IMPLEMENTATION OF TECHNOLOGY IN ART CLASSROOMS IN AN ARIZONA SUBURBAN SCHOOL DISTRICT

by

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A Thesis Submitted to the Faculty of the

DEPARTMENT OF ART EDUCATION

In Partial Fulfillment of the Requirements
For the Degree of

MASTER OF ARTS

In the Graduate College

THE UNIVERSITY OF ARIZONA

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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

ABSTRACT

This thesis examines the role that technology may have in art education. It is a case study that describes how the art educators in one Arizona school district are currently using technology and the plans they have to use technology in their classrooms in the future. On site interviews and limited classroom observations were used to collect information. Art educators cooperating in the study were asked a wide range of unstructured questions to gather their views and impressions. Transcripts are included.

This case study suggests that there is a high level of support for the introduction of technology into the art classrooms in this Arizona school district. However, at this time it seems that the technologies under consideration are limited to microcomputers and CD ROM devices. In addition, in this school district there seemed to be no technical support system available to assist the art educators in their attempts to integrate technology into their art classrooms. Their future success might be limited by the lack of support available to them from outside sources.

LIST OF TABLES

CHAPTER 1: INTRODUCTION

Visual and decorative arts have long been an important aspect of education in many societies. Each of these societies has developed a means to teach its techniques and values to its children. According to Efland (1990) :

> As long as the arts have existed, artists, performers, and audience members have been educated for their roles. Every culture has devised ways to select and prepare individuals to engage in these roles. (p 1.)

The manner in which a society prepares individuals to engage in valued roles is the educational system of that society. In many instances a society applies its best minds, resources, and technologies to this educational process.

The use of technology in education has been traced to the Almira Caves by Saettler (1990). The technology in this case was defined as painting and pigments, and the ways they were used to create striking visual representations on the walls of caves. These methods of using pigments and drawing were novel and used to record the important aspects of their creators' lives according to Saettler. The oral educational tradition Cro-Magon

peoples was augmented by the visual elements of the Almira drawings and paintings and likely became an important element of education for Cro-Magon children. Saettler, 1990). There seems little doubt that the pigments, dyes, and implements used were in fact technological products used to produce outstanding visual works. These visual works were unlike anything seen before and involve the sophisticated use of pigment materials in a new and creative manner.

Deliberations as to who may be educated and what is education have often been of concern (Efland, 1990 and Saettler, 1990). Philosophers from many cultures have been interested in the role of education and how education may be used to maintain and communicate their societies' values.

The affinity of educators to adopt innovation and technology has also been long documented (Efland, 1990 and Saettler, 1990). It seems that technology has often been used to expand the scope of education to permit wider access to educational services, as well as to develop means to better educate.

The use of technology in American classrooms has been important since the turn of the century when the emerging technologies of standardized testing and motion pictures were first used to test and train U.S. troops for World War I. These early technologies included radio, film, printed material, and phonographs. As other technologies came along, they were quickly

included in the educator's tool box. Television in the 1950's, video cassettes in the 1960's, and the computer in the 1970's were all seen as important tools for educators.

The experience of technology in art education has a similar record to that of other disciplines. Prints, slides, videos and other visual technologies have long been used by art educators. While visual artists have tended to be more interested in the visual technologies, many visual arts educators, like all educators, have expressed interest in technology to improve their teaching effectiveness.

In recent years, technology has come to mean microcomputers, laser disks, CDROMs, and so forth. These devices have a high potential for utility in the art classroom. There is a considerable body of literature concerning the benefits of the use of laser disks and computers in the art classroom. However, little has been published in recent journals about the actual use of these new technologies in the art classroom.

According to Richmond (1970), "Educational technology is the application of scientific knowledge about learning, the conditions of learning, to improve the effectiveness and efficiency of teaching and training" (p 5).

The purpose of this thesis is to look at how new technologies are being used by art educators in one Arizona school district. In addition to reporting on what is being

accomplished by Arizona art educators, efforts will be made to look at the attitudes and feelings of these art educators toward technology in the art classroom.

CHAPTER 2: REVIEW OF THE LITERATURE

As previously mentioned, Efland (1990) clearly traced the evolution of art education to all societies. Educators in general, and art educators in specific, have always looked to intellectual and technical innovations to improve the quality and quantity of educational services to the members of their societies. This effort to improve the quality of instruction has by its very nature involved the use of educational technology as defined by Richmond (1970). The adoption of technology has a long history according to Saettler (1990) who made a careful distinction between intellectual innovations or technologies and physical technologies. Saettler cited managerial innovations in classroom management, such as team teaching and more traditional technologies such as high-speed printing and moveable type which are more physical technologies.

Gillett (1973) suggested that there is clear interrelationship between the adoption of technology in the classroom and the teacher's attitudes toward technology. According to Gillett, the more positively an educator felt toward technology, the more likely the educator had had a positive experience in the implementation of technology in his or her classroom. Gillett (1973) identified three common generalizations educators may have about educational technology:

- Technology is dehumanizing.
- Technology leads to loss of individual identity.
- Technology has a force and will of its own. (p. 5)

In addition, Gillett (1973) identified four views of technology that educators may hold. The "Optimistic View" is characterized by a belief that technology is great and that it is a desirable path to health and prosperity. The "Pessimistic View" is the converse of the "Optimistic View." Tenets of this view include the idea that technology is bad and dangerous. The idea that technology has little, if any, use in education is another tenet of this viewpoint. The third view is the "Null View." This view sees technology as being vastly overrated. Social development is more important under this view than technological innovation. Funds and efforts would be better spent on social change than technology, for example. The fourth view is the "Compound View." This view is more pragmatic and looks at a multiple of factors when considering the import of technology on education.

Hudson (1985) in his doctoral dissertation reported that the prior attitudes of secondary art educators and school superintendents in Missouri seemed to have an important impact upon the affinity of both groups in the integration of innovation into Missouri classrooms.

Another important aspect of educational technology is the cost of the technology in terms of the expertise required of the teacher as well as the cost of the technological devices, according to Oettinger (1969). In addition to these costs, Oettinger also stated that:

> The evidence makes plain, for example, that a relatively ancient form of technology, and one which in principle lends itself very well to individualization, the book, is still far from being effectively assimilated in contemporary schools. (1969, p.89)

The Office of Technology Assessment of the U.S. Government (OTA) reported in 1982 that the role of informational technologies were expected to have an important impact upon the future of all American educational systems. The technologies of concern in the OTA report were not limited merely to the microcomputer or video disk. The OTA report discussed the following educational technologies:

1. Communications
    a. Cable Television - Television signals that are transmitted by wire.
    b. Satellite Communication - Provides a range of direct services to users such as data transmission, voice

communication, video-conferencing and video-television.

c. Digital Telephone Networks - Provides a wide range of data and voice transmission capabilities to individual telephone users.

d. Local Distributed Networks - These smaller network services are becoming available from local telephone providers.

e. Direct Broadcast Satellite - Provides bypass of land based telephone and television providers by means of individual satellite transmissions.

f. Low Power Broadcast - Provides local (5-10 mile) radio and/or television transmission services.

2. Computers

a. Desktop Computers - Small microcomputer capable of classroom use.

b. Hand held Computers - Very small hand-held computer for data collection, media control, and other automation functions.

3. Human Interface

4. Storage Technology

5. Video Technology

a. Video Cassette Recorders

b. Filmless Cameras

c. Video Disks

6. Information Services
    a. Videotext
    b. Teletext
    c. Information Networks
7. Electronic Conferencing
8. Advanced Business Services

The Office of Technology Assessment reported in 1982 that the role of data terminals and microcomputers would grow in the coming years (p.141). OTA predicted that these technologies would be integrated into every aspect of the educational process. No mention was made in the Office of Technological Assessment report of education in the visual arts.

With the efforts to implement technologies into the classroom, several problems have emerged. In addition to the monetary cost of these technologies Cuban (1986) points to different levels of the use of technologies in classrooms based upon other factors relating to the socialization of educators.

The literature of the use of technology in art education seems to focus mainly on two recent technological innovations. The first is the laser disk and/or CDROM. The second is the microcomputer. While these technologies are interrelated from an engineering perspective, they seem to differ in several ways, according to recent literature.

Greh (1987) traced the generation of computer graphics to the 1950's and 1960's. These early computers were large and expensive. It seems clear that the size and cost of these early computers generally made them unsuitable for educational purposes. In addition, most of the development of graphics was for data manipulation, not artistic endeavors. Greh pointed to the early 1960's and 1970's as the time of the first use of computers by artists (p.15). Not much is known from this period about the use of computers to make art, according to Freedman and Relan (1992).

According to Eisner (1983):

> Although technology is frequently regarded as antithetical to the arts, in fact the relationship between technological progress and invention in the arts has long been an intimate one. (p.60)

Eisner saw the microcomputer as a new tool which would permit students to better exercise their creativity. Oettinger and Roland (1986) seemed to also hold this view when they say that the microcomputer may be used in a variety of ways that simulate current studio activities. As recently as 1991, Freedman (1991) published a survey of the computer software and hardware capable of supporting studio activities. Most of this software

was commercial software capable of accomplishing only low levels of graphics.

Freedman and Relan (1992), and Freedman (1993) also pointed out that microcomputers are neutral and that students might become more focused on the processes involved in the production of microcomputer graphics than on the results of their efforts.

Hubbard (1985) called the microcomputer "a major new thrust in education" (p 15). Galbraith (1993), D'Angelo (1988), Jones (1986), and Greh (1986) all see microcomputers as important assets and tools for art educators. All, however, seemed to feel that the integration of the microcomputer into the visual art classroom has taken place slowly. Greh says:

> In art education, the outlook is not quiet as optimistic. Whether for political, economic, or personal reasons, computers have not found their way into most art rooms. (1986, p.5)

These reasons seem to echo the comments Cuban (1986) made about the implementation of computers into education in general when he discussed the problems inherent in the implementation of new technologies into American classrooms. In fact, Hannafin and Savenye (1993) traced a technological cycle of disappointment, disillusionment and abandonment relating to technology. They

argue that there is a dual aspect involving the encouragement of technology on one hand and the resistance based upon previous socialization on the other.

Another aspect to the lack of emphasis being reported on the use of microcomputer in the visual arts classroom was suggested by Hawkins (1974) who reported that only 1.2 to 1.8 percent of the articles in Art In America, Studies In Art Education, and School Arts over a ten-year period dealt with technological issues.

Luherman (1985) also alluded to problems with the issues inherent in using microcomputers in the classroom when he said that "... education is engaged in an exciting adventure (the implementation of microcomputers), but not in one that will revolutionize the school" (p.51).

On the other hand, Roland (1990) saw a wider role for the microcomputer in the art classroom than Luherman. Roland (1990) described an art classroom in which students have access to individual computers for a wide range of art-making activities.

The second most common technological device appearing in recent art education literature is the laser disk. Versions of the laser disk predate the microcomputer. There are several articles in the art education literature.

For example, Hubbard (1989) pointed out that video players (a form of laser discs) were a significant art education

technology in 1989. Jansen (1989) reported that video laser disks were an important educational tool in Holland.

Hausman (1991) in an editorial in Art Education suggested that teachers should lead the way for students in the incorporation of technology into the classrooms. The implication was that American students were somehow "ahead" of art educators in the use of technology in the schools.

A video disk and data base for art educators was discussed by Marschalek in 1991. Schwartz (1991) also spoke glowingly of the laser disk for art educators. Corwin and Perlin (1995) have identified several implementation issues involving the video disk. One is the cost ($3000 to $15000) and another requires:

> ... art teachers to move from a traditional view of student achievement which emphasizes mastery of subject matter to a constructivist view of student achievement that emphasizes higher order cognitive processes. (p.16)

Gregory (1989) has also suggested that the laser video is an important aspect of the multimedia art classroom.

It seems clear from the literature that the term "educational technology" for the art classroom has focused upon the microcomputer and the laser disk in recent years. Clearly

there may be other technologies available for the art educator, but none have been written about with frequency of the microcomputer and laser disk in the art education journals.

Research Questions

Based upon this survey of the literature concerning art education, the following questions are suggested:

1. Does technology mean CDROMs and microcomputers to the study area art educators, or does the term mean other devices?

2. Do these art educators seem to have preconceived attitudes toward technology that impacts their ability or inclination to use technology in a classroom situation?

3. Do these art educators believe that technology is dehumanizing, leads to a loss of individual identity, or has a force and will of its own?

4. Do data terminals and microcomputers have a large role in education as predicted by the OTA report?

5. Do the art educators in this study perceive the microcomputer as a new tool that permits students to better exercise their creativity?

6. Have these art educators experienced a "cycle of disappointment" relating to technology?

7. Where do the art educators in this study area find technological support?

CHAPTER 3: RESEARCH METHODS

The basic concept of this project is to look at the actual approaches to art educational technologies by art educators and specialists in the field. What technologies are they using? What technologies would they like to have and why?

In addition, it might prove interesting to determine how the art educators participating in this study work together and manage their program. Also, the views of these art educators toward the previous seven questions (See Section 3.1) will be researched.

The Survey

A brief survey was prepared and sent to the art educators participating in this study before the interviews were conducted.(Appendix A). The purpose of the pre-survey was to allow interviews to think about the issues to be discussed before the actual interviews and to collect background information in a non-intrusive manner.

The Interviews

Site interviews were conducted with six of the eight area Unified School District art educators. Two educators were unavailable due to personal emergencies. One of the art educators was unavailable due to family emergency. These interviews were held in individual classrooms and were focused upon gathering the classroom teacher's experiences and feelings toward technology in the art classroom.

Results

The results of the questionnaire and site surveys will be organized according to general themes. The goal of this effort is to present the views of the art educators in this study toward technology. In addition to this general theme, the attitudes of the art educators toward technology training and the integration of technology into the classroom will be canvassed.

Definitions

CDROM - Compact Disk Read Only Memory - A high capacity storage device used to store programs, images, and audio. It is

a read-only technology. Smaller than a laser disk, the CDROM is more readily available.

Disk - a round storage media for microcomputers.

Elementary Schools - Grades K-5.

High School - Grades 9-12.

Laser disk - A optical read only high capacity storage device.

Microcomputer - A small computer designed for use by one person.

Middle School - Grades 6-8.

MODEM - MOdulator/DEModulator - A device to permit computers to communicate across telephone lines.

ROM - Read only memory

Unified School District - A school district in Arizona offering K-12 education.

CHAPTER 4: CASE STUDY

This document represents a case study of one school district in Arizona in its use of technologies in visual arts classrooms. The school district selected is a urban Unified School District in Arizona. The art educators of this school district agreed to participate in this study.

Study School District

The study area Unified School District is in an urban county in Arizona. Table 1 summarizes selected social characteristics of the study county.

Table 1

Selected 1990 Census Social Characteristics

Characteristic	United States	Arizona	Study County
Percent Urban	75.2	87.5	65.6
School Enrollment*(%)	26.1	27.1	22.0
Private School(%)	9.8	5.6	4.7

Elementary or High School(%)	17.1	17.3	14.1
At Least High School Graduate(%)	48.1	49.4	56.6
Median Family Income	$35,225	$32,178	$26,238
Below Poverty Level(%)	13.1	15.7	13.6

* Persons 3 years and older enrolled in public, private, or parochial school. Includes pre-school.

Source: 1990 Census of Population and Housing, STF 3A, 4-page summaries, Arizona CDP's/Places.

There were 15,243 elementary and secondary students in the study county in 1990, according to the 1990 Census. There were 13 Elementary School Districts, one High School District and nine Unified School Districts in this county, according to the State Board of Education. The Unified School District studied was one of the Unified School Districts serving the major urban area of the study county. There is one high school, two middle schools and 6 elementary schools in the this School District. Each of the schools was visited during the course of this study.

Overview of Art Educators

Each educator provided a brief summary of their professional background. Five of the six educators participating in the case study has access to a computer at home. In all cases that computer was a Macintosh. In addition, all of the art educators expressed a strong preference for Macintosh microcomputers. They seemed to feel that brand of microcomputer was better suited to the needs of visual arts educators because of the graphics and art programs available for use by artists and educators.

Table 2 illustrates the educational degrees achieved by the

six participating art teachers.

Table 2

Educational Accomplishments of Participants

Degree	Number
Associate of Arts	2
Bachelor of Science	4
Bachelor of Arts	3
Master of Fine Arts	1
Master of Arts (Art Education)	2
Master of Arts	1

Note: Most of the respondents reported receiving more than one degree.

There did not seem to be a high degree of job turnover in this school district. The average number of years of teaching experience was 12.7 (standard deviation was 5.4).

Results of Survey

A series of general statements were presented to the respondent and each was asked to indicate their degree of agreement (or disagreement) along a scale of 1-5. There were positive as well as negatively oriented questions. For example, the maximum pro stance on one issue might be represented by a

score of 5 while a similar stance on a subsequent question would be represented by a score of 1.

Table 3

Average Scores of Respondents on Twenty

Statements = strong agreement, 5 = strong disagreement

Statement	Mean	Std.Dev.
1. Computers are useful to present art criticism.	1.42	0.731
2. Technologies are a fad.	4.83	0.373
3. There is never enough money for all the things we need.	1.50	0.647
4. Computers are useful to present art production	1.67	0.745
5. Computers are useful to present aesthetics	2.00	1.155
6. Computers are useful to present art history.	1.00	0.000
7. I have always been interested in new technologies.	1.40	0.490
8. Art is for all students.	1.83	1.067
9. I plan on using computers less in the future.	4.83	0.373
10. Computer graphics is important to students	1.67	0.745
11. I plan on using computers more in the future.	1.33	0.745
12. The school board encourages art education.	2.83	1.067
13. The school board encourages the use of technology.	1.667	1.106

14. I think my school is doing a good job using technology.	1.50	0.500
15. Too much emphasis is placed on technology.	4.50	0.500
16. I have received sufficient training in technology.	4.00	0.000
17. I am interested in new and novel teaching methods.	1.50	0.500
18. I think the tried-and-true teaching methods are best.	2.83	1.344
19. Students are interested in technology.	1.17	0.373
20.We need more money for technology.	1.00	0.000

Note: These scores are based upon the six art educators responding to the questionnaire.

There was a high degree of agreement on several statements as represented by small values of standard deviation. The standard deviation values were 0.000 for statements 6, 16, and 20.

The responses to statement 6 relating to the usefulness of microcomputers to teach art history were unanimous. Each art educator gave a score of one (strongly agree) to this statement. All felt that the microcomputer was an important tool in their classroom.

These educators also strongly agreed with Statement 20 that

more money was needed for education. Funding for schools was of great interest partially because one art specialist position was not funded for the 1996-1997 school year.

All art educators in the study strongly disagreed with the statement that they had received sufficient training in technology. All desired additional training on technological devices.

There was a strong disagreement with the idea that technology was a fad. The art educators also felt that their students were interested in technology.

The widest range of responses as measured by standard deviation came on Statements 5, 8, 12, 13, and 18. The educators participating in this study seemed to have different opinions concerning the usefulness of technology in presenting aesthetics (Statement 5).

In addition, there was variation on the idea that art is for all students (Statement 8) and whether or not the school board encouraged the use of technology (Statement 12) in art education. There was also a wide range of responses about the role of the school board in general toward technology (Statement 13). There was also a range of responses about the value of "tried-and-true" teaching practices (Statement 18).

In general, there seemed to be a high degree of agreement in

the attitudinal responses of the art educators to this brief questionnaire.

Interviews of Art Educators

This section is based upon the interviews conducted with individual art educators of study district. The art educators were interviewed during the week of May 16, 1995 in their classrooms in Arizona. Names have been altered, and the interviews are presented in no particular pattern. A short description of each teacher's classroom precedes each interview.

Teacher 1

This educator's classroom is in a relatively new building. It is well lighted and has a considerable amount of work space. There are several students busy disassembling a large television set to cannibalize for the construction of a sculpture. The students work quietly and all seem on task.

The teacher shares an office with another teacher located between their classrooms. The office has several desks, two computer systems, a laser printer, a shelf of art books and a laser disk library. Students come in and out of the office. All

students seem to be on task and working quietly.

The day of the interview George (not his real name) is installing a new "state of the art" Apple Macintosh PowerMac.

He has several art programs including Painter, Canvass, Quark Express and Adobe Photoshop. He and his students use Painter the most. Painter is used to generate graphics and transparencies. Students manipulate images and create silk-screen masks on the printers.

George says that he would like to have a slide scanner to permit students to keep portfolios on disk. He says that he does not have enough computers to use them as actual curriculum tools. The computers he has "get used by those kids that are ahead of the game on the assignment that is going on, and those students that have a special project they want to do."

When asked how many computers would be needed to use them in the curricula, he said that 10 systems would be nice. "I would like to get my class size down to about 28 instead of 35. But we are under budget crunches and the classes are very popular. I hate to turn anyone away who wants to be in here."

When asked if he was interested in other technologies such as electronic mail, local area networks or portable computers, George responded that they were of no interest to the students. Calling laser disk players a "god send" to art teachers because of the quality of the image, he felt that laser disks tended to

hold the attention of the "MTV generation." "In some ways the laser disks are a handier tool than the computer. For example, (they would be useful)in art history."

He has had one-half of a day of formal training on his Macintosh computer. Friends and trial and error have provided his other training. He would like to have more training.

PowerMacs, digital cameras and scanners are on his wish list. He fully supports the district goal of making K-12 disk-based portfolios.

Teacher 2

This teacher's classroom duties involve more that art. She serves as the district coordinator the entire fine arts program which includes journalism and theater arts.

The classroom is new and has storage along two walls. There is one large double sink in the rear of the classroom. Her classroom is full of first year art students. She has stopped what she is doing to assist a special needs student who was absent during the studio demonstration for a tie-dye project. She returns with colorful hands. Her students are quietly working on task.

She says that she would like to be able to interface her personal computer to the laser disk. She plans on using personal

time this summer to complete this project. Her goal is to set up an electronic portfolio project to collect student work on a electronic media that allows student work to travel with the student from K-12.

She would like to have more internet access for both herself as well as her students. She thinks that in order to use computers as a part of her art program, 25 systems would be needed.

When asked about the high level of agreement concerning the goals of art educators in the study area Unified School District, she said:

> I think part of that is that the art teachers are pretty unified. We meet monthly. We communicate all the time. Our first goal is to put children's art in the faces of the patrons of (urban area) as much as possible.

She also said that she had assistance from the Arizona Department of Education when the school district established its art program. The Getty Institute presented a workshop on Discipline Based Art Education for all of the area teachers. She felt that a lot of the ideas and concepts of art educators came from these organizations.

Current school district training in technology in general,

and microcomputers in specific, is not sufficient. She would like to return to training under the control of art educators. Currently training is "boring mandated rules about Arizona Skills Assessment Program (ASAP)" rather than training geared to the needs of art educators. "We have little contact with the local universities because we are so far away," she said.

Linda (not her real name) does not believe that they are using technology sufficiently. Calling for additional training for art educators, she would also like to see smaller class sizes.

"When we built the building, I asked them to put in extra phone lines so everything eventually would be hooked together. Every year she prepared the budget for the entire area art program. In this way she has added laser disc players and monitors to all classrooms. Her current plan is to use textbook money to purchase digital cameras for all classrooms.

Teacher 3

Beverly (Not her real name) is teaching a class in a well maintained middle school. The office area is small and is shared with another teacher. There is plenty of storage space and students work at large work tables. As we talk she has one group of boys who are having problems staying on task. Her area of

expertise is clay. She teaches pottery at the middle school as well as at the high school. In the following school year she plans on teaching full time at the high school.

Beverly doesn't put a computer in the class because of the dust. Next year, at the high school, she plans on using a laser disk and Macintosh microcomputer. She is working on a Hypercard stack to support her lessons. She plans on using images of pottery patters in a Hypercard based lesson for students. She is doing this on her own time. "The problem is getting time to write the stack," she maintains. The only training that has been available has been training she has provided to other teachers.

Beverly would like CDROMs and a CDROM library. She would like to be capable of placing student work in electronic portfolios.

To Beverly, the term technology relates to microcomputers and CDROMs. The main uses of technology in her classroom would be for art history according to her.

Teacher 4

The classroom is bright and all students seem to be on task. There is plenty of storage and students are assigned to specific seats. Another student takes roll. Susan (not her real name) teaches middle school and shares an office with another teacher.

She is experienced in the use of a MacIntosh SE microcomputer and laser disk player with TV monitor. The microcomputer is not interconnected to the laser disk. Susan comments on the lack of sufficient materials for the laser disk and says that she is interested in going to CDROMS. She enjoys the thousands of images she has access to in the laser disk format. She has her own video library in the classroom collected from District resources. Her first technological goal is to switch from laser disk to CDROM because there is more material available for the CD media.

Placing student work on electronic media is an interest of hers. She visualizes a K-12 assessment program in which examples of every student's work would be maintained for assessment purposes. "One of our biggest holdbacks to the assessment thing is storing stuff. Where do you keep the 20 pieces of art work the child has done?"

When asked about the possibility of using microcomputers in her middle school classroom Susan said, "We only have one computer for 35 students here, and it is really difficult at the middle school level to have one kid on the computer". She does not see the microcomputer as a graphics tool saying, "At this age try to get them to work more originally."

Referring to the strong leadership experienced by art educators in the area she says that the frequent meetings of the

entire district's art education staff has produced a high degree of cooperation. She would like to have more training time on the new technology.

Teacher 5

The classroom is a modular building. Storage space is scarce. Student work is stacked in boxes and hangs from the ceiling. The module is located along side of the playground and several times other students enter the classroom.

The teacher has a small disk in one corner of the room. A laser disk sits on a stand and is playing a tour of the National Gallery in Washington D.C.

The elementary students are active, happy and work with a high level of background noise. There are about 40-45 students in the 5th grade class.

Computers have been in the art classroom only for the previous year. Joy (not her real name) says that special areas such as art were at the bottom of the priority list for computers. She eventually did get a computer by using an art award she won and the school subsidized the remaining funds. Joy thinks that technology is great in the art classroom. She is looking at software and trying to work the computer into her elementary curriculum. A CDROM has been ordered to present art

history in her classroom. " ... there's resources like the animals CDROM from the San Diego Zoo. They make a great resource for doing life illustration and that kind of thing." She would like a color ink-jet printer or a laser printer.

Currently all of her budget goes towards art supplies. Joy uses computers mainly for free time activities for students.

Joy has attended general district training on basic computers. Her school has provided Hypercard training. Joy says, "I know I can coordinate my computer to my laser disk player," and "I haven't had any training on that. So, a lot of that is slow going because I am on my own." The school has a digital scanner which she has not been able to access because "there was no training and someone took it home to learn how to do it. That's all I've seen or heard of it." She has problems using the computer lab at the school because it is prescheduled for traditional classroom activities.

Due to budgetary constraints, her position is scheduled to be eliminated, and the classroom teachers will take over elementary art education at her school. She feels that classroom teachers do not have the necessary resources and knowledge to teach art. She says:

> I imagine if they have to teach art they will have in-service. Many of them teach quiet a bit right now. ... They

do support visual arts as a part of basic education. Your will have teachers that are really into art and will seek our resource. I think the others, unless you bring it to them, they are not going to do it.

Teacher 6

The classroom is large and spacious. There is plenty of work room. Several clay wheels are in one section of the room. Two are motorized. There is plenty of storage and student work is prominently displayed. An art history time line can be seen along the top of one wall. The back door of the classroom opens into a general shop classroom. The teacher has a close relationship with a vocational education teacher who has an interest in technology. Fred (not his real name) is considering a cooperative lesson unit with the vocational education and journalism classes to write and produce a weekly school news video.

Fred's interests are clay, stained glass, drawing, and the renaissance. He points to student work on the walls dealing with renaissance drawing issues. This is the only art history he gets into, he says, except for "a little modern stuff when we do graphic design." He continues, "Most of my classes are only nine weeks long. I don't really get a chance to develop anything. We

are increasing the 7th graders to a semester course. That will be a lot better."

He uses his laser disk to assist in the section on the renaissance. He has two disks on the Louvre. "I use it as a teaching tool. It is not entertainment. We plan on using our textbook money ... for computers. I think they will be Apple computers with CDs and digital cameras."

He uses his classroom computer mainly for art history and has about three hundred artists cataloged. Due to administrative rules his laser disk has to go back to the library weekly. Even though no one else uses the laser disk player, he can not build a permanent installation for it.

He does not want to turn his class into a computer lab, preferring to have professionally prepared software and images. He says:

> I am not really excited about computers. I personally think that computers will never take the place of a kid's sensitivity to creativity, to fill in the materials in their hands instead of pushing a button on the computer. I think it is really cold, and I think it takes the humanism out of it. It dehumanizes art.

One computer per child would be required, he feels, if he were to teach computer graphics. "I'll never have one computer per child." He adds, I'm a visual arts teacher. I'm not a computer teacher and I don't plan on ever being one."

Fred would like to have a larger physical facility and another instructor if funds were available. He feels he is at school to teach the components of art, not computers.

CHAPTER 5: CONCLUSIONS, DISCUSSION AND IMPLICATIONS

It seems clear that technology in general, and the microcomputer in specific are seen as useful tools in area schools by the art educators participating in his study. All of the educators reported that they had high expectations relating to the integration of CDROMs and microcomputers into their classrooms. While opinions about the role of computers in art and art education varied among the study's art educators, all used a microcomputer for some classroom functions and all planned on using microcomputers more in the future.

The concept of technology for art education clearly meant CDROMs and microcomputers to the study art educators. While there was a small level of interest in other technologies, their current classroom plans were focused on CDROMs and microcomputer based curricula.

It was unclear as to whether or not the art educators participating in the study have preconceived attitudes toward the use of technology in the art classroom. No effort was made to identify prior attitudes of the educators participating in this study.

There seemed to be little resistance to the introduction of

new technologies into the art classroom. Not art educator participating in the study said that they would resist the introduction of new technologies. All seemed to feel that technology was good and ought to be incorporated into their classrooms.

While one art educator talked about technology as dehumanizing and two were concerned about the impact of technology upon student creativity, all planned to use technology in the classroom. No one mentioned a loss of personal identity or the idea that technology might have a "face and will" of its own.

While the data terminal was not mentioned as an useful technological tool by the area art educators, all were concerned with microcomputer technology. All seemed to agree with the OTA prediction that microcomputers would be important to the future of education in the U.S. One said:

> I only have three ... this is my third computer right now. With an average of 35 students to a classroom it is tough to make it an actual curriculum tool ...(Teacher 5)

There was no evidence of a "cycle of disappointment" uncovered by these interviews. However, in part this might be due to the fact that the study area art educators have yet to implement a significant portion of their plans. It would

probably be interesting to take another look at these art educators in the future to see how they are progressing with their plans.

Budget constraints and training limitations were the problems most often mentioned by the art educators. Budget limitations included not only the cost of the hardware but also the costs associated with software and the integration of the technologies into the art classroom. Other concerns included space, communications lines and the protection of the equipment from environmental problems such as dust.

All educators expressed a belief that the students were ready to use microcomputers in the art classroom. Several felt that some students were further ahead in the use of technology than they were. All art educators had the capability to use video disk technology in the art classroom. Thus, students were being exposed to video disk technology from elementary school through high school. When the number of computers was limited, their use by students was limited to those who had finished their current projects.

The technologies being used, and considered for adoption, by the art educators in the area were basically selected by the art educators themselves. For this reason there seemed to be little resistance, personal or institutional, to technology by the art educators.

One of the more interesting points that came out in the study was the high degree of coordination and cooperation existing among the art educators in the Unified School District. All art educators met monthly to plan and coordinate student art shows, curricular issues, and presentations to the School Board. Generally one person served as the interface between the art educators and the School Board. Most art educators participating in the study expressed interest in using electronic mail facilities to provide even more opportunities for communication among each other. Due to the size and current closeness of the art educators in this district, this Unified School District might be a good place to study the implementation of electronic communications among art educators in the field.

Another topic of agreement was the goal of using electronic storage technology to develop a K-12 portfolio capability for art educators. The goal of this project was to have a portfolio on disk for each area student which would contain samples of their art work for each year they attended area schools. It could prove interesting to look at how the art educators dealt with the issues sure to arise in the accomplishment of a task like the CDROM project.

Another interesting idea would be to look at the communication among these art educators to see the issues they saw as important during the integration of new technologies such

as the CDROM project. Electronic mail might be a suitable vehicle for such a study. It should be possible to collect all of the communications among the art educators for evaluation.

The lack of suitable software for classroom use was discussed by several of the participants. While all of the educators seemed to think that there was new software available, or soon to be released, for use in art education, none could identify any. One elementary teacher said that there were programs available for secondary students but none for elementary use. Also, there seemed to be an underestimation of the amount of effort necessary to integrate new hardware and software into the classroom. School Arts was the only professional journal discussed as a source of technological assistance by the area art educators. No close ties for technological support with any of the Arizona universities was reported by the participants.

Discussion

There seemed to be a high degree of cooperation and agreement among the art educators in the subject School District. This consensus is likely due to the nature of one person in the district who has been serving as a de facto leader for all of the arts programs. This one person attends School Board meetings and represents the arts programs to the public. It was due to

activity by this person that the School District first moved to laser disks and large screen monitors several years ago. It is likely that this person, who has been in the School District for more than 14 years, will continue in this role. I think that a lot of the current progress and future plans of the art educators in this study is a direct consequence of the leadership of this key person. It seems that the activity of such a leader has played a significant role on the levels of agreement among area art educator

The art educators in this study are receiving no significant technical support from the School District, State of Arizona, or Arizona university system. They are on their own and have developed their goals and objectives by themselves.

Although the study art educators have never implemented any technological systems of a complex nature, they are still optimistic. They do not seem to be aware of the complex nature of implementation good, usable systems. None has any systems analysis or systems engineering experience. They use friends and local computer stores as their major technological resources.

Budgetary cuts are playing a significant role in the growth of art education in the study district. All teachers seemed to be concerned with the possible impact of budgetary cuts on themselves and their programs.

Implications for Future Research

This case study of an Arizona urban school district has produced several potential topics for future research and consideration.

E-mail could provide a way for the art educators in this study to further enhance their interpersonal communications. In addition, wide area communication services could provide a manner for these art educators to communicate with other art educators as well as to acquire technological support services.

As previously mentioned, the educators in this study seemed to feel that the technologies of concern to them were limited to CDROMs and microcomputers. It could prove interesting to determine what other technologies might prove of value to them. For example, local area networks, laser printing systems, high capacity computers, all might have a potential application to the art classroom. The fact that the educators of this study were not technological sophisticated may have limited their consideration of technologies to those commonly advertised and available.

In conclusion, it seems that the art educators who participated in this study are proceeding along a path of technological innovation alone. While the education journals in general, and the art education journals in specific promote the

use of technology in the classroom, there is little day-to-day support, or practical "how-to" technical or curricular support available to them. They are using off-the-shelf applications and programs in the hope that these microcomputer based applications will be useful and cost-effective in their art classrooms. There are few, if any, success stories of the application of technologies to the art classroom for them to use as a guide or roadmap.

It is unlikely that the art educators participating in this study can implement a system as complex at their proposed CDROM project without systems analysis and engineering support. Even though these educators have reached a high level of agreement on he goals of the CDROM project and have excellent leadership, it is doubtful that they can produce, implement, document, operate and maintain a technologically complex system without outside assistance.

APPENDICES

APPENDIX A

Survey Document

Questionnaire for the School District

Art Educators

I am a graduate student at the University of Arizona working on a survey of the use of technology in art education. I would appreciate any feedback that you can provide.

Name: _____ Date: _____

Address : _____

Telephone: _____

Please describe the kind and type of technology you have access to at home.

Please list all degrees received, University, major, and date received.

Please list teaching certifications and endorsements:

How many years have you taught art?

What grade levels do you currently teach?

Please select the number that best matches your attitudes or feelings in the following list: Select 1 for strongly agree and 5 for strongly disagree for example.

1. Computers are useful to present art criticism.

2. Technologies are a fad.

3. There is never enough money for the things we need.

4. Computers are useful to present art production.

5. Computers are useful to present aesthetics.

6. Computers are useful to present art history.

7 I have always been interested in new technologies.

8. Art if for all students.

9. I plan on using computers less in the future.

10. Computer graphics is important to students.

11. I plan on using computers more in the future.

12. The school board encourages art education.

13. The school board encourages the use of technology.

14. I think my school is doing a good job using technology.

15. Too much emphasis is placed on technology.

16. I have received sufficient training in technology.

17. I am interested in new and novel teaching methods.

18. I think the tried-and-true teaching methods are best.

19. Students are interested in technology.

20. We need more money for technology.

Please describe how you currently use technology in your art program. Do you have any technological devices you do not use? Why?

Art there any technologies you thin will be useful in the future? Please describe.

Additional Comments.

Do you want a copy of the results of this survey?

APPENDIX B

Transcript 1

Located in a middle class neighborhood. New school. Seems well maintained. Art rooms are bright with many windows.

Q - What technologies do you use?

A - ... being able to use my laser disk with my personal computer. Now part of that is the setup of where we have the computers and where the laser disk player is. It is something that I am working on this summer so we can get it all networked together. It's just been a new building and a new job responsibility for me so a lot of things that used to come easy in the art classroom are now more difficult because so much of my time is spent with the theater. That's one of the things. But my goal (and I told you this earlier) was to get the portfolio going. We are real excited about that. We do have money set aside to do that next year.

Q - Is there any technology out there that you know about that you would like to have?

A - We were talking about the internet. I would like to see our kids being exposed to things through the internet artwise. For example there are a couple of schools doing an exchange from Florida and I think upstate New York. They have this wonderful comradiery and the kids are sending things back and forth. I

guess just more computers. We have a color printer and a laser printer here at the high school. I have ordered another color printer. A inkjet which we can run on regular paper. The Tectonic that Mike has is like 50 cents a page.

Q - If you could get as many computers as you wanted, how many would you have?

A - Twenty-five.

Q - How would you use them?

A - Everyday. I would use them as art history, aesthetic lessons. I would use them for kid's art concerns, word processing... If they were there, I wouldn't have to leave the room to do that. I am a MAN person so they would have to be the Mackintoshes.

Q - Your district seems to have a lot of consistency on goals. What do you attribute that to?

A - I think part of that is that the art teachers are pretty unified. We meet monthly. We communicate all the time. Our first goal is to put children's art in the faces of the patrons of (our area) as much as possible. I am sure the elementary

people talked about art shows. We have district art shows. We cover our district office. We have the foyer with a lot of art shows. The fact that they recognize one of us as a spokesperson. Being that spokesperson I am able to go to the administration .... I'm pushy. I'm assertive I guess. I just don't stop until I get things the way we want them to be. Gretchen Daly from the state department in her former role as visual arts specialist helped us to get on target as far as a unified school curriculum; helped us get on target as far as state essential skills. She brought us up to date in the world of art education. The Getty Institute, they were the ones that pricked us when we were mediocre.

Q - What did they do for you?

A - They tailored a workshop for some of us that were in the district at the time. They tailored a workshop on Disciplined Based Art Education. Of course all of us would do aspects of that but it did not have a name. They hit us in the face with it and we though "Wow, this would be neat if we could sell our district on this form of academic approach." So, that's how we started. They eventually, through Arizona art ed, channeled us into what our state department was doing with the national art ed. That is how it all came together. She was also instrumental in tipping me off on how to work school funding and how to really

work your PR with the district. I owe a lot to her. She has been very helpful. One of the goals six years ago was to get ten dollars per student a year into the art room. I was able to get $50,000. We put a art computer, printer, laser disk player and television in every art classroom. Plus the software to support that. Of course that is now all outdated. They were the little black and white SE's. That's OK because the elementary kids use those all the time in some of the classrooms. What is not complete with this whole process is not being able to keep up with the technology. It is so rapidly changing. That is frustrating for me because I always want to have the very best for everybody. I want my kids to have it, I want my teachers to have it to work with, and I just think that it is ludicrous for a teacher, and I don't care what they teach, to be in a classroom without a computer and without a telephone. My goal as a coordinator in the district and sitting in with the big guys all the time has to constantly handle that (getting the best for all art educators). I think change has happened to Washington Elementary School and Lincoln Elementary School all have telephones in their rooms. The other schools are going toward that. When they do that they bring more phone lines in and then are connected. They can internet with everyone. The state department has the Genie software for the Man and they give you a number and I've just got on this. The biggest problem is there are only four lines, four 800 number lines, into the state

department. Teachers are getting up at two o'clock in the morning in (our area) to get in and spending a couple of hours on the internet. There is so much happening out there. Personally I think I am just going to subscribe to it myself and see what happens.

Q - What about inservice training. Is it sufficient?

A - No, it is never sufficient. When we first acquired our computers (now we are just talking technology, correct?), we had two days a year. They would just let us have our own space and we would bring in the people we wanted to listen to. Now it is a big district kick, but everything has to be site based management. We have principals that get into accountables. They let specialized people go to what will benefit them the best. So they keep them in boring mandated rules about ASAP (Arizona Skills Assessment Program). I would love to see, and I am always pushing for this as I am a coordinator on that committee, I really want to see if we could get our time back.

Q - Do you have any support with the local universities?

A - Very little. We are too far away. Schools this far out are pretty much an oasis.

Q - Do you have student teachers?

A - Sometimes. Not that many. We had a couple from NAU (Northern Arizona University). From Prescott College, we get a few. It is a little different thing.

Q - What about the University of Arizona?

A - Not many. Dwaine Greer is the one that pricked our ear up here. We used to have 90 minute periods, but everything is changing. But there are more constraints.

Q - What about year-round school?

A - God help us. I couldn't work year around. It takes me three months just to recover from the year.

Q - What else can you tell me about your use of technology?

A - Probably that we aren't using it enough. If I went out and looked I would probably say that Susan (Not her true name.) probably uses it most at the Elementary School. Carol (Not a true name.) probably uses it the least. In the middle schools, probably Nancy (Not a true name.) uses it the most, although Fred (Not a true name.) has finally taken some computer classes. I

think Fred is a little intimidated by the technology. I keep telling people that it doesn't matter what their preference is. We all work together anyway. Here at the high school I have constraints because of my class sizes. I have the largest classes because they are beginning level. I have the kids that are not that serious about art. They are just in there to get their requirement out of the way. I would like to use it but I gave all of my computers to George (Not a true name.) to use for the projects the advanced kids are working. Next year we are hoping to get more. Usually if I have a kid that is advanced in art, I will move him to George's class because I want him to be challenged. He makes really good use of the computers. Of course, one of the kids that was in there this morning, Sam (Not a true name.), I don't know if you saw him this morning, those guys are TAs for me, but they are also my theater hackers. They run everything. Sam does all the programs all the posters on the computer. Everything is laid out for me next year on Quark Express. All I have to do is plug in the play, change the names and everything is ready. So we do try to incorporate it into everything. We've taken student generated art, scanned it in and used that. When we built the building I asked them to put in phone lines that would eventually be hooked together, networked together, and then also be able to networked to other schools. Every year I have purchased for the department. So, drama has computers in their offices and the music teachers also. We're

connected to social studies, to the main secretary and to our journalism department. Every time we have to add a new line I have to go to the administration. I think we have a good cross section of teachers. I think I have the most seniority in this district. They are hard working people.

APPENDIX C

Interview 2

Mile High Middle School is located in a downtown setting. Sprawling campus. Good physical condition. Art classrooms bright. Plenty of storage. Many windows.

Q - What is your experience in using technology?

A - Every art teacher is equipped with a Macintosh SE, a laser disk player, a tv monitor - I can't remember the inch. It's probably 19-inch. We have laser disks that are in a central location. We check them out. The thing that we've noticed is that there is not a lot of companies making laser disks. And we are real tempted to go into the CDROM for two reasons. There are more of them and they are less expensive. But right now that's primarily the major kind of technology. One of the things that we've found that we really enjoy about this laser disk is that we can have access to thousands of visual images that we can bring up on our screen and when we are talking about American impressionists or whatever time period, the renaissance, we can bring so many images that would be impossible for us to store in our art rooms, and it's right there. All we have to do is type in what we want. We even have the capability of doing what they call slide shows where we can go ahead and go in and pick all of Vincent Van Gogh's images we want and store them in this little

disc and just put it in and we have a show of 20 of Vincent VanGogh's most popular pieces of work.

Q - Who keeps the CDS?

A - We do. Right now there are two art teachers here; Susan (Not a true name.) and myself. We share the computer , the laser disk player and the TV. We have a little bit of video. We have a small video library. We have a nice video library in the district office which all teachers can check stuff out of. But what we are really excited about, what we're hoping to do, is .. I don't know how familiar you are with assessment ... and districts are going to district assessment plan, or DAT plan. So what we are thinking about doing is to have the capability to scan students' art work onto their own disc so if a student starts out in one of our elementary schools in the first grade we can scan two or three top-notch pieces of work that students do in that year and then that disc follows that student during all his elementary years, then comes up with him to middle school. We can scan his work on there ... and [it] then follows him to the high school. That can be used for colleges ... you know the student can take the disc and show a gradual progression from elementary on. We really are excited about that. We are finding one of the biggest holdbacks to the assessment thing is storing stuff. Where do you keep the 20 best pieces of art work the child has done? If we

could have the technology, the scanners, cameras. We are hoping we can start that out of the high school... have the high school buy that since their students are really into the portfolio preparation and college bound... and then gradually have that filter to the middle schools and then on to elementary schools. That's what we are looking forward to getting.

Q - What about teaching graphics?

A - You know, we have a computer lab here at Mile High that houses 28 computers. There are some programs there for graphics. [Art programs do not generally have access to the school's computer lab. In the classroom the art educator has one computer.] But, because there is only one computer for 35 students it is really difficult at the middle school level to only have one kid on the computer. Any graphics they do is in the computer lab.

Q - If you could get any technology you wanted for your classroom, what would you get?

A - I would really like to make the switch from laser disk to CD. I really ... there is just so much out there CDROM wise that we just are not finding with laser disk.

Q - What about the internet?

A - I would love to have internet.

Q - What about teaching materials, curriculum? Have you seen anything useful?

A - No. We have ... in fact we just finished this year ...we have to revise and rewrite our curriculum. We have a pretty specific and ... I think it is a pretty good curriculum we follow. As far as supplementing our curriculum we use a lot of information from Stevie Mack. We really like her. We like the way her company puts things together in units, like a Haitian unit.

Q - Do you see CDS as more of a library resource?

A - Yes.

Q - What about the ability of students of use images?

A - At this age I try to get them to work more originally. I think that in high school they use a lot of work based on others.

Q - Why do art educators in this area work so well together?

A - I think the key is we have a person in a leadership position. Anita (Not a true name.) is our visual art coordinator for the district. I don't think people realize how having a real, quality person in that position can help beautify the whole process. We meet on a monthly basis. We meet on the second Tuesday of every month. We have an agenda. We talk about upcoming events. We talk about shows we're hanging, fairs we're doing. We talk things that kids are doing well. High school teachers might say "you know you need to hit color harder." Someone might say, "I am doing Gauguin and someone else might say "I already did that with them." It's really good for communications. I really feel that strengthens our entire program. We all know each other. I am the last one hired and I've been here for five years. It is a group that there's not a lot of movement in or out of it. We all know each other. We enjoy each other's company. We work hard at doing what we do. I think [our moderator] and her leadership is the key. It's wonderful. It really helps us. She is really into technology so she pushes us along.

Q - What about training?

A - We often spend our inservice days learning new programs or whatever. When we originally got our computers we were given

district time. Me met at the district office, we all brought our computers and we were trained on how to use them. We would like more of that time.

APPENDIX D

Interview 3

Lincoln Elementary School is a brick building with several modular classrooms along the side of the playground. Music and art are taught in these modules.

The art classroom is packed. Materials are stored along all walls. Student projects are in cardboard boxes or hung from the ceiling on strings. The teacher has a small desk along one corner. A laser disk on a stand is playing a tour of the National Gallery in the background.

The students are active, happy, and work with a high level of background noise. This is a 5th grade class and many students want individual attention. There are about 30-40 students in the class.

Linda (Not a true name) stresses that students should complete their projects as the end of the year is only a couple of weeks away. She wants to have the work completed so it can be used to decorate an upcoming open house.

Social groups seem to be sitting together.

After the class it is Linda's open period. Several students come in to work on uncompleted projects.

Q - What type of technology do you use?

A - It took a long time to get anything in the art room. It is not always a priority. We had a technology committee here and when we first started to get computers in our school ... which has only been in the last four years ... special areas were put at the bottom priority for getting a computer out of the technology funds. It even got to the point where they were starting to put second computers into the building and we still hadn't gotten any. So, I eventually did get a computer but I used an award we won and the school subsidized the balance. We were really wanting one but again there was that perception that first classrooms first. Technology I think is terrific for the art classroom. In my mind it is one of the first places that the technology should be set up and budgeted for. We use computer, right now I am just working it into the curriculum and trying to learn about software. There is not a whole lot of software available for art ... as far as working into a curriculum. There are a lot of "paint and draw" types of programs which I am basically learning to use.

Q - Do you have a CDROM?

A - Yes, I have a CDROM. I've just ordered my first CD. I took me a while to find something. I am still not sure ... I got an

art history survey CDROM ... There really is not much for elementary level. But there's resources like the animals CDROM from the San Diego Zoo. They make a great resource for doing life illustration and that kind of thing. Indirectly there are some things out there. Budget wise that's a big problem. Right now my budget goes strictly toward consumable art supplies ... At school there is a format you have to go through to order through the technology budget. The problem is usually that when you buy something it has to apply to everybody's use. That's always a challenge too. So I just purchase little bits at a time on my own with my own art budget. Mostly the computer is used on paint and draw type of things. It is mainly used as free time, where students finish early. We only have one computer for everybody in here. We don't have a lab setup where I can take a whole class in and work on something as a group. That's something for the future.

Q - Do you have a printer?

A - I have an imagewriter with a color ribbon. It works for now.

Q - If you had any equipment you wanted, what would you have?

A - A color ink-jet. Laser, the best. Kids are real product

oriented. What they see on the screen is not what they get off the printer. That makes a big difference for them.

Q - Would you like to be networked with other art classrooms?

A - That would be great. But, we don't all have the same technology. We are networked here at school. District wide networking would be wonderful. We could share a lot. Budget wise that would help out tremendously too.

Q - What about training?

A - The district ... not the district per se ... they have provided training in general for any teachers on some of the basic types of programs. Claris Works and that kind of thing. Our school site made some training available for Hypercard and basic Claris Works when we first got our computers. Other than that there has not been any training for ... like the CDROM. There hasn't been any training. I know I can coordinate my computer to my laser disk player and I haven't had any training on that. So, a lot of that is slow going because I am on my own.

Q - Are there any materials available about using the computer in art?

A - No. Not that I know. I am always looking. The regular arts and activities magazines, I get those and School Arts. Whenever there is something in there, I definitely look to that. That is about the only resource I've found. Here in the district we art teachers have tried to share what we have learned. But we have different technology. I have more technology than most elementary teachers. Theirs is basically just record keeping.

Q - How many computers do you think you need?

A - Well, ideally it would be nice to have one per student. If I had the space for it, I would like to have one per student. That is where a computer lab could come in handy. I teach at another school that does have a computer lab.

Q - Do you take them over there?

A - No. Because when they figured their scheduling out they did not make any room for special area teachers. Classroom teachers have it booked as far as the scheduling goes. I'm only there two days a week and they pile in their scheduling on the day they have their special area so they can have more time. Ideally, a computer lab would make a lot of difference.

Q - What sort of projects would you do if you had a computer lab?

A - Assuming the basic training would be there, for example I would love to have a class working in tesselania at the same time, including tessellations. That would be a project. Any assignment we are doing in the classroom I would like to apply to the computer so that students can see. Portraiture on the computer.

Q - Do you have a scanner available to you?

A - The school has a scanner. I have not been able to have access to it. I think what happened was there was no training and someone took it home to learn how to do it. That's all I've seen or heard of it. I inquired one time. We had a textbook adoption coming up and the question was, if we could not use technology as our text? We have been looking into buying video cameras so we can start portfolios for our students. There is so much we don't know about. We are new to that technology even though it's been here for a while. In time, we need more inservice. It's a slow process. We are getting somewhere but it's slow.

Q - What about school district support?

A - They do. But when push comes to shove, we are already in

line for cuts. We survived cuts for this coming school year in art, music, and PE. But the following year we are slated to lose an elementary art teacher, which is my position, a music teacher, and the entire PE program for elementary schools. In moral support, it's there. But when it comes right down to it, they still have that idea that these are areas that can be handled in the classroom if necessary.

Q - Do classroom teachers have any art resources available to them?

A - Not really. Not at this time. I imagine if they have to teach art they will have in-service. Many of them teach quite a bit right now. Which is really nice. They do support visual arts as a part of basic education. You will have teachers that are really into art and will seek out resources. I think the others, unless you bring them to them, they are not going to do it. They will come to me as a resource.

Q - What about CDROM?

A - I have one laser disk now, the National Gallery. I am working now on a soft cover book that came out using images from the National Gallery. I am trying to take that and have the students, I don't have a scanner, so they would have to punch in the frame

numbers on the laser disk, find the images, and answer the questions. That's a summer project I started last summer. It looks like it will take me this summer to finish.

APPENDIX E

Interview 4

Notes: Granite Mountain Middle School is located on top of a hill in the northern section of the city. It is surrounded by a well kept middle class neighborhood.

George's classroom is a long rectangular room with six modern clay stations, a kiln, and large work tables. One wall is lined with doored cabinets and student art work is prominently displayed. A commercial art time line is mounted along one wall.

George has a close relationship with the vocational education teacher whose room is behind George's classroom. They have discussed doing joint video projects using visual arts, journalism, and vocational education students to produce student videos.

He expressed concern that the art people use Man's while the vocational folks use IBM's. George seems impressed with the mass of cables and equipment involved with the student designed and constructed video studio.

Q - What technologies do you currently use?

A - Well I have two electric potter's wheels that have been here since day one. The school is 19 years old. These wheels have been here the entire time. Kick wheels also. Most of the

equipment also. Nothing has been replaced or is really new except for the kiln. My kiln is fairly new. It's about four years old. I teach clay, stained glass, drawing. I do a fairly large segment on the renaissance. The 1300's and 1600's. I don't get in the high renaissance much. I stick with Michelangelo, Leonardo DaVinci, and that group. I stick with the Italian renaissance. Most of the stuff you see on the board is a result of that, anatomy, aerial perspective, linear perspective, closeup studies of nature. We are just now finishing up that unit. That is the only art history I get into except for a little modern stuff where we do graphic design. Most of my classes are only nine weeks long. I don't really get a chance to develop anything. We are increasing the 7th graders to a semester course. That will be a lot better.

Q - Will you see them every day?

A - Yes.

Q - I see you have a laser disk. Do you use it?

A - Yes I use it. All of us do. I have a renaissance disk and the Louvre disk and ...I have two renaissance disks. Basically what I use it for is to enhance what's going on here. I have a lot of visuals here. I usually do anatomy. Obviously I can't do

the entire anatomy so I usually do hands. They are very gestural. Hands and feet. That was a stickler with most of those guys. The example I use is Michelangelo's Pieta with Mary that is excellent with the hands. The laser disks I have I generally use for visual things to look at. They are really good on architecture. One disk is excellent for teaching one or two-point perspective. It is excellent, the art work typifies one and two point and the architecture that shows the one and two point perspective. I use it as a teaching tool. It is not entertainment.

Q - Do you ever use CDs?

A - We've been promised them. We've been promised ... well I shouldn't say promised because it is not set in stone ... we wanted to use our textbook money, but we don't need any more textbook money ... so Susan (Not a true name.) asked for if we could use our textbook money for computers. We've ordered them and they are ready. I don't know if the school board is going to ... (They are brand new Apple computers with CD and digital camera.) thinks. I'd love one of those. Mine's very limited. I use mine for art history mainly. I've got maybe three hundred artists cataloged on there. Impressionists.

Q - Did you catalog them yourself?

A - No. It was software that all of us use. Each artist will have a reference of three or four art works. Some more. Picasso. We have quite a bit of Picasso. The visuals of some of hem are on the National Gallery of Art disk which of course ... my computer screen is so small. The laser comes up on this, which is nice. I have yet to see anyone get it all together. This has to go back to the library every week ... it's for the art room ... nobody else uses it but me ... but it has to go back to the library. For cleaning or what ever they want to do. So I can't really build a permanent place for it. I wanted to build a cabinet. I wanted to take this chalk board down and move it over there and get rid of all that stuff and then put the computer center kind of here with the laser disk and everything. Ira (Alias for the vocational teacher.) has a nice cabinet I could use. They want it back. It is actually for the art room and nobody else uses it but me.

Q - Are you interested in getting images and building your own stacks?

A - I don't want to ... That is not my thing. I don't want to turn it into a computer lab. I am not really all excited about computers. I personally think that computers will never take the place of kids' sensitivity to creativity, to feeling the materials in their hands instead of pushing a button on the

computer. I think it is really cold and I think it takes the humanism out of it. It dehumanizes art. I've got some really nice pieces of work up here which could never be generated on a computer. Right not. It's nice for visuals, it's nice for art history, it's nice to show how to do things. I really don't think ... I mean maybe in that sense .... But I really don't have that much time to spend with these kids so I can't .. I don't have them all year. My eighth graders are one semester, then they are required to move on to something else. So you really can't generate any kind of continuity. I've learned how to use my computer and it's kind of useful to me. But, as many kids as I have, they can't benefit from that computer. There's too many kids and one computer. I'll never have one computer for every child. That's the only way you can run, if you are going to run a graphics design class. Like NAU... NAU that I went to last summer. I went to their computer lab and did some work. Gee that would be nice but this school district will never have that kind of money. I am not ready to be a computer teacher. I am a visual arts teacher. I'm not a computer teacher and I don't plan on ever being one. But, I do know how to use it and if kids want access to it and get into it and do some research on an artist they can because I've got the National Gallery and they can look up anything they want. But as far as a tool for doing art work, no.

That's one computer for 150 kids.

Q - Do you do DBAE?

A - Well, not ... no .. I don't use the DBAE form. I don't use it exclusively... This is what we're going to do and I'm going to evaluate the work according to DBAE. We do use the components unconsciously. I don't use them intentionally. But they're nothing new. They have always been part of art. Art, the history, aesthetics, the evaluation or assessment. It's always been there. They come up with new words for it. DBAE just happens to be a new one. What I usually have the kids to do after their studio work.... I haven't got into it real heavily, but ... we've got into portfolio and self assessment. It gives me an idea of where they feel they are at. Especially the eighth graders. Sixth graders they really haven't learned how to critique and assess the value of their work. The eighth graders have been through art a couple of years, most of them, and the third year they have a reasonable amount of intelligence and can assess their work, and other works. I do some assessment. We do some written assessment on their work and they have to turn that in at the end of the quarter. They only have to assess one piece of work and it has to be a full page. They have to go through the components of assessment. The physical work itself, the history behind the work ... I think it's important to have the kids stand back and evaluate their work. The Getty Institute is real hot and heavy on DBAE.

Q - If money were no constraint, what sorts of technological things would you be interested in?

A - Well, gosh I don't know. To do the things that would really benefit the kids, you would have to have a larger facility, another teacher, and more computers in the classroom, and a computer station. You know ... somewhere where you say "this is where we do this sort of work" ...I think space and another teacher would give us a more competitive edge. Schools that do this need more than money to set these kids at a computer or ...

Q - If you had that what would you do?

A - Kids are bombarded with videos, television. A lot of them are tired with technology if you want the honest truth. You can't show these kids a movie or a video and have them to sit still for more than ten minutes. Their attention span ... you know how you keep their attention span? ... video games where they aren't responsible for anything. I think a lot more space, a lot more room for the technology and another teacher would benefit this school.

Q - What about a graphics printer and other things?

A - What would we use them for? At this age level, what would we

use them for? What would the benefit be? I don't know. To me they would be of no benefit. Because I'm here to teach the components of art. I'm here to see that the components are used in a visual piece of work. A physical presentation, something not on a computer screen, something that's going to be printed out digitally where it looks like it came off a ....It goes back to dehumanizing art. I think the computer is a dehumanizing object. It is meant to make life easier. To do unusual things. It has its own characteristics. To me... and I was real resistant to using a computer. I had thing in the room for a year and half before I did anything with it. I finally took a computer class and learned more about it. I am the lousiest typist in the world. I type one word a minute. I takes me a while. I am real reluctant. There is more to life than graphic design. If kids want to follow that, there are technology places all over the country. They get a little bit of it at the high school. But again, we are talking money. A lot of money. What good is my new computer going to do ... CDROM, video camera, and all of this really neat stuff, you know ... when I have 150, 175 kids? What good is that? Are all these kids going to have access to my computer? Am I going to let them use it? That is expensive stuff. The facility is adequate for doing what I do. ... If they were to say we are going to put 15 computers in your room ... where would I put them? We really need a computer room for art. A sterile room and that is where the other teacher comes in. I'd love to

see it for the kids. It would be an elective. The kids that wanted to paint, throw clay, or do stained glass could do so. The others more graphically oriented could do the computer graphics class. I can see that as a benefit for those kids.

APPENDIX F

Interview 5

Mile High Middle School is a sprawling campus in an downtown area. The classrooms are neat, light, and have plenty of storage. Students are working in small groups on a drawing assignment.

Q - What do you teach?

A - I teach art here [Mile High Middle School] and at the high school I have two pottery classes. At the high school I don't put technology in here except minimally and then take it back out again. The clay dust will destroy it. Next year we are looking at getting me a computer full time. I will be teaching at the high school full time.

Q - What are you going to use it for?

A - I am going to use it for both informational ... like I use my laser disk and may MAN with the laser disk hooked to it... allows me to access examples quickly. A collection is easier. Generally what I would do is to work out a Hypercard stack so I wouldn't have to look for it. Because if there is any time the kids have to wait, they are gone.

Q - Do you prepare this all yourself?

A - Yes. There are some available. But, we have a program where we can write our own. The problem is getting time to write the stack.

Q - What about training?

A - The only training we've had is what I've done for the other teachers.

Q - If money were not a problem, what kinds of technology would you use?

A - Roms ... CDROMs - they have so much information and are so quick to access. I'd like a ROM library, but, I'd also like a ROM [player]. I don't have one. I like more programming, or enough time that the kids ... but [I'd like to] have a program written that kids could call up their own files. I'd also like to be able to .. portfolio. I'd like to do portfolios. There is a program out now where students can do their own portfolios. But getting time to access it is something else. At high school it would work great. For us, it would be us taking their work and scanning it in. A camera ... three dimensional work would be a problem.

Q - Would you use E-mail?

A - None of the schools have it. I've never used it. I don't know if I would use it or not.

Appendix G

Interview 6

This classroom is in a new building, well lit with a lot of storage space. Students are on task and working singly and in small groups.

Henry (Not a true name.) shares a large office with another art teacher. One wall is lined with shelves of art books and laser disk material.

There are two Apple computers, a laser printer, a scanner, and a color printer along one wall. The day of the interview, Henry is busy installing a new "state of the art" PowerMac with CDROM. He is doing the installation himself between classes.

Q - What do you teach and how do you use technology currently?

A - I have several art programs which are specific to the curriculum, among them Painter is the one we use the most. We also use Canvass sometimes. We use Quark Express and Adobe Photoshop extensively. Those are probably the two main ones we use. These help us generate graphics and with the laser printer we can run a transparency through the laser printer, we can scan an image in through the computer and then a transparency through the printer and use that for silk screening processes, and then dark room processes. We also have a color printer, an inkjet

printer which is very expensive to run. I don't really run it as often as I would like to. The students will sometimes manipulate either a scanned in image or something they have drawn on the computer with the mouse and then print that out as a color print. We could really use a slide scanner. That way our student portfolios could be kept on hard disk or on floppies the students could just take with them. That's one of the next tools we want to get, is either one of those digital cameras and boot right into it or a slide scanner. I only have three ... this is my third computer right now. With an average of 35 students to a classroom it is tough to make it an actual curriculum tool 'cause it would take ten to twelve days before each kid has one classroom period on it. I don't think you can hold kids' attention that long unless you are right on top of it. So basically it gets used by those kids that are ahead of the game of the assignment that is going on, those students that have a special project they want to do. Some of the things they have done to do ads for parents' businesses. Right now they are generating these for a senior t-shirt for the graduating class. This was hand generated and drawn and you can see how it would look inverted. It would take forever to generate this any other way without a computer.

Q - How many computers would you like to have for 35 students?

A - Ten would be nice. Ten would be ideal. I could probably do it with six and that is my goal, six. I would like to get my class size down to about 28 instead of 35. But we are under budget crunches and the classes are very popular. I hate to turn anyone away who wants to be in here. This next class is my class of beginners and it may be my best class of all time. How can I turn away people when really they are turning out to be my favorites?

Q - Is there any other technology that is of interest to you?

A - No, even before we got the computers, laser disk players, they are a godsend to art teachers because the quality of the image that they project is so superior to slides. They tend to hold students' interest. They tend to have enough of that MTV rapid fire imagery that also tends to hold student attention. We have an extensive supply of laser disks. We've pretty much stopped using videos because of the quality of it. We still use slides because there's so many things available on slides that aren't available on laser disks. In some ways the laser disks are a handier tool than the computer. For example in art history. Maybe CDROMs might make the computer better at that.

Q - What about the internet?

A - We have a big problem with E-mail in that we only have one line from the high school and that is a long distance line to the university in Flagstaff. We are talking about spending some of our monies in order to get E-mail here because it would be a valuable addition. It would allow me to contact other instructors who have already experienced problems that I am about to face.

Q - How would you use E-mail or the internet?

A - I would use it to take what I could use. Knowing where to find it would be great.

Q - How much training have you had?

A - We've had district inservice training which was one half-days worth. I've had two personal sessions with a friend who is very competent. Other than that it has been trial and error.

Q - You also have a science degree, don't you?

A - Yes.

Q - Did you use PCs then?

A- Yes, 15 years ago when I was in college I used mainframes,

FORTRAN digital processing, SPSS (Statistical Package for the Social Sciences), and I thought that was so neat.

Q - If you could get anything you wanted what would it be?

A - I would go with the PowerMacs. Scanners are necessary for what we are working with, some way to digitally get a image in and out - either a digital camera or a slide scanner. What we are doing now to do that is, we either take prints that we can scan or we take a slide and go to Kiko Copy Center and get some instant prints and have them with their slide scanner reduce it to prints. The quality tends to degrade. Some of those copier shops do not like to deal with us because we are asking for the world on one image and they are only making a buck-and-a-half from us.

Q - What about training? What kind of additional training would you like?

A - I did have a nice offer for a training session but it was all the way in Florida. Although it was free, and the lodging was free, the travel costs and food costs and all that was prohibitive. I would certainly be willing to split the travel costs to the west coast. Or even Phoenix or as far away as Chicago but Miami was a long way for me to go. It was a great

offer. I just wish more of them would come my way. I wish there were more state department-run training sessions. And they do tend to oriented toward Macintoshes. Our school's computer department tend to be IBMs. Whatever you learned on seems to be what people like; and I haven't really learned on any of them.

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