaluated by a “jury” of internal and external experts (Brocato, 2009; Cossentino, 2002; Dannels, 2005, Kuhn, 2001).

Cossentino (2002) posits “the tradition of ongoing and reciprocal performance punctuated by criticism is so central to the pedagogy of the design studio that it is not considered assessment at all. Rather it is the essence of instruction” (p. 44). Through the feedback of artist teachers, guest artists and their peers, students learn “what it means to be a professional in the design arena” (Dannels, 2005, p. 140). Through the tradition of the critique, students are “socialized into the norms, values, and culture of that context” (Dannels, 2005, p. 154). Even if the feedback during a critique is lacklustre, critiques are valuable to “guide students toward artistry” (Cossentino, 2002, p. 47). By questioning assumptions, critique conversations provide opportunities for students’ technical and conceptual growth. This is what makes the critique central to visual art studio instruction.
The Influence of Computer Technology in the Teaching Studio

Activity in the teaching studio is influenced by the social pressures of the cultural context (Davies & Elmer, 2001; Eisner & Ecker, 1966). The cultural context of the teaching studio includes education, the art world, and society, which are all influenced by computer technology. Artist teachers and their students live between these three spheres and bring their experiences of computer technology with them into the art teaching studio (Atif, 2012). The teaching studio is an incubator for creating artists, a “practice field” (Senge, 1994, p. 83) in which learners are engaged in simulations that they will experience outside of school when they are practicing artists themselves. Wood (2004) notes that the influence of computer technology in everyday culture outside the classroom may affect students’ perception and experience within the classroom. Computer technology changes “social and individual relationships” (Franklin, 1999, p. 2). In response to the changing needs of students, Kelly et al. (2009) urge teachers to “address the shift in thinking patterns of digital kids” (p. 23). In order to prepare students to be artists, what is taught in the teaching studio must be current and relevant to what is going on in the external environment of visual culture and the art world.

The Influence of Computer Technology on the Teaching Studio Experience

At root, the teaching studio cultivates “exploratory, sensory learning” (Heywood, 2009, p. 202). Perhaps this is why artist teachers are especially interested in computer technology in both artistry and teaching (Wood, 2004). Many artist teachers acknowledge that working with new mediums provides new perspectives (Kuhn, 2001). As computer technology merges with our personal and collective experience, it makes sense that computer technology bleeds into the teaching studio from the outside world.
The Influence of Computer Technology on the Iterative Cycle of Art Making and Learning

Computer technology enhances the iterative cycle of art making, teaching, and learning in the art studio. During the proposal stage, students research and sketch ideas. With the help of computer software programs and the Internet, students can quickly compose visual ideas by downloading, scanning, digitizing, layering, testing visual results, and gathering immediate visual feedback. Students can freely experiment and make iterations since revisions are saved and easily retraceable. During the critique stage students are able to communicate with their peers and professor through information communication technology. For example, students and teachers may share images via digital projectors or computer screens. Some artist teachers experiment with online critiques. During the exhibition stage, students are able to post their artwork online to share with a global audience.

The Influence of Computer Technology on the Physical Space of the Teaching Studio

In order to integrate computer technology into educational spaces, the studio method is recommended (Cennamo & Brandt, 2012). For example, Atif (2012) describes a studio-modeled learning space where student workspaces are circled around a central teacher workstation. This physical layout is recommended to reconfigure the classroom setting in order to facilitate collaboration and discussion. For example, this round table set up facilitates discussion and collaboration since students and teachers have easier access to each other's screens or a digital projection. The teaching studio is already modeled in this way, perfectly structured to adopt and adapt to computer technology integration.
While the teaching studio is a unique environment for shaping future artists, sceptics question the value and relevance of teaching studios in institutions of the future. Studio spaces are valuable real estate whose utility, inefficiency, and expense cannot be justified when compared to the efficiency of lecture theatres and self-help computer suites (Heywood, 2009). Those who are more conceptually driven criticize the teaching studio since “art long ago abandoned worship of the material object supposedly endowed with sensory, aesthetic properties, so why struggle to preserve the modernist studio, which has always had this myth at its core?” (Heywood, 2009, p. 198). The studio reinforces the legend of the inspired genius artist who creates artwork commodities available to a “wealthy, influential, but narrow” group (Heywood, 2009, p. 198). Heywood (2009) explains the critic’s point of view that the teaching studio is:

irrelevant, or inherently unsympathetic to important forms of contemporary practice, like those produced by computing, digital media and the like. In sum, art no longer privileges the senses, the material artefact, and the skills that go into making it. Art can take any form appropriate to conveying or referring to its idea, and as an idea is non-material, so too should be works of art. The studio is fundamentally a modernist institution and as such obsolete. (p. 198)

Since the computer is now being used for research and collaboration, the office may be a more appropriate model for a workspace for artists in the future than the traditional studio (Heywood, 2009, p. 198). In addition, the gallery and studio are no longer as closely connected since the Internet enables a global art space, the art studio is no longer the only bridge that connects students to the art world (Brandt et al., 2013; Heywood, 2009). Many artist teachers do not have the technical skills to keep up with
the times and keep the teaching studio relevant and “may have to declare their own qualifications obsolete” (Silvers, 2004, p. 22). Brown and Cruickshank (2003) and Heywood (2009) suggest that the teaching studio must be rethought and reconfigured if it is to remain a relevant place to prepare students to meet the changing, computer integrated world.

**The Artist Teacher and the Influence of Computer Technology**

The following outlines who the artist teacher is, what the artist teacher does, and the influence of computer technology on pedagogy. As practicing artists, artist teachers work both in the wider context of visual culture and the art world as well as the academic institution. Artist teachers bridge the gap between learning and practice. This is played out in the experimental teaching studio environment where artist teachers mentor students, support students explorative learning through the iterative cycle of art making and offer students critique in order to help students develop into artists. As well as teaching formal curriculum, artist teachers teach intuitively, based on their repertoire of experience. Sometimes this “knowing-in-action” (Schon, 1985) is disrupted by computer technology, causing artist teachers to pause and reflect on their pedagogical response. By responding to individual students needs, artist teachers help students to discover their own styles of artistry.

**Artist Teacher**

An artist teacher is “a person who both makes and teaches art and is dedicated to both activities as a practitioner” (Thornton, 2005, p. 167). Artist teachers are a unique group of educators who move between the art world, the world of education, and the world of art education (Thornton, 2005). While art teachers are typically trained first as
educators and then specialize to become competent teachers of visual art; artist teachers usually begin as artists and teach as an extension of their creative practice (Thornton, 2005). In short “teachers teach art … artists teach artists” (Singerman, 1999, p. 3).

Thornton (2005) offers some observations that distinguish artist teachers from art teachers. The “motivations and convictions [of artist teachers are] based on their art practice and exposure to the culture of art” (p. 168). They are “aware of a tension that can exist between the socializing aspects of education and the autonomy of art and artist” (Thornton, 2005, p. 168). Artist teachers have a “positive relationship between personal art-making and teaching” (Thornton, 2005, p. 168), and are “regularly involved in producing art” of their own (p. 169). Their practice informs their teaching while their teaching enriches their practice (Thornton, 2005). Artist teachers “acknowledge differences between art made within educational institutions and art made outside them but strive to interconnect these in various ways” (Thornton, 2005, p. 169). These characteristics stem from having “developed an identity as an artist or art specialist … before embarking on a career in teaching” (Thornton, 2005, p. 167). Artist teachers are typically found in post secondary institutions, where their specialized experience and depth of study is particularly valued (Thornton, 2005, p. 167).

**Artist Teachers Are Mentors**

As mediators between the art world and academia, artist teachers are well equipped to shape the next generation of artists (Driscoll, 2005; Gaudelius & Speirs, 2002). Singerman (1999) posits that “artists are … both who and what is taught” (p. 3). In light of this, artist teachers mentor students by modeling an artistic worldview (Brandt et al., 2013). For example, artist teachers may encourage students to visit art galleries.
Reflecting on her artistic development, Canadian artist Emily Carr (1978) emphasizes the importance of artist teacher mentorship: “didn’t I see my way through Lawren? … I did not want to copy his work but I wanted to look out of the same window on to life and nature, to get beyond the surface as he did” (p. 64).

Based on their own, first hand experience of art making, artist teachers are able to help their students develop meaningful artistic practice (Lowenfeld & Brittain, 1970). Sedgwick (1993) states that “all art is a meeting between technique and feeling” (p. 39). Artist teachers demonstrate technical skills for art making. For example, artist teachers may recommend a particular shape of pencil and show students how to achieve a desired effect.

The creative nature of art making, each student artwork is a unique product. Since art making is a subjective experience, each student may be at a different place in their artistic development and personal journey. Lowenfeld and Brittain (1970) emphasize meeting students at their own level of creative development and encouraging students to learn and grow in unique ways. Welter (1989) points out that “the arts are the one curricular area where close contact between the teacher/artist and the student is indispensable to learning” (p. 19). Mentoring by exercising mutual respect, demonstrating techniques specific to individual student needs and modeling an artistic lifestyle, are important ways that artist teachers to shape aspiring artists. Bruner (1999) recommends that artist teachers treat students as artists.

**Artist Teachers Support the Iterative Cycle of Art Making and Learning**

Teaching and learning visual art making is an interactive process (Sagun & Demirkan, 2009). Through a cycle of critique and revision students learn by doing
(Schon, 1987). Throughout this process “student and teacher are partners working toward a common goal, the emphasis shifts from being critiqued to learning the art of criticism in the context of performance” (Cossentino, 2002, p. 46). In working toward a common goal, artist teachers and students benefit from a relationship of mutual respect. Bruner (1999) recommends that artist teachers treat their students like artists, for example: “the schoolboy learning physics is a physicist, and it is easier for him to learn physics behaving like a physicist than doing something else” (p. 14). Carr (1978) stresses the importance of mutual respect between artist teacher and student. Observing her friend teach, Carr writes “he suggests—leaves you to ask questions if you are interested—answers them patiently and fully—then gives you, as it were, a gentle push-off and leaves you to think things out for yourself. That’s real teaching” (p. 86). By treating students as artists, artist teachers facilitate art making and learning (Rieber, 2000).

Collaborative, co-constructed learning is important for art students’ development (Cennamo & Brandt, 2012). Carr (1978) contrasts conventional teaching with co-constructed learning as “light and life stretching out and intermingling, not bottled up and fermented” (p. 64). Kuhn (2001) compares studio based teaching to a jazz improvisation, which is much like the reciprocal conversation of the iterative cycle of making art revisions and reflecting on artwork through critique (Brandt et al., 2013; Brocato, 2009; Kuhn, 2001). The teaching studio is a “community of practice” where people share ideas and strategies to build solutions and innovations (Wenger, 1998). Collaboration is a core concept of teaching and learning in teaching studio. The teaching studio is both an individual and team learning environment where students collaborate with peers, interact with a mentor, cooperate and combine skills, reflect, and apply what they have learned in
new situations (Atif, 2012; Sagun & Demirkan, 2009). Teaching studios are often conversational learning environments where knowing why (conceptual) and knowing how (reflective) are equally important (Scott, 2009). Vygotsky (1978) posits that learning and development are collaborative activities that are relevant to the real world. Long (2005) outlines a conversational-learning structure in which learners can develop skills through immersive, real life experience. His practical suggestions are similar to what already takes place in the drawing studio as “students, teachers and the design work itself … are interwoven together into a whole. This whole itself is a phenomenological experience that opens design process to new possibilities waiting for interpretations” (Hisarligil, 2012, p. 257).

**Artist Teachers: Critique and Reflection**

Aware of market trends, but not subject to them, artist teachers transmit their awareness of the art field to students. As practicing artists, artist teachers are active in the art field, engaging in conversations and working with artist peers, curators, gallerists, writers, critics, and collectors. In this way, artist teachers stay current about evolving dimensions and values of art practice. Artist teachers bring their contemporary knowledge about the art field into the teaching studio. Offering students feedback through critique is one way that artist teachers judge and reflect upon student artwork in progress at the same time as they blur the boundaries between the learning environment and the art field. This practice is part of the iterative process of art making and learning. Artist teachers perform critiques in both formal jury settings as well as on individual student basis (Cossentino, 2002).
Artist teachers’ approach to critique is unique from other teachers who may employ this component of the studio method. As artists, artist teachers themselves are subject to critique from their peers and critics of the art world. As artists, artist teachers submit artwork to a variety of contexts for judgement including competing for grants, awards, residencies, and commissions, as well as competing for gallery representation and art shows. In these ways, artist teachers are vulnerable and competitive in similar ways as students, and know first hand the value of mindful feedback. With this background experience, artist teachers judge and reflect on student artwork with the same rigor that they use in their own practice as they confront the changing dimensions, values and “tastes” in the field of art.

Similar to creating an artwork, artist teachers craft and perform each studio class. Much like the iterative cycle of art making and learning where students create art iterations and respond to critique, artist teachers engage in pedagogical critique, teaching and then reflecting on their teaching. Schon (1985) describes this self, pedagogical critique as “reflection-in-action” and “reflection-on-action.” In the teaching studio, artist teachers typically teach what they have “acquired through training or through on-the-job experience. It is usually tacit, and it is delivered spontaneously without conscious deliberation … dynamic knowing process, rather than a static body of knowledge” (Schon, 1985, p. 24). Schon (1985) calls this “knowing-in-action” (p. 24). Sometimes there are disruptions in this teaching process, “unanticipated events which do not fit existing understandings” (Schon, 1985, p. 25). In this study the new opportunities offered by computer technology are part of the shifting environment that artist teachers face. When teachers are confronted by a surprise that disrupts their “knowing-in-action,”
teachers respond by asking themselves “‘What is this?’ and at the same time, ‘How have I been thinking about this?’” (Schon, 1985, p. 25). By critiquing their practice during class, as teaching is happening, artist teachers engage in “reflection-in-action.” Considering what happened during teaching after the class, is “reflection-on-action.” Responding to “surprises” (Schon, 1985, p. 24) by “reflection-in-action” and “reflection-on-action,” artist teachers critique their pedagogy, confront the tensions of new dimensions of practice and allow themselves to restructure, experiment, and explore (Schon, 1985) new ways of dealing with computer technology. Artist teachers should be well prepared to confront such surprises since they are immersed in the art field where their interaction with cutting edge experimentation through conversations with other experts and interaction with new artwork, bring them face-to-face with a broad range of practice, a variety of expanded tools and expressive possibilities.

**Summary**

This literature review discussed the influence of computer technology on drawing pedagogy by narrowing understanding of the broad influence of computer technology on society and the art world to the teaching studio and finally to artist teacher pedagogy. Firstly, the literature tells us that images are becoming our primary mode of communication (O’Gorman, 2006) and that computer technology is redefining art making (Bowen, 2003). Therefore is it important to equip students to navigate a “visual saturated world” (Gaudelius & Speirs, 2002, p. 15). Secondly, the teaching studio is both an incubator and a “practice field” (Senge, 1994, p. 83). It is structured to accommodate the studio method, the iterative cycle of art making and person centered teaching (Brandt, et al., 2013; Cossentino, 2002; Schon, 1987). Thirdly, the literature confirms that the artist
teacher is “a person who both makes and teaches art and is dedicated to both activities as a practitioner (Thornton, 2005, p. 167). Artist teachers teach by modeling artistic practice, mentoring aspiring artists and offering critique (Brandt et al., 2013; Brocato, 2009; Cossentino, 202; Heywood, 2009; Kuhn 2001; Singerman, 1999). Artist teachers are reflective practitioners (Schon, 1985).

The art making process, the art learning process and the art teaching process evolve through iterative cycles of making and doing, and reflection and critique. “Reflection-on-action” (Schon, 1985) is an especially key practice in art teaching that is central to this study. Key concepts regarding drawing and art making were explained in order to understand how drawing is taught in a teaching studio setting and the influence of computer technology on art making, learning and instruction.

Although the literature suggests that computer technology is influencing culture, the art world, the art studio, and the teaching of art, there is a gap in the literature about the perceptions of artist teachers on how new technologies are influencing their daily pedagogical practices, and how these adjustments are impacting them as artists as well as artist teachers. Therefore, this study investigated how Canadian postsecondary artist teachers respond to computer technology in their drawing pedagogy. Hopefully the findings will encourage artist teachers to reflect on their response to computer technology on their pedagogy and think about creative and responsible use of computer technology in the teaching studio.
CHAPTER THREE: METHOD

The purpose of this research was to explore how Canadian postsecondary artist teachers respond to computer technology in their drawing pedagogy, specifically with regards to the computer technology used in the teaching of drawing, the computer technology used for teacher administrative tasks, and the use of computer technology to encourage motivation, productivity and creativity in the drawing class. A qualitative approach is appropriate for this study due to the subjective nature of participants’ experiences (Creswell, 2008). The Delphi method is an appropriate design strategy for this study since it allows participants to co-construct knowledge both with other participants and the researcher in a reflective way (Adler & Ziglio, 1996). The Delphi method is a reflective process well suited to accommodate the constructivist and critical pedagogy lenses used to approach this study. Selection of participants, data collection procedures, data analysis and ethical considerations will be explained in this chapter.

Research Design

A qualitative approach is well suited for this inquiry in order to present the personal opinions and experiences of Canadian postsecondary artist teachers regarding their responses to computer technology in their artistry and drawing pedagogy.

Rather than survey a large sample and produce volumes of statistics, this research focuses on the experiences of a select group of Canadian postsecondary artist teachers in order to represent the participants’ responses as richly, deeply and authentically as possible (Denzin & Lincoln, 1994; Fosnot, 2005; Lincoln & Guba, 1985; Patton, 2002). By weaving together individual accounts to create a holistic picture, qualitative inquiry
enhances understanding (Creswell, 2008; Erlandson, Harris, Skipper, & Allen, 1993; Mason, 2002; Patton, 2002).

The Delphi Method

The Delphi method is an appropriate strategy for data collection and analysis in this study since it is an effective, flexible, and efficient research process well suited to structure group conversation in order to glean depth of understanding where there is incomplete knowledge of a problem (Adler & Ziglio, 1996; Linstone & Turoff, 1975; Skulmoski, Hartman, & Krahn, 2007). Through the iterative cycle of collecting feedback and questioning a group of purposely-selected experts, the Delphi method allows the researcher to pool and distil knowledge and judgements (Adler & Ziglio, 1996; Skulmoski et al., 2007). A Delphi study evolves based on controlled opinion feedback from the group (Adler & Ziglio, 1996), thereby focusing the “problems, opportunities, solutions, or forecasts. Each subsequent questionnaire is developed based on the results of the previous questionnaire” (Skulmoski et al., 2007, p. 2).

The Delphi method is especially effective when the subjective judgments of a group can clarify a problem that does not lend itself to a precise analytical technique (Adler & Ziglio, 1996; Linstone & Turoff, 1975). Delphi is also appropriate when a problem does not have adequate information or when a problem is complicated by several interconnected issues (Adler & Ziglio, 1996; Linstone & Turoff, 1975).

The Delphi method is useful to collectively generate new insight (Adler & Ziglio, 1996). Rather than pushing a quick compromise, the Delphi method supports critical discussion (Adler & Ziglio, 1996). By interviewing each participant individually, the
researcher assumes the role of discussion facilitator. Doing so, provides flexibility for discussion among participants despite distance and time constraints.

The Delphi method is known for generating rich feedback while protecting the anonymity of each participant (Skulmoski et al., 2007). The Delphi method allows participants to contribute to the group conversation freely, without worry about peer pressure or being limited by social (hierarchical or political) pressure. For these reasons the Delphi method is an excellent way to hear many candid viewpoints of individuals and the group as a whole to discuss a complex problem (Linstone & Turoff, 1975).

In this study, information was collected using Skulmoski et al.’s (2007) steps for a two-round Delphi method which is outlined as follows:

- Round One Interview
- Construction of the Comprehensive Summary
- Round Two Interview
- Construction of the Numeric Summary
- Construction of the Unanimous Summary

Data collection involved two rounds of one-on-one interviews with five purposely selected Canadian postsecondary artist teachers. In the first round of interviews participants were asked questions about how they respond to computer technology in their drawing pedagogy. Participants were asked to respond to an a priori table of computer technology forms that they might encounter in their drawing pedagogy.

After the first round of interviews the data was transcribed, analyzed, and condensed into a document called a Comprehensive Summary. The Comprehensive Summary was comprised of anonymous statements from all the participants. Each
participant was emailed the Comprehensive Summary prior to the second interview for member-checking, a process in which participants confirmed the accuracy of my interpretation of their contributions.

In the second interview, participants were asked to respond positively or negatively to the anonymous statements that comprised the Comprehensive Summary. During the second interview, participants were asked to respond to the statements with regard to their own pedagogy, thereby explicating and rationalizing their own pedagogy.

Following the second round of interviews, the Numeric Summary was constructed from participant feedback to the Comprehensive Summary. I then extracted only the statements with unanimous agreement from the Numeric Summary to form the Unanimous Summary. The Unanimous Summary was sent to the participants.

When the interview and member checking process was complete, I began thematic analysis by coding and then categorizing comments from verbatim transcribed interviews into three layers according to Schley and Noblit (1982) by “making the obvious, obvious,” “making the obvious, dubious,” and “making the hidden, obvious.”

**Pilot Study**

I completed two pilot studies before commencing this research. In the first study, I met with three former drawing instructors from the Ontario College of Art and Design University (OCADU). I met each participant separately for one informal interview. Two interviews were conducted face to face and one was by telephone. The participants were asked questions developed from my literature review. Questions were revised to more accurately capture desired perspectives and responses.
In a second pilot study, I tested my revised interview questions with two former drawing instructors from OCADU. I met with the two participants separately for both a first and second round of interviews. I used a simplified version of the Delphi research design and protocol.

In the first interview participants helped me to test and chose appropriate vocabulary and strengthen my interview questions. Participants of both the first and second pilot study contributed to building the table of a priori computer technology forms which was used in the final Round One Interview Guide (Appendix B). In the second pilot study I used a simplified version of the Delphi research design and protocol to test my interview questions. This informed the design of the Interview Guides (Appendix B and Appendix C).

Participants

Participants in this study were purposely selected (Creswell, 2008, Erlandson et al., 1993; Patton, 2002). I made a list of potential postsecondary institutions which offered studio drawing courses. I then researched possible participants by looking at faculty profiles posted on Ontario postsecondary institution websites. The criteria for possible candidates were very specific. I searched for postsecondary artist teachers who teach or have taught a postsecondary studio drawing class within the past 5 years, and who may use computer technology in their artistic practice and teaching studio. Of a group of 10 desirable possible participants, I emailed five possible participants a letter of invitation. The email consisted of a brief description of the objectives and proposed procedures of this study as well as an invitation to participate. If the targeted participant did not respond to the invitation within a week of my sending the email, I decided that I
would telephone the potential participant, asking them if they received the recruitment email and if they have any concern or questions about the research process. I would then again invite the potential participant to participate in the study. I was prepared to respect the participants’ wishes if they declined to participate. Three possible participants accepted my invitation by email, however, I did not hear back from two of the possible participants within a week, therefore I called them by telephone. During our telephone call, I asked the potential participants if they had received my email. One of them had not, so I was able to explain the invitation email orally. The other potential participant had received the email but did not respond because he did not think that he was an appropriate candidate. After answering their questions, both potential participants accepted the invitation to participate by telephone. The meeting time and place was arranged by telephone with all participants. Upon recruiting all five participants I emailed each participant individually. This email included an Informed Consent Form, Summary of Content (Appendix A), and the Round One Interview Guide (Appendix B).

Participants in this study were all postsecondary artist teachers who have taught a postsecondary studio drawing class within the past 5 years. As artist teachers, all participants were also practicing artists. This means that they were actively engaged in the art world by creating and exhibiting artwork. All participants in this study used computer technology in their artistic practice. While some have deliberately experimented with computer technology in their teaching, all have encountered computer technology in the drawing teaching studio.

Within the participant selection process, diversity was sought with regard to race, culture, age, and gender. The group of participants ranged in age between 30 and 70.
There were two female and three male participants. The culturally diverse group of participants included one Asian, one Caucasian, one European, one Latin American, and one Native Canadian.

In respect for their anonymity, I asked participants to choose a pseudonym. While participants were asked demographic related questions, I removed all discernable identifiers when referring to and quoting participants.

The Delphi method allows for flexibility since it can support a large or small-scale study (Skulmoski et al., 2007). Only five expert participants were selected because this is a manageable size to reflect difference and similarity with regard to the research question. Since I used a two-round Delphi method, considerable data was generated by a total of ten, one-hour individual interviews. In the volume of collected data, I discovered more potentially interesting findings after I had answered the research questions I had set out to answer. Therefore, I decided to continue with a second and third layer of analysis in order to present these discoveries.

**Data Collection and Analysis**

Data generated using Delphi method is an iterative cycle of collecting feedback and questioning a group of purposely-selected experts, then pooling and distilling knowledge and judgements form those experts into summaries, which are then presented to the group of experts for further feedback (Adler & Ziglio, 1996; Skulmoski et al., 2007). Thus, data analysis begins almost as soon as data is collected. The process is one of interviews, analysis and construction of a summary, presenting the summary to participants for further feedback, clarification, and extension of ideas, analysis and construction of summary documents, and a final round of member-checking from
participants to ensure their perspectives and voices have been accurately represented in the summaries as described below.

**Data Collection: Round One Interviews**

Prior to each round of interviews, I emailed each participant an Informed Consent Form and an Interview Guide (Appendix B, Appendix C). I conducted an individual, one-on-one, in-depth interview with each of the five participants at a location of the participant’s choice. Three interviews took place in participants’ offices and two interviews took place in the participants’ personal art studio. For the purpose of transcription, each interview was audio-recorded using my password protected personal cell phone. Each interview followed semi-structured interview guide (Doody & Noonan, 2013), which may be viewed in Appendix B. I began the interviews by reviewing the informed consent form. I asked the participants if they had any questions regarding the study or the informed consent form. There were some questions regarding confidentiality, parameters of the study and clarifying definitions. After reviewing the parameters of the study and obtaining both oral and written informed consent from participants, I asked participants to keep their answers succinct and explicit, and began asking interview questions.

The interview began with demographic questions. I asked participants to describe themselves, their artwork, and their teaching so that I could gain an understanding of their point of view. I then asked participants to refer to a table of computer technology organized by categories of hardware, software, and the Internet. As we read through this table together, I checked off the forms of technology with which participants were familiar. I crossed out the forms of technology that were unfamiliar to participants, or that
participants felt were irrelevant. I then asked participants if there were any forms of
computer technology that they would like to add to the table. This exercise was an
efficient way for me to establish which forms of computer technology participants
encountered in their personal art studios and their teaching studios. With this groundwork
in place, I began the next part of the interview questions, asking participants to explain
how, if at all, they use forms of computer technology in their teaching to promote
motivation, productivity and creativity among students. Participants were asked if they
use computer technology forms for administrative tasks. Participants were asked if they
use computer technology to promote technique, aesthetics, and conceptual ideas when
teaching.

To conclude, participants were asked if they had anything further to add regarding
their use of computer technology in their drawing pedagogy.

**Data Analysis: Comprehensive Summary**

Following each interview, Round One interviews were transcribed verbatim.
From these transcripts I constructed a Comprehensive Summary (Appendix D) consisting
of statements derived from participants’ contributions. I began by amending the a priori
table of possible forms of computer technology used by participants. First, I checked to
be sure that all additional forms of computer technology were represented. I then placed
the initial of participants’ pseudonyms beside each technology corresponding to the
participants’ responses to the table. I made another iteration of the table, which
represented the number of participants who use each form of computer technology. Using
the frequency chart and the verbatim transcripts, I created sentence statements. First, I
read through the verbatim transcript again, writing the topic and computer technology
form being discussed in the margin. I also highlighted possible quotations. I then extracted verbatim statements from the transcript. I summarized the verbatim quotes to remove extraneous language and create sentence statements. I grouped similar statements together and summarized these into one single statement. Upon determining the final statements, I indicated the number of participants contributing to each statement in a corresponding frequency column. Beside each statement, I placed the initials of participants that had contributed to the content of each statement. I confirmed participants’ contributions with the corresponding initials-version of the a priori table. The resulting Comprehensive Summary (Appendix D) was organized into three categories including hardware, software, and the Internet, following the structure of the a priori table.

I created a personalized copy of the comprehensive summary for each participant by replacing their initial (beside each statement) with an asterisk and erasing the initials of the other contributors.

**Data Collection: Round Two Interviews**

In preparation for the second interview, I emailed each participant a copy of the Round Two Interview Guide (Appendix C) and a personalized copy of the Comprehensive Summary (Appendix D) with each participant’s contribution to statements indicated by an asterisk. The personalized Comprehensive Summary enabled each participant to see their own statements in relationship to the anonymous statements of the other participants. Participants were asked to prepare for the second interview by reviewing the personalized copy of the Comprehensive Summary and the Round Two Interview Guide. Referring to the Comprehensive Summary, participants were asked to
select three statements, with which they strongly agreed or disagreed. Participants were also asked to think about which three statements they considered to be the most relevant regarding the influence of computer technology on artist teachers’ drawing pedagogy.

Participants were asked to answer what three major influences shaped their strongly held beliefs about teaching drawing and the use of computer technology. In the second interview participants were invited to respond to the anonymous statements that comprise the Comprehensive Summary in order to explicate or further describe their own drawing pedagogy.

I met with each participant individually to conduct the second round of interviews. I began the second interview by reminding participants of their right to withdraw at any time. After orally obtaining participants’ consent to continue, they were directed to the Comprehensive Summary (Appendix D). I invited participants to share their prepared responses to three pointed questions. First, participants indicated which three statements of the Comprehensive Summary they strongly agreed or disagreed with. Participants were asked to explain their selections. Secondly, participants explained which three statements they considered to be the most relevant contributions regarding how artist teaches respond to computer technology in their drawing pedagogy. Thirdly, participants shared three major influences that shaped their strongly held beliefs about teaching drawing and the use of computer technology. I asked participants how they felt about the influence of computer technology on students’ creative process.

While creating the comprehensive statements, I noticed that some participants contributed conflicting statements during the first interview. I asked participants to verify
my interpretation of their contributions, as a form of member checking. Participants clarified and confirmed their contributions to the Comprehensive Summary.

**Data Analysis: Unanimous Summary**

When all interviews were transcribed I created the Numeric Summary (Appendix E) by amending the anonymous statements of the Comprehensive Summary (Appendix D) as necessary and adding new statements from the Round Two interviews. New statements were extracted from the Round Two interviews by reading the verbatim Round Two interview transcriptions, writing the discussion topics in the margins and highlighting possible quotes. Based on the ideas in the verbatim transcripts, I revised the wording of the Comprehensive Summary statements and updated the corresponding frequency column.

The Unanimous Summary (Appendix F) was created by extracting only the statements of unanimous agreement from the Numeric Summary (Appendix E).

To summarize participants’ responses to three pointed Round Two interview questions, a table of Convergence of Round Two Interview Questions (Appendix G) was constructed. The Convergence of Round Two Interview Questions was created by extracting participants' individual statements from the transcripts, grouping them according to the question answered, and summarizing the ideas. The first grouping consisted of statements participants indicated to most strongly agree or disagree with. A second grouping contained statements they indicated to be the most important. Finally, a third grouping contained three influences that shaped their strongly held beliefs. The Convergence of Round Two Interview Questions (Appendix G) was used to identify themes, and structure Layer Three of the analysis.
The Numeric Summary (Appendix E), the Unanimous Summary (Appendix F), the Convergence of Round Two Interview Questions (Appendix G), and verbatim transcripts were used as the basis for the three layer analysis detailed in chapter 4 from which the findings of the study were developed. The analysis and findings are detailed in chapter 4.

**Quality of Research: Trustworthiness**

According to Erlandson et al. (1993), sound research “must demonstrate its truth value, provide the basis for applying it, and allow for external judgements to be made about the consistency of its procedures and the neutrality of its findings or decisions” (p. 29). In short, Lincoln and Guba (1985) define trustworthiness as findings “worth paying attention to” (p. 290). In this study trustworthiness is established by documenting an audit trail, peer debriefing, and member checking.

**Audit Trail**

The researcher’s journal is a method of collecting data, in addition, an audit trail ensures trustworthiness. By recording the researchers’ daily “schedule and logistics, insights, and reasons for methodological decision” (Erlandson et al., 1993, p. 143), the researcher can track how the study unfolds. Lincoln and Guba (1985) recommend adding process notes and raw data notes and analysis sheets to the researcher’s thick descriptions to make the journal more like a scrapbook. At root, “the key to the audit trail is reporting no “fact” without noting its source and making no assertions without supporting data” (Erlandson et al., 1993, p. 150). I kept a physical journal to record my academic activities. I drew diagrams and tables and worked out ideas on paper in this journal. I also kept an audio journal, which I used most consistently during the data collection stage of
this research. I kept an online journal as well to document my academic progress. In these ways I hope to have ensured the trustworthiness of my procedures and analysis.

**Peer Debriefing**

One of Vygotsky’s major contributions to the philosophy of education is the notion of the More Knowedgable Other (MKO) (Cicconi, 2014). Cicconi (2014) explains that the MKO is “someone with more knowledge or a greater understanding of a particular task or process than the leaner” (p. 58). In this study, my thesis supervisor acted as the MKO as she reviewed the Comprehensive Summary, Numeric Summary, and Unanimous Summary documents I constructed to ensure the accuracy of my interpretations and presentation of participants’ perspectives.

**Member Checking**

Member checking is an important way to ensure the credibility of this study. During the pilot study, participants co-constructed and reviewed interview questions during the development of both Round One and Round Two interview guides. During the second interview of the two-round Delphi process, participants were asked to review and respond to the Comprehensive Summary statements which were created based on my interpretation of participants’ round one interview contributions. In this way, participants were invited to verify that the “reconstructions of the inquirer [were] recognizable” (Erlandson, 1993, p. 142), and, in other words, to confirm the accuracy of my account in presenting their perspectives and opinions (Creswell, 2008).

**Limitations of the Study**

This study has several limitations. As the sole interpreter of the participants’ stories, I may be biased by my own experiences of the teaching studio and drawing
pedagogy since I have been both a student and teacher of visual art. While the emergent themes of this study may be somewhat generalizable, they are shaped by a small group of purposely selected participants (Lincoln & Guba, 1985). While Delphi is an excellent method to come to a consensus of opinion, the resulting opinions may not represent the opinions of all artist teachers (Branchequ, Janz, & Wetherbe, 1996). Lindstone and Turoff (1975) point out eight pitfalls of the Delphi method, where the researcher may compromise the strength of this method of study. The urge to predict, simplify, and discount the future, sloppy execution, illusory experience, deception, overselling, and optimist-pessimist bias are dangers a Delphi researcher must be conscious to avoid. I may have affected the participants’ responses by how I interacted with participants during the in-person interview (Brenner, 2006). For example, I may have compromised the honesty of a response by expressing surprise or disapproval or by speaking for the participant by filling in silence. Aware of this, I have made a great effort to “listen actively and note any new or interesting data the participant provides” (Doody & Noonan, 2013, p. 29). The pilot interviews helped me to practice interviewing. While I did my best to be an active listener and a confident interviewer, I could not control how participants’ responses may have been affected by our social class, age, race, and gender differences (Brenner, 2006).

As well, as the sole interpreter of the participants’ stories, I may be biased by my own experiences of the teaching studio and drawing pedagogy since I have been both a student and teacher of visual art; therefore to minimize bias I sought a peer debriefer to review my interpretations and summary constructions. I have also been especially vigilant to document an audit trail by keeping a reflective academic journal, thereby hoping to restrain these limitations.
Ethical Considerations

Prior to recruiting participants and commencing data collection, I sought ethical clearance from the Brock University Social Science Research Ethics Board on October 31, 2013. Ethical clearance for this research was granted on November 26, 2013. The file number of the certificate is 13-102 - FRANCIS. There were no anticipated risks to participants. I emailed participants a Letter of Invitation, Informed Consent Form, Summary of Content to be Discussed (Appendix A), and Interview Guide prior to commencing interviews. The Informed Consent Form outlined confidentiality policies as well as risks and benefits of participating in the study. Both my supervisor’s and my telephone number and email addresses were provided to participants in the Informed Consent Form. The Informed Consent Form informed participants of their right to withdraw from this study, either orally or in writing, by contacting myself, or my supervisor, at any time without penalty. In order to maintain ethical integrity I asked each participant to select a pseudonym, which I have used with their consent throughout the study to protect participants’ anonymity.

Additionally, I omitted personal identities and discernable identifiers when quoting and describing participants. Personal information such as telephone numbers, addresses, names of post secondary institutions were kept in a locked file on my locked personal computer in my home office. Audio recordings of the interviews were temporarily stored on my locked personal cell phone until I transferred the files to my locked personal computer. I then permanently erased the audio files from my locked personal cell phone and stored the audio files on my locked personal computer in a locked file in my home office for the duration of the research. I will permanently delete
the audio files, verbatim transcriptions, and participants’ personal identifiable
information from my locked password protected personal computer when this Master of
Education thesis is passed and confirmed.

**Challenges of the Interview and Interpretive Process**

Although participants shared experiences of similar contexts, that of the art world, the personal studio and the teaching studio, each of them was unique. As artists, each participant extended their art into the way they projected themselves both in dress and the space around them. Meeting participants in person in their space enabled me to see a snapshot of their personality, values and artistic lifestyle. It was an honour to be invited into these very personal spaces and to meet each of the participants face to face. I learned a great deal from my encounter with each of them. In the following paragraphs I describe some of the highlights and challenges I faced during the interview and interpretive process.

Two participants invited me to their personal studios for our interviews. When I interviewed Daisy it was a sunny day. I pulled up to a historic building nested in a ring of soft pines. Daisy greeted me with a warm smile as she held open a wooden screen door to welcome me. She offered me hand knit slippers and a vintage chair beside a large computer screen. A few moments later, she reappeared with a tray of steaming tea served in pottery mugs handmade by her friends. I was nervous at first since it was one of the first interviews I had conducted, but Daisy’s hospitality and enthusiasm put me at ease. It was a pleasant and enjoyable interview.

Tati also invited me to conduct our interview in his studio. The space was under construction with minimalist decor. I was seated on a white, modern couch in a white,
modern room that echoed Tati’s whispering voice. Although quiet, his answers were simple and profound, reflecting his simple, meticulous fashion and interior design. Tati was peaceful, calm, and confident.

While Daisy and Tati invited me into their studios, the other interviews took place in office spaces at the postsecondary institutions where the participants taught. Although furnished with a standard corner office desk and grey venetian blinds, Gus’s office was unlike a typical industrial office space. Visual art was displayed on every wall and every surface was strewn with electrical wires, computer cables, and technology devices. Stretched canvas frame paintings leaned stacked against the wall, while several computer screens congregated around the participant like eager students. I sat in a chair across a desk island covered with thick art books, open magazine journals, electrical and computer wires, and stacks of paper. Gus was enthusiastic and honest throughout the interview conversation.

In general, my first experience of academic data collection was pleasant, but not without two notable exceptions. In hindsight, I recognize that my interview with Migizie was abusive. Migizie and I agreed to meet at noon for a one hour interview. We met in an open concept shared office which was divided into three parts, with a comfortable couch meeting area, two computers at a bar height counter along one wall, and a large table for grading assignments. A wall of windows let in lots of natural light, and was peopled with thriving plants. When I arrived, I was expected to help move a painting, which, as it turned out, involved me delivering the painting and waiting for over half an hour while Migizie had an informal meeting. On our way back, Migizie picked up something to eat. We finally began our meeting. She insisted reading the hard copy of the interview guide
before I could begin the interview. Outwardly, I waited patiently, watching the sun move across the window wall, while inside I reminded myself that my purpose here was simply to collect precious data at all cost. After Migizie finished reading the document, she noticed the time and suddenly became frantic because she wanted to go to a “short” lecture, insisting that it was relevant to my research and that I come along. The lecture was long and unrelated. Throughout the afternoon I suggested we reschedule our interview several times, but Migizie insisted that the errands would only take a minute, or half an hour, before springing new errands on me throughout the afternoon until suddenly it was dark outside. Finally we returned to the office to begin the interview.

Unfortunately Migizie’s responses were as fragmented and erratic as my afternoon had been. Often she did not finish thoughts or sentences. I tried to be a respectful listener while trying to keep track of what data I still needed, however, after a mind-numbing day of waiting, I was tired and wilted. I thanked Migizie for her insights and we parted on good terms. But I was exhausted. I went straight to a pub and ordered fries. After a glass of beer, I plugged in my headphones and listened to the audio recording of our interview, panning for gold: hoping to find a nugget in the river.

Of the total of 10 interviews, both my first and last interview was with Baco. Both of my interviews with Baco were stressful for me. Before my first interview, I sat in my vehicle, reviewing the interview guide in preparation for my very first interview. I was nervous, my sweating hands indifferent to the December cold. I walked through a winter garden and into the back door of a shiny new art building. The office looked more like a studio than an office, with sailing ceilings, whitewashed walls and a large window. I walked through an aisle between mismatching vintage metal filing cabinets and was
invited to sit on a paint splattered metal stool between a long row of tables. The tables to my right were sparse with two computer workstations. Above them hung a large poster of optical illusion art. Facing this was a large oil painting under which dishevelled heaps of student paper drawings waited for grading on another long counter of tables. Baco sat neatly against the window, leaning back in an office chair with crossed legs and incessantly tapping a pen. I strained to hear his voice as monotone and disinterested as the white noise of a ceiling fan. We both had a hard copy of the interview guide. I was unable to conduct the interview the way I had rehearsed because Baco began by reading the interview guide out loud and answering the questions in a nonlinear way. I became distressed because I could not keep track of what topics had been covered and what information I was missing. With my eye on the time, I grew increasingly nervous. I worked hard to remain attentive, composed and confident even though I was shrivelling inside. I asked for an additional 15 minutes. During the final minutes of our interview, I took the reins and open fired direct questions, interrupting once I had gotten an answer and moving along quickly. I apologized for rushing, but in my mind I was racing to glean from those last 15 minutes everything I had predicted would take an hour. I accomplished most of the data collection in those final minutes. I thanked Baco for his insight and we shared a few brief moments of small talk while I put on my winter coat. The door of the art building slammed behind me in a gust of wind and I let out an exasperated sigh.

I found myself conducting my last interview where I began, in Baco’s office. The interview unfolded in a similar way. At the end I was again granted 15 minutes more time. Unfortunately I was unable to lead the final interview at all. While I kept a close eye on the time, Baco kept adding points. Suddenly he grew frustrated and ended the
interview abruptly. Turning his office chair toward the computer, he picked up the telephone and ignored me. I thanked him for his insight between pauses in his telephone conversation and slipped out into the twilight feeling hurt and invisible. Back in my vehicle, I rested my head on the steering wheel, relieved that the interview phase of this research was over.

Brenner (2006) warns that emergent interviews typically generate irrelevant data that can be difficult and time consuming to process. I found this especially true of pairing emergent interview structure with artist teacher participants. It is possible that participants were not familiar with formal academic interview protocol. Perhaps artist teachers are used to art magazine interviews, which typically exploit the eccentricity of the artist, and focus on the artwork they produce. Perhaps this is why some participants were uncomfortable, veering into discourse about unrelated topics. It is possible that some participants struggled to exercise mutual respect since I am a Canadian-born, Caucasian female student in my late 20s. Whatever the case may be, the data collection process was challenging for me, and sorting through pages of irrelevant data was time consuming. I found it difficult to extract quotes, statements and themes from the verbatim transcripts.
CHAPTER FOUR: FINDINGS

This chapter includes findings that answer the research question of how Canadian, postsecondary artist teachers respond to computer technology in their drawing pedagogy, specifically with regards to the computer technology used in the teaching of drawing, the computer technology used for teacher administrative tasks, and the use of computer technology to encourage motivation, productivity, and creativity in the drawing class.

This tri-layer analysis is derived from data generated by five participants. Analysis is based on a hermeneutic theoretical framework in order to “make the obvious, obvious,” “make the obvious, dubious,” and “make the hidden, obvious” (Schlety and Noblit, 1982). Patton (2002) explains that the first layer of analysis, “making the obvious, obvious,” confirms that what we know is supported by the data (p. 408). The second layer, “making the obvious, dubious,” allows the researcher to interpret and challenge the findings of layer one (Patton, 2002). This allows the researcher to highlight controversies that arise from participant discussion. In the third layer, the “hidden is made obvious” by analyzing the entire set of data holistically to identify themes regarding artist teachers’ strongly held beliefs.

Language

The language in this chapter has been carefully chosen to describe a snapshot of the wide spectrum of ever-changing computer technology. Several word choices deserve attention. The term “cell phones” in this research is a generic term that includes “smart phones” and other mobile communication devices. Today, most cell phones are smart phones equipped with a camera, Internet access, and a range of applications. Participants differentiated between cell phones, smart phones, and iPads. However, in conversation
participants used the term cell phone to discuss this group of computer technology.

Similarly, references to “laptop,” a portable personal computer, include a range of computer styles. The stationary desktop computer is on one end of the range spectrum, while small hand held computer devices such as tablets or iPads are on the other. The laptop fits in the middle of this spectrum. Computer tablets and iPads are similar to laptop computers as platforms for software since they are used for internet browsing and computing in general. However, drawing tablets are also unique input devices specifically designed to emulate drawing. Drawing tablets are a computer tool for creating artwork. In conversation, participants referred to this range of computer technology as laptop, therefore this term is used as the title of this technology grouping.

**Layer One: Stating the Obvious**

The findings of the first layer of this analysis enabled me to answer the three research questions of this study regarding how, if at all, computer technology is used in the teaching of drawing, teacher administrative tasks, and to encourage motivation, productivity, and creativity in the drawing class. The findings are based upon a priori categories initially determined by types of current technology, which were organized by hardware, software, and Internet technology. These a priori categories generated participant discussion about cell phones, laptops, projectors, music, and digital images. The Layer One categories below reflect general unanimity among participants.

**Cell Phones**

Participants agreed that cell phones could be helpful for student learning. Cell phones can be used in at least two ways. The first use of cell phones is that they can be used as a visual communication tool due to their photographic capacity. Participants
welcome using the cell phone for research and visual communication for concept development and creating artwork. The second use of cell phones is off task communication. This is discouraged during class time, as it is considered disrespectful by participants.

The following comments were agreed upon unanimously by all of the participants. I combined phrases of the participants’ words to create the following summary statements.

- I allow cell phone use in the classroom as a visual communication tool (e.g., audio record, video record, photograph blackboard or physical source material in class, for research and ideation, to show images of artwork in progress).
- Students are usually respectful with cell phone use and it is not a chronic problem (distracting to my students and/or my teaching) during class time.
- I work with students’ technological culture, not against it. In order to keep art instruction current, I am interested/excited about the potential of digital technology in the classroom.

**Laptop Computer**

Participants use the laptop for research in preparation for class, during class to present lectures, and outside of class time when they use email and post additional resources on the Learning Management System (LMS). LMS is a communication network specific to each postsecondary institution. All agreed that laptop computers are welcomed in the teaching studio as long as they are used responsibly. While students also use lap top computers in the same ways, the use of tablets, iPads, smart phones, and other mobile communication devices is becoming more common during class. Students’ appropriate use of these devices includes research, communication both in and outside of
class, ideation (building the concept for an art work before pursuing it), and creation. The following statements of unanimous agreement are directly from the Unanimous Summary table (Appendix F), derived from participants’ feedback and commentary.

- I use a laptop/computer to access the Learning Management System (LMS) (e.g., emailing, posting supplementary material, and posting student marks).
- I use a laptop/computer to research in preparation for teaching.
- I use a laptop during class time (e.g., to summon presentations for lecture/talks, to show examples of concepts to students while they are working, sketching from projected image as source material, editing images)
- I allow students to work on iPads and drawing tablets during class time.

**Digital Projector**

The digital projector is the computer technology that has replaced the use of overhead slide projectors. Digital projectors are used to display images such as PowerPoint, and are useful for presenting lectures/talks, facilitating student presentations and creating and showing artwork. While it is common for most participants to wheel a digital projector into the teaching studio on a cart, some of the participants’ teaching studios are equipped “smart rooms” with built in digital projectors. The following comments are a synthesis of what participants said during interviews.

Unanimous agreement of the following comments shows that digital projectors are especially valuable to artist teachers since visual communication is critical for visual art drawing instruction and learning.

- I use a digital projector to present lectures/talks.
• I allow students to present assignments and/or final artwork projects using digital projectors.

**Digital Music**

While artist teachers often present a lecture or talk during class, the teaching studio is characterized by independent artistic exploration. Participants agreed that it is appropriate to allow students to listen to their own music through headphones during independent work times in class. The following statement was derived from participants’ first interview comments and confirmed in the second interview by all participants.

• I allow students to listen to their own music through headphones during class.

**Digital Image**

Prior to computer technology, visual images were created by drawing, painting, printing, or taking photographs. Computer technology can be used to complement these traditional forms of image making. Since computer technology is becoming more affordable, accessible, and adaptable to visual art, artists are now able to create and modify visual images digitally. Digital technology may be used to create images. For example, Photoshop is designed to enable artists to draw and paint with tools that emulate physical tools (e.g., graphite pencil and paintbrushes). Students use tablet devices to accomplish these images. In this way it is possible for artists to create work that is born digital (UNESCO, n.d., Annex 5, Article 1). Although using digital images as source material for making artwork is a fairly recent practice, participants unanimously agree:

• I allow students to use digital images as source material.
• I allow students to photograph physical source material in class and to continue to work on their assignment at home using the digital image as source material to allow them to finish the assignment.

• I will provide feedback on digital images of work in progress.

Despite their interest and enthusiasm for the influence of the digital image in the teaching studio all participants agree:

• I prefer to work directly with the student on physical artwork.

Computer Technology Is Used in the Teaching of Drawing

Participants confirmed that computer technology is used in a variety of ways for teaching drawing. Participants communicate with students through computer technology mediation in order to provide critique feedback for art making and learning. Participants also use computer technology as a medium for creating artwork and a tool for training students’ in drawing technique.

Participants use ICT including cell phones, computer devices, the Internet and LMS to communicate with students. Migizie, Daisy, and Tati use mobile computer technology devices with screens (e.g., cell phones, tablets and laptops) in order to visually communicate with students. For example, students will “show work in progress … on the screen” (2T6) for teacher and student to discuss. Students sometimes correspond with artist teachers via email and receive feedback on images of artwork assignments. Migizie digitally photographs student artwork and edits the digital image of the artwork in order to explain how to improve the artwork. In this way Migizie uses the digital camera to offer students critique and refine students’ drawing technique. Gus digitally photographs
student artwork to “look back and see progress leading up to [students’] final assignment” (1G10).

Participants make use of computer technology as a medium for art making, a tool for skill training, and a vehicle for displaying student artwork. Migizie says “I see technology as a medium” (2M5), facilitating students to use computer tablets for drawing and computer software for editing and assembling artwork. Tati shares an example of one student who manipulates digital images in the process of creating physical artwork, thereby using computer technology as a medium for making artwork. Gus aims to “teach students what are the best tools [including computer technology] to be using to convey [meaning]” (2G8). Gus and Baco agree that some students incorporate computer technology into artwork in a way that strengthens the artwork. For example, Gus described two students who used digital projectors to create drawing assignments. One student made a series of drawings on a tablet, compressed them into an animation and projected the animated drawings onto luggage. Another student traced the movements of sign language gestures to create an animated line drawing (1G12).

Migizie uses computer tablets as a tool for teaching students how to “enhance [eye-hand co ordination] skill” (2M7). She insists that the skills required to make artwork using computer tablets trains students in technical skills which “makes the [art]work stronger” (2M8). Computer technology software enables students to experiment when art making, freeing students to “move [visual] elements around a lot” (2M8). Migizie encourages students to “work with the tablet, take all of their drawings and come up with some kind of composition that is interesting by collaging these images together...[they]
then scan their images and play with them on the computer” (2M5). Daisy shares a story about one student who pulled out a digital drawing pad to start to work out...compositions and ideas...the student was working a lot more quickly with a lot more complex solutions to the problem than would have been possible just with a pencil and paper. (2D2)

Gus uses digital images as a tool for training students to see value and create proportional composition. First he asks students to draw a blurry digital image, then he shows students the same digital image in focus. In this way students focus more on “value and tone...without getting stuck on...how accurate your representation” (1G8).

All participants agreed that they prefer to see artwork in the context in which it is intended to be seen. Regarding student artwork Daisy explains that it “depends nowadays what the intention is of the student [artist] behind the [art]work—if it’s meant to be on a web platform, then that's where I'll view it” (1D10). Daisy posts her students’ drawing animation assignments online where they can be viewed by an international audience.

**Computer Technology Is Used for Teacher Administrative Tasks**

Participants confirmed that they use computer technology including cell phones, laptops and Learning Management Systems (LMS) to manage the studio class. Participants and students use computer technology for research when preparing lessons and assignments.

Every participant in this study was familiar with LMS supported by their postsecondary institution. In short the LMS is a communication hub between artist teachers and students. Daisy describes the LMS as an
online teaching aid, organizational aid, we can post all of our project descriptions, our course outline, as well there is a discussion group, links to the students via email, like an easy email link, grading, assessment potentials, as well as a blog for the students to post material on … I find this is fantastic because it allows the students to access the material that is presented in the course all the time at their leisure so I post all my image lectures in PowerPoint presentations … [so that students] have those images to reference. (2D3)

With the support of LMS, student “engagement with the material continues outside the classroom” (2D4). LMS are online and can be accessed by a variety of computer technology forms including laptops. Participants value the laptop as “an important vehicle for communication” (2M5), especially “in this day and age where digital media is kind of ubiquitous- to have one space which is kind of a hub of sorts … [is] crucial for me” (2G1). Students frequently communicate with participants via the LMS. Participants considered email supported by the LMS useful for communicating with students about personal matters, for example medical absences. While most participants use LMS to communicate with students, Migizie provides students with her cell phone number. She admits “a lot of my students text me all the time” (2M8). Daisy has very clear parameters regarding communication with students. She explains that students “think that I’m online 24/7 if I don't respond to their email within a couple of hours they start to panic. I let them know … I check my email in the morning and … evening … I will get back to them” (1D16). In general participants do not have a problem with the amount of email communication with students.

All participants confirmed that they use computer technology to conduct research
in order to prepare for class, construct assignments and stay current in their field. Gus uses computer technology to research articles and artist websites because it is “a lot more accessible...more research is happening online” (2G7). Tati admits that he spends most of his research time on screen because “I’m closer to this [cell phone] all the time … you are flipping your iPad, go online, looking [at artwork]” (2T15). Despite the convenience of computer mediated research participants stress the value of physical research as well. Daisy reminds me that “art is gathered from every source. … I’m not … just doing my research online … I go to a lot of exhibitions that I will talk about to the students … [in order to share] that real life encounter that I bring into the classroom” (2D11).

Students also use computer technology to research in preparation for creating art assignments. Gus and Tati’s students typically use laptops and computer tablets during class for online research in preparation for creating artwork. For example, students may look up artwork for inspiration or read about “theories surrounding aesthetics and philosophies surrounding beauty” (2G3). Students also use mobile computer technology devices to retrieve digital images which they use as source material to inform art making.

Artist teachers typically present lectures during class in order to outline assignments and explain techniques. Daisy considers the digital projector an invaluable tool “to disseminate images and pictures and videos anywhere, anytime [for example during class to provide]...concrete images and inspiration while the students are working in the studio” (2D4). Gus uses computer technology to “embed URLs, and video, and sound” (2G5) into his lecture presentations to enhance and compliment his teaching. Migizie prefers to use digital images and digital projector for lecture presentations in order to avoid using heavy and cumbersome carousel projectors. Additionally, digital
image lecture presentations may be posted on the class LMS for artist teachers and students to access at any time.

**Computer Technology to Encourage and Motivate Productivity and Creativity in the Drawing Class**

Some participants use computer technology to enliven teaching of foundational principals and make learning contemporary. By encouraging students to use medium that they feel comfortable using, Daisy and Gus observe that students who create artwork in mediums with which they feel most comfortable, produce stronger artwork. For example, Daisy encourages students to use digital cameras and cell phone cameras to collect images for an exercise regarding colour and composition. She explained that students are “really comfortable with their phones and their digital cameras and I find they get really excited to start collecting images” (1D13).

Daisy also encourages students to use Photoshop for some assignments in order to train students to structure visual compositions. In general, participants allow students to use digital images as source material for making artwork assignments. Instead of setting up a physical still life during studio class, Tati allows students to create and photograph their own still life and use the resulting digital photograph as source material for creating drawings. Gus encourages students to incorporate digital projectors with traditional drawing medium. Migizie promotes the use of computer drawing tablets during studio class by enabling students to experiment with rented technology.

**Layer Two: Making the Obvious Dubious**

During the Delphi interview process I discovered information that I felt could be additional findings for this study. I used Schlety and Noblit's (1982) layers of analysis to
further uncover deeper findings. This second layer of analysis reveals three distinct controversies that arose during participant discussion regarding the influence of computer technology on pedagogy. The first controversy was regarding whether the use of digital images in art making, art teaching and art research is helpful or harmful. The second controversy was regarding whether the influence of computer technology on the experience of art making may be helpful or harmful. The third controversy was regarding whether teaching with computer technology may be helpful or harmful.

**The Digital Image May Be Helpful or Harmful**

While all participants in this study agreed that the digital image is a part of their teaching studio, they had different opinions about the parameters surrounding the use of digital image sources in art making during class, art teaching, and art research. Discussion of these controversies follows.

**The digital image as source material for art making.** To make visual art images, artists may begin by observing physical objects, remembering things that they have experienced or seen, or generating art from their fantasy or imagination. Artists may also combine existing images together in order to create a new image. The material that is used to create artwork is called source material. Traditionally, source material is a physical object (a bowl of apples), a memory of an object (a memory of a bowl of apples), or an imagination of an object (an imagination of a bowl full of apple-like forms). Recently it has become such common practice for students to use digital photographic images as source material for artwork to make artwork during class, that they no longer question the legitimacy of this practice. For example, an artist may use a photograph of a bowl of apples to inform a drawing.
It is increasingly common for cell phones to be equipped with digital cameras; this makes it easy to collect, share, and view digital images. Digital images are easily accessed through computer technology (e.g. cell phones) and the Internet. Artists often do not bother to print a digital image that they have photographed or found and selected to reference as source material. It is becoming more common for artists to use the computer screen directly to reference source material that guides them as they create artwork. For example, an artist may look at computer screen pixels that form the digital image of a bowl of apples in order to draw a bowl of apples. Tati explains:

When I was a student I used to bring objects [to studio class]...I would paint from whatever I would set up in front of me. Students go online and look for images of still life, they make their own [still life] and take a photograph of that and show it on a laptop or screen. (2T2)

Traditionally, the artist teacher sets up a physical still life display (e.g., a bowl of apples) in the studio class as source material for students to draw. Additionally, nude models are hired to pose as physical source material for drawing students. Some artist teachers continue to set up physical source material during class from which students are expected to create artwork. However, some “[Students] prefer to take [photographs] even if the still life is in front of them” (1D11). Tati agrees: “Whether you have the [physical] thing in front of you is irrelevant. … [Students] don’t make that kind of critical judgement” (2T9).

In some teaching studios, creating artwork from digital source images is so commonplace that some artist teachers no longer make the effort to set up physical source
material for students to create artwork from during class: “I don’t even set up [a] still life anymore. … [Students] create their own images” (1T8).

In contrast, some artist teachers insist that students create artwork directly from physical source material. When working from physical source material, artists translate what they see in three dimensions into a two dimensional artwork. Artists use medium and illusion techniques (e.g., perspective) in order to convey the physical source object in their artwork. Students who look at a two-dimensional image as source material do not have to translate the three-dimensional source material themselves. This is because: “images are flattened... [the translation process has already occurred] in the choice of the medium that [students] translate from” (2T5). When working from images as source material, Daisy believes students are “cheating themselves” (1D11). For this reason Migizie does not allow her students to photograph physical still life during class. Students are only permitted to photograph still life if “[students] don’t finish what they’re doing in class and they really want to do a little bit more work” (1M13).

**Support for digital images as source material for art making.** Some artist teachers encourage students to use digital images. These artist teachers assert that while drawing the final artwork is important, the manner by which students arrive at the final drawing may be informed by digital source material. For example, Migize expects that students will use (digital) photographic source material to help them create a coherent drawing of an imaginary creature: “[Students] will probably use photographic material, digital material...but they have to draw it” (1M14). Tati shares another example of how digital images are used in art making in the teaching studio. One of his students selects
images of figures from popular culture (fashion magazine models photographed in classical poses) as source material for traditionally styled artworks.

There are some advantages of working from digital images as source material. Computer technology, for example, microscopic and telescopic cameras, can provide new possibilities for art making by allowing artists to see things that they could otherwise not see. Photographs even allow us to look into the past. Baco shares: “without the camera we wouldn’t have images of war” (2B16).

High-resolution digital images can be enlarged, giving artists the ability to see what is sometimes difficult to see with unaided vision. The simplicity of low-resolution digital images can benefit artists who wish to use a digital image as a springboard upon which to build their own imaginative interpretation. Artists typically build an artwork with physical layers of medium as they respond to (interpret and convey) source material. Digital tools enable artists to emulate and extend this collage practice. In this way, artists often inevitably add more lines or colours than are discernable in the source material. Since the “digital image is less than a material image” (2T3), this leaves even more room for artistic interpretation of the source material because artists are compelled to add more to the artwork than what they can see in a source material image of poor quality.

**Opposition to digital images as source material for art making.** Despite growing interest in how digital images might be used to make visual art, some artists discourage the use of digital images as source material. Some artist teachers are concerned that by using digital images as source material students are tempted to reproduce “a technical translation from one medium to another which is not particularly creative” (1B14). Merely reproducing an existing image without adding interpretive
meaning is redundant. Artist teachers agree that “something has to happen between the artist and the photograph” (2B16). I understand this to mean that the artist's interpretation of source material is important in the art making process.

Some artist teachers concede that while digital image source material can be helpful as reference, it must not become a crutch. Migizie explains “I allow [students] to use the digital image as a mnemonic device” (2M17). Gus adds: “I wouldn't mind if [students] were using that [digital] image to complement or supplement what they're doing observationally” (1G8). Sceptics of digital image source material point out:

Since the photograph flattens an image there's not the complete value scale that you would see when you are drawing [physical source material] yourself … you have to know how to make it round, how to compensate to make something look three dimensional when … the photograph shows it as being flat. (1M14)

The lack of visual information offered by a photographic image whether printed on a magazine cover, viewed on a screen or projected onto a surface can be the cause of frustration for artist teachers and their students alike.

Some artist teachers recognize that “we are conditioned to accept certain visual artefacts…Misinformation in a photograph we accept it as a mechanical thing [even] when something goofy happens” (2B6). Baco offers two examples of why making artwork from image source material can be problematic. Firstly, portrait drawings made by students who use photographs or digital images as source material sometimes don’t make sense. For example, while smiling for a photographer is common cultural practice, smiling for a long period of time while an artist draws a portrait would be painful. Secondly, students sometimes trace a projection of a digital image in order to determine
the structure of a physical artwork. When students implicitly trust a tracing, the resulting anatomy of the drawing may be disproportionate: “[Students] don’t realize that it’s not a foolproof system” (2B5). Moreover, the artist who created the original image would have made many of the creative decisions that the copying artists would simply copy. When students use and copy a found image they may bypass the aesthetic judgement process and thereby relinquish aspects of originality. Baco points to this when he says “students are often deceived by the impression that photographic information is you just simply have to copy it there’s another interpretive process that’s required to make it work at least in drawing” (2B4). Daisy feels that students cheat themselves of learning when copying because the translation of the object has already happened.

When student embed found images into their artwork, questions of originality arise. Even when images are derived from royalty free sites, the parameters of authorship may be unclear to students. There is a need for artist teachers to address issues of originality, appropriation and copyright especially since these issues are engrained in cultural practice. Therefore, it is now important for artist teachers to discuss and explore originality with students in a meaningful way so that artwork made with digital images is made thoughtfully and ethically (Burrough & Mandiberg, 2013).

**Photoshop for art making.** Photoshop may be useful for generating source material for art making. Some artist teachers encourage students to generate source images from existing images through a technique called collage. Collage is a collection of various pieces (e.g., images) structured together to make a composition. Computer programs such as Photoshop can be useful for creating collages of digital images, which
are useful as source material for artwork. Some artist teachers recognize Photoshop as a problem-solving tool to be used in any number of ways [laughs]. Some projects required that—others don’t—but [students] can use [Photoshop] to generate images, they can use it to edit, they [use it as source material], in the end it’s a [physical artwork], its not a digital print, but they can use the tool to help them visualize or generate images. That’s fine. (1T14)

Ideation is the conceptual and logistic component of art making. Ideation includes planning the composition of an artwork, considering how the art piece will be made and anticipating how the viewer will respond to the artwork. Traditionally, sketching is useful during this stage of art making when the idea is being developed. As a tool for ideation, Gus observes that “[Photoshop] is replacing sketching to a degree...in that sense of mocking something up. I don’t see a problem with that” (2G18). Some participants don’t have a problem with students using Photoshop to develop creative ideas because “it’s not an end output of the work [that is important], it’s in the process” (1B5).

**Common ground: Not difficulty but difference.** Some participants stress that translating a physical three-dimensional object into a two-dimensional artwork is an important skill. Some artist teachers claim this translation is a difficult task, others say it’s not a matter of difficult; it’s a matter of difference. I want to teach the difference … there’s a challenge and learning potential in [both working from life and working from a digital image]. … It will give you a different insight … [both are] equally necessary. (2B15, 16)
Although there is controversy regarding the best ways to use the digital image in art making, artist teacher participants agree. “Definitely there’s a difference between painting from a live model than painting from a photograph” (1T8). While artist teachers may disagree on the parameters of computer technology use they agree that “all of those channels are quite important” (2B16).

**The digital image as a tool for teaching visual art.** Visual communication is important in the teaching drawing studio. Digital images are one form of visual communication. Digital images are used in many forms for teaching art including sharing digital images printed in books, magazines, and photographs, and projected as digital slides. Digital images may be displayed on cell phone and computer screens and posted on the Internet. For example, Tati explains that cell phones may be used in the teaching studio to share source material images during the art making process. Sharing digital images on cell phone screens is helpful for visual communication among students and teachers.

Artist teachers and students communicate and develop visual ideas by sharing digital images via computer technology. Tati explains: “[Students] can bring me a book also to show me image that they like or magazine or they can show me [an image on their] cell phone” (2T7). Tati admits: “Sometimes we use [computer technology] because it’s convenient. It just happened student has a cell phone. I have a cell phone. We look at some images on the cell phone… we use it from time to time by chance” (1T5). Daisy agrees: “Students...communicate with me via their phones a lot by showing me [artwork] that they’ve done or are working on at home or larger projects that they can’t bring in and out of the class easily” (2D5).

**Grading artwork.** Some artist teachers use high-resolution digital cameras and
cell phone cameras to document student artwork assignments. Digital images of student artwork are used as reminders of what was seen physically. This way, artist teachers can “look back and see progress leading up to [students’] final assignment” (1G10). Artist teachers may also use visual documentation to “grade [student artwork] at home just to remind myself, but I will have seen the work obviously physically” (1D10). Some artist teachers do not document student artwork with digital cameras, firmly insisting that their encounter with the physical artwork is enough to determine a final grade. These artist teachers hold a strong belief that sensual experience in visual art making and viewing is especially critical when grading student artwork assignments. Some artist teachers will grade digital images of physical artwork only in extenuating circumstances.

While artist teachers’ opinions about grading artwork with computer mediation differ, all participants agree that they expect to mark student artwork in the manner in which the student intends to present the final work: “[Artwork] has to be presented in a way that best compliments the work” (1G11). Regardless of their parameters regarding computer mediation, artist teachers insist: “I want to see the [art] work how [the student has] decided [the final artwork] needs to be seen” (1D10). For example, “If [an artwork is]... meant to be on a web platform, then that’s where I’ll view it [to grade it] and then that’s considered the physical placement” (1D10). However, “if [the artwork is] about creating a physical drawing, yeah, then I need to actually see it [physically]” (1G10). If the artwork is physical, artist teachers want to respond to the physical artwork, not a digital mirage of the physical artwork, especially when grading: “I don’t mark anything that is supposed to be made physically, I don’t accept digital imaging” (1T7), restating: “[Students] have to bring the [physical] paintings [for me to grade]” (2T12). Baco adds:
“I know it wouldn’t be sufficient just to deal with the digital image [in order to grade a final artwork assignment]” (1B18).

**Classroom lectures.** When introducing new concepts or explaining the parameters of an upcoming assignment, artist teachers often chose to present a formal lecture or informal talk during class. Visual examples are key to explaining expectations and showing successful assignment standards. Artist teachers typically include many images in their lecture presentations which are commonly displayed to the class using a digital projector. Before computers became commonplace, these image lectures were presented with photograph slides and mechanical projectors. Because the shift to digital images and projectors is recent, some artist teachers are able to compare the quality of physical and digital slide images. Although some artist teachers prefer physical slides, many no longer show them in class. Daisy explains the difference between physical slide images and digital image projection:

Three years ago, I was still using slides in the classroom just for that reason because the quality is so nice … [in contrast, digital images are not as good because] you can see the pixels. Yeah, in the digital images. And the colours are skewed oftentimes. … Depending on the projector, and how it’s set up, you have to go through all the settings to get the colour balance just right … whereas the [physical] slides, you pop the slides in and if its a good slide projector and the bulb hasn't blown, you're always going to get a really stable, beautiful image with no pixilation...its reliable. It’s simple … [physical] images are just better quality. (1D9)

While some artist teachers prefer the quality of physical slides, all participants conceded that the convenience of digital image presentations outweighs the aesthetic quality of
physical slides. However, artist teachers who appreciate the benefits of digital images also pointed out that digital images are not without limitation.

**Limitations of using digital images for teaching visual art.** Artist teachers point out several limitations of using digital images to teach visual art. In order to teach visual art effectively, it is critical to convey the surface texture and construction of an artwork (e.g., the direction of brush strokes or the layering of pencil marks and paint medium) accurately. Artist teachers express frustration about the poor quality of digital images. Some artist teachers bemoan grainy and oftentimes inaccurate colouration of digital images. Poor resolution images sometimes distort and limit visual information. Rather than enlarging a low quality digital image for the class, many artist teachers compensate by scanning only small parts of an image from a book. Others photograph a small area of a physical artwork and display these additional detail images for clarity.

Another controversy regarding digital image projections for teaching is about the meaning of context. Digital image projection is limited by a lack of context. The scale, the materials used and the placement of an artwork are often critical to fully understand and engage with it. Artist teachers are aware of the importance of context and quality of artwork and the limitation of showing digitally mediated mirages of artwork via digitally projected images. Gus explains:

I try to make that clear. Quite often when I’m presenting work … a scan from say, even a book, that’s now on a computer that’s going to a projector which is on screen which is in a room so that level of mediation. I try to point [students] to galleries partially because in this mediated world with so many of these mediated
devices, I think students lose track of the fact that an artwork in a gallery is very different from what we see on a screen. (2G5)

Digital images may have a long way to go before they are comparable to the quality artist teachers wish for, but working with digital images is convenient.

**Advantages of using digital images for teaching visual art.** There are several advantages to digital images, which make teaching visual art more convenient. Some artist teachers celebrate the convenience and efficiency of digital images. Some artists source high-resolution images from art gallery websites and online museums. These artist teachers celebrate the ability to look at the detail of artwork due to high definition resolution. “You can zoom in right to a little speck of a huge painting...and really demonstrate the quality of [an art] work much closer” (1B17). Carrying heavy equipment and fussing with slide carriages is not worth the effort when high resolution digital images are available. “I don't notice too much difference [between digital and physical slide images] but, I mean, maybe other people do” (1M 18). Baco recounts the transition from physical slides to digital images:

> It was a dawning of a new era, and I just thought we needed to scan images- some from slides, but mostly I just started collecting books personally. I used overhead projectors before, along with some slides or I would have certain slides made that I particularly wanted for my classes, but when that paradigm shift was on the horizon I saw it as an opportunity to really approach a much fuller support for drawing images and then started collecting books and used research money and so forth to set up quite a separate library for drawing itself, a digital library for people who were teaching drawing. (1B11)
Artist teachers recognize that digital images are useful as source material when creating artwork. They encourage the exploration of hybridization, when digital images and computer programs such as Photoshop are used as tools. Digital images are helpful when communicating visual ideas as students learn both on an individual (e.g., showing work in progress on a cell phone screen), and collective (e.g., showing digital image projections during lecture) basis. Despite the challenges, the digital image is “part of reality, our experience. I can't imagine excluding [digital images]” (1B15). The artist teacher participants in this study agree that while nothing compares to the quality of experiencing visual art first hand, for now, the trade off is worthwhile.

**The digital image in visual art research.** Artist teachers require a breadth of knowledge, not only about visual concepts used for constructing an artwork but they also must be aware of humanitarian issues and historical and cultural contexts while staying current and tuned into what is known as the visual conversation.

Artist teachers research by reviewing physical and online journals where they can read published articles written by artists, art historians and art critics. Journals are also useful to stay current about art shows, conferences and film and book releases. Artist teachers browse the Internet, subscribing to online art newspapers, art journals, artist websites, and blogs. Artist teachers equally value research conducted online as well as physical research to prepare for teaching. Artist teachers visit art galleries and attend art openings and art performances in order to view artwork in person. Artist teachers may travel internationally in order to visit large exhibitions for example, art biennials.

**Online research is convenient.** All artist teacher participants in this study agreed with the following statement: “I research online (touring galleries and artist websites) to
prepare for teaching lessons.” Online research makes information accessible. “If you don’t have a vehicle or you don’t have the finances to go travel [and see the artwork physically in person for yourself]” (2G6). Some artist teachers especially value the laptop as a research tool. Gus explains how he uses his laptop for research:

A million different ways, everything from researching technical subjects, conceptual research building, the theoretical framework for [art] work, I mean, in a million different ways, but also then, looking at solutions—how other artists have approached similar or maybe different kinds of questions, but also not just artists, like, architects and looking at [ideas] from different fields as well, I try to [research] in a really broad spectrum. (1G6)

Artist teachers use computer technology for image research by scanning images from books, consulting digital images from an image librarian, but most commonly, surfing the web. Migizie explains:

I’ll go to the CCCA website [The CCCA Canadian Art Database, http://ccca.concordia.ca/] for Canadian Art. … I’ll go to [provincially funded art galleries] or other sites, or I’ll just put the [artist’s] name in [to the online search engine] and see what comes up and if it’s a decent image at high enough resolution I’ll put it in [to my image presentation/lecture]. (1M19)

Online research is important to art students as well. In general, artist teachers celebrate the convenience of online research “I know there are problems online but there are occasionally good things too, in terms of the kind of content [students can access]” (2B19). Students and artist teachers alike increasingly turn to the computer to research:
I do see that as a positive thing … the speed at which [research] can happen. … I remember spending weeks in libraries for stuff that now I can figure out in minutes. There’s goodness in [online research] … for teachers and for students in terms of being able to access information. (2G10)

**Online research is overwhelming.** Both artist teachers and students research images in preparation for presentations but also in preparation for making artwork. An understanding of historical, cultural and artistic context strengthens the conceptual development of artwork. Traditionally, artist teachers and students would attend physical gallery shows; look at physical books and magazines to view images.

Making sense of an image-based culture can be overwhelming, especially when considering the complexity of the Internet. Evaluating and responding to visual culture is part of what artists do. The artist teacher participants in this study feel strongly that critical thinking equips students to navigate visual culture. Some artist teachers are concerned that because students are bombarded with images: “students get confused as to even what are their own thoughts because there’s so much they have access to—to create a thesis of their own argument becomes difficult when the stream of finding the information is endless” (2G15). Gus believes artist teachers have a very serious responsibility to “help people navigate information and to guide them and steer them and coach them … through an overabundance of imagery” (2G10). Teaching students how to discern quality and credibility is important to many artist teachers. They stress the importance of critical viewing. Baco encourages students to challenge everything they see especially when researching online where “everything comes up equal. I try to develop certain gate keeping mechanisms” (2B19). Baco is concerned about the quality
of research students bring to class and into their art making. As research has “shifted from the physical library, book library, to the Internet … quality control is a bit of an issue” (2B19).

One way to help students develop critical thinking is through critique discussions. Migizie wants students to develop the skills to be able to view an artwork and discern what elements are unsuccessful and how to improve them. By practicing critical viewing, Migizie hopes students will gain confidence to appraise the technical, theoretical, and conceptual elements of artwork.

Computer technology enables artist teachers and students not only to access but also to share images much more easily. For example, most cell phones are equipped with cameras and Internet access. These accommodate downloading, saving and sharing Internet resources, which also allows for image capture and editing. For example, photographs of people can be taken with the phone camera, posted online or sent by using Internet applications. Similarly, students can take a photograph of a blackboard note or class demonstration, post it online, email it to friend, or save it for future reference. The fluidity of image use, access and traffic is facilitated by the pairing of mobile communication devices and the Internet.

**Physical research is important.** While not as convenient as online research, physical research is a key part of artistic practice. All participants agree: “I research from physical sources to prepare for teaching lessons (books, visiting galleries).” Artist teachers are concerned about how information overloads influence students’ research practice:

Meaning is homogenized in the media world and students get a little confused, [they might think] I don’t really need to go see a show, I’ve seen it online … I
don’t think it’s even an intentional thing; it’s a subconscious, cultural thing. (2G6)

Physical research allows artist teachers and students to view and experience artwork unmediated by computer technology. Physical research includes attending gallery art shows, visiting museums and libraries, meeting artists, attending performances, and experiencing environments and cultures. Viewing artwork directly in the context in which it is displayed allows the viewer to understand important information more clearly. The scale of the artwork, the materials with which it is made, how the medium is treated and used, the quality of light and the context contribute information about the meaning of an artwork. Artist teachers acknowledge this: “Studio work is about one third of the work that [artists and aspiring artists] are going to be doing to sustain an artistic practice of whatever sort” (2G6).

Physical research is important for artist teachers to stay current in the field and prepare for teaching. Artist teachers may photograph and audio record while conducting physical research, collecting images, videos and sounds to share with students. Gus stresses that keeping a balance between digital and physical research is important: “I research firstly from physical sources and then move online and try to keep a balance of close to 50/50 in terms of the physical kind of research to keep it in balance” (2G7); he adds that “I work from reality first and secondarily, supplementary, online to learn more about those artists. That’s how I function” (2G18).

Artist teachers who value physical research encourage students to visit the physical library. Physical books with high resolution quality are capable of displaying drawings especially well. In the case where the original drawing cannot be viewed, a large, quality reproduction of a drawing in a physical book is the next best thing. Some
artist teachers bring physical books to class and show students images of drawing artwork printed on physical paper: “I like to pass [books] around [during class]” (2G6). Many artist teachers prefer students to consult physical books rather than viewing images of artwork online.

Some artist teachers prefer the quality of images in books to digital images. Digital images sometimes do not accurately convey the colour, surface quality or construction of the artwork. For this reason some artist teachers feel that students are: “Better off finding a print book and actually working from that [image] unless they get a very high-resolution image off the computer” (2M19). Artist teachers prefer students look at artwork images printed in physical books rather than digital images. Ideally, artist teachers: “Prefer to have the students to go to the gallery” (2G5).

**Common ground: Research harmony.** Artist teachers recognize that both physical and digital research is equally important in visual art learning. Convenience and accessibility make digital research a valuable tool, while first hand experience of artwork and the quality of drawings printed on paper in books are invaluable resources. Since both digital and physical research have different strengths, providing different perspectives and information, artist teacher participants in this study agree. “I expect my students to research from online sources in addition to physical sources.” Artistic research can be multifaceted and cover a breadth and depth of information. It is the artist’s challenge to navigate information and present their interpretation of information in the form of a visual artwork. Artist teacher participants explain art research practices. “I use the laptop for research, preparation for teaching, but not exclusively, obviously.
Because [I am] also going to galleries…not preferring one over the other, [online research to physical research] are working together” (2M4). Daisy agrees:

It’s not one or the other … art is gathered from EVERY source so I just wanted to make sure that I’m not specifying that I’m not just doing my research online. I go to a lot of exhibitions that I will talk about to the students or recommend they go see, so there is that real life encounter that I bring into the classroom. (2D11)

Gus adds:

Primary [research] is in person if it is at all possible. Secondarily would be probably some sort of online experience and thirdly, I do use books. But I definitely use media more than I do use books because of the abundance of what’s available out there. (2G6)

Because artist teachers value both physical and digital research in their own practice, they encourage students to use both where appropriate:

If [students] need photo evidence I let them use it. So it can be digital or it can be not. But, when they were doing the master copy form a digital image I felt it didn't work as well, and I sent them back to look for books, because sometimes they printed an image off and the resolution is very poor or they try to draw from the computer screen and its a poor printer, but if its a good image on the computer screen it will be fine, but if it prints off terrible then and they try to copy a terrible image then … sometimes the drawing is a poor resolution and you can't see the stroke direction which is what I want them to get … but it depends on what the image is, if its an image of a drawing or if its an image of a texture of an alligator skin, so if they're doing that, then yes, I would let them. (1M15,16)
The Influence of Computer Technology on the Experience of Art Making May Be Helpful or Harmful

Visual art is one way to capture and convey experience. Artist teacher participants in this study stress the importance of physical, first-hand experience in the art making and learning process. Artist teacher participants address the contrast between physical experience and computer-mediated experience in the making and teaching of visual art.

The sensual experience of visual art making. Visual art is more than an art product; it is an expression of the artist's experience. Traditional art is made by expressing experience through the physical manipulation of physical medium. This traditional approach to art making is highly sensual. When discussing the impact of computer technology on the experience of art making, artist teachers reference the physical, sensual aspects of the art making experience which is especially noticeable during this process of translating the source material into a two dimensional drawing. The manner by which artwork is made affects the meaning of an artwork. When looking at a physical subject matter object, artists translate what they see into what is seen by an artwork viewer. Artists first deconstruct what they see in order to reconstruct it with art medium to create an artwork. During this process the artist’s experience of the source material and the medium influence the outcome of the artwork. Artist teachers have different opinions about how to incorporate computer technology while preserving the sensual experience of art making.

Embracing computer technology for visual art making. Some artist teachers notice that some students prefer to use computer technology as a medium to create artwork: “[Students] really want to avoid the physical [artwork] because it’s a burden for
them” (1T8). In addition, it seems that students no longer feel the need to respond to physical objects as source material. “It doesn’t really cross [students’] mind they need to set up real objects to paint from life. They’re totally fine to paint from the screen” (2T2). Many students seem indifferent to painting from physical source material or digital image source material. Some students prefer to use digital cameras on their cell phones to photograph source material. They display digital images on a screen as source material to create artwork. While physical artwork and still life are cumbersome, computer technology is convenient, which is perhaps why some artist teachers are equally indifferent to whether students create artwork from physical or digital image source material. Many students seem to appreciate the convenience of being able to access their work on a computer since it allows them to work and rework images at their own speed.

Disinterest in physical art making may be rooted in what Tati refers to as a culture of simulacra where what is real is fundamentally challenged. Tati explains that he is concerned about “a whole culture of looking at things as opposed to looking at simulacra or images of things. The paradigm of the simulacra is totally embedded in this generation. They don’t even bother with the real anymore” (2T2).

**Concern regarding computer technology mediated visual art making.** Some artist teachers express concern about the experience of computer mediated art making. These artist teachers stress integrity in art making. Baco warns of the dangers of using computer technology as a crutch for art making. He explains that artwork is not merely a verbatim copy of source material, but a response to source material. True artwork is inspired by the artists’ experiential response to source material they depict in the form of artwork. Baco warns that “students are often deceived … that photographic information
is you just simply have to copy it. [But] there’s another interpretive process that’s required to make it work at least in drawing’’ (2B4). Baco suggests that there is a difference between copying a photograph that is being used as source material and using a photograph as source material to create original artwork. For this reason, Migize allows students to use image source material as a “Platform [for] triggering the real experience, but...also allowing [students] to use what they know to develop [artwork]” (1M14). In this way, Migizie allows students to work from image source material as a “mnemonic device” (1M14) to inspire a new, creative artwork. Images as source material and other forms of computer technology can be useful to supplement creative development, but perhaps most useful to trigger the memory of an artist’s experience. Baco says merely copying source material is especially problematic if the source material image is already an artwork in its final form. When this is the case, a direct copy of the final artwork is redundant because the resulting artwork is not truly an original artwork. The sensual experience of responding to physical source material is a key part of making art.

Some artist teachers are especially passionate about students’ experience of making artwork “from life.” I ask: “If there was an apple on the table and a photograph of that apple or a digital image of that apple on the table, which object do you prefer students to use as source material to make a drawing?” Migizie responds without hesitation:

The physical apple. Absolutely. Because it’s life. It’s a living thing, it’s the physical, it’s the real object and the photograph flattens things. Unless [students] know how to compensate for the photograph flattening an object or an element whatever you’re drawing, they won’t be able to do an adequate drawing. (1M14)
For example, Migizie shares a story about a student who asked if a drawing of a faux plant would suffice. Migizie told the student: “Your plant drawings have to be from real plants that carry that energy and there's a relationship between you and a living being.” (1M14).

In contrast, some artist teachers are not as concerned that students respond to the aura of a physical object as much as that students convey thoughtful conceptual response to whatever form of source material they chose to work from. In response to my question about physical apple or an image of an apple as source material, Baco is clearly indifferent:

I don’t care. If that photograph of the apple was by Maplethorpe for example and recognized as a really great photograph of an apple and you’re going to draw it because it’s a great photograph of an apple, I think that’s a far less interesting contribution to the exercise than either photographing [a physical apple] yourself of finding, even if you take the Maplethorpe and copying, cutting, drawing … because you just want a composition with a half circle, for example, nothing wrong with using part of it, or adding to it, using that apple and putting it on top of an ice cream cone … your contribution as an artist is of some consequence and that can be, really, take any form. (1B15)

**Common ground: Hybridizing the visual art making experience.** Artist teachers’ and students’ attitudes regarding the sensual experience of making an artwork in response to physical subject matter is changing. Tati does not commit to whether this change is positive or negative: “It's just changing. I can’t judge that anymore [laughs] at this point” (2T3). Baco explains that there are advantages to both physical and computer
technology approaches to art making. The key is making sure that students are aware of
the differences so that they can make informed choices when creating artwork: “Both
[working from life and a photographic source] are viable and they’re actually different …
the key thing is that they’re different … [it is important for students] to understand to
properly use them effectively I stress that quite a bit” (2B4). While artist teachers have
differing opinions about the sensual experience of art making, they agree that the
experience of using physical medium to make artwork is different from the experience of
using computer technology as a medium to create artwork.

**Embracing hybrid visual art making.** Recently artists, artist teachers, and
students experiment with using both traditional and computer technology mediums and
tools for art making. An example of this is artwork made by hybridizing traditional
medium such as graphite pencil with computer technology such as digital cameras to
capture animation and project the final artwork image(s) with a digital projector. In
general, artist teachers welcome hybridized experimentation by student artists. “A lot of
interesting art is being made that is a mash up of these kinds of electronic or analog and
digital methodologies; so, I'm fine with it” (1G7). Baco agrees: “I allow students to use,
well, anything they require [to make artwork] (digital images included?) of course. And
they do, quite regularly” (2B4).

While artist teachers acknowledge the potential of hybridized forms of art
making, Baco warns of the differences between the two approaches. He explains that an
understanding of the strengths and limitations of each approach can empower students to
use both approaches in a hybridized way to create successful artwork:

[It is important for students to grasp] what the information is and how it works so
that [they] can maximize the benefits of each. Working from life has its benefits, working from photography has benefits. Working digitally has benefits. In fact, all three, I’d have to say, they’re quite distinct … [students] have to really learn what the difference is [between traditional and computer technology mediums and tools] before [they] can usefully use them [for making artwork]. (2B4)

**Concern regarding hybrid visual art making.** Artist teachers who teach art making as conceptually driven, are especially concerned that students have an understanding of how to use materials and tools in order to “complement the sensibility of the artwork as well. Tools and methodologies, they all have to be equally considered to be successful [in conveying meaning]” (1G20). To illustrate, Gus and Tati share three examples of successful hybrid student artworks. One of Tati’s fourth-year students uses a Photoshop filter to simplify landscape images. The modified digital images are source material for paintings. Gus says “I’m interested to see [students] find ways to project onto various objects” (1G12). One of Gus’s students presented thousands of drawings made directly in Photoshop using a tablet. The digitally created drawings were animated and projected onto physical luggage. The student was able to complete thousands of drawings in a short period of time because of her access to and creative use of computer technology. Gus shares another example of successful hybridized art making. Starting with a video of a person doing sign language, the student projected this video onto an image of Stonehenge. The student traced the movements of the signing hands to create a delicate and complex network of lines. The resulting artwork is an “example of there being an interesting feedback loop between drawing and projecting [technology]” (1G12).
While all artist teacher participants in this study are interested in the potential of hybridized art making and hybridized art teaching, some still feel a responsibility to defend traditional, sensual experience. Tati remarks that there is a possibility that some of his students may become the next generation of artist teachers, a generation of artist teachers who may never have had a problem with hybridization. He thinks that they may not be critical of hybridization, however, he feels “at least I’m this generation who might still raise this question [about] embodiment” (2T9). This argument may fail to recognize that artists may choose to what extent they are grounded in the physical world. It is not the tools but rather the artists’ critical perspective that determines the extent of their physical engagement in art making.

In defence of the sensual experience of art making some artist teachers emphasize the importance of physical art making skills, for example hand-eye coordination. “Eye-hand coordination are important for inspiring artists to master because that’s important, whether you are doing technology or whether you are doing analog” (2M7). If students rely on computer technology, Daisy warns that students may be cheating themselves of skill development: “Those eye and coordination exercises to build the synapses I think those are really important skills to have in fine arts so I think they’re cheating themselves” (1D12). In contrast, Migizie uses computer technology as a tool to support physical art making skills: “I see technology as a tool for developing both the artists' skill in technical means as well as to help them to conceptualize or visualize their ideas and or possibly as a final or mixed media process” (2M6). Migizie adds “I use the technology as a tool to enhance their understanding of, to enhance their skills and for their own creative development” (2M18). Tati considers the benefits and detriments of hybridized art
making and teaching. His musing illustrates the conflicted tension many artist teachers wrestle with:

I think the older generation, if you paint from a screen image you don’t have as much information. You can’t walk around an image, you can’t have multiple access point to the still life in front of you, alright, the image is flat. And it’s already fixed whatever amount of information you get. So I think it’s detrimental for me, for the quality of the artwork. But I’m not sure if it’s [detrimental] for teaching. … Translation; that is key. What you are translating from, you can translate a real thing to an image; you can translate an image to an image. … I think it’s a different kind of translation, its what you are translating from that is the foundation now. What do you translate from we took it for granted. We have to paint from real life in my generation, we didn’t think of that as translation, just painting still life or model and now its so evident translation from one medium to another from one image to another. (2T3)

Common ground: Experience is experience. Artist teachers and students experiment with appropriate use of computer technology in art making and teaching. The changing relationship between artists and computer technology prompts Daisy to reflect that computer technology affects students in “the same ways as reality or experience in real time and space” (2D7). I understand Daisy’s comment to mean that art making experience, regardless of whether it is physical, unmediated contact, or digitally computer mediated, is still experience. From this perspective, neither physical nor computer mediated experience are more “real” or important.
Teaching With Computer Technology May Be Helpful or Harmful

While all participants in this study consider themselves progressive regarding computer technology use in the teaching studio, they inferred that their colleagues are not all receptive to technology. Tati comments to this directly: “There are colleagues, especially the older ones—they are more strict with these kind of stuff. I read their syllabus, there are no possible [computer] devices allowed in the classroom” (1T14). I asked Gus how he responds to students working from digital source material to create artwork: “Yeah, I’m quite open to it; I know that there are other instructors who are VERY much against it” (1G7). The artist teacher participants in this study want to be progressive: “I don’t want to feel like a luddite” (2B17). However, many artist teachers still struggle with the tension between physical and digital art making. Gus explains

I’m not a luddite but I’m a little bit of a sceptic in terms of what computers can do. It’s more what people would do [with computers]. … I don’t put computer technology on a high pedestal and this is the be all and end all and I’m not going to critically look at it—is it perfect? NO. I think it's really important to analyze issues … [it is] important for teachers to be instilling a level of critical analysis of media, its use and abuse. (2G10)

The sensual experience of teaching art making. When teaching visual art, artist teachers typically demonstrate techniques during class. Demonstrations may be presented in a lecture style to the students collectively. Artist teachers may also demonstrate techniques to individual students in response to a particular artwork. Migizie explains that physically demonstrating in class is a primary way of teaching drawing: “[Sometimes I start teaching with] hands-on demonstration and [then, secondly] would be the
technology for everything from communication (which includes the laptop and cell phone)” (2M7).

While there is generally curiosity and interest in the potentials of computer mediated teaching, many artist teachers still prefer physical, in person demonstration. Baco suggests that physical demonstrations are richer since they offer students sensual, hands-on learning experience: “Some things are actually still better in class. I’ve resisted [online demonstrations] because I still think the charcoal hitting the page and making a mark is something that has to happen in immediate proximity. It’s a physical thing” (2B17).

Whether demonstrating a technique with physical medium, creating art in response to a physical source material object or discussing physical artwork, artist teachers feel that teaching in reference to physical material is most efficient. Gus explains: “I prefer to speak to students in person because it’s more efficient, we are responding to the same physical object, not mediated by some other inaccurate version or mirage of the object” (2G18). Some artist teachers are interested and experimenting with new ways of computer enhanced, computer mediated and online teaching. Because of Internet technology, and learning management system networks, it is possible to video record technique demonstrations and have students learn from online tutorials. Some artist teachers experiment with this kind of supplementary teaching.

**Resistance to teaching with computer technology.** Artist teacher participants admit their initial fear of computer technology:

For years I resisted PowerPoint [because I had] weird associations with PowerPoint and the corporate world and looking at it as something that didn’t fit
the vibe of the studio … I saw its use and misuse … however I realized that there are different ways to approach [PowerPoint]. (2G4)

Some participants are still guarded about appropriate use of computer technology in the studio class:

I wouldn’t say I’m so excited, I would say I’m interested … interested means I’m going to research it, excited means I know all about it. And I don’t. So for me it’s still a learning curve … I’m interested and open to learn more about it or to develop more use of not just cell phones but technological media. (2M14)

Artist teacher participants in this study embrace computer technology but not without being guarded with scepticism. Participants remember initially resisting computer technology.

I myself actually resisted the cell phone for a long time. And I resisted Facebook for a long time. Until I went to China and there are no landlines … and no one could find me. People have two, three cell phones in China each so I was kind of forced into it and then, I don’t think about it. I just use it. (2T7)

I’ve had to learn stuff I would never have learned alright and so I would never have learned how to use the tablet if the school hadn’t said were going digital and we think you should be incorporating some of these digital things and I thought ok, well I’ll get into it right away. (2M7)

[I now use computer technology in my own artistic practice] quite significantly. I didn’t used to, I was a luddite, and I was terrified of technology and then I went and did my graduate studies and yeah, surprise, surprise. I’m now working almost exclusively with technology. … I’m the go-to person a lot of the
time for technology, to answer questions. … I still have a giggle about that all the
time, if people only knew! (1D4)

There is a correlation between artist teachers willingness to welcome computer
technology into the teaching studio and their comfort and confidence with it:
Some students [use tablets] it's ok. Because I know I can respond to that. I can see
some of my colleagues who are not familiar with these technologies they might
not be comfortable because they don’t know how to react. But not a lot of
students [use tablets], no; but if they do its ok because I know [how to use tablets
and how to help students to use tablets effectively]. (2T18)

When artist teachers are comfortable with computer technology they are able to
encourage students to experiment. Even though Daisy and Baco do not own tablets or
smart phones, their confidence with computer technology in general helps them to keep
an open mind when guiding students. “I personally don’t have an iPad but I have had
students who bring them in. … I find it really exciting and fascinating ‘cause they’re able
to visualize much more quickly their concepts” (1D7). Similarly, Baco adds: “I don't
[teach students how to use computer technology] … if a student were to work through
that [tablet technology]... I’d work with it, it’s not out of bounds” (1B16).

Resolve regarding teaching with computer technology. Artist teacher
participants in this study all use computer technology in a variety of ways in their
professional practice as artists for art making. For example, several use the digital image
as mnemonic device to supplement source material. Some record audio and video, which
are incorporated into mixed media artwork. Many use Photoshop to manipulate and
create images. All use computer technology in varying degrees to create artwork. It
follows that artist teachers who use computer technology in their own work are more receptive to students' use of computer technology in the teaching studio.

The Future

Artist teachers observe that students are “coming into school with incredible technical expertise in media related areas, so why not actually encourage that and get them to be better at using those skills as opposed to, thwarting it” (1G7). Artist teachers recognize that “you have to keep up with the times, right? I always thought that education sometimes doesn’t keep up with what’s happening … so I’m really conscious of that” (1D19). Artist teachers agree that “[Computer technology and digital culture is] not going away. [Computer technologies] are only going to grow in importance or relevance” (2G13).

Layer Three: Making the Hidden Obvious

In this layer of analysis I uncovered artist teachers’ strongly held beliefs that emerged from the controversies outlined above. Artist teachers implied that teaching art is an art, that teaching art is rooted in experience and that teaching art is sacred. These can be seen as common truths that provide a context for how we fundamentally understand artist teachers' responses to computer technology in their pedagogy.

Teaching Art Is an Art

Making art is not confined to the walls of the studio. Artists think about art making all the time, gathering experiences and information from every source. Experiencing performances and artwork in person, browsing artwork online, reading articles and books, sketching, photographing, audio and video recording, meeting people and asking questions; artists think critically about life experience and how to express
themselves and convey their ideas through art. Similar to the art making process, artist teachers are constantly searching for ways to improve and enrich their teaching. Artist teachers research in preparation for class as they would research to create an artwork. They gather relevant literature, images and ideas, which they share with their students. Art research influences how artist teachers approach art making in both their artistic practice and in their teaching. For example, artist teachers who experiment with computer technology in their own artistic practice tend to be more confident about helping and encouraging students to use computer technology in their artwork as well.

Art making and art teaching are both creative endeavours, which evolve organically. When making an artwork, artists build an image with medium, every mark and every stroke work together to form a whole. Every time an artist adds a mark to an artwork it is in relationship to the other marks that make an artwork. Artist teachers respond to students’ learning development similarly, responding to students’ needs and interests. For example, students may bring computer technology into the studio class and use it to create artwork. Artist teachers may choose to respond to this positively by helping students channel their enthusiasm to create meaningful artwork. One way of teaching responsively is to teach to the unique competence level of each student. It is important to remember that artwork is rooted in subjective experience, each student brings a level of originality to their artwork, making the outcomes of a studio assignment highly diverse. Therefore, it is important for artist teachers to teach in response to individual student artwork. By responding to the individual needs of each student to help them develop technical and conceptual art making skills, artist teachers expect that art making is an expression of unique and personal creativity. The artist teacher looks for
divergent approaches to studio challenges rather than convergence toward one “correct” response.

Artist teachers may contemplate students’ artwork and artistic development throughout the day, outside of class. For example, an artist may browse the Internet and discover an artist whose work would be inspiring or helpful to a particular student. An artist teacher may be visiting a museum and see an object that might help a student develop artwork, or hear a radio program of interest to the student. Artist teachers live alert and mindfully, consciously and subconsciously gathering and organizing material for art making and art teaching.

**Teaching Art Is Rooted in Experience**

Artist teachers identify as artists. Artists define themselves as people who are highly observant, challenge traditions and norms and value aesthetic qualities in the world around them as well as the worlds they create. This worldview is central to artist teachers’ pedagogy. Artists do not work in a vacuum, they are constantly responding to the world around them and gathering ideas for art making and art teaching. They live mindfully, every experience contributing to a sensual library. Artists are aware that their experience is an important ingredient in the process of creating artwork. As artists, artist teachers live with an artistic lens. For example, an artist does not shop for produce mindlessly. An artist selects an apple, noticing its colour and texture. Noticing the apple’s weight and the play of light on its waxy skin artists may recall what they experience about apples when making an artwork later. The experience of responding to the apple may have obvious influence in art making, perhaps influencing colour choice, or the way light is conveyed on a shiny surface. The encounter with the market apple might
otherwise be a covert influence on art making. For example, when studying a human knee joint for a figure drawing, the artist may rely on a memory of the experience of the apple, the way light and shadow rest on a round form, in order to make sense of the ball joint and convey what is seen into an artwork.

Artist teachers feel compelled to pass on their experience and knowledge of art making and its traditions. When teaching, artist teachers build on the fundamentals of their discipline. Primary amongst these is observational drawing which is rooted in direct experience of the real world. Artist teachers see themselves as mentors, equipping aspiring artists with the tools to express new insights, and to develop new ways of conveying meaning. While artist teachers stress that exploration is exciting, they firmly maintain that traditional techniques and mediums are foundational for artistic development.

Like all teachers, Artist teachers teach within the space of their existing knowledge. Mindful of their limitations, many artist teachers strive to expand their repertoire for teaching. Aware of the risk of raising an army of clones, many artist teachers respect students as creative individuals and are careful to structure courses and assignments to allow room for diversity. At the end of day, artist teachers stress that art making, and therefore art teaching, is about uniqueness.

Experimentation is central to successful art making. One way of staying open minded is to experiment with new forms of art making. Some artist teachers learn new skills in order to realize a concept in the form of a new medium. This may require teaming up with another artist or hiring an expert to help complete the artwork. Another way of challenging comfort zones is to confront fears or explore the issues that they are
most sceptical about. For example, several artist teachers shared that they began their artistry as luddites only to become leaders of computer technology in their departments. Daisy says “I was terrified of technology and then I went and did my graduate studies and yeah, surprise, surprise I’m now working almost exclusively with technology which still boggles my mind” (1D4). By confronting challenges artist teachers gain confidence to experiment with computer technology in their pedagogy.

Artist teachers and students inevitably bring their experience of culture into the teaching studio: “[computer technology is] part of life. Its part of their life and part of my life” (2T9). Artist teachers observe how students respond to contemporary culture, learning from students' insider perspectives. Artist teachers highly value their interaction with students, saying that students challenge them, give them new insights and refresh their practice. Gus says “one of the biggest things that I enjoy about teaching would be this fluid exchange in the studio, and that’s coming partially from the students … an exchange of ideas that I appreciate more than almost anything” (2G21). Daisy adds “communication goes both ways” (2D1). Artist teachers value student influence “there is much for us to learn from [students], too, as teachers” (2G12). This openness toward student insights puts artist teachers in a unique position where learning is co-constructed, as tactful educators work with students to solve problems (van Manen, 1991).

Artist teachers have a knowledge base that comes in part from personal exploration, from life experience, and from their professional experience in the field. Students also have a knowledge base, they bring their experiences and contemporary culture into the teaching studio. When both the student and artist teacher are willing to acknowledge their limitations and explore art making together both sides benefit. This
reciprocal relationship, an imparting of tradition and the challenge of incorporating the new, is what makes teaching powerful. Learning is a two way street, maintained by mutual respect and trust. When both artist teacher and student respect each other’s experiences and engage in conversational learning, they have the potential to develop their practice into successful artwork.

**Teaching Art Is Sacred**

The experience of art can be deeply affecting. I believe that the artists whom I interviewed would likely agree with Canadian painter Emily Carr (1978) who asks herself “Why want to paint? When the thing itself is before one, why not look at it and be content?” (p. 201). Answering her own questions and touching on the sacred experience of art making, Carr writes “you want something more. It is the growth in our souls, asking us to feed it with experience filtered through us. We are very lazy experiencers, content with the surface instead of digging down” (p. 201). Although Carr wrote these lines long before computer technology, surely she would take a dim view of the current practice of using harvested digital images as references for paintings. Carr explains: “we can't paint till we can see and feel into our subject, experiencing it. There are no short cuts. The matter rests between God and your own soul” (p. 76).

Migizie echoes Carr when she insists that student “plant drawings have to be from real plants that carry that energy and there's a relationship between you and a living being” (1M14). Whether creating an artwork with a drawing tablet or a pencil and sketchbook, artist teachers insist that it is important to be mindful of the subjective experience often responding to the physical world. Some artist teachers are wary that the computer not get in the way of the experience of art making. Art making is a sacred
experience, an ability to “know what we see. So many of us open our flesh eyes but shut the eyes of the soul” (Carr, 1978, p. 132).

Artist teachers who are committed to the subjective and sacred notion of art experience insist that viewing a physical artwork in the environment in which the artist intends it to be viewed is integral to understanding meaning. For example, artist teachers insist on experiencing art installations in person whenever possible. Artist teachers prefer to grade and view student artwork in person rather than mediated through ICT.

Guiding students through the experience of art making requires sensitivity. Art making is a creative, exploratory, rhizomatic, iterative cycle. The teaching studio is an environment where creativity and diversity are celebrated. For example, unlike a chemistry lab, where students follow instructions and are expected to produce the same product or outcome; in the teaching studio, artist teachers design assignments which enable students to explore their personal relationship to their subjective experience. While the aim of a science lab is uniformity, the aim of a teaching studio is diversity. Rather than linear thinking, artists tend to create and learn in rhizomatic ways, “a learning that takes off in a variety of directions” (Usher, 2008, p. 31). Reilly (2014) describes rhizomatic teaching and learning as a flowing river with many tributaries, always changing and moving. Artist teachers suggest that diverse, rhizomatic teaching approaches are appropriate to respect the sacredness of artistic learning and making because artists teach and think inductively rather than deductively.

Artist teachers have strongly held beliefs about genuine first hand encounters with art. For example, being in the “real,” live, presence of art is important to artist teachers. Artist teachers make effort to visit art exhibitions in person where possible rather than
viewing art in a mediated environment. Artist teachers believe in the first hand encounter so strongly that many expect students to draw physical objects (e.g., living plants) in a physical sketchbook. Artist teachers are committed to the belief that such direct experience is part of the human condition and our capacity to make deeply affecting and meaningful art.
CHAPTER FIVE: SUMMARY

This chapter provides a summary of the research discussion of how Canadian, postsecondary artist teachers respond to computer technology in their drawing pedagogy. This chapter also addresses recommendations for future research. These findings add to our understanding of how computer technology is influencing visual art instruction in a studio setting, specifically, how postsecondary teachers respond to computer technology in their drawing pedagogy.

Summary: Conclusions of Findings

The research focus of this inquiry was to discover how Canadian, postsecondary artist teachers respond to computer technology in their drawing pedagogy, specifically with regards to the computer technology used in the teaching of drawing, the computer technology used for teacher administrative tasks, and the use of computer technology to encourage motivation, productivity, and creativity in the drawing class. This qualitative inquiry was approached through both constructivist and critical pedagogy lenses. The Delphi method of data collection and analysis allowed artist teachers to engage in an iterative and reflective cycle of co-constructing knowledge. This method was appropriate for this study because artist teachers engage in an iterative and reflective cycle of teaching which toggles between iterations of art making and reflective critique. Furthermore, artist teachers are self reflective, constantly evaluating their pedagogy as they are confronted with new opportunities and challenges regarding computer technology. Students’, artists’, and teachers’ encounters and responses to computer technology influence pedagogy. Artist teachers respond to computer technology influence on the visual art world. For example, artist teachers research artistic practice regarding
how professional artists are creating artwork in response to computer technology, and they show their students these contemporary practices. Artist teachers also respond to computer technology in their own art making experimentations and share their discoveries and challenges with their students. For example, one participant translated her experimentation with animation into a course assignment which encourages students to incorporate computer technology with drawing practice.

Artist teachers respond to the technological culture students bring with them into the class. Artist teachers constantly make decisions about the appropriate use of computer technology during teaching including art research and art making. Artist teachers are constantly engaged in “reflection-in-action” (Schon, 1987) which is when they make on the spot decisions about the appropriateness of computer technology use during class. Artist teachers also “reflect-on-action” (Schon, 1987) which involves evaluation of decisions about how they responded to computer technology use during class. During the data collection of this research, participants were invited to participate in reflection-on-action as they shared their responses to computer technology on their drawing pedagogy. Artist teachers’ responses to computer technology are important to study because of the traditional nature of drawing medium and the recent introduction of computer technology on making drawings and teaching drawing.

A two-round Delphi method was used to generate discussion among five purposely chosen artist teacher participants. Hermeneutic analysis structured by Schlety and Noblit’s (1982) layers of meaning guided the analysis process to make “the obvious obvious,” the “obvious dubious” and the “hidden obvious.” Findings emerged from analysis of verbatim interview transcripts, Numeric Summary and Unanimous Summary
tables that resulted from distilling participants' interview contributions. Key findings are discussed below.

**Layer One: Making the Obvious Obvious**

In the first layer of analysis, I confirmed what we already knew to be true (Patton, 2002). It is increasingly common for students and artist teachers to use computer technology during teaching studio class and for purposes of communicating and creating artwork outside of class. Artist teachers confirm that they are confronted by computer technology forms in the teaching studio. Artist teachers confirm that the most common forms of computer technology used in the teaching, learning and making of studio drawing include cell phones, laptop computers, digital projectors, digital music, and digital images. Specifically, the findings indicated that computer technology is used in the teaching of drawing in these ways:

- Participants use computer technology to communicate with students about the development of artistry. Through ICT including cell phones, computer devices, the Internet, and LMS, artist teachers are able to offer critique feedback that is helpful for student learning.
- Participants use computer technology as a tool for training students in art techniques and a vehicle for disseminating student artwork. Participants encourage students to use computer technology as a medium for creating artwork. Additionally, computer technology was used for teacher administrative tasks. Specifically, the findings indicate:
  - Participants use computer technology to manage the class. The LMS enables participants to email students, keep track of grades, and post supplementary class
material and PowerPoint lectures.

- Participants use computer technology to research in order to plan lessons, design assignments, stay current in the field and help students contextualize art making. Finally, analysis showed that computer technology was being used to encourage motivation, productivity, and creativity in the drawing class in these specific ways:

  - Participants use computer technology forms including cell phones, laptops, digital cameras, drawing tablets, digital projectors, software programs, and the Internet to motivate productivity and creativity in the drawing class. Creative use of computer technology enlivens teaching of fundamental art making techniques. By promoting the use of computer technology as a medium for making artwork, participants work with students’ culture rather than against it. Students respond well to participants' efforts of making instruction contemporary and relevant.

Layer Two: Making the Obvious Dubious

The wealth of information provided by the Delphi method allowed me to uncover a second layer of analysis in which I reconsidered the findings of Layer One and outlined the controversies that emerged from participants' discussion of their encounters with computer technology forms in the studio class. While artist teachers in this study were interested in the use of computer technology in art making, learning and teaching, they were also sceptical and critical of how computer technology can best be used for teaching drawing without compromising traditional, foundational drawing practices. While some artist teachers may have disagreed with each other on the parameters of responsible computer technology use in teaching, it was notable that tensions were also highly internal and personal. At first glance, some artist teachers contributed what seemed to be
conflicting opinions regarding computer technology. When artist teachers were asked to clarify, they sometimes struggled to justify how they were able to reconcile these apparent tensions.

Controversies regarding whether the use of the digital image sources may be helpful or harmful included debate about appropriate source material for art making, the digital image as a tool for teaching and the appropriate use of digital images for research purposes. Artist teachers agreed that when the digital image is used appropriately the focus is not about the difficulty implied by the use of new mediums, rather the difference of how new medium can make meaning. Artist teachers agreed that computer technology can be an effective tool for teaching when it is not used as a crutch, and artist teachers agreed that both physical and digital research is equally important.

Although artist teachers held different opinions about the experience of visual art making with computer technology, all agreed that hybridizing is key to furthering visual art practice. Artist teachers agreed that the integrity of experience is key to visual art whether that visual art is made or taught with or without the influence of computer technology. Echoing Wenger (1998), artist teachers agreed that “it is the meanings we produce that matter” (p. 51). All artist teachers agreed that teaching with computer technology is the way of the future and that they must find ways to integrate computer technology into their pedagogy.

Layer Three: Making the Hidden Obvious

In my final analysis, I considered the strongly held beliefs that participants implied throughout their discussion about their response to computer technology in their drawing pedagogy. Artist teachers implied that teaching art is an art, that teaching art is
rooted in experience and that teaching art is sacred. These can be seen as common truths that provide a context for how we fundamentally understand artist teachers’ optimistic scepticism toward computer technology in their pedagogy.

Artist teachers imply that teaching art is and art, teaching art is rooted in experience, and teaching art is sacred. This is supported by common beliefs that underlie artistic practice. Artist teachers live what they teach and embody their art. In this way, artist teachers consider teaching art to be a creative endeavour. For example, each class is crafted like an artwork, through a responsive, iterative, and organic cycle. The presence of the artist teacher in the class creates an energy that makes each class a creative experience. While artist teacher participants in this study were generally enthusiastic about computer technology integration in the teaching studio, they saw themselves as gatekeepers and torchbearers committed to impart the fundamentals of art making, including direct observation, to students. Artist teachers value art making and, by extension, art teaching, as a sacred practice. Respecting that art making is rooted in first hand, subjective experience, artist teachers emphasize the importance of building on individual and shared experience in the teaching studio.

Discussion

While there has been significant research regarding the influence of computer technology on teaching. Few studies have investigated computer technology in the teaching studio, and those that have done so tend to focus on design rather than visual art. I have found no literature focusing on artist teachers’ responses to computer technology on their drawing pedagogy. In this study, discussion among participants regarding computer technology uncovered participants’ strongly held beliefs about teaching studio
drawing. While artist teachers are curious about the potential of computer technology in the drawing studio class, they are cautious to embrace computer technology influence without criticism and in such a way that might short circuit foundational skills. Art making is based on tacit knowledge which is most successfully taught by training technique and mentoring artistry. While participants encourage students to develop unique works of art in new ways with new mediums, they feel a strong responsibility to preserve and bestow drawing tradition to the next generation of artists. While advanced software and haptic computer technology have the ability to mimic the textures and gestures of drawing with traditional materials, the sensual and embodied experience of working with physical, traditional drawing medium (e.g., ink, charcoal, and paper) are still very important to participants despite the benefits of making drawings with advanced software on tablets. Whether made with or without the influence of computer technology, artist teachers stress that the subjective experience of art making is a sacred human activity worthy of defence.

**Implications**

The following are implications of this study for theory and practice. This study confirms that participants reflect on their practice of teaching in a similar way that they reflect on their practice of art making. During art making, artists engage in an iterative cycle of making artwork both “reflecting-in-action” (Schon, 1985) as the artwork unfolds and “reflecting-on-action” (Schon, 1985) when they critique artwork and decide how to proceed. Similarly, in teaching, when participants are confronted with computer technology they respond-in-action as class unfolds as well as reflecting-on-action after class. Participants are critical and reflective as they decide how best to respond to
computer technology in how drawings are made, how drawing is taught and how drawings are displayed in the studio class.

In the first interview, participants were asked if they used computer technology in their art practice. In the second interview, participants were asked to point to three major influences that shaped their strongly held beliefs about teaching drawing and the use of computer technology. While participants in this study were self taught in computer technology, many pointed to their institutions as major influences that changed their attitudes toward computer technology enhanced teaching. Some participants felt pressured to incorporate computer technology:

I would never have learned how to use the tablet if the school hadn’t said we’re going digital and we think you should be incorporating some of these digital things … I thought—ok, well I’ll get into it right away. (2M7)

Most participants overcame their fears and inhibitions toward computer technology when their curiosity and access to it increased. This was largely due to the enthusiasm of their postsecondary institutions which encouraged them to experiment with computer technology and gave them access to computer technology forms, leading them to experiment and learn appropriate ways of integrating it into drawing practice and teaching. Funding and access to computer technology were key factors which influenced how participants felt about incorporating computer technology into their drawing pedagogy. Several participants began their artistry as luddites, committed to traditional forms of art making and resistant to computer technology. However, with access to computer technology, they began to experiment with it in their own art making first, and then adopted ways of teaching with it. Gus said,
I haven’t always had access to all these kinds of [computer technology] tools … experimentation and play is a luxury that I’m afforded … in this [artist teacher] position. I really appreciate [increased access to computer technology] because I know that I haven’t had it for much of my life … [increased access has been critical to] shaping me as an artist and … teacher. (2G14)

Participants’ personal experiences with computer technology in art making profoundly affected their attitude toward students’ use of computer technology. Training workshops and studio workshops could be helpful ways that artist teachers could be introduced to computer technology and encouraged to experiment with computer technology forms in a safe, exploratory environment. If artist teachers had opportunities to play and experiment with computer technology in co-operation with their peers in creative, non-threatening studio sessions, perhaps more artist teachers would gain confidence with computer technology, discover new ways of incorporating computer technology into their pedagogy and refresh teaching studios to be relevant, contemporary and cutting edge teaching spaces. Attending conferences where artist teachers could share creative use of computer technology in the studio might be inspiring. Trade shows designed to cater to artist teachers may inspire new ways of using computer technology in visual art and the studio class. Art shows that focus on artist teacher and student artwork that incorporates computer technology may inspire colleagues to use it in their art, leading them to use art in their pedagogy.

Rather than forcing or pressuring artist teachers to incorporate computer technology in their drawing pedagogy with mandatory classes, workshops or conferences, it would be wise for institution administrations to focus on the power of inspiration, where excitement
about incorporating computer technology ignites intrinsic desire to explore. Making computer technology accessible to artist teachers for their personal use as well as for teaching, inspiring artist teachers with incentives to inspire each other through conferences, workshops, demonstrations, art shows and guest speakers might change how computer technology is incorporated into studio teaching in the future.

Continued funding toward computer technology access is important. Participants observe that although students are interested in incorporating computer technology into their art making, many typically do not have the finances to acquire it. In courses open to double-majoring students, Daisy notices the number of students who incorporate computer technology into their art making is much higher. In classes not specific to only fine art students, there is a stronger presence of computer technology. Daisy posits, “it’s a wealth issue … [in fine art classes] you have a lot of students who are not financially well off … it’s a stereotype [the starving artist]… I don’t want to propagate it, but it’s there” (2D12). Gus notices that students “come up with the idea [in class] but they don’t have the tools with them, but they do at home” (2G3). Both artist teachers and students benefit from increased access to computer technology during studio class time. When institutions provide access to and support of how to use computer technology, artist teachers and students may feel more comfortable to take new risks and apply computer technology to art making and teaching.

From participants in this study I learned that computer technology can be integrated into the teaching drawing studio without threatening the sacred experience of the teaching studio provided, that it is embraced with both excitement and thoughtful criticism.
Participants in this study provided a snapshot of how artist teachers respond to computer technology in their drawing pedagogy, which is with both curiosity and caution.

While this study focused on artist teachers’ use of computer technology in the postsecondary drawing studio, their stories may be inspiring to teachers of art in other institutions as well. Art teachers may benefit from computer technology focused guest speakers, workshops, conferences, trade shows and art shows both in pre-service training and in the field. Art teachers may wish to organize computer technology art shows in their schools, invite practicing artists who use computer technology to speak to their classes, or demonstrate or host workshops. Student art exhibitions may be organized to promote awareness and excitement about computer technology use. These are some practical ways that art teachers may be inspired, supported and encouraged to incorporate computer technology in their pedagogy and embrace the future with enthusiasm without compromising their strongly held beliefs about art and teaching.

**Recommendations: Future Research Directions**

This research provides a snapshot of how Canadian, postsecondary artist teachers respond to computer technology in 2014. The following are recommendations for future research directions.

- It would be interesting to repeat this study several years from now to discover if and how artist teachers adapt and evolve their pedagogy in response to changing computer technology and how, if at all, computer technology is further integrated into post secondary drawing pedagogy. Comparing repeated studies to chart the evolution of artist teachers’ pedagogical response to computer technology might offer an amplified view that may be helpful to identify pedagogical trends.
• While the focus of this study is on artist teachers’ pedagogical responses, a similar study might be conducted with student responses to computer technology influenced teaching. A similar study might consider the effects of the influence of computer technology on the product of student artwork and how artist teachers respond to such trends in their teaching.

• While all participants in this study were currently employed postsecondary artist teachers, it would be interesting to conduct this study again with retired participants, an earlier generation of artist teachers for whom computer technology might have been even more foreign at first. In such a study the contrast of pedagogy before and after the introduction of computer technology may be even more profound. Conversely, a similar study with participants new to teaching postsecondary studio drawing might show interesting results and shed light on how best to support teachers during transitions when new technologies change our lifestyles and teaching styles.

• The participants in this study were all Canadian. A similar study conducted in specific provinces, with urban or rural parameters, another country or international sample of participants might reveal interesting results.

• This study was specifically focused in the context of the teaching drawing studio. This study could be repeated in other specific studio settings, for example, a print making, textile or sculpture teaching studio. This study could be repeated in a secondary school teaching studio instead of a postsecondary teaching studio. This research could be repeated in a field other than the visual arts.
• A similar study could be conducted with attention given to the influence of financial support on artist teachers attitudes toward incorporating computer technology in their pedagogy. Such a study may provide insight into how to direct funding efficiently.

• A similar study might consider how artist teachers who teach both art stream and non major student classes contrast their experience of teaching these classes with regard to access to and interest in computer technology. Such a study may direct institutions and teachers in how to provide equal access and opportunity to all students.

• A study that focuses on first year university students’ use of computer technology in art making and learning, their response to computer mediated art and computer enhanced teaching may prompt ideas about new approaches to studio pedagogy.

Reflection

At first, the teaching studio with its messy floors and earthy smells seemed to me the most inhospitable environment for the sterile hum of computer technology. However, I was surprised to discover how well suited this unlikely pairing could be.

When I began this research I felt fearful, sceptical, and threatened by the encroaching influence of computer technology on traditional visual art making and especially traditional studio drawing instruction. As a result of this research journey, I am now inspired and enthusiastic about the creative and thoughtful use of computer technology in both art making and teaching.

Throughout this research I learned that teaching is situated in social and political context. Society is influenced by technology. Students and teachers who live in society
and work in and outside of the teaching studio are influenced by computer technology in daily life. Inevitably, students and artist teachers bring their experiences with computer technology into the teaching studio. This influences both art making and art teaching.

Scholars suggest that the studio method is the best way to integrate computer technology into teaching. The studio method is extracted from studio-based teaching. Although the teaching studio seems like an archaic place, ironically, it is perfectly structured for computer technology integration. This is especially true since the practice of artistry includes experimentation.

**Looking Back, Looking Forward**

One of the artist teacher participants in this study invited me to observe and participate in a figure studio class where students would be expected to use a computer tablet as medium to create drawings instead of paper and pencil. I enthusiastically accepted the opportunity to see first hand how one artist teacher was experimenting with computer technology integration in the teaching drawing studio. The teaching studio space was traditional. The room was spacious and furnished with benches arranged in a circle around a carpet covered model stage. The cement floor was paint splattered. Whitewashed corkboard walls were smudged with charcoal dust fingerprints and peppered with pinpricks from decades of students who had pinned up artwork. Students dribbled into the sunlit room as a young model, absorbed with his cell phone, sat on the edge of the stage in a frumpy tracksuit.

Students sat on old drawing benches, their laptop computers where drawing boards should be. The instructor handed out computer tablets for students to use during class. When students were issued computer tablets excitement percolated in the room like
Christmas morning. Unzipping a lean tablet, a girl to my left remarked “this thing is bigger than my laptop” which, glancing over at her tiny laptop was undisputable. The tablet truly was at least twice as big as her laptop screen. When the girl to my immediate right returned from signing out her tablet, she turned to her friend and admiringly said “this is huge.” Most students simply plugged the tablet into their laptops and began to draw. The model disrobed and posed. He was an unusually classically perfect model who presented exceptional, classical poses. The classical aesthetic of the model in the traditional drawing teaching studio environment was a jarring contrast to the tangle of computer chords and screens in the room. While some students struggled to get their tablets working with the help of two technology support people who dodged around the room frantically, I grew increasingly anxious and agitated as every moment, every pose slipped by.

This was the first time I had drawn on a computer tablet to make artwork. Usually, I clip a large pad of paper to a drawing board. When the model changes poses, I flip the paper to the next, new, page. The transition of flipping paper matches the time it takes for the model to repose. With a tablet, I had to save and close my drawing before opening a new page, selecting the width and quality of the tool I wished to use, before I could begin a new drawing. In the time it took me to complete the transition process, the model was already halfway through a one minute pose. I ended up having to draw only every other pose because of the time it took me to transition between pages and tools.

Transitioning between tools in Photoshop was time consuming because I had to stop drawing and click several options before being able to continue drawing. When I draw without the computer I select several drawing tools at the beginning of a set of poses and hold all tools between my fingers for quick, easy access.
After the first hour all students had settled into the class and were drawing using the tablet in focused silence. The room was eerily silent. No pencil or charcoal friction was heard scuffing paper. No paper being flipped on a paper pad between poses. Simply silence. Our hands moved a stylus across soundless screens. The professor quietly walked around the room checking to ensure that students were following instructions as she guided the class through a series of drawing exercises.

At the end of the class there was no lingering dust, no smell of ink, no dirty papers to roll, no heavy wooden boards to stack against the wall. Instead of chatting while packing up and washing their hands, students packed up their laptops very quickly and handed in the loaned tablets. The model zipped up his coat and pressed ear bud headphones into his ears. Cell phone in hand, he disappeared, melting into the exodus of students.

I walked home in the setting sun, fingering my Smartphone with clean hands in my pocket. Recording my experience through the pinhole microphone on my ear buds, it struck me how eerily my experience mirrored my imagination of what a futuristic teaching studio might look like. In part, I experienced what I had imagined only five short years before. Truly, computer technology is changing the teaching studio; adopted by students and adapted by artist teachers to support art making and creative learning.

Instead of artwork on paper (see Figure 1) rolled and tucked under my arm, I carried home only my laptop computer, my digital artwork (see Figure 2) nothing but abstract binary code stored in “the cloud,” a complex network of data storage servers somewhere in the world. Artwork is not only a creative configuration of physical materials. At root, art is as ephemeral as my digital drawings. Art is not only something we hold in our hands, rather it is an experience that we carry in our hearts.
Figure 1. Charcoal Drawing From Life Model in Teaching Studio.

Charcoal on newsprint paper. Author Charlotte Mikolajewski 2013.
Figure 2. Digital Drawing From Life Model in Teaching Studio.

Adobe ® Photoshop with Wacom ® Tablet. Author Charlotte Mikolajewski 2014.
References


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Appendix A

Brief Summary of Content to be Discussed

This research study explores how Canadian postsecondary artist teachers respond to computer technology in their drawing pedagogy. A two round interview (Delphi) method will be used to analyze the comments of five post secondary artist teachers.

The Delphi method used in this study involves two rounds of interviews (via phone or in person) in cooperation with five purposely selected post secondary artist teachers. After inviting and confirming five participants, each participant will be emailed a consent form, an interview guide and interview questions. Participants will be asked about their use of computer technology in the teaching drawing studio and how they respond to computer technology in their drawing pedagogy. Each interview will be audio recorded. After the first round of interviews, the data will be transcribed, analyzed and compiled into a comprehensive summary. Participants will be emailed this comprehensive summary, and the interview questions for the second interview. In round two, participants will be asked to provide feedback and commentary on the comprehensive summary generated by the first interviews. In this way the insights of five purposely selected participants will be summarized and thematized.

Core Issue

The purpose of this research is to explore how purposely selected Canadian, postsecondary artist teachers respond to computer technology in their drawing pedagogy. Many scholars consider drawing to be one of the foundations of visual art making (Shenk, 2005). Drawing is considered a traditional way of making art (Gaudelius and Spiers, 2002; Heywood, 2009). As both foundational and traditional, the drawing studio is a particularly interesting context in which to study the influence of computer technology both as a medium of art making and art instruction. Computer technology is changing constantly (Lister, Dovey, Giddings, Grant & Kelly, 2003) and the increased accessibility of personal computer technology since the 1980s (Flew, 2004; Lister et al., 2003), has led to more research about how computer technology affects pedagogy in classrooms. However, few studies focus on the effects of computer technology in the pedagogy of artists who teach in the postsecondary drawing studio. The research question of this study is: How do Canadian, postsecondary artist teachers respond to computer technology in their drawing pedagogy? The following three research questions further develop the central research question.

1. How (if at all) is computer technology used in the teaching of drawing?
2. How (if at all) is computer technology used for teacher administrative tasks?
3. How (if at all) is computer technology being used to encourage motivation, productivity and creativity in the drawing class?
Appendix B

Round One Interview Guide

Introduction
- Thank you for meeting with me today. I am very pleased that you have decided to participate in my study which explores how Canadian postsecondary artist teachers respond to computer technology in their drawing pedagogy.
- In this first interview I would like to begin by reviewing the parameters of the study, and receiving your informed consent.
- In this first round, I am looking for direct, succinct and explicit answers. Your answers will be reduced through analysis to create a comprehensive summary which will be seen by all participants in the second round. Your comments will remain anonymous and all personal identifiers taken out in the transcription process. In the second interview, I will be asking for more in-depth responses such as detailed explanations and commentary of how you respond to computer technology in your drawing pedagogy.

Informed Consent
- Oral review of informed consent and verbal consent.

Interview Questions
- Oral review of informed consent and verbal consent.

Interview Questions
- I just want to remind you that when we talk about pedagogy we mean the whole of how you teach, not just your time lecturing or demonstrating.
- Can you please choose a pseudonym so that I can protect your anonymity when I transcribe our interviews?
- Let’s begin by clarifying your demographic information:
  - Can you tell me where you were born and your approximate age now?
  - What degrees do you have and where and when did you study?
  - What is your current academic role (i.e. Assistant Professor, Tenured, other) and where are you teaching now?
  - Can you summarize your primary places of employment since art school?
  - How did you become and artist?
  - How would you describe your artwork?
  - Do you use technology in your art practice, and how?
  - How would you describe your teaching style?
  - Do you use computer technology in your drawing pedagogy? (if not, why not?)
  - What forms of computer technology do you use in your drawing pedagogy?
  - I would like to ask you some questions about specific computer technology
  - How do you use computer technology in your drawing pedagogy?
  - (how) Do you use computer technology for teacher administrative tasks?
  - (how) Do you use computer technology to promote motivation with you students?
• (how) Do you use computer technology to promote productivity with your students?
• (how) Do you use computer technology to promote the craft of drawing (technique)?
• (how) Do you use computer technology to promote the aesthetics (value, composition) of drawing?
• (how) Do you use computer technology to promote conceptual ideas in teaching drawing?
• (how) Do you use computer technology to promote creativity with your students?
• Is there anything that we have left out and that you would like to talk about in relation to your use of computer technology in your drawing pedagogy?
• Thank you for your time this morning/afternoon.
• What date would suit for our second interview?
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<td>Software</td>
<td>Photoshop</td>
</tr>
<tr>
<td></td>
<td>3D modeling</td>
</tr>
<tr>
<td>Internet</td>
<td>Summon resource material for teaching lessons</td>
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<td></td>
<td>Showcase website</td>
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<tr>
<td></td>
<td>Tour online galleries</td>
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<td></td>
<td>Resource website for students</td>
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<td></td>
<td>Email</td>
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<td></td>
<td>Learning Management System</td>
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<td></td>
<td>Online presentations</td>
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<td></td>
<td>Online videos (youtube/animoto/vimeo)</td>
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<td></td>
<td>Web 2 Online drawing tools</td>
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<td></td>
<td>Online videoconferencing</td>
</tr>
</tbody>
</table>
Appendix C

Round Two Interview Guide

Introduction

• Thank you for meeting with me today.
• I want to take a moment to remind you that you may withdraw from this study without penalty at any time.
• In this interview I would like to refer to the comprehensive statements. After reviewing the comprehensive statements, I ask that you choose three statements that you strongly respond to (either strongly agree or disagree) that reflect your overall philosophy of teaching drawing with the influence of computer technology.
• In the next portion of our time together I will ask you pointed questions regarding how computer technology has/is developing your pedagogical beliefs and practice.
• I will ask you what you consider to be the three most relevant statements regarding the influence of computer technology on artist teachers drawing pedagogy.
• I may ask you to flesh out a few questions specific to you, based on our first interview together.
• Please bear in mind that for this interview, pedagogy is defined as the act of communicating what you know (teaching) about drawing to students in a teaching studio context (including before, during and after class).

Upon Reviewing the Comprehensive Summary

1. Let’s visit the three statements you have selected to comment upon (because you strongly agree or disagree with the statement).
2. What do you consider to be the three most relevant contributions regarding how artist teachers respond to computer technology in their drawing pedagogy?

Formal Interview Questions

3. Can you point to three major influences that have shaped your strongly held beliefs (philosophy) about teaching drawing and the use of technology (e.g. influential academic articles you have read, collaborations with colleagues, encounters with students, your educational or artistic development)
4. How do you feel about computer technology influence (if at all) on (student) artists’ creative process?
5. Interview specific questions

Closing Remarks, Comments and Questions

• Thank you for your insight. I have learned so much from you.
• What are your preferences on receiving the executive summary (email or hard copy)?
• Do you have any further comments or questions?

Conclusion of In-person Meeting

I am so glad that we were able to meet today. Your contribution to this study is helpful to gain understanding of how Canadian postsecondary artist teachers respond to computer technology in their drawing pedagogy.
Appendix D

Comprehensive Summary

Hardware

Cell Phone- Professor
I do not use my cell phone during class time.

I use my cell phone during class.

Cell Phone- Students
I expect students to turn off their cell phones during class.

I allow students to use their cell phones during class time (including off task communication).

I allow cell phone use in the classroom as a visual communication tool (e.g. audio record, video record, photograph blackboard or physical source material in class, for research and ideation, to show images of artwork in progress).

Cell Phone- Student Cell Phone Culture
I DO NOT allow students to use cell phones when there is a live model in the classroom.

Students are usually respectful with cell phone use and it is not a chronic problem (distracting to my students and/or my teaching) during class time.

Students are sometimes ignorant to traditional etiquette: talking and texting on the cell phone during critique and lecture is distracting and disrespectful to my students and/or my teaching.

I only address cell phone use when a problem arises: when it is excessive, disruptive or problematic.

If texting interferes or distracts during class time it is their loss. Students are doing a disservice to themselves and their colleagues. It is not my problem.

I work with the students’ culture not against it. To keep art instruction current, I am excited about the potential of cell phone use in the classroom and direct it to positive use in the classroom.

Digital devices (including cell phones and laptops) are not appropriate in a traditional teaching studio.
**Laptop- Professor**
I use a laptop to access Learning Management System (e.g. emailing, posting supplementary material, posting student marks).

I use the laptop to research in preparation for teaching.

I use a laptop during class time (e.g. to summon presentations for lecture/talks, to show examples of concepts to students while they are working).

**Laptop- Students**
My students typically do not bring their laptops to studio class.

It is typical for students to bring their laptops to studio class.

I allow students to use laptops in the classroom as a research tool and medium (e.g. research, ideation, photoshop, work on scanned images).

**iPod iPad Tablet**
I do not have an ipad/tablet.

I use my ipad (to play music, for visual communication with students) in class.

I allow students to work on ipad and drawing tablets during class time.

I expect students to work on a tablet during class time.

The use of ipad/drawing tablets is inappropriate during class time.

**Smart Room**
My teaching studio is an equipped smart room with built in computer hardware.

I bring a projector into the teaching studio.

**Digital Projector**
I use a digital projector to present lectures, talks.

I allow students to present assignments and/or final artwork projects using digital projectors.

**Digital Camera- Professor**
I use the digital camera as a teaching tool (I take digital photographs of student work and edit the work directly on the camera to show how the student might improve the work).

I take digital images of submitted physical assignments to document progress and remind me of work when marking.
Digital Camera and Video Camera- Students
I allow students to use Film and Video as medium to create artwork for class assignments.

I allow students to use digital images as source material.

I discourage the use of digital source material during class (because students are cheated of education, because digital source material provides inadequate visual information, because of compromised creative integrity).

Students occasionally draw from life models in class otherwise I no longer set up physical still life because students use digital source images.

Students prefer to work from digital source images instead of physical still life, they avoid using physical source material and/or making physical artwork because it is a burden for them.

Eye hand coordination skills are important skills for aspiring artists to master- I am trying to teach how to translate three dimensional space onto a two dimensional surface, which is much more difficult than translating 2d to 2d.

Even with a drawing aid like a viewfinder, students struggle with working from life.

Music
I sometimes select and play background music to promote energy in the teaching studio.

I allow students to listen to their own music through headphones during class.

I do not allow students to listen to music through headphones when I am giving individual instruction. They tend to clue out and that is a problem.

Video
I show (online) video during class/ lecture presentations and through LMS or email.

I share videos (e.g. through LMS or email) with my students and colleagues.

I create video lectures.

Software

Photoshop- Professor
I show images generated from photoshop as examples to introduce assignments and as a supplementary teaching tool.

I do not teach photoshop techniques but if a student is going in that direction I will assist them.

I prefer to work directly with the student on physical artwork.
Photoshop- Students
I allow students to use photoshop (to visualize and develop ideas, to generate and edit images as final work/source material).

I expect students to use photoshop for assignments/during class.

I do not require students to use photoshop.

In Design, Premier, and Illustrator
I use Premir/Illustrator in video as teaching material and to create artwork.

I use Premier to motivate students to learn elements of perspective, composition and concept development.
InDesign/Premier/Illustrator are irrelevant in my teaching studio.

Internet
Research
I research primarily online (touring galleries and artist websites) to prepare for teaching lessons.

I research primarily from physical sources to prepare for teaching lessons (books, visiting galleries).

I do not source or tour websites on behalf of students during class. I expect students to research themselves.

I expect my students to research primarily from online sources.

Email
My primary method of communication with students outside of class is email. I respond to student email questions to clarify deadlines/assignments and for confidential communication.

I give students email feedback on their artwork.

I do not teach through email.

I prefer students to talk to me in person.

Learning Management System (LMS), Website, Blog
I use LMS/Website/Blog to post the course outline, additional learning material (e.g. readings, images, links, videos) and announcements.

I find LMS/website/blog a convenient/efficient communication hub (e.g. emailing and posting additional material).
Lecture- Online Lecture
I am creating online lectures for teaching this year.

Lecture- Video Conferencing
I have used or participated in videoconferencing (e.g. skype).

Lecture- Studio
I access my lecture presentations online.

I use a usb key/flash drive to summon material to present lectures.

I show images from physical books during lectures.

I use powerpoint to present lectures.

I prefer to use pdfs in a slideshow to present lectures.

I use digital images (sourced from image librarian, art database, wiki images, gallery websites, artist websites, scanned book images, scanned from physical slides).

The Image
I show digital slides in class. I no longer show physical slide images in class.

Digital image slides compromise integrity (quality) when representing a physical artwork.

The difference between physical and digital slides is not an issue.

I allow students to work from digital source images.

I expect students to draw in a physical sketchbook.

I allow students to photograph physical source material in class and to continue to work on their assignment at home using the digital image as source material in to allow them to finish the assignment.

Typically I do not allow students to photograph their work in order to finish the in class assignment later on their own.

Technology as Medium
I allow students to work with computer technology as a medium to create artwork during class.

I motivate students by encouraging them to apply digital devices in new ways.

Assignments
I do not design assignments for the use of specific computer technology.

I design assignments specifically for the use of computer technology.

**Marking**
I will provide feedback on digital images of work in progress.

I refuse to mark a digital image of a physical artwork.

I mark final work submitted by digital images.

I expect to mark the final work in the medium in which it is meant to be viewed.

I digitally photograph submitted physical assignments to remind me of physical artwork when marking.

**Student Characteristics and Pedagogical Preferences**
Students are more comfortable with computer medium (camera, hand held devices) than traditional medium (pen and paper).

Students are more comfortable with traditional medium (pen and paper) than computer medium (camera, hand held devices).

Students have a short attention span.

We have a hard time filling the digital technology classes, they are always the least enrolled. There is a higher demand for painting and drawing classes.

I prefer to speak to students in person about clarifying assignments or for feedback before, during, after class or during designated specific office hours.

I teach responsively (in response to students’ needs and interests regarding computer technology). If a student goes in the direction of using technology to create artwork, I will assist, encourage and support them.
# Appendix E

## Numeric Summary

### Hardware

<table>
<thead>
<tr>
<th>Category</th>
<th>Statement</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cell Phone – Professor</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>I do not use my cell phone during class time.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>I use my cell phone during class time.</td>
<td>2</td>
</tr>
<tr>
<td><strong>Cell Phone – Students</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I allow students to use their cell phones during class time (including off task communication).</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>I allow cell phone use in the classroom as a visual communication tool (e.g. audio record, video record, photograph blackboard or physical source material in class, for research and ideation, to show images of artwork in progress).</td>
<td>5</td>
</tr>
<tr>
<td><strong>Cell Phone - Student Culture</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I do not allow students to use cell phones when there is a live model in the classroom because most cell phones have cameras and it is important to respect the privacy of the model.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Students are usually respectful with cell phone use and it is not a chronic problem (distracting to my students and/or my teaching) during class time.</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Students are sometimes ignorant to traditional etiquette: talking and texting on the cell phone during critique and lecture is distracting and disrespectful to my students and/or my teaching.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>I only address cell phone use when a problem arises: when it is excessive, disruptive or problematic.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>I work with students’ technological culture not against it. In order to keep art instruction current, I am interested/excited about the potential of digital technology in the classroom.</td>
<td>5</td>
</tr>
<tr>
<td><strong>Laptop/computer – Professor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I use a laptop/computer to access the Learning Management System (e.g. emailing, posting supplementary material, posting student marks).</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>I use the laptop/computer to research in preparation for teaching.</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>I use a laptop during class time (e.g. to summon presentations for lecture/talks, to show examples of</td>
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</tr>
<tr>
<td><strong>Laptop- Students</strong> – G says re: this area more so tablet than laptop</td>
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<td></td>
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<tr>
<td>---------------------------------------------------------------</td>
<td></td>
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</tr>
<tr>
<td>My students typically do not bring their laptops to studio class.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>It is typical for students to bring their laptops to studio class.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>I allow students to use laptops in the classroom as a research tool and medium (e.g. research, ideation, photoshop, work on scanned images).</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Tablet/ipod/ipad</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>I do not have a tablet/ipod/ipad.</td>
</tr>
<tr>
<td>I use my tablet/ipod/ipad (to play music, for visual communication with students) in class.</td>
</tr>
<tr>
<td>I allow students to work on ipad and drawing tablets during class time.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Smart Room</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>My teaching studio is an equipped smart room with built in computer hardware.</td>
</tr>
<tr>
<td>I bring a digital projector into the teaching studio.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Digital Projector</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>I use a digital projector to present lectures, talks.</td>
</tr>
<tr>
<td>I allow students to present assignments and/or final artwork projects using digital projectors.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Digital Camera- Professor</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>I use the digital camera as a teaching tool (I take digital photographs of student work and edit the work directly on the camera to show how the student might improve the work, I take photos of student work to show in class as examples).</td>
</tr>
<tr>
<td>I take digital images of submitted physical assignments to document progress and remind me of work when marking.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Digital Camera- Students</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>I allow students to use Film and Video as medium to create artwork for class assignments.</td>
</tr>
<tr>
<td>I allow students to use digital images as source material.</td>
</tr>
<tr>
<td>I discourage the use of digital source material during class when there is specific material set up for them to work from observation (because students are cheated of education, because digital source material provides inadequate visual information, because of compromised creative integrity).</td>
</tr>
<tr>
<td>I create video lectures.</td>
</tr>
<tr>
<td>Students prefer to work from digital source images</td>
</tr>
</tbody>
</table>
instead of physical still life, they avoid using physical source material and/or making physical artwork because it is a burden for them.

Eye hand coordination skills are important skills for aspiring artists to master- I am trying to teach how to translate three dimensional space onto a two dimensional surface, which is different than translating 2d to 2d.

Music

<table>
<thead>
<tr>
<th>Category</th>
<th>Statement</th>
<th>Freq.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>I allow students to listen to their own music through headphones during class.</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>I do not allow students to listen to music through headphones when I am giving individual instruction. They tend to clue out and that is a problem.</td>
<td>3</td>
</tr>
</tbody>
</table>

**Software**

<table>
<thead>
<tr>
<th>Category</th>
<th>Statement</th>
<th>Freq.</th>
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</thead>
<tbody>
<tr>
<td>Photoshop – Professor</td>
<td>I show images generated from photoshop as examples to introduce assignments and as a supplementary teaching tool.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>I do not teach photoshop techniques but if a student is going in that direction I will assist them.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>I prefer to work directly with the student on physical artwork.</td>
<td>5</td>
</tr>
<tr>
<td>Photoshop – Students</td>
<td>I allow students to use photoshop (to visualize and develop ideas, to generate and edit images as final work/source material).</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>I do not require students to use photoshop.</td>
<td>4</td>
</tr>
<tr>
<td>InDesign, Premier, Illustrator</td>
<td>I use Premier/Illustrator in video as teaching material and to create artwork.</td>
<td>2</td>
</tr>
</tbody>
</table>

**Internet**

<table>
<thead>
<tr>
<th>Category</th>
<th>Statement</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>I research online (touring galleries and artist websites) to prepare for teaching lessons.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>I research from physical sources to prepare for teaching lessons (books, visiting galleries).</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>I do not source or tour websites on behalf of students during class. I expect students to research themselves.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>I expect my students to research from online sources in</td>
<td>5</td>
</tr>
</tbody>
</table>
addition to physical sources.

<table>
<thead>
<tr>
<th>Category</th>
<th>Statement</th>
<th>Freq.</th>
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</thead>
<tbody>
<tr>
<td><strong>Email</strong></td>
<td>My primary method of communication with students outside of class is email. I respond to student email questions to clarify deadlines/ assignments and for confidential communication (e. g. doctor’s notes).</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>I give students email feedback on their artwork.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>I do not teach through email.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>I prefer students to talk to me in person especially about their artwork.</td>
<td>5</td>
</tr>
<tr>
<td><strong>Learning Management System/ Website/ Blog</strong></td>
<td>I use LMS/Website/Blog to post the course outline, additional learning material (e.g. readings, images, links, videos) and announcements.</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>I find LMS/website/blog a convenient/efficient communication hub (e.g. emailing and posting additional material).</td>
<td>4</td>
</tr>
<tr>
<td><strong>Lecture – Online</strong></td>
<td>I am creating online lectures for teaching this year.</td>
<td>3</td>
</tr>
<tr>
<td><strong>Lecture – Studio</strong></td>
<td>I access my lecture presentations online.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>I use a usb key/flash drive to summon material to present lectures.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>I show images from physical books during lectures.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>I use powerpoint to present lectures.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>I use digital images (sourced from image librarian, art database, wiki images, gallery websites, artist websites, scanned book images, scanned from physical slides).</td>
<td>5</td>
</tr>
<tr>
<td><strong>Video</strong></td>
<td>I show (online) video during class/lecture presentations and through LMS or email.</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>I share videos (e.g. through LMS or email) with my students and colleagues.</td>
<td>3</td>
</tr>
</tbody>
</table>

**Other**

<table>
<thead>
<tr>
<th>Category</th>
<th>Statement</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Image</td>
<td>I show digital slides in class. I no longer show physical slide images in class.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Digital image slides compromise integrity (quality) when representing a physical artwork.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>I allow students to work from digital source images.</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>I expect students to draw in a physical sketchbook.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>I allow students to photograph physical source material</td>
<td>5</td>
</tr>
</tbody>
</table>
in class and to continue to work on their assignment at home using the digital image as source material in to allow them to finish the assignment.

<table>
<thead>
<tr>
<th>Technology as Medium</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I allow students to work with computer technology as a medium to create artwork during class.</td>
<td>4</td>
</tr>
<tr>
<td>I motivate students by encouraging them to apply digital technology in new ways.</td>
<td>2</td>
</tr>
<tr>
<td>Technology is a medium tool for student creative exploration and ideation.</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assignments</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>I do not design assignments for the use of specific computer technology.</td>
<td>3</td>
</tr>
<tr>
<td>I design assignments specifically for the use of computer technology.</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grading</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I will provide feedback on digital images of work in progress.</td>
<td>5</td>
</tr>
<tr>
<td>I refuse to grade a digital image of a physical artwork.</td>
<td>2</td>
</tr>
<tr>
<td>I grade final work submitted by digital images.</td>
<td>2</td>
</tr>
<tr>
<td>I expect to grade the final work in the medium in which it is meant to be viewed.</td>
<td>3</td>
</tr>
<tr>
<td>I digitally photograph submitted physical assignments to remind me of physical artwork when grading.</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Characteristics and Pedagogical Preferences</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a diverse demographic of both technology savvy and luddite leaning students in my teaching drawing studio.</td>
<td>5</td>
</tr>
<tr>
<td>Students have a short attention span.</td>
<td>2</td>
</tr>
<tr>
<td>I prefer to speak to students in person about clarifying assignments or for feedback before, during, after class or during designated specific office hours.</td>
<td>5</td>
</tr>
<tr>
<td>I teach responsively (in response to students’ needs and interests regarding computer technology). If a student goes in the direction of using technology to create artwork, I will assist, encourage and support them.</td>
<td>5</td>
</tr>
</tbody>
</table>
## Appendix F

### Unanimous Summary

#### Hardware

<table>
<thead>
<tr>
<th>Category</th>
<th>Statement</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Phone – Students</td>
<td>I allow cell phone use in the classroom as a visual communication tool (e.g. audio record, video record, photograph blackboard or physical source material in class, for research and ideation, to show images of artwork in progress)</td>
<td>5</td>
</tr>
<tr>
<td>Students are usually respectful with cell phone use and it is not a chronic problem (distracting to my students and/or my teaching) during class time</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>I work with students’ technological culture not against it. In order to keep art instruction current, I am interested/excited about the potential of digital technology in the classroom.</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Laptop/computer – Professor</td>
<td>I use a laptop/computer to access the Learning Management System (e.g. emailing, posting supplementary material, posting student marks)</td>
<td>5</td>
</tr>
<tr>
<td>I use the laptop/computer to research in preparation for teaching</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>I use a laptop during class time (e.g. to summon presentations for lecture/talks, to show examples of concepts to students while they are working, sketching from projected image as source material, editing images)</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>I allow students to work on ipad and drawing tablets during class time</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Digital Projector</td>
<td>I use a digital projector to present lectures, talks</td>
<td>5</td>
</tr>
<tr>
<td>I allow students to present assignments and/or final artwork projects using digital projectors</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Digital Camera– Students</td>
<td>I allow students to use Film and Video as medium to create artwork for class assignments</td>
<td>5</td>
</tr>
<tr>
<td>I allow students to use digital images as source material</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Music</td>
<td>I allow students to listen to their own music through headphones during class</td>
<td>5</td>
</tr>
</tbody>
</table>
### Software

<table>
<thead>
<tr>
<th>Category</th>
<th>Statement</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photoshop-Professor</td>
<td>I prefer to work directly with the student on physical artwork</td>
<td>5</td>
</tr>
<tr>
<td>Photoshop- Students</td>
<td>I allow students to use photoshop (to visualize and develop ideas, to generate and edit images as final work/source material)</td>
<td>5</td>
</tr>
</tbody>
</table>

### Internet

<table>
<thead>
<tr>
<th>Category</th>
<th>Statement</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>I research online (touring galleries and artist websites) to prepare for teaching lessons</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>I research from physical sources to prepare for teaching lessons (books, visiting galleries)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>I expect my students to research from online sources in addition to physical sources</td>
<td>5</td>
</tr>
<tr>
<td>Email</td>
<td>My primary method of communication with students outside of class is email. I respond to student email questions to clarify deadlines/ assignments and for confidential communication (e.g. doctor’s notes)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>I prefer students to talk to me in person especially about their artwork</td>
<td>5</td>
</tr>
<tr>
<td>Learning Management System/ Website/ Blog</td>
<td>I use LMS/Website/Blog to post the course outline, additional learning material (e.g. readings, images, links, videos) and announcements</td>
<td>5</td>
</tr>
<tr>
<td>Lecture – Online</td>
<td>I use digital images (sourced from image librarian, art database, wiki images, gallery websites, artist websites, scanned book images, scanned from physical slides)</td>
<td>5</td>
</tr>
<tr>
<td>Video</td>
<td>I show (online) video during class/ lecture presentations and through LMS or email</td>
<td>5</td>
</tr>
</tbody>
</table>
Other

<table>
<thead>
<tr>
<th>Category</th>
<th>Statement</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Image Frequency</td>
<td>I allow students to work from digital source images</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>I allow students to photograph physical source material in class and to</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>continue to work on their assignment at home using the digital image as</td>
<td></td>
</tr>
<tr>
<td></td>
<td>source material in to allow them to finish the assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I will provide feedback on digital images of work in progress</td>
<td>5</td>
</tr>
<tr>
<td>Student Characteristics and Pedagogical</td>
<td>There is a diverse demographic of both technology savvy and luddite</td>
<td>5</td>
</tr>
<tr>
<td>Preferences</td>
<td>leaning students in my teaching drawing studio.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I prefer to speak to students in person about clarifying assignments or</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>for feedback before, during, after class or during designated specific</td>
<td></td>
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<tr>
<td></td>
<td>office hours</td>
<td></td>
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<tr>
<td></td>
<td>I teach responsively (in response to students’ needs and interests</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>regarding computer technology). If a student goes in the direction of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>using technology to create artwork, I will assist, encourage and support</td>
<td></td>
</tr>
<tr>
<td></td>
<td>them</td>
<td></td>
</tr>
</tbody>
</table>
Appendix G

Convergence of Round Two Interview Questions

<table>
<thead>
<tr>
<th>1. Agree/Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students Lead</td>
</tr>
<tr>
<td>I teach responsively</td>
</tr>
<tr>
<td>I follow students lead</td>
</tr>
<tr>
<td>I work with students culture not against it</td>
</tr>
<tr>
<td>Specific Technology</td>
</tr>
<tr>
<td>Laptop is a &quot;hub&quot;</td>
</tr>
<tr>
<td>Projector, LMS, ICT students bring in</td>
</tr>
<tr>
<td>Real/ Digital Experience</td>
</tr>
<tr>
<td>Digital video camera, simulacra real/digital image</td>
</tr>
<tr>
<td>Technology in lecture/ real art and digital experience</td>
</tr>
<tr>
<td>Disagree with 2d 2d: technology makes it different not difficult</td>
</tr>
<tr>
<td>Physical research, physical book</td>
</tr>
<tr>
<td>Student conversations in person</td>
</tr>
<tr>
<td>Technology as medium for meaning making</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology is part of life</td>
</tr>
<tr>
<td>Embrace Technology don’t fight it or ignore it</td>
</tr>
<tr>
<td>Technology real/digital source material/image</td>
</tr>
<tr>
<td>Help students navigate media saturated culture through critical scepticism</td>
</tr>
<tr>
<td>Access: students have greater access to course material outside of class time</td>
</tr>
<tr>
<td>I teach responsively</td>
</tr>
<tr>
<td>Learn from students</td>
</tr>
<tr>
<td>Artists have to stay current</td>
</tr>
<tr>
<td>Experimentation potentials</td>
</tr>
<tr>
<td>Communication in and out of class</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Influences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own artistic practice/educational development</td>
</tr>
<tr>
<td>Animation background, easier to accept technology culture</td>
</tr>
<tr>
<td>Graduate studies journey from luddite to technology savvy</td>
</tr>
<tr>
<td>Technology convenient especially for collaborative opportunities</td>
</tr>
<tr>
<td>Theorists</td>
</tr>
<tr>
<td>Mcluhan</td>
</tr>
<tr>
<td>Gil Germain</td>
</tr>
<tr>
<td>Reeves and Nash</td>
</tr>
<tr>
<td>Artists</td>
</tr>
<tr>
<td>John Cage</td>
</tr>
<tr>
<td>Bridget Riley</td>
</tr>
<tr>
<td>Family members</td>
</tr>
<tr>
<td>Student Encounters</td>
</tr>
<tr>
<td>Family Members</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Access to computer technology through University funding</td>
</tr>
</tbody>
</table>