The Art Educator's Role in Technology Education

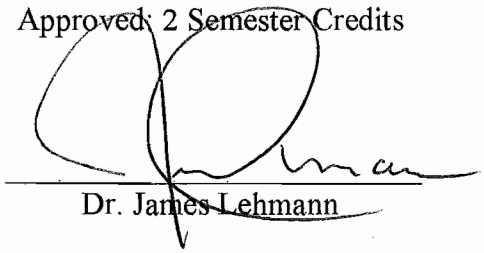
by

William Geiger

A Research Paper
Submitted in Partial Fulfillment of the
Requirements for the
Master of Science Degree
in

Education

Approved: 2 Semester Credits



Dr. James Lehmann

The Graduate School

University of Wisconsin-Stout

May, 2009

The Graduate School
University of Wisconsin-Stout
Menomonie, WI

Author: **Geiger, William R.**

Title: ***The Art Educators Role in Technology***

Graduate Degree/ Major: MS Education Professional Development

Research Adviser: **James Lehmann, Ph.D.**

Month/Year: **May, 2009**

Number of Pages: **55**

Style Manual Used: **American Psychological Association, 5th edition**

ABSTRACT

Currently, art educators across levels are inconsistent in using technology in the art classroom for exploring art, discussing art, and creating art. This study analyzed current use and awareness of digital media resources in the K-12 art classroom. The literature review provided in this study has provided examples of the pedagogical value of the use and education of technology in the art classroom. Literature has also provided examples of how technology has been used in the creation of art, education of art, and communication of the art world.

Data collected from an online survey of art educators in the Marshfield, Rhinelander, Stevens Point, Wausau, and Wisconsin Rapids school districts has provided a sample of how art educators are currently implementing the use of technology into the K-12 art classroom, and has also indicated how art educators feel about introducing the use of technology as an artistic medium. Two face to face interviews conducted with art

educators at the middle school and high school level have provided an opportunity to discuss issues related to technology use in the art classroom.

The Graduate School

University of Wisconsin Stout

Menomonie, WI

Acknowledgments

This research paper has proved to be challenging, timely, and enlightening throughout the process. I would like to thank my wife Jessica for her patience throughout my work. I found comfort in her guidance and experience while I pounded away at the keys, organized my data, and waited impatiently for my results. I would also like to acknowledge my four year old son Reid, and my six year old daughter Allison for taking me away from my work to play ball, assemble projects, and find what they have lost. As usual, my family has helped me appreciate the things that can't be replaced like experience, laughter, smiles, and play.

I would also like to thank Dr. James Lehmann for taking on the burden of working along with me as my research advisor. His clear, concise, and honest reviews of my work have made me a better writer and have given me the confidence a graduate student needs to complete a research paper. His friendly and casual demeanor shows in his writing and reviews, making him very approachable and accessible.

TABLE OF CONTENTS

List of Tables

Chapter I: Introduction

The role of the art educator is currently taking on new forms with the development of new technologies and art mediums used in the lives of practicing artists and art educators. Careers have been created where the knowledge and expertise of professional artists who have the ability to handle technological mediums is necessary to express ideas. The Internet has provided a venue for art to be sold, displayed, and shared with millions of people around the world. Artwork can be researched, studied, and discussed at the touch of a button.

Visual art as language has two sides: writing and reading, expression and reception (Stankiewicz, 2004). Visual literacy has never been so important in the lives of our children who seek out the latest technologies and get involved with the dynamics of graphic design, altered images, and moving pictures. Art educators today need to better understand technologies and the types of images that students learn to interpret. Children should have the ability to interpret, negotiate, and make meaning from information presented through digital images. Trained professionals in the visual arts have the ability to educate children about the development, interpretation and perception of this form of mass media.

A dialogue needs to begin between artists and communications and information technologists to rethink the roles of traditional and new arts pedagogies. Art educators need to revisit the visual arts curricula related to the use and function of technology (Gouzouasis, 2006). Technology has become a relevant art medium just as drawing, painting, sculpture, and collage have been practiced to achieve expression for years. An art educator's role is to make available current and past practices of visual expression to

students and explore future practices that are relevant to their future in the fine arts. For many, virtual education is unthinkable. The pleasure and significance that resonates in the rich sensory and cognitive experiences of making art seems to take precedence over the application of new digital technologies. Then again, paper, paint, and clay were new technologies at one point, just as digital media was new when Charles Csuri made his first computer generated artwork back in 1963 (Krug, 2004).

Art educators today need to become more sophisticated in their use of newer digital technologies, acknowledging that opportunities for image-making must extend beyond clay, crayons and paint (Stankiewicz, 2004). Visual expression has become readily available for anyone with a computer and digital camera. Art educators can take advantage of their role in visual arts to introduce technology and its uses to create, share, and express original ideas. Appropriate education in the use and etiquette of digital programs is essential for understanding the true qualities and limits of the digital media. Students need to be aware of the rights involved in using digital media to create original artworks, and have the proper understanding of the effects of using the media inappropriately.

Statement of the Problem

Current and future visual arts classrooms need to include the practice of both traditional and modern art media. The sensibility of the arts educator whose careful design engages artistic endeavor is significant in the exploration and education of newly developed arts infused digital media. Currently, art educators across levels are inconsistent in using technology in the art classroom for exploring art, discussing art, and creating art. Gouzouasis (2006) suggested leaving such matters solely to information

communication technology (ICT) instruction where the arts are invisible suggests that good practice is ignored. The continued development of new technologies available to artists has created a new visual arts medium that is as valuable to artists as traditional mediums such as paint, graphite, and film. While the use of digital media continues to grow and change the way we look at visual expression and literacy, technology educators are taking on roles that may be better left to experts of the visual arts. Neglecting to educate students about the use and significance of digital media and technology as both an art form and resource leaves students naïve to modern visual literacy, and unprepared for art related careers that embrace technology.

Purpose of the Study

This study intends to provide evidence for the need of art educators to take a more prominent role in the education and development of technology and digital media in the art classroom. The study will also seek to analyze current use and awareness of digital media resources in the K-12 art classroom. Knowledge of the ongoing relationship between technology and the visual arts, and evidence of technology's pedagogical value may promote appropriate use of technology in the K-12 art classroom to meet the needs of today's students.

Research Questions

This research seeks to answer the following questions:

1. What pedagogical value does the use and education of technology have in the art classroom?
2. How are art educators currently implementing the use of technology into the K-12 classroom?

3. Do art educators feel a need to introduce the use of technology as an artistic medium?

Assumptions of the Study

The primary assumption of this study is that art educators are not taking a large enough role in the development and education of technology to develop art, interpret visual images, and practice programs and resources available to artists. While technology educators are at the forefront of the use of technology, art educators who are trained to be visually literate are in their art classrooms working with predominantly traditional art mediums. Additionally, it is assumed that many art educators have less experience working with digital mediums than traditional art mediums leading to less use of technology in the art classroom.

Definition of Terms

Art Medium. Materials and techniques used by artists to produce art works are considered art mediums.

Digital Media. A storage device that holds visual, auditory, or literary digital data can be considered as digital media. Digital Media may include hard and optical discs and USB drives. Any form of information stored in the computer, including data, voice and video is also considered digital media.

ICT. Information communication technology is a broad subject concerned with technology and other aspects of managing and processing information.

Interactive Media. Interactive media is a type of collaborative media that allows for active participation by the recipient.

Internet. The Internet is a global network of interconnected computers, enabling users to share information.

Visual Literacy. Visual literacy is related to the ability to interpret, negotiate, and make meaning from information presented in the form of an image. Visual literacy is based on the idea that pictures can be "read" and that meaning can be communicated through a process of reading.

Limitations of the Study

As a qualitative study of the perceptions of art educators in five researcher selected school districts, the survey will suggest the attitudes and practices of a select group of individuals in art education. Technological resources available to art educators may have a significant impact on their ability or desire to use technology in the art classroom. Familiarity with technology and comfort level when working with technology may also be related to what is being practiced currently in art classrooms throughout the school districts included in the study. A meta-analysis of the pedagogical value of using technology in the art classroom will be limited by the amount of research completed and available literature related to technology in art and art education.

Methodology

This study was conducted in the Spring Semester of the 2008-2009 school year while the researcher was working as an art educator in the Marshfield School District in Marshfield, WI. Twenty-seven art educators in five selected school districts were surveyed to collect data on the perception and practices of art educators' use of technology in K-12 art classes. Additionally, two interviews were conducted based on availability of art educators in the researcher's home school district. Previous research

relating to the use of technology in art making and art education was reviewed, analyzed, and included in a comprehensive study of technology's place in art and art education.

Chapter II: Literature Review

Literature has suggested that computers and digital media are the most exciting development in art this century. Art education scholars, practicing artists, and technology experts have written about subjects as specific as children's perceptions of Internet art, the development and evaluation of computer-aided learning in relation to the practice of printmaking, and as general as educational technologies.

The Relationship of Technology and Art

Gouzouasis (2006) wrote an article in *Arts Education Policy Review* focusing on providing a formative, critical analysis of the role of the arts in technology and technology education and to extend the rationale for arts-based technology education. Gouzouasis suggested, "In an arts infused new media context, it is the sensibility of the arts educator whose careful design engages artistic endeavor" (p. 3). New technologies draw on both artistic and scientific knowledge, each contributing to the other's design. As an artist employs varied media to send an expressive message, there is a push to stretch the imagination and the media (materials used in art making). The visual arts, which communicate and inform, are effective in communication when content (idea) is meaningful and the medium manipulated is used fittingly. For example, graphic design students have become heavily dependent on computers as part of their creative repertoire in designing and communicating content (Hamilton, 2003). Artists have utilized the critical and creative nature of their minds in the form of digital video, music, and publishing.

Gouzouasis believed the role of the arts in all aspects of research, teaching, learning, and technology texts has been overlooked. He found that leaving the instruction of technology matters solely to information communication technology (ICT) instruction suggested that good practice was ignored. Gouzouasis proposed that partnerships constructed between the arts and interactive computer technologies are extremely important ones in forming and defining the future of technology and arts education.

Gouzouasis (2006) also carried that belief that an integrated arts and technology curriculum should start in the primary grades, although he acknowledged the lack of a designed curricula and available courses in school districts for arts-influenced technology. Concepts presented in the Gouzouasis article may be skewed toward an artist's perspective, but the issues he covered could become relevant for others outside of artists involved with teaching and learning with new technologies. The issues Gouzouasis discussed show relevance for all educators who share an interest in the exploration and development of new pedagogies and teaching materials, and in rethinking the ways we use new teaching and learning technologies.

The digital arts have been described by Legrady (2005) as a hybrid practice, integrating the aesthetics and conceptual strategies of art with the logical, systematic methods of technological processes from engineering and the sciences. The digital arts have allowed artists to create aesthetically pleasing artworks through the use and manipulation of the functional digital tools available to engineers. The new age of photography has naturally lent itself to the computer learning process. The digital arts provided a new medium to artists that could be pushed to its limits to develop and take on conceptual art pieces dominated by idea and circumstance.

Stankiewicz (2004) suggested that for many art educators, technology was associated with overhead projectors and VCRs, video and digital cameras, computers with graphic programs and presentation software, and images rendered in pixels. She brought attention to the notion that visual literacy and technology have been inseparable since the first rock artist demonstrated to a young apprentice how to make a hand-print with ground pigment from the earth. The hand print told the story of the artist and the pigment ground by stones demonstrated the technology developed.

Stankiewicz argued not only do we depend on image-making and image-reproducing technologies as resources for student learning, but drawing can function as a language for the invention of new technologies. She found significance in understanding the complex relationships of technologies to cultural values, and believes in broadening the texts, the types of images and the objects that students learn to interpret. The technology defines the time and how a culture embraces it defines the cultures values. Art educators today need to become more sophisticated in their use of newer digital technologies, acknowledging that opportunities for image-making must extend beyond clay, crayons and paint.

Rand (2008) discussed the refutation or vandalizing of art that is possible with digital imaging. An artist through the digital basis of negation can create a world. Rand suggested the desecrator can say more than the artist through the use and manipulation of their images. Rand's point was that digital art's most astonishing expressions are not the same as computer (assisted) art, which can be a pretty traditional extension of visual or musical media, etc. Rand suggested that radical digital art aims to create a world, a what-if condition contrary to current actuality, a necessity that urgently moved artists of every

age. The art that current technology invites solicits new artistry, new expressions, and perhaps even new forms of art.

Professional Development

An integrated arts and technology curriculum requires teachers with strong conceptual understandings (Gouzouasis, 2006). Accompanying changes in technology and digital media is the growing need for professional development for art teachers in the area of digital technology. Change in the digital technology field is so rapid that art educators are challenged to keep abreast of changes and to incorporate them into their programs (Sabol, 2006). The impact of digital technology in the field of education has created a number of significant problems with which art educators must deal. Art programs at all instructional levels have been found to have insufficient access to hardware and software to significantly contribute to the programs. Some art educators struggle to gain funding needed to maintain existing digital technology and to acquire newer versions of technology such as software programs, computers, smart boards, and digital visual equipment.

This constantly diminishing and replenishing medium and tool has seen changes in software, applications, and the rise and fall of Internet sites (Colman, 2004). The equipment, software, and availability of programs changes along with the expectations and relevance to students. Art teachers must understand the use of technology and the computer to create and manipulate artworks, and to investigate the arts (Walling, 2001).

Candy (2007) suggested that bringing digital tools into the creative process led to a more highly constrained creative space because of the inherent characteristics of the technology. The constraints (limits) Candy discusses were related to the systematic nature

of the available tools and procedures involved in digital technologies. These constraints limited the artist. The processes required in manipulating the tools and the boundaries set by the software and equipment constrained artists' choices and ability to control the medium. These limits however, have also been responsible for moving artists in new directions, pushing them to explore unfamiliar territory.

Candy (2007) suggested the constraints were both inherent to the nature of computers and the digital arts. She discussed how the multi-faceted character of the technological medium gave rise to very different approaches to its use in the arts. She believed when working digitally, the process of specifying the constraints (limits) in digital form could be understood as an integral part of the creative process. The artist's ability to identify the digital mediums limits and stretch their boundaries is part of the process of understanding the restrictions of any artistic media. The artist's choice of whether to program or to use a software application would be critical to how much the artist has control over the character of the constraints to be specified. Candy (2007) concluded by suggesting the use of digital technology in the arts is in its infancy relative to the other media. "If we are to fully understand both the degrees of freedom and types of constraint that apply as a result of using it in creative works, we need more experience, more practice and more research" (p. 367). Candy found limits while working with computers and digital media as an artistic medium for creating art. When the constraints (limits) were identified, Candy was able to work around the constraints and their restrictions to create and develop her artwork. While the constraints may have been limiting, Candy had also acknowledge the value of working within their limits to explore new ideas.

Many art educators found the steep learning curve for sophisticated computer graphics software and other digital technology used in the classroom resulted in the need to spend much of their instructional time acclimating students to the software environment (Colman, 2004). Spending more time with students to ensure they are familiar with the software allowed less time for instructing students about manipulating the software to create and complete artistic visions. Colman believed artists have a critical responsibility in developing visions of technology that present alternatives to those inspired by commerce. She also believed when it comes to teaching students about digital media, art educators have a responsibility to devise pedagogical goals that go beyond preparing students for future employment. Colman looked to encourage secondary students to think critically about their perceptions and use of the Internet. Her goal was to guide them in analyzing Internet art and introduce them to using the Internet as an artistic medium.

In a study related to Internet art, Colman (2004) investigated pedagogical strategies that would encourage her students to think critically about their perceptions and use of the Internet and guide them in analyzing works of Internet art. She also introduced them to using the Internet as an artistic medium. She found that engaging students in activities could facilitate their transition from conceiving the World Wide Web as an information repository to conceiving of it as an expressive medium. She found that an art educator must guide student exploration of Internet art works for the students to become aware of how Internet art challenges established web design and content conventions.

Pedagogical Value

Krug (2004) expressed concern about art educators, and educators in general reaching a crossroads regarding leadership and research of educational technologies. He believed it was time to analyze critically our own positions, practices, and policies concerning the effective use of technology in learning. Technology such as CD-ROMs and the Internet offer resources for teachers to practice aesthetics, art history, and art criticism. Krug suggested we need to reimagine how these technologies and others can be effectively integrated to support and enhance pedagogical practices. "How has, does, and will technology literacy, technological fluency, and technology integration effectively support and enhance learning in and through the visual arts?" (Krug, 2004, p. 3).

While social institutions such as schools have attempted and often succeeded in controlling what students could write or draw, the development of digital technologies increasingly supports individual expression in sophisticated visual forms that can be published and distributed through the use of technology (Congdon & Blandy; Stankiewicz as cited in Stankiewicz, 2004). Pedagogical and practical processes have been facing changes due to current technological pressures and are establishing the significance that computers play as a vehicle for expression and production in digital and traditional mediums (Hamilton, 2003).

Digital mediums such as photo editing software, illustrative software, digital video editing software, and design software has made digital art production accessible to anyone with a computer. These digital art mediums develop and change with the development of computer technologies and capabilities. Traditional mediums such as paint, graphite, ink, collage, and printmaking can be used in unison with these digital

technologies in preparation of artworks or become artworks themselves as a result of technologies planning, design, and layout capabilities.

Hamilton (2003) completed a project related to the use of technology in printmaking, its future in art education and pedagogy in relation to art design. Printmaking, a familiar traditional art medium for many artists, was used to complete multiple images for illustrative purposes, publishing, and the creation of original artworks without the aid of a computer. The computer has since taken place of printmaking in areas such as graphic design. Hamilton studied the use of the computer not in graphic design, but in the development of printmaking.

Hamilton's case study involved graphic design students' use of technology in the print making module of their coursework. His research demonstrated what could be produced using the computer as a tool in printmaking. Hamilton's own printmaking skills developed during this case study. Hamilton began utilizing computer components such as scanners, art pads, printers, digital cameras and image manipulation software. He came to believe a move in art towards instant gratification through technology was a reflection on society's demands for speed and the declines in labor-intensive disciplines. Technology allowed the artist to quickly draw, color, and manipulate images in a short time without any permanence. Marks could be as easily erased and altered as they were created. Hamilton suggested this was fed by the speed and quality of computer generated printmaking with little loss in quality. Hamilton believed that the use of technology in printmaking has enabled the production of images not possible using traditional printmaking methods.

Colman (2004) completed a study designed to investigate pedagogical strategies that would encourage secondary students to think critically about their perceptions and use of the Internet, guide them in analyzing works of Internet art, and introduce them to using the Internet as an artistic medium. Internet art is created specifically with and for the online environment, as opposed to artworks that have been created using traditional mediums transferred to the online environment in digital form. Internet artists do not use the Internet as a medium like a painter may use paint, but as a transmission system for data. Colman suggested Internet art was comparable to conceptual art, as they both share an emphasis on audience participation and transfer of information.

Colman found that the students' general reactions to and perceptions of Internet art evolved from a strong initial dislike to acceptance, as it was practiced through sustained interaction, individual assistance, and learning basic web authoring. Colman also found that despite students' familiarity with the Internet and traditional art forms, their knowledge did not enable them to analyze Internet art. Many students felt the Internet art pushed the definition and boundaries of art. Students also found differences in Internet art, "typical" websites, and traditional art.

Interactive Arts and Student Use

As digital media and online learning became integrated into the art curriculum, art educators had been encouraging students to use computers and other digital technologies for personal and collective self-expression. The online learning environment allowed students to visit art galleries around the world, view art by professional and novice artists alike, and discuss their findings. The online learning environment supported group-based

learning activity and enabled the use of a mixture of individual and team-based learning tasks (Naidu, Anderson, & Little, 2001).

Naidu et al. (2001) developed and completed a study related to the use of technology in creating a virtual print exhibition. Students had access to a very large online database of images and catalogue information about the prints to produce the virtual print exhibition. Students could work on their own to create exhibition proposals, but needed to come to an agreement within their team about the content and layout of the final exhibit. As students engaged in this type of learning activity, their work was stored in individual student folios, which were available for student reflection on design and functionality. Documents and messages produced for and by a team were available for review by all members of a team for increased communication. The visual exhibit activity used the tools available on the Web to create a collaborative and interactive learning experience.

The field of interactive arts, through the digital medium, has allowed artists to create wider sensory experiences in which viewers participate more fully in the aesthetic environment and even add to the environment (Gigliotti, 2001). Gigliotti also suggested that this field has accomplished what many arts educators have desired for many years. It has begun to connect the world of the arts to the world at large. Not only could the field of the interactive arts connect students with artworks from around the world, but also has connected artists from around the world. Gigliotti claimed this was due to the ubiquity of computer technology and the digital medium's inclusion in how the world works and communicates. Krug (2004) suggested that for many art educators, virtual education is unthinkable when they consider the pleasure that rich sensory and cognitive experiences

brings to artists when making art.

Milekic (2000), an Associate Professor of Cognitive Science an Digital Design set out to present an analysis of the characteristics of digital environments and suggest their potential uses in the building of collaborative pedagogical procedures for the digital medium. A digital environment is designed to create a medium which will afford different kinds of unique interactions. While the analysis presented could be generalized, Milekic examined the role of digital technology in the context of Art Education.

Milekic (2000) suggested that children were the most adaptable and fast learning consumer population which can be trained to accommodate for different shortcomings of offered technology. In the area of art education the number of available digitized reproductions of works of art was approaching a million. Milekic found the challenge for computer interface design was to provide an interactive way to allow children to browse these digitized reproductions of works of art. The pedagogical goal was not just to expose the children to the reproductions of artworks but also to convey some educational information. This was done, both at the level of individual works and at the level of art as an inherently human activity. A touch-enabled computer display (touch-screen) allows for this kind of interaction to occur in a natural way. A child is able to focus undistracted on a single work of art, at any given time with only one image on the screen, represented in the largest format possible (Milekic, 2000). The flexibility of digital representations and the hands-on quality of digital environments allows exploration of works of art to an extent which was never possible before. The process of art creation can also be described as a process of selection. The artist is making choices all along the path of creation.

Technology has always affected both the study of art and its making (Milekic, 2000). Albrect Durer, the master of the German Renaissance, used and created devices (technology) in the form of compasses and rulers to assist with linear perspective. Milekic (2000) suggested that a discussion of computer technology in art education must address using the computer to create images, and investigate the visual arts. Students who make art are finding many uses for the computer. Students have used the computer to make plans for sculptures, and to produce finished "virtual" objects.

Digital Storytelling

In the summer of 2005, pre- and in-service art teachers at the University of Houston learned about art education technology through a graduate-level course focusing on the application of digital storytelling to art education (Chung, 2007). Digital storytelling referred the practice of incorporating digital text, imagery, video, and audio into the presentation of a computer created, multimedia story. This course explored the potential of digital storytelling for visual culture art education through the expansion of technology skills and knowledge for teaching art in a digital age. Each student presented a completed digital story to the class, elaborating on both its personal and professional meaning. These digital stories included digital images, video clips, artwork, audio, and text. Class participants evaluated each story based on creativity, cohesion, success, and meaningfulness. The students' stories included (a) an advocacy of art education, (b) a questioning of standardized tests, (c) a biographical account of a Houston art philanthropist, (d) an aesthetic inquiry into the purposes of art, an introduction to campus public art at the University of Houston, (e) historical account of making ancient manuscripts, and (f) a piece on art careers. The class of 7 rated each of the student digital

stories favorably during peer evaluation. They all considered the amount of time (48 hours) dedicated to this project to be appropriate and appreciated having the opportunity to learn about digital storytelling related to art education. Although some students were first time users of digital software such as Adobe' Premiere', Microsoft' Photo Story 3, and Windows® Movie Maker 2.1, their multimedia stories showed quality execution with digital media.

Digital Art in Illustration

Lane (2006) discussed author Lane Smith's use of technology in illustration. In a 2002 School Library Journal article, Smith talked about using computers in creating the illustrations for *Pinocchio, the Boy*: or *Incognito in Collodi*, also written by Smith: "I place it on a scanner (a scanner is like a digital copy machine) and copy, or scan, the image into the computer. I then 'cut out' the shapes with digital scissors and collage them together with digital glue. The computer becomes just another artist's tool, another way to experiment." Also advocates of computer aided illustration; Lane discussed husband and wife team Don and Audrey Wood. Their book *Bright and Early Thursday Evening* was their first book to feature digital art, as well as that of their publisher. After their son challenged them to try it, the Woods learned the process of creating digital illustrations together using several different computer applications. They described the story as fantastical, like a dream opposite of reality. They couldn't imagine a better way to illustrate this than with the use of computer illustration that allows the artist to display intricate details. They felt their illustrations gave astounding detail that would be hard to achieve using pencil sketch, watercolor, or oil paintings. They felt this computer generated detail was needed in this story.

In response to Lane (2006), author Jane Breskin Zalben discussed the use of digital art as a tool in illustration. Zalben (2006) claimed that many artists use digital art as a tool, as described in Lane's article, but it isn't always using the computer in a creative and new way in terms of publishing. She believed as far as book illustration goes, computer art is in its early stages. The computer generated art was used as a backdrop and is static. It is not an integral part of the page. Zalben suggested that every artistic age demonstrates the use of the best and most advanced technology of its time, alongside the cherished traditional arts from the past. Additionally, she found more often than usually assumed, artists in the forefront of conceptualizing and deploying technology art are ultimately judged not by the conceptual reach or theoretical potential of the medium, but by what the art achieves.

Computer Drafting

Gibson, an associate professor of design and environmental analysis discussed the processes involved when teaching freshman design students to draft on the computer (Winter, 2003). Gibson is an expert in interior design, computer simulation and analysis, modeling and animation, and the human-computer-environment interface. Students drafted on the computer first, and then she gave them an exercise to draft by hand. Gibson found they were more efficient and produced a higher quality of work than if she taught hand skills first. The ability to work and rework designs on a computer allowed students to develop a quality design more efficiently. The permanence of each mark in a hand created design made this process more difficult and time consuming.

Gibson believed when it comes to rendering, the computer is a first step that builds students' confidence and encourages experimentation. She mentioned students'

reluctancy to put color on drawings when working by hand because it is so difficult to remove color if they do not like the effect. With a computer, colors could be changed with the click of a mouse—a red wall can become a green wall, then a blue wall and back again—in a matter of seconds. Gibson also found that when students first trained using the digital medium, then later work by hand, they were willing, from the start, to take more risks, work faster, and inevitably produce higher-quality scenes and perspectives.

Students' learning was all about the process, about sharing one to one through the daily e-mailing back and forth between client and students. There were valuable discussions, of give and take, that could not be achieved without the computer because there would be no way to get a real client to interact this much with students. In Gibson's design classes, she blended traditional methods of working and digital ones, using each to complement and propel the other. Her innovative approach gave her students the richest perspectives, the best of both worlds.

Research has been conducted exploring the function, use, and direction of using technology in the art classroom as a tool for viewing art, sharing art, developing art, and discussing art. Artists have explored and are currently exploring the use of technology in their own art production. The development of technology and digital media has made this new art medium and resource difficult to ignore.

Chapter III: Methodology

A problem exists in art education that reflects an inconsistent use of technology and digital media in the art classroom. The continued development of new technologies available to artists has created a new visual arts medium that is as valuable to artists as traditional mediums such as paint, graphite, and film. This study includes a meta-analysis

of literature related to the use of technology in the art classroom and its pedagogical value for students in the art classroom. The subject selection, instrumentation, and data collection procedures used to illustrate a valid and reliable sample of current art educator practices is described in detail. The researcher has also included a detailed description of how the data will be analyzed, and discuss methodological limitations.

Subject Selection and Description

Art educators from five school districts in Wisconsin were selected to participate in this study to illustrate the current technology practices of art educators. Forty-four art educators working at the elementary, middle, and/or high school levels in five school districts in Wisconsin were surveyed or interviewed based on availability. The public school districts included in this study are Marshfield, Rhinelander, Stevens Point, Wausau, and Wisconsin Rapids. Student enrollment populations and staffing numbers vary by district, but the school districts offer similar art programs and are guided by the Wisconsin State Art Standards.

The School District of Marshfield, a unified school district serves approximately 4053 students (School District of Marshfield, December 4, 2008.). Wisconsin Rapids Public Schools, also a unified school district serves a school population of approximately 6,000 students (Wisconsin Rapids Public Schools, 2008). The School District of Rhinelander serves nine surrounding townships and the City of Rhinelander and serves a total of approximately 2774 students (School District of Rhinelander, 2008). As of 2007-08, the Wausau School District serves approximately a total of 8780 students (Wisconsin Successful School Guide, (n. d.). As of 2007-2008, the Stevens Point school district serves a total of 7537 students (Wisconsin Successful School Guide, (n. d.).

In the five school districts studied there are a total of 40 elementary schools, eight middle schools, and six high schools. Ten of the art educators surveyed teach at the elementary level. Twelve of the art educators to be surveyed teach at the middle school level, and 12 of the art educators surveyed teach at the high school level. One of the art educators interviewed teaches at the high school level, while the other art educator teaches at the high school level. It is important to note that multiple teachers teach across levels.

Instrumentation

The survey used in this study has been designed specifically to give a description of art educators' current use of technology outside and inside the art classroom, as well as their attitudes regarding the use of technology in the art classroom. As suggested by Healy (2005), repeated contacts and reduced questionnaire length improved response rates and quality of responses. The survey only intends to give a description of the sample at one point in time. White (2003) found the use of online survey to be useful and reliable.

Interviews were conducted with a smaller number of art educators. A guided interview was conducted with art educators in the researcher's school district. The interview was designed to give a description of the current practices and attitudes of art educators' use of technology in the art classroom.

Data Collection Procedures

A 13 question online survey (see Appendix A) was administered to K-12 art educators of the five school districts via an email link. The survey took approximately five minutes to complete and was available to subjects for approximately one month.

Subjects were contacted and invited to take the survey on three occasions to ensure a reliable and quality sample. Shannon (2002) found receipt of responses was significantly quicker for electronic surveys, and response rates for electronic surveys were comparable and in some cases higher than traditional mail. Multiple electronic mailings to respondents took place in a fraction of time it would take to mail surveys and with none of the associated costs. White (2003) described benefits of online surveys to include an apparent entertainment value to respondents and response time.

Two interviews with art educators took place face to face in the researcher's school district. Interviews were conducted following a predetermined list of questions (see Appendix B) related to educator use and perception of using technology in the art classroom. The interviews provided specific examples of technology use in the art classrooms offered explanations for attitudes surrounding technology use in the art classroom.

Data Analysis

Data was compiled and sorted through the University of Wisconsin-Stout online survey program. Twenty-seven of a possible 44 subjects completed the survey, while two of two subjects completed an interview. The data was then transcribed and analyzed to describe the current practices and attitudes of art educators related to the use of technology in the art classroom. Attitudes toward technology, self-efficacy with technology, and technology uses were also compared.

Data found through previous research was analyzed to identify trends in the results of studies concerning the use of technology in the art classroom. Data compiled through survey and interview was also analyzed to determine relationships between

general teacher use of technology and technology use in the art classroom. Data was also analyzed to determine relationships between age level taught and technology use. Information acquired through detailed interviews and specific use of technology described in survey will be discussed and translated.

Limitations

Data collection was limited by the number of art educators who took the time to take the online survey. Respondents to this survey must have been familiar with technology both to access the survey and to complete it. Some subjects may not have completed the online survey because of failure to use their email. Others may not have been comfortable using technology and fear the use of online surveys. Subjects who did not take the online survey after the first attempt were contacted up to three times to ensure a quality sample. Some email addresses compiled were no longer recognized by school districts and survey links were not sent to those addresses.

Summary

This study aimed to identify the current use of technology by art educators in the art classroom. The survey allowed the researcher to account for attitudes, resources, and working conditions that may affect the subjects' use of technology in the art classroom. Interviews of subjects were intended to increase the reliability of the researcher's findings through survey and provided specific explanation for practices.

The meta-analysis of literature related to the use of technology in art education was intended to confirm or deny the pedagogical value of using technology in the art classroom, and illustrate how technology is being used by artists in and outside the art

classroom. The review of literature also identified areas of concern while using technology in the art classroom.

Chapter IV: Results

This study intended to provide evidence for the need of art educators to take a more prominent role in the education and development of technology and digital media in the art classroom. The study also attempted to analyze current use and awareness of digital media resources in the K-12 art classroom by art educators in the Marshfield, Rhinelander, Stevens Point, Wausau, and Wisconsin Rapids school districts. An online survey was given to practicing art educators to determine the current use of technology in their art classrooms, and illustrate their attitudes about using technology in the K-12 art classroom. Two interviews were conducted with art educators teaching at the Middle and High school levels to provide more detailed information surrounding their use and attitudes about technology in the art classroom.

Item Analysis

Data collected through 27 completed online surveys and two conducted interviews has been broken down into five areas related to technology use and perceptions of technology use by art educators. The five areas of analysis include (a) grade level and experience, (b) technology use in the classroom, (c) impact of technology on professional life, (d) attitudes about technology, and (e) accessibility to technology.

Grade Level and Experience

Subjects in this study were asked to indicate the grade level or levels they were currently teaching art (see Table 1). Data regarding grade level was significant in determining any correlation between grade level and technology use in the art classroom.

Thirty-seven percent of the art teachers surveyed indicated they were teaching grades K-2 at the time of survey completion. Thirty-seven percent of the art teachers responding also indicated they were teaching grades 3-5. Grades 6-8 were taught by 44% of the art teachers surveyed. In addition, 44% of the sample surveyed indicated teaching at grades 9-12. One of the subjects interviewed indicated teaching at the 6-8 level, while the other art teacher indicated teaching in grades 9-12.

Table 1

Indicate all grades you are currently teaching art

Response	Response Total	Percentage
	Sample size (n = 27)	
K-2	10	37%
3-5	10	37%
6-8	12	44%
9-12	12	44%

Many of the subjects who responded indicated teaching at multiple levels, justifying a response total of 44 by 27 subjects surveyed. Just four of the subjects surveyed taught grades K-2 and 3-5 exclusively. Five of the 27 art teachers surveyed taught grades 6-8 exclusively, while five others indicated teaching multiple levels including K-2, 3-5, and 6-8. Just one of the subjects teaching grades 9-12 taught at multiple levels. This subject also taught grades 6-8.

Subjects were also asked to indicate their current level of computer expertise. Twenty-six percent of art teachers who responded considered themselves a novice

computer and technology user. Forty-eight percent of the art teachers considered themselves an intermediate computer and technology user and 26% of those responding considered themselves to be an advanced user. Both subjects interviewed considered themselves to be advanced computer and technology users.

Technology Use in the Classroom

Data collected to determine current art teacher technology use in the art classroom was obtained through a series of questions related to website management, types of technology used, and online coursework. Subjects indicated whether or not they maintained a website for their school art program. Thirty-three percent of the art subjects who responded indicated they did maintain a website for their school art program, while 67% indicated they did not maintain a website for their art program. One of the interviewed subjects indicated they maintained a website for their art program, while the other did not maintain a website.

Subjects were also asked to indicate types of technology they were using at the time of survey (see Table 2). Ninety percent of subjects surveyed indicated using a computer, while 90% of art teachers also indicated using a still or digital video camera during the school year. Seventy percent of those surveyed also indicated using a scanner.

Table 2

Indicate technology tools you typically use during the school year

Response	Response Total	Percentage
	Sample size (n = 27)	
Computer	25	93%
Still or Digital Video	25	93%

Camera		
Scanner	19	70%
Other (e.g. visualizer, data projector, document camera, SMART Board, Elmo, and webcam)	13	48%

Forty-eight percent of the art teachers surveyed selected other and listed items such as a visualizer (digital interactive teaching tool), data projector, document camera, SMART Board (an interactive whiteboard), Elmo (a digital visual presenter), and webcam. Interviewed art teachers indicated using the Internet, email, Adobe Photoshop (digital imaging software), I Movie (digital video software), digital still and video cameras, scanners, and Power Point (digital presentation software). Interviewed art teachers also specified that courses such as Advanced Placement Art History and Cartooning and Animation lend themselves to more technology use in the art classroom.

Art teachers who responded to the survey also indicated what students were doing while they were online for their art classes. Seventy percent indicated that students were doing research while they were online for their art classes. Twenty-six percent indicated they were publishing artwork on the Web, while 59% indicated students were visiting online galleries for their art classes. In seventy percent of the classrooms students were developing and creating artworks while they were online. Just 19% of art teachers indicated they were not asking students to work online for their art classes. The interviewed art teacher teaching grades 9-12 indicated that students work online to

acquire resources and view visuals. The art teacher teaching at the seventh and eighth grade level suggested there was minimal student use of online tools and resources in the art classrooms.

Impact of Technology on Professional Life

The impact of technology on the art teachers' professional life was measured to provide data related to how technology has affected their practices. To determine the subjects routine Internet use, art teachers were ask to indicate how many hours they were currently online in one week. Twenty-two percent indicated they were online one hour or less during the week. Forty-eight percent (nearly half) of art teachers surveyed indicated being online for two to four hours a week at the time of survey. Fifteen percent of art teachers surveyed indicated they were online ten or more hours in a week. Interviewed art teachers at levels 6-9 and 9-12 indicated being online for ten or more hours in a week to obtain resources, view art, and communicate.

When asked to identify all areas in their professional life where the Internet has made a significant impact, 100% of art teachers indicated using the Internet for finding and collecting resources (see Table 3). Ninety-six percent of subjects responding indicated the Internet has made a significant impact as a communication tool. Twenty-two percent of art teachers surveyed identified the Internet as an instructional tool for viewing images, while just 15% indicated using the Internet as an interactive tool for student learning. Eleven percent (3 of twenty-seven teachers) of the art teachers responding indicated other and specified using the Internet to display student work and art curriculum. One subject also indicated using the Internet as a forum for students to respond and communicate through a blog (weblog). Interview subjects indicated using

the Internet for obtaining resources, networking with professional artists, establishing art events, and getting into professional art shows to display their own work.

Table 3

Indicate all areas in your professional life where the Internet has made an impact

Response	Response Total	Percentage
	Sample size (n = 27)	
Communication	26	96%
Collecting resources	27	100%
Instructional tool for viewing images	22	81%
Interactive tool for student learning	15	56%
Other (e.g. display student work, access art curriculum, student response forum through a blog	3	11%

Attitudes about Technology

Subjects were asked to indicate their personal feelings about the importance of technology in the classroom, as well as their school district's feelings about the importance of technology. Fifty-two percent of the respondents felt that the use of technology in the classroom was very important. Forty-one percent of respondents felt technology use was fairly important, and just 7% (two of 27) considered technology use

in the art classroom to be not at all important. Data compiled to indicate school district attitude towards the use of technology was very similar to the subjects' personal attitudes. Fifty-two percent of subjects felt their respective school district held technology as a high priority, while just 4% of the respondents indicated their school district held technology as a low priority. Forty-four percent of the respondents considered their school district to hold technology as a moderate priority. Interviewed subjects indicated that technology use was of above average importance in their school district and was becoming less important in their classrooms as a result of time constraints.

Subjects were also asked to indicate their level of interest in learning more about the use of technology in the art classroom. Fifty-two percent of art teachers responding indicated they were very interested in learning more about the use of technology in the art classroom. Forty-one percent indicated they were somewhat interested, while just 7% were not interested in learning more about the use of technology in the art classroom at the time of survey. Interviewed subjects indicated they were interested in learning more about the use of technology in the art classroom both professionally and independently.

Accessibility to Technology

Accessibility to technology may be a driving factor in an art educator's use of technology in the art classroom. Subjects were asked to indicate any and all factors that may affect their accessibility to technology for art education. Eighty-nine percent of subjects indicated having computers available in and around their classroom was an obstacle affecting their use of technology. Just 26% of subjects had five or more Internet-connected computers in their classroom. Seven percent of art teachers indicated having 3-5 Internet-connected computers, however 67% indicated having at least 1-3 Internet-

connected computers. Interviewed subjects indicated having 1-3 Internet-connected computers available for grades 9-12 and 4-5 Internet-connected computers for grades 6-8.

In addition, 56% of art teachers surveyed indicated having art and design software available in and around their classroom. Eighty-five percent had access to digital cameras and 52% percent indicated they had access to digital video projectors. The 33% of subjects who indicated other, specified having access to items such as a SMART Board and document camera. One of the twenty-seven subjects surveyed indicated they did not have any technology accessible for student use in the art classroom. Interviewed art teachers indicated they had digital still and video cameras, computers, and video projectors available for use in and around their classrooms.

There are multiple factors (obstacles) affecting art teacher use of technology in the art classroom as shown in Table 4. Art teachers were asked to indicate what obstacles impeded on their use of technology in the art classroom. Seventy percent of subjects indicated time constraints as an obstacle affecting their use of technology in the art classroom. Forty-four percent of art teachers surveyed indicated accessibility to digital resources as an obstacle affecting their use of technology. Thirty-seven percent of subjects selected limited knowledge of using technology in the art classroom as a factor in their use of technology and thirty percent indicated lack of technical support as an obstacle. Just 15% of art teachers expressed limited interest as an obstacle affecting their use of technology in the art classroom. The 22% of subjects who indicated other, specified budget and focus on traditional art medium use as factors affecting their use of technology. The art teachers interviewed described equipment issues such as maintaining

current software as an obstacle affecting technology use in their classrooms. They also expressed frustration with constraints set by time, space, and schedule.

Table 4

Indicate any/all obstacles that affect your use of technology in the art classroom

Response	Response Total	Percentage
	Sample size (n = 27)	
Accessibility to digital resources	12	44%
Limited interest	4	15%
Lack of technical support	8	30%
Limited knowledge of the use of technology	10	37%
Time constraints	19	70%
Other (e.g. budget, focus on traditional mediums)	6	22%

Chapter V: Discussion

This study was intended to provide evidence for the need of art educators to take a more prominent role in the education and development of technology and digital media in the art classroom. Currently, art educators across levels are inconsistent in using technology in the art classroom for exploring art, discussing art, and creating art. The continued development of new technologies available to artists has created a new visual arts medium and resource used by teachers and students alike. Neglecting to educate

students about the use and significance of digital media and technology as both an art form and resource leaves students naïve to modern visual literacy, and unprepared for art related careers that embrace technology.

The literature review provided in this study has provided examples of the pedagogical value of the use and education of technology in the art classroom. Literature has also provided examples of how technology has been used in the creation of art, education of art, and communication of the art world. Literature has made evident the impact that technology has made on artists, art educators, and students of the visual arts.

Data collected from the online survey of art educators in the Marshfield, Rhinelander, Stevens Point, Wausau, and Wisconsin Rapids school districts has provided a sample of how art educators are currently implementing the use of technology into the K-12 art classroom and how art educators feel about introducing the use of technology as an artistic medium. Two face to face interviews conducted with art educators at the middle school and high school level have provided an opportunity to discuss issues related to technology use in the art classroom.

Limitations

Data collection was limited by the number of art educators who took the time to take the online survey. Data collection was also limited by using a predetermined sample of art teachers located in school districts in Wisconsin near the researcher. Respondents to this survey must have been familiar with technology both to access the survey and to complete it. Subjects who did not take the online survey after the first attempt were contacted up to three times to ensure a quality sample. Some email addresses compiled

were no longer recognized by school districts and survey links were not sent to those addresses.

Literature available for review related to the use and education of technology in the arts was available, but many sources available were related to professional artists use of technology in art making. There is a need for more research related to the use of technology in the art classroom.

Pedagogical Findings

Art educators have indicated that they are using technology in their professional life and their personal life. Many art teachers are using technology as a communication tool and tool for collecting resources, not unlike many general educators sitting down at the computer to quickly gain access to the story, image, or lesson they are interested in implementing. However, not all educators surveyed are using technology as an instructional tool and art medium for the creation of art. Krug (2004) suggested forms of technology such as CD-ROMs and the Internet offer opportunities for art teachers to practice aesthetics, art history, and art criticism. While 81% of art educators surveyed did indicate they used the Internet as an instructional tool for viewing images, just over half of art educators took the next step of using the Internet as an interactive tool for student learning.

Technology in the form of an electronic digital catalog of artworks can be accessed quickly and easily. Art teachers have access to nearly any image they can imagine. The Internet can be an excellent resource for art educators. However, many interactive tools available through online galleries are also quickly accessible and offer opportunities for students to take ownership over their learning. Stankiewicz (2004)

believed in broadening the texts, the types of images and the objects that students learn to interpret through the use of technology and digital images. Art teachers must understand the use of technology to investigate the arts. Children should have the ability to interpret, negotiate, and make meaning from information presented through digital images. An art educator who is using technology merely as a resource is not taking advantage of the opportunities available to educate young artists about the use and function of technology as a teaching tool and art medium.

The development of digital technologies increasingly supports individual expression in visual forms (Congdon & Blandy; Stankiewicz as cited in Stankiewicz, 2004). These visual forms (artworks) can be published and distributed through technology, specifically the Internet. Twenty-six percent of the art educators surveyed indicated they were publishing artwork on the Web for their art classes. However, there is a possibility of more art educators displaying student work on the Web as indicated by the 33% of art educators who maintained a website for their art classes.

Before publishing artworks on the Internet students need to have an understanding of the tools available for creating the digital artworks. Walling (2001) suggested art teachers must understand the use of technology and the computer to create and manipulate artworks. Areas such as graphic design have become heavily dependent on computers as part of the creative process and completion (Hamilton, 2003). The new age of photography in digital form has lent itself to the computer learning process through image editing and manipulation software. Many of the skills associated with the use and education of these digital tools are not being taught until the secondary and post secondary level. Just 56% of the art educators surveyed acknowledged having art and

design software available for use. Nine of the 14 art educators who had art and design software available taught at the high school level.

Pedagogical and practical processes in the visual arts have faced changes due to technological pressures and have established the significance that computers play as a vehicle for expression and production in the digital and traditional arts (Hamilton, 2003). Colman (2004) completed a study designed to investigate pedagogical strategies that would encourage secondary students to think critically about their perceptions and use of the Internet, guide them in analyzing works of Internet art, and introduce them to using the Internet as an artistic medium. Colman's study indicated a need for art educators to teach students how to become critical viewers of what is seen on the Internet. The new form of visual literacy produced by technology could be easily misinterpreted by naïve eyes lacking the skills to question and challenge what is presented.

Current Implementation of Technology

The survey administered to K-12 art educators was developed to provide data related to the art educators current implementation of technology in and outside the art classroom. Nearly half of the art teachers considered themselves an intermediate computer and technology user and one quarter of those responding considered themselves to be an advanced user. Interviewed art teachers considered themselves to be advanced computer and technology users. The seven art teachers who indicated they were novice computer users taught outside of the high school level indicating art teachers at the high school level were more familiar with technology and its capabilities. A higher percentage of high school art teachers also indicated having more technology based resources available.

All but 10% of subjects surveyed indicated using a computer and/or still or digital video camera during the school year. Seventy percent of those surveyed also indicated using a scanner. The data suggests technology has worked its way into the art classroom in multiple forms. It was not indicated however, if art teachers were using their available resources consistently. The technology may have been used by the art teachers themselves, but there is less indication if students were using these resources at a significant level. A small percentage of the art teachers surveyed also specified using items such as a visualizer (digital interactive teaching tool), data projector, document camera, SMART Board (an interactive whiteboard), Elmo (a digital visual presenter), and webcam. These items as well as art and design software create a more substantial implementation of technology in the art classroom. Interviewed art teachers discussed using the Internet, digital still and video cameras, scanners, and computer software such as Adobe Photoshop (digital imaging software), I Movie (digital video software), and Power Point (digital presentation software). Interviewed art teachers also specified that courses such as Advanced Placement Art History and Cartooning and Animation lend themselves to more technology use in the art classroom.

Nearly half of all art teachers surveyed acknowledged using the Internet for two to four hours a week indicating they had experience using the Internet. One third of the art educators surveyed also indicated they maintained a website for their school art program. In many cases the art classroom website becomes a vehicle for communicating the events of the art classroom and becomes an online gallery for displaying student work and activities.

All 27 art teachers surveyed indicated using the Internet for finding and collecting resources; an activity which benefits art educators lacking visual resources and information presented in books and artist reproductions. Just over half of the art educators also indicated using the Internet for student centered activities. Some art educators indicated using the Internet as an interactive tool for student learning, and one subject indicated using the Internet as a forum for students to respond and communicate through a blog site (weblog). Interviewed subjects also indicated using the Internet for obtaining resources, but included specific examples of Internet use such as networking with professional artists, establishing art events, and getting into professional art shows.

The online learning environment allows students to visit art galleries around the world, view art by professional and novice artists alike, and discuss their findings. Seventy percent of art educators indicated students were doing research while they were online for their art classes. Twenty-six percent indicated they were publishing artwork on the Web, while 59% indicated students were visiting online galleries for their art classes. Rand (2008) suggested the art that current technology invites solicits new artistry, new expressions, and even new forms of art. In 70% of the classrooms students were developing and creating artworks while they were working online for their art classes. Just 19% of art teachers indicated they were not asking students to work online for their art classes. It became evident that many art educators are using technology in their art classrooms for a variety of pedagogical and resource needs, however not all art educators are using technology at the same level.

Current Attitudes

Data collected related to current art educators' attitudes about the use of technology in the art classroom illustrated a near 50/50 split in their view of the significance of technology. The split is also evident in art educator interest in learning more about the use of technology in the art classroom and school district attitudes as suggested by the art educators. Fifty-two percent of the respondents felt that the use of technology in the classroom was very important. Forty-one percent of respondents felt technology use was fairly important, and just 7% (two of 27) considered technology use in the art classroom to be not at all important. Data compiled to indicate school district attitude towards the use of technology was very similar to the subjects' personal attitudes. However, the art educators determined their respective school districts attitude about the use of technology, so data indicates the perception of the art educator. Fifty-two percent of subjects felt their respective school district held technology as a high priority, while just 4% of the respondents indicated their school district held technology as a low priority. Interviewed subjects indicated that technology use was of above average importance in their school district and was becoming less important in their classrooms as a result of time constraints. The link between school district attitudes and art educator attitudes is an obvious concern for those art educators indicating interest in learning more about the use of technology in the art classroom without school district support. There is also concern for school districts who hold technology use as a high priority, but have teachers who do not.

Art educators indicated their level of interest in learning more about technology to determine if art educators are content with their use of technology and current practices in

the art room. Just over half of art educators responding indicated they were very interested in learning more about the use of technology in the art classroom. Forty-one percent indicated they were somewhat interested, while just 7% were not interested in learning more about the use of technology in the art classroom at the time of survey. Interviewed subjects at the middle and high school level indicated they were interested in learning more about the use of technology in the art classroom both professionally and independently outside of the art classroom.

Conclusions

Just a very small percentage of art educators indicated they had little use for technology in the art classroom and have little interest in learning more about the use of technology. However, only half of art educators consider technology use to be very important and would like to take the time to learn more about its use in the art classroom. Art educators are split on its use and its significance in the art classroom. Although, nearly all of the art educators surveyed acknowledged using computers and digital cameras throughout the school year, and 100% of art educators indicated they used the Internet for finding and collecting resources. Even 70% of art educators acknowledged having students work online to complete research and create artworks. Aside from these activities however, there is a substantial decline in technology use in the art classroom.

Data suggests art educators are using technology to create, share, and express original ideas, but there is a strong indication technology is getting used for obtaining resources more than anything else at this point. Data categorized by grade level indicated art educators at the 9-12 level had more technology available for use and were using their resources to the greatest potential. Contrary to Gouzouasis (2006) who carried that belief

that an integrated arts and technology curriculum should start in the primary grades, many art educators teaching at the K-5 level had fewer resources overall and were not using them at the same level. The use of technology in the art classroom is inconsistent across levels, along with attitudes and interest. Data does not indicate a substantial attitude for nor against the use of the technology in the art classroom.

Many factors have been indicated that have affected art educator use of technology in the art classroom. A substantial majority of art educators indicated having computers available in and around their classroom was an obstacle affecting their use of technology. One of the subjects surveyed even indicated they did not have any technology accessible for student use in the art classroom. As expected, time constraints were also indicated as an obstacle affecting educator use of technology in the art classroom. Many of the art educators indicated teaching at multiple levels and in some cases these teachers were teaching in multiple buildings, possibly affecting technology use and availability. As indicated through interview, some classes were cut from 18 week courses to 9 week courses limiting what could be completed in the art class. Art programs have been found to have insufficient access to hardware and software to significantly and consistently contribute to the programs. Forty-four percent of art teachers surveyed indicated accessibility to digital resources as an obstacle affecting their use of technology.

Recommendations

Further research is recommended in determining how the state art standards suggest the implementation of new media forms and how these standards are being met without consistent use of technology in the art classroom. It is also unclear why

technology use in art classrooms is inconsistent across grade levels, although 93% of art educators are somewhat to very interested in learning more about the digital arts and the use of technology. While literature is abundant in artists perceptions of the use of technology and the art educators role in the education of technology, research is difficult to find directly related to technology use in the art classroom at the primary and secondary levels. More research is necessary regarding the role of technology in the art classroom to provide sufficient data to support or deny the effectiveness of using technology in the art classroom. Educator age was not a factor in this study, but research related to the age of an art educator and technology use may prove to be beneficial.

References

Candy, L. (2007). Constraints and creativity in the digital arts. *Leonardo*, *40*(4), 366-367. Retrieved November 23, 2008, from Academic Search Elite database.

Chung, S. (2007). Art education technology: digital storytelling. *Art Education*, *60*(2), 17-22. Retrieved September 20, 2008, from MasterFILE Premier database.

Colman, A. (2004). Net.art and net.pedagogy: Introducing Internet art to the digital art curriculum. *Studies in Art Education*, 46(1), 61-73. Retrieved September 20, 2008, from Wilson Web database.

Gigliotti, C. (2001). The challenge of the technological future and the arts. *Arts Education Policy Review*, *102*(3), 7. Retrieved September 20, 2008, from Academic Search Elite database.

Gouzouasis, P. (2006). Technology as arts-based education: Does the desktop reflect the arts?. *Arts Education Policy Review*, *107*(5), 3-9. Retrieved September 20, 2008, from Academic Search Elite database.

Hamilton, P. (2003). Research in progress: the printmaking studio of the future in higher education? *Art, Design & Communication in Higher Education*, *2*(1/2), 67-81. Retrieved September 20, 2008, from Academic Search Elite database.

Healey, B., Macpherson, T., & Kuijten, B. (2005). An empirical evaluation of three web survey design principles. *Marketing Bulletin*, *16*, 1-9. Retrieved February 23, 2009, from MasterFILE Premier database.

Krug, D. H. (2004). Leadership and research: Reimagining electronic technologies for supporting learning through the visual arts. *Studies in Art Education,* 46(1), 3-5. Retrieved September 20, 2008, from Wilson Web database.

Lane, H. (2006). Don't judge the art by its medium. *Children & Libraries: The Journal of the Association for Library Service to Children*, *4*(1), 28-29. Retrieved March 8, 2009, from Academic Search Elite database.

Legrady, G. (2006). Perspectives on collaborative research and education in media arts. *Leonardo*, *39*(3), 215-218. Retrieved November 23, 2008, from Academic Search Elite database.

Marshfield School District. (2008). *Marshfield school disrict at a glance*. Retrieved December 4, 2008, from http://www.marshfield.k12.wi.us/districtglance.cfm

Middleton, H. (2005). Creative thinking, values and design and technology education. *International Journal of Technology & Design Education*, *15*(1), 61-71. Retrieved September 20, 2008, from Academic Search Elite database.

Milekic, S. (2000). Designing digital environments for art education/exploration. *Journal of the American Society for Information Science*, *51*(1), 49-56. Retrieved September 20, 2008, from Academic Search Elite database.

Naidu, S., Anderson, J., & Riddle, M. (2001). The virtual print exhibition: A case of learning by designing. (ERIC Document Reproduction Service No. ED466202) Retrieved December 1, 2008, from ERIC database.

Rand, H. (2008). The other side of digital art. (pp. 543-547). . Retrieved March 8, 2009, from Academic Search Elite database.

Sabol, F. Robert, & Dorn, Charles M. (2006). The effectiveness and use of digital portfolios for the assessment of art performances in selected secondary schools, *Studies in Art Education : A Journal of Issues and Research in Art Education*, *47*(4), 344-62. Retrieved September 22, 2008, from Wilson Web database.

School District of Rhinelander. (2008). *School district homepage*. Retrieved December 4, 2008, from http://www.rhinelander.k12.wi.us/

Shannon, D., & Bradshaw, C. (2002). A comparison of response rate, response time, and costs of mail and electronic surveys. *Journal of Experimental Education, 70*(2), 179. Retrieved January 6, 2009, from MasterFILE Premier database.

Stankiewicz, M. (2004). Notions of technology and visual literacy. *Studies in Art Education: A Journal of Issues and Research in Art Education, 46*(1), 88-91. (ERIC Document Reproduction Service No. EJ740500) Retrieved September 20, 2008, from ERIC database.

White, G (2003). An on-line survey of food and beverage consumers on the Internet: an evaluation of the survey methodology. (2003, May). *Marketing Bulletin*, Retrieved February 23, 2009, from MasterFILE Premier database.

Winter, M. (2003). The computer as a partner in design education. *Human Ecology, 31*(1), 21. Retrieved March 8, 2009, from Academic Search Elite database.

Zalben, J. (2006). Digital art is not an easy way out. *Children & Libraries: The Journal of the Association for Library Service to Children, 4*(2), 3-3. Retrieved March 8, 2009, from Academic Search Elite database.

Appendix A: Online Survey

Technology in Art Education

Page 1 of 1

The Digital Art Classroom

1. **Indicate all grades you are currently teaching art:***
   Select at least 1 response and no more than 4 responses.
   - ☐ K-2
   - ☐ 3-5
   - ☐ 6-8
   - ☐ 9-12

2. **Rate your current level of computer expertise:***
   - ○ Novice
   - ○ Intermediate
   - ○ Advanced

3. **Indicate which technology tools you typically use during the school year:***
   Select at least 1 response and no more than 4 responses.
   - ☐ Computer
   - ☐ Still or Digital Video Camera
   - ☐ Scanner
   - ☐ Other, please specify

4. **How many hours a week are you currently online?***
   - ○ 1 hour or less

- [ ] 2-4 hours
- [ ] 5-9 hours
- [ ] 10 or more hours

5. **Identify all areas in your professional life where the Internet has made a significant impact:***
Select at least 1 response and no more than 5 responses.

- [ ] Communication tool
- [ ] Finding and collecting resources
- [ ] Instructional tool for viewing images
- [ ] Interactive tool for student learning
- [ ] Other, please specify

6. **Do you currently maintain a website for your school art program?***

- [ ] Yes
- [ ] No

7. **How important is classroom use of technology in your school district?***

- [ ] Low priority
- [ ] Moderate priority
- [ ] High priority

8. **How important do you personally feel the use of technology is in the classroom?***

- [ ] Not at all important
- [ ] Fairly important
- [ ] Very important

9. **Select all technology/digital tools accessible for use in and around your art classroom?***
Select at least 1 response and no more than 6 responses.

- [ ] Computers
- [ ] Art/Design Software
- [ ] Digital Cameras
- [ ] Digital Video Projectors
- [ ] Other, please specify

10. How many Internet-connected computers are available in your art classroom?*

- ( ) None
- ( ) 1-3
- ( ) 3-5
- ( ) 5 or more

11. What are students doing while they are online for their art classes?*
Select at least 1 response and no more than 5 responses.

- [ ] Research
- [ ] Publish artwork on the Web
- [ ] Visit online galleries
- [ ] Develop and create artworks
- [ ] Other, please specify

12. Select any/all obstacles that affect your use of technology in the art classroom?*
Select at least 1 response and no more than 6 responses.

- [ ] Accessibility to digital resources
- [ ] Limited interest in using technology
- [ ] Lack of technical support
- [ ] Limited knowledge of the use of technology in art
- [ ] Time constraints

- [ ] Other, please specify

13. How interested are you in learning more about the use of technology in the art classroom?*

- ( ) Not Interested
- ( ) Somewhat Interested
- ( ) Very Interested

Appendix B: *Interview Questions*

Technology in Art Education
Interview Questions

1. What grade level are you currently teaching art?
2. Would you consider yourself a novice, intermediate or advanced computer user?
3. What types of technology are you currently using during the school year?
4. Are there specific courses or a level of students that are using technology more in the classroom?
5. How many hours are you currently online?
6. Has the Internet made a significant impact on any areas in your professional life? If so, what are they?
7. Do you currently have a website for your school art program? If so, do you maintain it?
8. How important is classroom use of technology in your school district?
9. How important is classroom use of technology in your perspective? Explain.
10. What technology/digital tools are accessible for use in and around your classroom?
11. How many computers are available in your art classroom?
12. Are students working online for their art classes? If so, what are they doing?
13. Are there any obstacles affecting your use of technology in the art classroom?
14. What forms of digital media are you aware of for use in the visual arts?
15. Are you interested in learning more about the use of technology in the art classroom?

Appendix C: Survey Results

Technology in Art Education

Respondents: 27 displayed, 27 total
Launched Date: 02/19/2009
Status: Closed
Closed Date: 03/11/2009

1. Indicate all grades you are currently teaching art:

	Response Total	Response Percent
K-2	10	37%
3-5	10	37%
6-8	12	44%
9-12	12	44%
Total Respondents		27

2. Rate your current level of computer expertise:

	Response Total	Response Percent
Novice	7	26%
Intermediate	13	48%
Advanced	7	26%
Total Respondents		27

3. Indicate which technology tools you typically use during the school year:

	Response Total	Response Percent
Computer	25	93%
Still or Digital Video Camera	25	93%
Scanner	19	70%
Other, please specify View	13	48%
Total Respondents		27

4. How many hours a week are you currently online?

	Response Total	Response Percent

1 hour or less	6	22%
2-4 hours	13	48%
5-9 hours	4	15%
10 or more hours	4	15%
Total Respondents		27

5. Identify all areas in your professional life where the Internet has made a significant impact:

	Response Total	Response Percent
Communication tool	26	96%
Finding and collecting resources	27	100%
Instructional tool for viewing images	22	81%
Interactive tool for student learning	15	56%
Other, please specify view	3	11%
Total Respondents		27

6. Do you currently maintain a website for your school art program?

	Response Total	Response Percent
Yes	9	33%
No	18	67%
Total Respondents		27

7. How important is classroom use of technology in your school district?

	Response Total	Response Percent
Low priority	1	4%
Moderate priority	12	44%
High priority	14	52%
Total Respondents		27

8. How important do you personally feel the use of technology is in the classroom?

	Response Total	Response Percent
Not at all important	2	7%
Fairly important	11	41%

Very important	14	52%
Total Respondents		27

9. Select all technology/digital tools accessible for use in and around your art classroom?

	Response Total	Response Percent
Computers	24	89%
Art/Design Software	15	56%
Digital Cameras	23	85%
Digital Video Projectors	14	52%
Other, please specify view	9	33%
Total Respondents		27

10. How many Internet-connected computers are available in your art classroom?

	Response Total	Response Percent
None	0	0%
1-3	18	67%
3-5	2	7%
5 or more	7	26%
Total Respondents		27

11. What are students doing while they are online for their art classes?

	Response Total	Response Percent
Research	19	70%
Publish artwork on the Web	7	26%
Visit online galleries	16	59%
Develop and create artworks	19	70%
Other, please specify view	5	19%
Total Respondents		27

12. Select any/all obstacles that affect your use of technology in the art classroom?

	Response Total	Response Percent
Accessibility to digital resources	12	44%
Limited interest in using technology	4	15%

Lack of technical support	8	30%
Limited knowledge of the use of technology in art	10	37%
Time constraints	19	70%
Other, please specify View	6	22%
Total Respondents		27

13. How interested are you in learning more about the use of technology in the art classroom?

	Response Total	Response Percent
Not Interested	2	7%
Somewhat Interested	11	41%
Very Interested	14	52%
Total Respondents		27