2005

Building Hypertext in the Elementary School Art Classroom: An Integrated Approach to Learning and Curriculum

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BUILDING HYPERTEXT IN THE ELEMENTARY SCHOOL ART CLASSROOM: AN INTEGRATED APPROACH TO LEARNING AND CURRICULUM

A thesis submitted in partial fulfillment of the requirements for the degree of

Master of Art Education

Virginia Commonwealth University

by

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December, 2005

ACKNOWLEDGMENTS

The author wishes to thank several people. I would like to thank Dr. Pam Taylor for her patience, guidance and inspiration. I would like to thank Dr. Steve Carpenter for making me want to become a teacher. I would like to thank my husband, Shea for understanding and supporting me in this endeavor. I would also like to extend a special thanks to my students for their constant energy, effort, and inspiration.

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Abstract

In response to the many demands and pressures faced by both students and teachers in public schools, the art teacher in this action research study searched for ways to change her teaching practices to facilitate active inquiry. She utilized Thinking Maps®, a specialized form of graphic organizers, and Inspiration®, a hypertext linking program to promote interdisciplinary teaching and learning. The goals of the study were to increase student engagement, improve learning, and promote higher order thinking in elementary school art classes. The target group was comprised of the third grade students at Saunders Elementary School in Newport News, Virginia.

Each third grade students researched the natural world through the lens of a chosen creature. The students then created personalized Inspiration® documents that described their creatures. Faced with limited time and a wide range of student abilities, the teacher used an interactive approach during the following class sessions to facilitate continued inquiry. As a result of this transition, the teaching methodology described underwent a transition from teacher-as-disseminator to teacher-as facilitator. The resulting classroom atmosphere became a student-centered community of learning. The students and the teacher collaborated to ask questions, find answers to those questions, and create relevant links within Inspiration® documents (webs). The teacher found that she could not control the design of the connections within the documents to the degree that she had previously hoped, but new revelations regarding hypertext design were assimilated. The documents produced during this study were forms of authentic assessment that held the potential for use in future teaching.

Chapter 1

Adversities and Possibilities in the Art Classroom

These kids don't have time for hands-on nonsense. They need facts, facts, facts! (Kathy D., third grade teacher, personal communication, February 9, 2005).

Sometimes I am afraid that I am just turning my students into robots (LeAnne N., third grade teacher, personal communication, June 1, 2005).

Like these teachers, I became frustrated with some aspects of teaching in a public school. The last thing I ever thought I would do was become a teacher. I hated school as a child, and when I became an art teacher and began working in an elementary school, I was troubled that many of the same issues that caused me difficulty as a student still existed. The school environment where I started teaching was very similar to what I experienced as a child. Students were crammed into large classes and expected to sit in cold, hard chairs for many hours each day. When they were allowed to stand up, they were expected to walk quietly in straight lines down the hallway. This rigid physical environment directly reflects what I believe is the psychological environment of many schools.

A common complaint among many fellow teachers is that students today are required to undergo many hours of standardized testing on a regular basis, and that these tests require students to recall facts and information that has little or nothing to do with their daily lives and values. All of these realities contradict what I believe to be a healthy environment for teaching and learning. Many teachers I have spoken with lament the

reality that their teaching practices focus on trying to get the students to memorize facts, but they feel powerless to do otherwise. Upon reflection, I found that I was also guilty of too often relying on memorization as a teaching goal. This realization prompted me to examine my own teaching practices in search of new instructional approaches. I wanted the learning environment in my classroom to foster inquiry and exploration.

Translating theory into practice. Even though I disagreed with many of the methodologies in practice within the school where I began working, I found that as teachers, we are faced with many problems in translating theories and teaching philosophies into practice. In my own teaching, I struggled to find ways to create lessons that addressed standards-based learning requirements while teaching themes and big ideas and connecting content to the daily lives of my students. I frequently felt overwhelmed by the fast-paced schedule that required me to teach up to seven classes each day with only five minutes between each class. I found it extremely challenging to switch from one grade level to the next so quickly. These factors caused me to sometimes rely on teaching practices that did not reflect my personal teaching philosophy. This included teaching lessons that were strictly studio-based with little or no connections to meaningful concepts or content and focusing on vocabulary and fact recall as a form of assessment. Although these were not my only teaching and assessment strategies, I struggled to develop practices that would give my students tools to find meaning in their own art, the artworks of other artists, and the world in which they live.

During my studies toward my teaching licensure, I became inspired by the possibilities for teaching art in ways that would lead my students to new insights about themselves and the world around them. I found that one way that this can be achieved is

through the process of examining important real-life issues. This led me to write lessons based on themes such as the marketplace and the environment which provide platforms on which to examine personal values and choices and the impact that our actions have on the world. In order to validate the content of my lessons, however, I needed to connect art content with content from other subject areas. I will use the terms "integrated" and "interdisciplinary" to refer to this type of instruction.

Interdisciplinary connections. As an elementary school art teacher, I am required to support the "core" subjects. In other words, in addition to teaching art content, I must also make connections to math, science, English, and social studies. Integrating subjects makes sense because real life is not compartmentalized by subject, but the challenge is to integrate content in such a way that it makes sense to the student. According to Heidi Hayes Jacobs (1989), "There is a need to actively show students how different subject areas influence their lives, and it is critical that students see the strength of each discipline perspective in a connected way" (p. 5). We do not use subject matter in isolation for blocks of time throughout the day, but it is common teaching practice to do so in schools. Unfortunately, when learning is compartmentalized into separate disciplines, students are denied opportunities to make connections between ideas, concepts, and experiences. In contrast, education that is integrated prepares people to function in the world by teaching how to transfer knowledge from one context to another.

From a biological perspective, we know that we cannot separate the brain from the rest of the body and still maintain the function of the parts. So why would we attempt to separate our thinking into separate disciplines? In my teaching practice, I often call upon other areas of knowledge to inform the study of the arts. For example, when

studying a stained glass window one day with a fifth grade class, I asked my students to investigate the mathematical/geometric arrangement of the shapes. One of my students said "I thought this was art class." This was an opportunity to discuss how subjects are connected (Cornett, 2003; Jacobs, 1989). After explicit examination of the connections between math and art within this context, the class agreed that we could not separate art from the other information that was sometimes needed to understand and make works of art.

Technology and connections. One problem that I found was how to organize the diverse connections of an integrated curriculum. When teaching from an interdisciplinary approach, how can the lessons and content be put together into a coherent form? How can I help my students make sense of the connections between seemingly fragmented sources of information in such a way that learning is enhanced and students can make connections between the content of various subjects and their own life experiences? Drawing on my previous experience as a student, I looked to technology for a set of tools to provide a structure for planning, teaching, and learning.

When studying with Dr. Pamela Taylor and Dr. Stephen Carpenter, I developed an appreciation for hypertext technology as a tool for facilitating inquiry and making connections that cross boundaries of disciplines. In classes with Drs. Taylor & Carpenter, I learned to use Storyspace™ and Tinderbox™ software. In these programs, information in the form of text and images can be stored in spaces, or "lexia." The lexia can be opened to reveal the contents, or collapsed to show a diagram or map view of the spaces. The information can be linked, providing paths to travel between the lexia. External links to other documents and the Internet can also be created.

Making connections among ideas, images, and concepts through the use of Storyspace™ was exciting and liberating, because I began to realize the potential for various ways of thinking and seeing. When working with Storyspace™, every time I created a new connection or space within the web, I saw multiple opportunities for further connections. I also made links between my ideas and those of other students. When we shared our webs with each other, we saw possibilities for linking the content of our documents to create new webs. This is what Carpenter and Taylor (2002), referring to Kristeva, describe as intertextuality. "Intertextuality refers to the discovery and creation of new ideas that are made through examining relationships" (p. 6). Because of this work, I began to feel more connected to the world and the people around me.

While making connections was invigorating, I struggled with the structure of the many resulting connections. Arthur Efland (2000) discussed how connections can be made based on a lattice structure "as a way to open up avenues of interconnectivity between domains that stood in isolation within the curriculum" (p. 277). Efland further asserted that if the resulting "cognitive flexibility" leads to higher order thinking instead of bewilderment, then the increased complexity that can be found through a lattice structure is effective for learning (p. 289). However, according to Efland, the shortcomings of the lattice structure are as follows: too many choices can be confusing; learners are not always prepared to handle complexity; the lattice does not have limits and may not "adequately represent the process of alteration or renovation by which the cognitive structures themselves undergo change"; and "while a curriculum plan based upon the lattice, may be adequate to show the connecting links among domains of knowledge, it is less adequate to show how these domains might contribute to the life

world of the individual" (pp. 290-91). Efland suggests that using a city as a metaphor for curriculum design may work better. In this line of thinking, domains of knowledge are conceptualized "like zones of a city [. . .] that would partially overlap with each other and with the life world of the learner" (p. 294). As I began to think of ways to reorganize curriculum, I reflected on my previous experiences with technology in search of tools to help build functional structures.

Technology and interactive teaching approaches. When I first started teaching, I was very enthusiastic about using technology in the classroom. I used many different approaches to integrating technology including studio-based software, multi-media tools for art instruction, and the Internet, but I struggled to find practical applications that will embody the exciting hypertextual, interdisciplinary experiences that I encountered in my own learning. I was enamored for a time with PowerPoint®, because it provided an easy way to combine words, images, and hyperlinks in a format that was efficient for use in the classroom. What I realized however, was that my approaches to using the PowerPoint® slideshows placed my students in a passive role, not the dynamic, active role that is required in order to develop critical thinking.

I was inspired by Dr. Pamela Taylor's use of PowerPoint® as an interactive review and assessment tool for the "Technology in Art Education" course at Virginia Commonwealth University. She created a PowerPoint® presentation that reviewed the requirements and highlights from the class. We then viewed the document as a class, and we were encouraged to add our own ideas to the slideshow during her presentation. This connected the content of the learning with the experiences of the learners. I was even able to teach Dr. Taylor and the other students in the class how to make a "callout" on a slide.

Other students in the class gave their input as well. Through this type of interactive approach, the students and the teacher become co-learners. I wanted to see this kind of sharing and exchange of ideas in my own teaching, but I needed to find the appropriate computer program to use with my young students.

Chapter 2

Visualizing Connections

Legislators and administrators have made attempts to close the achievement gap and address issues of accountability and assessment, but the results of these efforts are that teachers and students have more requirements and tests and seemingly less time in which to achieve these tasks. Teachers are overwhelmed by the amount of work we must carry out. I taught art at Saunders Elementary School, in Newport News, Virginia for five years. In the halls, I frequently heard teachers complain, "It is too much! We can't do all of this!" I observed classroom teachers struggling with a tremendous amount of material to cover in a limited amount of time. They often expressed their frustration at how they were restricted by dictated pacing charts and testing schedules. Some of these same teachers argued against interdisciplinary teaching methods on the grounds that it is not practical within the context of the school day. I argue that integrating subjects can be a way to use time more efficiently and can lead toward higher levels of thinking when students explore connections among domains of knowledge and their own life experiences.

It might be difficult for some teachers to visualize the connections between subjects, but technology may well provide the resources to facilitate integration. According to art educator Kerry Freedman (2003), "Visual technologies easily and quickly enable us to cross conceptual borders, providing connections between people, places, objects, ideas, and even professional disciplines" (p. 128). How can we use technology to integrate disciplines, maximize time, and address issues of assessment?

Hypertext technology. Hypertext technology is an important tool for integrated education. According to Theodore Nelson (1967), hypertext is text that does not have a fixed order, deviating from the typical linear order of printed texts such as books. The most familiar example of hypertext is the Internet, which is connected with hypertext links, and the order in which the links are followed is determined by the individual Internet user.

There are many ways to build hypertext, and I began the process by using works of art as the foundation. Through the process of planning and teaching lessons based on those works of art, I linked documents to information within other subject areas that informed the understanding of the art. In the next chapter, I will describe in detail the process and the resulting documents. Organization within the hypertext documents became an issue as the number of links increased. I needed to transition between images, video, text, and sound in a coherent manner.

The problem with connections. Kirschenmann (2001) acknowledges these issues and asserts that there is difficulty in translating the increasingly visual and digital media "aesthetic processes and their results…into another symbol system, such as spoken or written language" (p. 12). With the continued growth of digital media, we are "facing a considerable increase in pictorial symbol complexity" (Kirschenmann, 2001, p. 13). This is what I experienced as I built and navigated through the hypertext documents. As the connections grew and intertwined, the information merged into a visual and conceptual

mess. While "intentionally tangling" [1] can be enlightening, it can also be confusing and frustrating. I was reminded of the scene from *The Cat in the Hat* (Grazer, 2003) when the characters find themselves in the house that has been taken over by "the mother of all messes." Pathways twist, undulate, and crisscross making it difficult to see where they are going. There is a difference between *making* connections and *seeing* connections. There is also a difference between *seeing* connections and *making sense* of the connections you see. For experienced and successful hypertext creators, the resulting documents may become clearer. "Because hypertext allows the creation of a visual document of the interpretations created by each individual, teachers and art education students actually 'see' the relationships among various parts" (Taylor & Carpenter, 2002, p. 11). For the purpose of using and building hypertext in the elementary art classroom, I needed to be able to navigate between various forms of information quickly and easily. In search of tools that would help me reach a higher level of organization with my connection of ideas, I looked to concept maps that illustrate different types of thinking.

Structures of connections. According to Rieber (1994), "the patterns of complex, nonlinear systems often only show themselves when the raw data is converted into visual form" (p. 6). When interacting with hypermediated work it seems sometimes like information just appears out of nowhere. In our increasingly hypermediated society, ideas and information move at lightening speed. With the click of a mouse we can move from "place to place." It is through connections, or hyperlinks, that this is possible. How can visualizing the structure of these connections help us to make sense of how ideas are

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[1] Carpenter and Taylor presented a paper entitled "Interactive Computer Technology and Art Education: The Intentionally Tangled Curriculum" at the *Society for Information Technology and Teacher Education International Conference 2003*. In this paper, Carpenter and Taylor (2003) advocate "[a]n intentionally tangled approach to interpretation and curriculum design-one that links visual culture, works of art, and content from various disciplines for the purpose of making meaning."

connected? Mark Bernstein (2003), the developer of Storyspace™, defined a variety of patterns for hypertext. "An appropriate vocabulary will allow us both to discern and to discuss patterns in hypertexts that may otherwise seem an impenetrable tangle or arbitrary morass" (Bernstein, 2003, ¶ 2). These patterns and other concept-mapping designs (Hyerle, 1995; Jonassen, 2000; Marzano, 2001; Plotnick, 1997; Reiber, 1994) are helpful in seeing the connections between ideas more clearly. This visualizing was very helpful to me in both connecting ideas intentionally instead of haphazardly, and getting out of conceptual tangles.

What can be said of the structures of these patterns? Humans have a tendency to create structures that replicate the organic structures and functions that are found in nature, both within and outside of ourselves. I was looking at a map of the United States one day. All of the major roadways were highlighted in red, and it suddenly struck me how much they resemble the synaptic structures and circulation systems found within the human body. I had the realization that the same structures that are necessary for our internal system functioning are apparently also needed for our external functioning. We build roadways for transportation, and computer information pathways for transferring ideas and information. "What we call 'mechanization' is a translation of nature, and of our own natures, into amplified and specialized forms" (McLuhan, 1964, p. 56). An electrician draws a schematic to visualize the flow of electricity through the circuits. The wires can then be connected to create a fully functioning electrical system. How can the same concepts apply to learning? How can patterns be used to design meaningful learning experiences and answer the need for an organizing structure for connections within the hypertext?

Bernstein proposes "that by considering these patterns, or patterns like them, writers and editors may be led to more thoughtful, systematic, and sophisticated designs" (Bernstein, 2003, ¶ 4). His dictionary of patterns includes the cycles, counterpoints, mirrorworlds, tangles, sieves, montages, neighborhoods, missing links, feints, and variations and combinations of these designs (Bernstein, 2003). These intriguing designs were tempting to experiment with, but I feared that they were too sophisticated for the purposes of this brief study. I needed to use a language that was already familiar. For this reason, I turned to Thinking Maps®, a system of concept mapping already in use within Newport News Public Schools.

> "Thinking Maps® combine the flexibility of brainstorm 'webs' and the structure of task-specific 'graphic' organizers with a clearly defined, common thinking process language. This enables easy transfer and continuous development of thinking processes across disciplines, grade levels, schools and feeder patterns in school districts" (Hyerle, 1995, p. 1-4).

Thinking Maps® are eight visual-verbal concept designs, each based on a fundamental thinking process and used together as a set of tools for showing relationships (Hyerle, 1995, p. 1-8). See Figure 1 for a list of the eight Thinking Maps®.

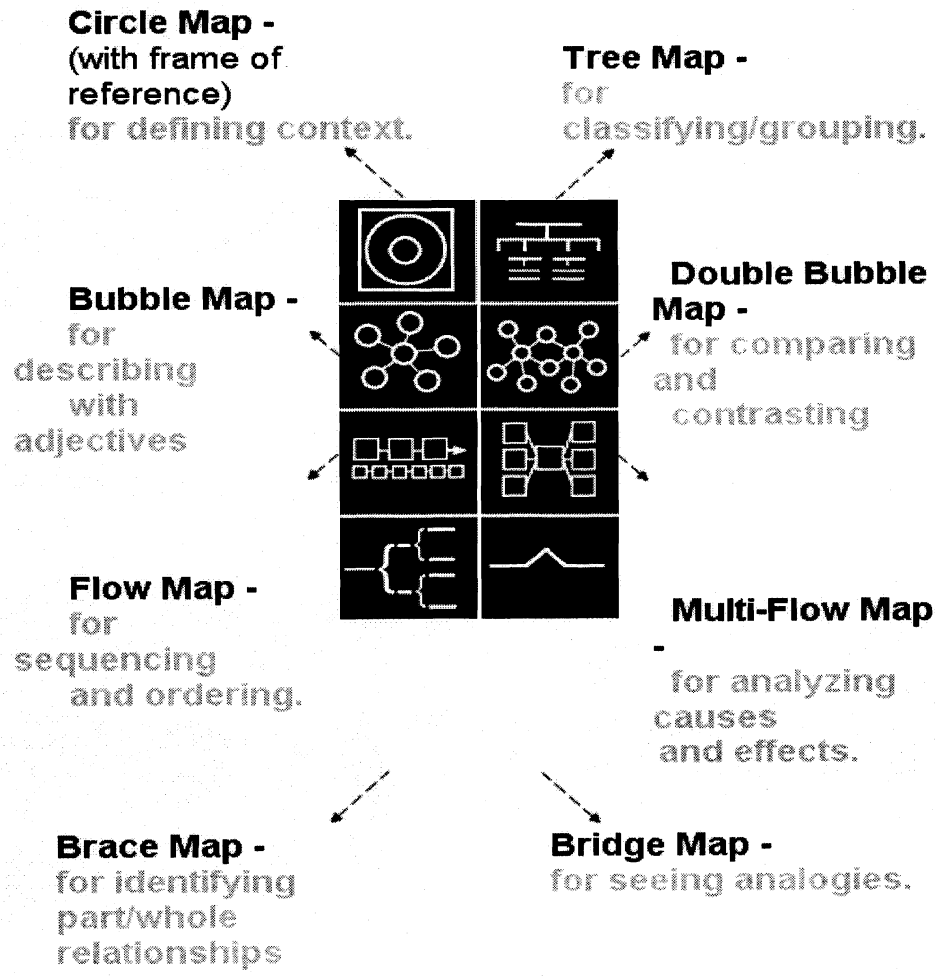

Figure 1. The eight basic Thinking Maps® each illustrate a specific type of thinking process (Thinking Maps®, 2004).

Research data shows significant increases in student test performance after schools began using Thinking Maps® (Thinking Maps® Results, 2004). In contrast to other traditionally used graphic organizers, specific training is required to use Thinking Maps® effectively. See Figure 2 for a comparison of graphic organizers and Thinking Maps®. All teachers working at Saunders Elementary School participated in Thinking Maps® Professional Development Training three years ago, and most of the teachers in the building use Thinking Maps® frequently with their classes.

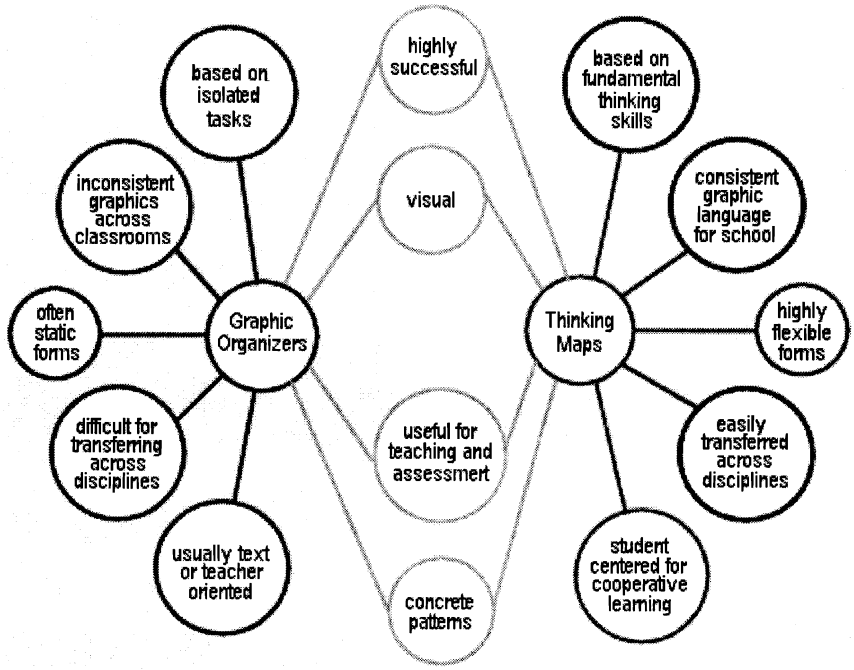

Figure 2. A "Double-Bubble" Thinking Map® is used to compare and contrast two items. Here, the similarities and differences between graphic organizers and Thinking Maps® are illustrated (Thinking Maps®, 2004).

By using this system of visually organizing the hypertext connections, I built upon previous learning and took advantage of a common visual language that was already in use. Would this system of design concepts provide more structure for the hypertext? To what extent would I be able to infuse technology and Thinking Map® structures into my teaching?

Barriers to Using Technology

Within the school community. Many teachers at Saunders Elementary School saw technology as a burden and just another "thing" that needed to be done. During the five years that I taught at Saunders, I witnessed and participated in the struggle to traverse the steep learning curve involved in integrating technology into teaching. For many teachers, it was a major hurdle simply to check their school e-mail accounts on a daily basis. In studying barriers to adopting technology in education, Rogers (1999), credits

Reiber and Welliver (1989) and Hooper and Reiber (1995) for a five-step model for infusing technology in teaching and learning. The "gestation period" begins with familiarization-which is basically exposure on the part of the teacher. The next stage is utilization, during which the teacher tries out a specific program, but does not find practical or efficient reasons for sustained use. Integration occurs when technology is used appropriately for developing and delivering instruction. "Teachers at this level do not use the computer for the sake of using a computer, but have made a choice about instructional delivery that is most appropriately handled by a computer" (Rogers, 1999, p. 6). After successful experiences in the integration phase, educators move to the level of reorientation. This phase is exemplified by the educator questioning the needs of the learner and his or her teaching practices in regards to meeting those needs. Finally, in the evolution stage, the technology, the learner, and the learning environment can change and grow depending on the needs that arise (Rogers, 1999; Jonassen, 2000).

Rogers (1999) also determined that barriers to technology adoption have both internal and external sources.

> Internal barriers may be summarized as 'teacher attitude' or 'perceptions' about a technology. External sources include the availability and accessibility of necessary hardware and software, the presence of technical personnel and institutional support, and a program for staff development and skill building. Barriers that cross internal and external sources are lack of time and funding (Rogers, 1999, pp. 7-8).

In Newport News, teachers were required to complete "Level 1" and "Level 2" technology training. We were each given personal laptops equipped with a wide array of

software. The school had three multi-media projectors, and every classroom had a television that could be connected to a laptop and used as a monitor. Most classrooms had between two and six iMacs. The computer lab had approximately 30 iMac workstations, and there were also four iBook classroom sets that could be checked out for student use. The Technology and Computer Integration Specialist (TCIS) worked in the school three days a week, and she was accessible at any time via e-mail and online technology support request forms. Even with these extensive technology resources, teachers were slow to integrate technology into their daily teaching practices. In addition to the fact that there were many other demands and requirements, teachers also face considerable barriers specifically related to technology.

Personal barriers. According to Kirschenmann (2001), while computers are becoming more often seen in schools, teachers are still lacking in specific technology skills, and "Art teachers are especially reserved when it comes to placing a computer next to their easel" (p. 12). Matthews (1997) argues that this is because "a traditional dichotomy has always existed between the quantitative origins of computers and the subjective and expressive nature of art" (p. 1). This line of thinking assumes that computer technology is used in art classes only for studio-based art applications. While some art is certainly expressive and there are many exciting studio applications of technology, I am striving to emphasize *thinking* in addition to making art.

Given that I am aware of the potential, and I have experienced the possibilities in the context of my own learning, what are my personal barriers to using technology to its fullest potential? According to Dwight and Garrison (2003), "There are many constraints to releasing the creative potential of hypertext and hypermedia" (p. 703). Namely, (a)

traditional curriculum theory and instructional design; and (b) “the metaphysical tradition of the West with its emphasis on fixed essences as the final telos of all action, including human development" (Dwight & Garrison, 2003, p. 703). In my efforts to use an interdisciplinary approach to teaching art, am I too chained to the hierarchical, authoritarian curriculum? When I analyzed the ways that I was using technology in my own teaching practice, I determined that I needed to explore new methodologies. I decided to analyze alternative ways to structure documents and to use more interactive teaching approaches with the computer. I will next discuss my exploration of these alternative approaches.

Chapter 3

Is integration possible?

> Integration of art with other subjects is congruent with . . . tenets of post-modernism because it relates ideas to form (shifting the focus of art education away from formal concerns to meaning-making), crosses disciplinary boundaries to reveal conceptual connections, and locates art in context with other disciplines. Most importantly for teachers, integration represents a concrete and feasible approach to teaching art in a postmodern way (Marshall, 2005, p. 227).

During my teaching experience, I found that my students see the world from a postmodern perspective. They do not see their experiences in a linear sequence, but rather a pastiche of encounters and connections with the world. How can we take advantage of these fresh, postmodern viewpoints?

I taught third, fourth and fifth grade students at Saunders Elementary School during the course of this study. The student population of Saunders Elementary School totals 433 students. Although I previously taught full-time at Saunders for three years, during the two-year span of this research study I job shared with another art teacher. We split the position in half, and I therefore taught approximately half of the students. I saw each class once a week for forty minutes, and I also taught art enrichment classes on Wednesdays with a selected group of fifth grade students.

I had opportunities to work with classes for additional time if I scheduled co-teaching sessions with the classroom teacher. I valued co-teaching experiences, because they provided rich experiences for the teachers and the students. When working on an

integrated lesson with another teacher, we both added our expertise to the experience. I found that it was difficult to schedule the co-teaching lessons if it was seen as an "extra" or extended art lesson, but if the content of the lesson was substantively connected with core standards and requirements, the classroom teachers were much more receptive. By using Thinking Maps® and Inspiration® to make these connections visual, I was able to clarify my own thinking and demonstrate to the classroom teachers where these opportunities could be found. I will next describe Inspiration® and explain how I planned to use this computer program in this action research study to facilitate art teaching and learning.

Third Grade Ecology Unit

Inspiration documents. For the purposes of this study, I decided to use Inspiration® to build interdisciplinary hypertext documents with my students. Like Storyspace™ and Tinderbox™, Inspiration® uses lexia and notes to store information which can then be viewed as a map or an outline. Links can be made between lexia, within the notes, external documents created using other applications, and the Internet. Inspiration® is highly engaging to young students and visual learners, because it contains an extensive library of symbols to use as the lexia. Inspiration® was also already used by many classroom teachers within the building, so once again I was building upon previous learning and using an available resource.

I used Inspiration® to design a unit of instruction for my third grade classes. The unit was designed to engage students in the process of thinking critically about real life issues regarding the natural world and man's relationships with it. I created an Inspiration® template with a series of interdisciplinary questions that my students were to

answer about a creature of their choosing. I planned for the template to also serve as a form of authentic assessment and a tool for the student to demonstrate his or her investigative work.

To begin the unit, I introduced Andy Warhol's *Bald Eagle* from his "Endangered Species" series to my third graders. We used a "Bubble Map" within an Inspiration® document to describe the work of art. I then provided the students with background knowledge about Warhol's "Endangered Species" series, and we began to make art and science connections. We discussed what it means if an animal is endangered and what factors can contribute to endangerment and extinction. We discussed natural habitats, defense mechanisms and conservation. All of this information from other disciplines helped us to better understand the work of art, and the students were very interested in discussing animals. They were eager to share what they already knew, and I could see by their expressions that they were really trying to understand new concepts as well. Some of the language was difficult, but we worked together to communicate and find common language. The students wanted to know more about Andy Warhol's artworks. I modeled how to search on the Internet, and I found a website that showed all of the prints from his Endangered Species series (The Andy Warhol Foundation, 2005). We viewed all of the prints, and I made a link to the website within the Inspiration® document.

Next, I showed the students an Inspiration® web in which I connected the ideas we had just discussed to a specific creature. My example was my cat, Susa. The students enjoyed learning about my pet, and they also shared information about their pets. I later thought that maybe this was not the best example. A wild animal might have worked better to demonstrate the myriad of possible connections that they could make to content

they were learning in other subjects areas, including the science content connections regarding habitat and defense mechanisms[2]. The advantage of using my pet was that I was able to incorporate elements of personal narrative into the classroom, which can be powerful learning tools.

Collaborative planning with media resource. The next stage of the plan required students to choose their own animal to research and document. When the students chose their own creatures to use in their individual documents, most of the students chose wild animals. At this point, the students needed to research to learn more about their chosen creatures. The timing conveniently coincided with the skills they were learning in English. During a grade level meeting, the third grade teachers asked for help teaching an English SOL about resources[3]. The media resource teacher, Mrs. DiPasquale and I came up with a plan to work together to let the students research their chosen creature during library resource time. I welcomed the extra support. By utilizing the media resources in the library, the students could find much more information than I could facilitate during art resource time. The students were to find answers to several key questions, write the information, and then enter the information into the Inspiration® template when they came to the computer lab (See Figure 3).

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[2] Virginia Standards of Learning for Science: 3.4 The student will investigate and understand that behavioral and physical adaptations allow animals to respond to life needs. Key concepts include a) methods of gathering and storing food, finding shelter, defending themselves, and rearing young; and b) hibernation, migration, camouflage, mimicry, instinct, and learned behavior. 3.10 The student will investigate and understand that natural events and human influences can affect the survival of species. Key concepts include a) the interdependency of plants and animals; b) the effects of human activity on the quality of air, water, and habitat; c) the effects of fire, flood, disease, and erosion on organisms; and d) conservation and resource renewal.

[3] Virginia Standard of Learning for English: 3.7 The student will demonstrate comprehension of information from a variety of print resources. a) Use dictionary, glossary, thesaurus, encyclopedia, and other reference books, including online reference materials. b) Use available technology.

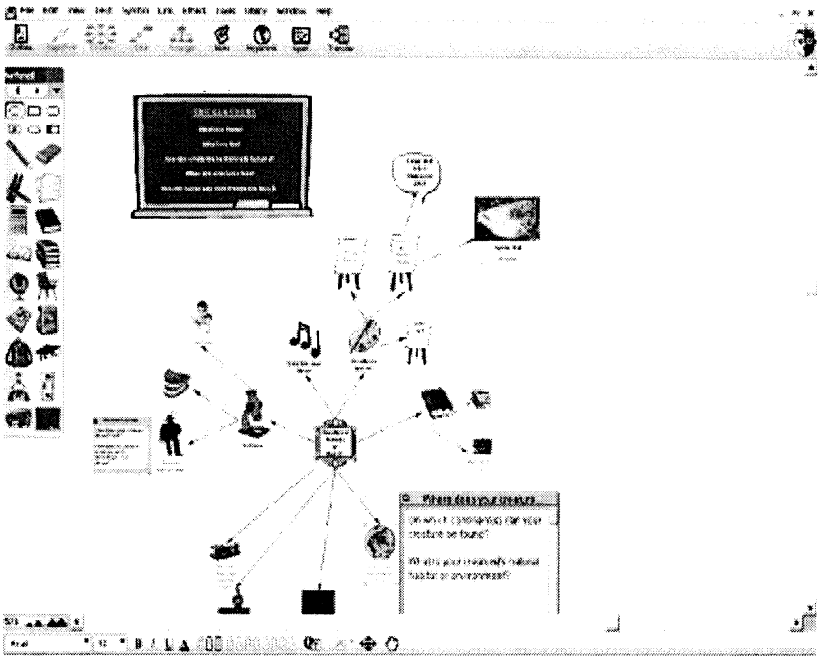

Figure 3. I provided each student with a template. Inside the notes, students were asked questions about their creature.

The template was structured after a bubble map Thinking Map® design, which followed the describing thought process. The students were then to add personal connections, digital images of works of art, and other information of their choosing to create their own individualized documents. I hoped that the students would also be able to access the Internet to find connections. I was unable to direct and facilitate Internet research with the third graders, and I had to admit that I set my expectations too high given time restrictions and the ability levels of my students. I will next discuss the experiences in the computer lab and explain how the study changed as a result of these experiences.

Chapter 4

Connecting with Students

Computer lab experiences. I spent three class sessions with the third graders in the computer lab. I introduced the Inspiration® program, and taught the basic skills of opening a note and typing answers to questions. We worked on the first few notes at the same time, so that I could model the process. I quickly noticed that within all four of the third grade classes, there was a wide spectrum of ability levels. Some students were able to type much faster than others, and the length of answers differed between students, determined by their individual writing abilities. The students who finished ahead of the others had some difficulty in waiting while the others caught up. After the first two weeks, I realized that some students were finished responding to almost all of the questions I had posed for them while other students had only answered a couple of questions. It was at this point when the student began helping each other, and this was a welcomed development. I encouraged students to share information if they were investigating the same creature. Students also helped each other with some of the basic computer and typing skills.

During the third week, Mrs. DiPasquale, the media resource teacher, came into the computer lab and helped students who were having difficulty entering their information. Unfortunately, Mrs. DiPasquale was not as comfortable with the active environment of students helping other students, and she reprimanded students harshly for talking and moving around the lab. I was uncomfortable with the severity of her scolding, and although I attempted to explain that the students were helping each other, her comfort level with the resulting noise and movement was tested. I realized that I should have

communicated with her about this ahead of time, and perhaps we could have reached a compromise. My focus at this point of the unit was to keep the students as motivated as possible. The more motivated the students were, the more their ideas and inspiration was evident.

Motivation. There was a high level of student engagement from the outset of the unit. The students said that they were excited about using the technology. Since they had not worked on the computer very much at this point in the school year, the computer held the advantage of novelty. I wondered if the newness would eventually wear off. As we progressed in the unit and worked in the computer lab, I found that the students did not get bored. They were consistently motivated and excited about working with the computers. They wanted to prove how much they could do on the computers, and they wanted to continue to learn more skills.

Student choice was also a motivating force as we worked with the individual Inspiration® documents. The students were required to enter the information from the five research questions. Beyond that, they could pick and choose which notes they investigated and answered. Some students wrote in almost all of the spaces. Some students only completed the five spaces, but most students were engaged in investigating the various lexia and notes within the document. Even if they did not type information in the document, they were looking at the art examples within the document and searching through the many icons for symbols that represented their creature.

I began wearing a thumb drive around my neck so that I could easily and conveniently save and transfer files. The students asked me about my thumb drive, and several students told me that they know someone else who has one such as a father,

cousin, or brother. One student said, "When I get older, I am going to get one and put all of my secret stuff on it." This example demonstrates how students want to "own" their own information. I questioned the level of ownership the students felt in respect to their Inspiration® documents, and I determined that some of the students did not feel a personal connection to the work they were doing. I wanted to give them an opportunity to individualize their documents instead of merely retrieving and entering data. Mrs. DiPasquale and I emphasized research skills, and while this was one of the main goals of the unit, I also wanted the students to explore and be creative. In addition to student ability levels, time was also a major obstacle to reaching these goals.

Limitations lead to change. I determined through the course of working with the third grade students in the computer lab that they could not demonstrate the level of connective thinking within the Inspiration® documents that I had originally envisioned. Next year, when these same students are in fourth grade, they would be able to take Inspiration® webs further individually, but within the scope of this research study, I was limited both by time and the abilities of the students. I needed to have the students give me ideas to enter into the web or I needed to show the students the webs in class and make connections through the process of discussion. I decided to do both. The students stopped working on their individual webs. We kept the files within their student folders in the computer database, and I informed the students that we would continue working on the webs as a community.

Higher level questioning. When I worked with the third grade students on their individual documents, I realized that I was asking them to answer simple questions. This was partially effective, because the students were learning research skills. It was

important that the students knew how to find specific information, and they were learning valuable computer skills. The research also allowed the students to form descriptions of their chosen creatures. But we could not stop there. According to the Bloom's Taxonomy cognition model (Jacobs, 1989, p. 61), we were working in the knowledge, comprehension and application levels of thinking. In order to move up to the analysis, synthesis, and evaluation thought processes, we needed to start asking higher-level questions. I began to think of the Thinking Map® structures and the individual webs were seeds. As the "seeds" began to grow and branch out, the higher-level questions were like water that made the web come to life.

After our work in the computer lab, I asked the students for feedback about the experience. We reflected on the concept of animals being friends and foes. We expanded our thinking to other kinds of relationships. As the dialogue continued, I was able to add more of the student's input into the web. I prepared for each class by connecting my laptop to the television monitor and opening the group Inspiration® document on the desktop. When someone made a connection that we thought should go into the web, I went to the computer and entered the connection into the document. When a question arose that we needed answered, I connected to the Internet, we did a search, and made links to web pages.

My role as an educator turned from that of a disseminator to that of a facilitator/documenter. The students were not hindered by their limited typing and computer skills, because I was doing that part of work for them. They were free to think, discuss, and connect. The students said that they enjoyed telling me what to enter into the web and what to search for on the Internet. For example, they wanted to know how many

animals were endangered, so I found the International Union for Conservation of Nature and Natural Resources (IUCN) website. We found out that there are *thousands* of endangered species, and we looked at the IUCN photograph gallery.

I was concerned at this point that I was beginning to lose all sense of structure and coherence of connections. The problem I faced was that after adding numerous connections, the Inspiration® documents were beginning to become tangled messes again. I struggled with keeping the Thinking Map® structures or embracing a more organic structure for the connections. I determined that I did not need to choose. My students taught me that I could be more flexible in my thinking, and Inspiration® allowed me to transfer between various kinds of structures. I could easily change the arrangement of the lexia to reflect the type of thinking that I wanted to emphasize at that time. Figures 4 and 5 show the same Inspiration® document in two different arrangements.

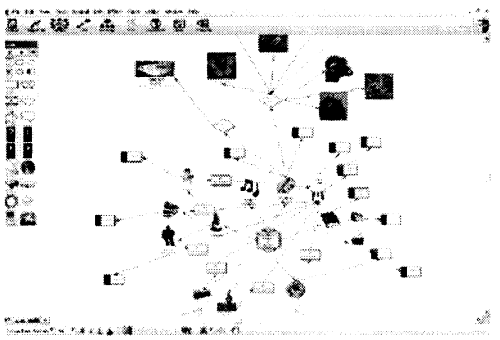

Figure 4. Cluster arrangement of lexia within an Inspiration® document.

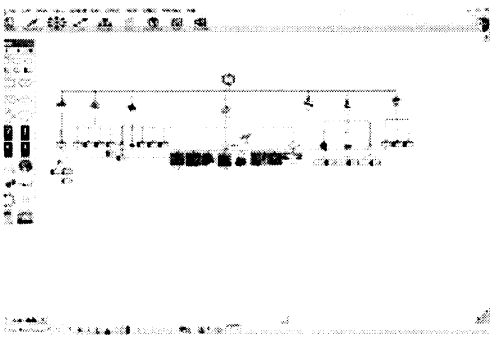

Figure 5. Tree map arrangement of the same document.

The tree map arrangement was useful for classifying the connections in terms of each content area. I saved several versions of the same document, and used the version that was most useful at any given time.

From virtual to physical. The students wanted to draw pictures of the animals they saw on the IUCN site, so we used several class sessions drawing, painting, and

making prints of some of the animals. The students also decided that they should make physical books about their creatures that included their artwork as well as pages that they printed from the computer. According to one student, "We could have the computer version and the real version" (Earl, personal communication, March 14, 2005). This demonstrates the students' concrete perception of reality being that something is real if you can hold it in your hand. I struggled with the transition, because I missed the interaction and exchange of ideas that the hypertext facilitated. Dwight and Garrison address these issues that emerge in using hypertext:

> Epistemological and ontological concepts of theory, literature, self, power, property, and pedagogy all have to be addressed. Structuralist paradigms will seem oddly out of place in a hypercontext, but what is to follow remains largely a mystery because hypertext calls for an emergent and co-constructed reality. We do not view this nebulous future so much as a dilemma as an opportunity to understand reality as an evolutionary process of eventful ebbs and flows (2003, p. 721).

My students would need more time and experience with hypertext to view our co-constructed reality as "real."

The third graders became very engaged in working on their books (Figure 6). Making the physical books gave the students the sense of personal ownership that was so important to them. Some students printed the diagram view of their documents, and others printed outline views to include in their books. When they took their books home it gave closure to the unit, and they expressed their intentions to share their books with their parents and siblings. I could not stop making connections, and I continued to work with

the Inspiration® documents and Thinking Map® designs to plan, facilitate and assess student learning.

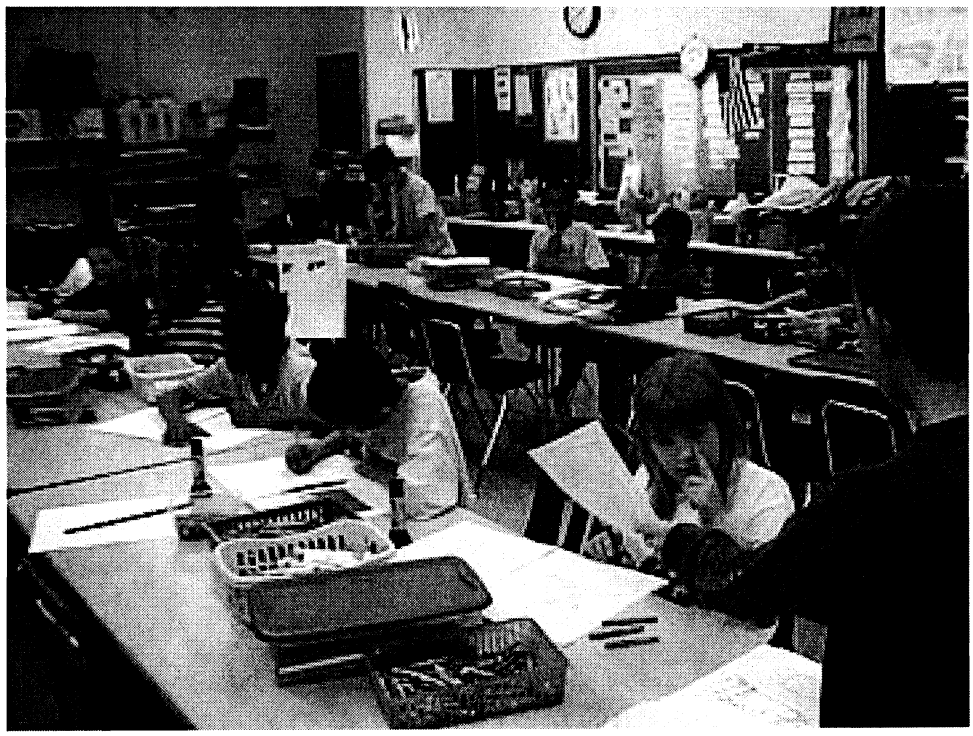

Figure 6. Students worked on books which included works of art and pages printed from their Inspiration® documents.

Chapter 5

LIVING CONNECTED:

IMPLICATIONS FOR THE SCHOOL COMMUNITY

AND THE POSSIBILITY OF AN EVOLVING

CURRICULUM

Connections to fourth grade content. As the web grew, I began to see connections between the third grade curriculum content and content in the fourth and fifth grade curricula. I originally planned to work with only my third grade students for the purposes of this research. As the study evolved however, I found that I could not take my experiences with one grade level out of the context of my whole teaching experience. When we began making substantive connections between subjects, I could not ignore the possibility for building upon those connections with the other grade levels. I realized that if I taught the same students next year, their learning could expand as a result of engaging in the curriculum that I teach with fourth grade students.

At the same time that I was teaching the "creatures" unit with the third graders, I was teaching a course of study entitled, The Marketplace: A Chicken's-Eye View of the Food Industry for the second year with my fourth grade students. I wrote the course of study for fourth grade students, because I saw opportunities for connections between the grade level's art standards of learning and content learned in other areas, especially in regards to nature and science. I created PowerPoint® slideshows to use as teaching resources for the four units within the course of study. After using an interactive approach to teaching with the Inspiration® documents, I realized that my use of the

PowerPoint® slideshows placed my students in a passive role. I needed to change my teaching methodology with these units to a more interactive approach.

Within the course of study, four units (Fast Food Culture; Dining at Home; American Agriculture; and Humanitarianism) are interdisciplinary and investigate media influences, dining experiences, and personal choices regarding food consumption. Within these units, works of art from popular and fine art sources are thematically contextualized to inform students' thinking about real-life issues regarding food. Students also critically examine issues and artworks to inform their judgments and decisions.

When I converted the images and text from the Food Industry PowerPoint® documents into Inspiration® documents, the information became more easily accessible and engaging for the students. I presented the Inspiration document to my students, and one student said, "It looks like a video game. You can go all of these different places." Several other students in the class agreed. We added connections, based on the interests and needs of the students.

Questions take us deeper. One fourth grade class in particular engaged in the process of making connections. During a class critique of *Farm Scene in Winter*, by William Williams (1802), the students discovered a person on the farm shoveling a pile of manure. The students did not initially understand what the purpose of the pile was. When it was determined that the manure would most likely be used as fertilizer, most of the students in the class decided that they did not want to eat fruits and vegetables again. After several unsuccessful attempts at explaining the natural processes involved in growing food, I decided to stop trying to explain and turn to the process of facilitating inquiry through the process of linking.

The science experiment. The students investigated food product packaging for information about the ingredients in their food, and we placed pictures of packaging designs in the Inspiration® web. Some students asked their parents whether they bought fruits and vegetable that were grown with organic fertilizers or chemical fertilizers. We also conducted a science experiment that involved using organic bat fertilizer on one avocado tree and chemical fertilizer on another. We created a link from the Food Industry Inspiration® document to a new web that documented the experiment. The experiment showed that the chemical fertilizer made the avocado tree grow faster. This led to a discussion comparing the organic fruits and vegetables in the supermarket to the "regular" fruits and vegetables. We determined through observation that the organic produce was usually smaller and less attractive, but it costs more. This critical inquiry led to questions concerning how to know what is healthy to eat and whether organic foods are healthier than other foods. We also questioned economic factors concerning food choices and the aesthetic preferences that cause the more attractive produce to cost more than the organic. We determined that advertising influences our choices, because advertisements usually show perfect examples of food items.

We then utilized the learning resources on PBS KIDS (PBS, 2005) to further analyze media messages and marketing strategies. We also investigated fast food culture. Students examined personal preferences for fast food and factors that inform their decision-making process regarding whether to eat fast food and which restaurant chains they visit. The program Inspiration® and Thinking Maps® facilitated critical inquiry by showing patterns of connective thinking and providing the space for documentation of our investigations for purposes of reflection and assessment. Without the Inspiration®

web documents, some of our learning experiences may have appeared out of context and deemed by some to be inappropriate for an elementary school art curriculum.[4] The webs however provided the impetus for and the validation of the divergent investigations that we embarked upon.

Building relationships and the "What if...?" question. My thinking and my teaching approach has been changed by engaging in this action-research process. When I studied art education with Dr. Carpenter, he taught me to ask "What if...?" He wanted his students to consider the possibilities of what teaching can be. He wanted us to push the limits. I tried to push the limits my first few years of teaching, but after teaching for four years, I was burned out. As a result of this research study, I became inspired and began to ask "What if..." questions once again.

What if students, teachers, and administrators were all on the same team? From my observation, we are still operating in a hierarchical educational system that requires students to gather knowledge from their teachers, who disseminate the knowledge that is prescribed by a rigid curriculum. I hear teachers lament frequently, "It's too much! We cannot do all of this!" A tremendous amount of requirements and stress are placed on the shoulders of teachers, but what if it did not have to be this way? Another complaint by many teachers is that students have too much energy and cannot sit down and be quiet. What if more of the responsibility for learning was placed on the student? What if students were truly engaged in their own research and allowed to ask more of their own questions? What if the curriculum was constantly changing and evolving?

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[4] There is currently dialogue and debate among art educators regarding the inclusion of visual culture in art curricula. Some of the curriculum content described in this study falls into the realm of visual culture. I will not go into detail regarding the implications or controversy surrounding visual culture studies. I will simply note that when students are allowed or encouraged to connect visual culture content to other areas of learning student engagement increases, and student interests are validated.

After teaching at Saunders Elementary School for five years, I needed a new vision of hope. At several points during the course of teaching at Saunders, I had a very dismal outlook on the environment there and in other public schools around the country. I questioned my visions of possibilities for change in educational realities. I found that I had to go deeper to the core of my own beliefs and assumptions. I also found that I had to change my teaching practices to reflect my beliefs. I had to stop being afraid of what the children might ask or say, and I had to admit that I did not have all of the answers and instead embrace the process. I feel that my use of hypertext technology and Thinking Maps® directly affected these changes by facilitating new approaches to teaching and learning.

I found that by letting go of the idea that I was the only person in the room who was teaching, that my students and I could be liberated. During the course of this research study, there were times when students taught me how to do things, and this helped to foster a collaborative community atmosphere. For example, I approached a student one day while we were working as a class in the computer lab. I initially thought that Legin was "playing" and needed to be redirected. He was actually "experimenting" with the program. When I inspected more closely what he was actually doing, he taught me how to select an entire Inspiration® web. I found that I could then copy and paste a web into another Inspiration® document and combine webs created by separate classes into one. I consciously began to urge my students to teach me more, and I explicitly revealed to them that I was learning from them. One student's wide-eyed reply was, "Really, you can learn from us?" I laughed joyously as I answered, "Yes!" This was not a change in my teaching philosophy, because I have always *believed* in community learning. What I

experienced was more of a change in the way I *acted* as a teacher. It is one thing to believe in something, but it is important to find ways to put those beliefs into practice. The interactive approach that was used in this research study facilitated that needed change in my teaching practices.

Further implications. As a result of this study, I also considered notable philosophical viewpoints. I now realize that there is no one "right" way to organize connections within hypertext. How you arrange connections depends on the information that you are organizing and what you want to emphasize. Thinking Maps® are useful for emphasizing types of thinking, but I do not feel that these designs should not be used in a rigid form. They should be flexible enough that each user can tailor them to their own purposes. Like all tools, the user determines their effectiveness, and increased use leads to greater efficiency and creativity.

Furthermore, various perspectives on the connections we make allow us to add and view layers in our thinking and experiencing life, the world, ourselves, and each other. I see hypertext as having the potential to go beyond the goals of curriculum integration and interactive teaching. I see the possibilities of finding ways to visualize the connections and identify patterns that can assist in making sense of the world. As I integrated the individual Inspiration® webs, the connections began to resemble synaptic connections and road maps (Figures 7-9).

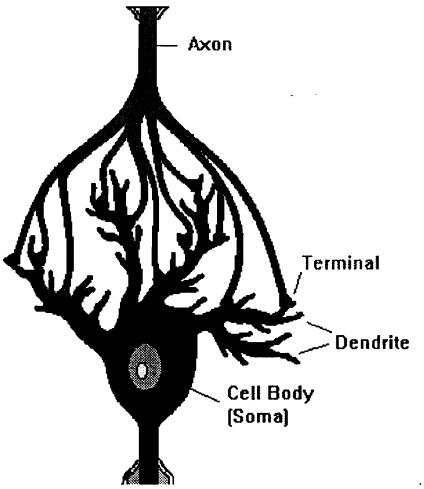

Figure 7. An illustration of synaptic connections (Chudler, 2005, ¶ 4).

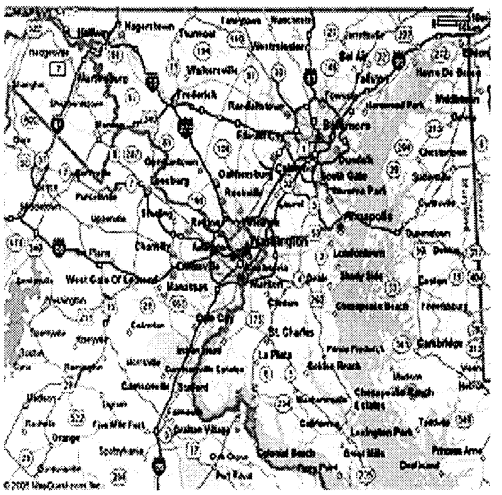

Figure 8. Connections of roadways (MapQuest, 2005).

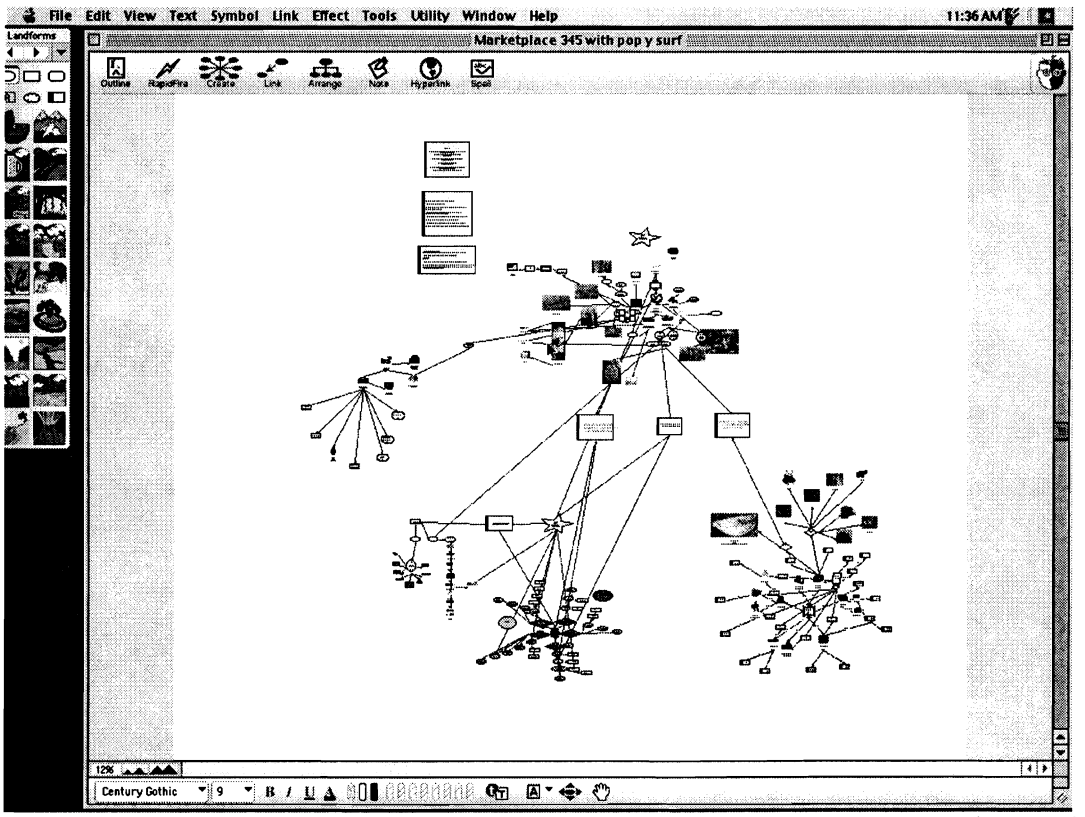

Figure 9. This Inspiration® web shows third, fourth, and fifth grade curriculum content and connections that were built during this study.

Many things look like this-ant tunnels, veins (in humans and plants), and all of these things connect and become the web of life. At the outset of this study, I hoped to

find structures for connections that would make learning tidier. I now see learning with hypertext as a way to come to terms with the messiness of life and learning. I reached a point when had to stop trying to impose patterns and structures on all of the webs. I had to let some of the connections become tangled. I had to learn to love the messiness of it. There were some places where the patterns and structures made sense, but in other places it seemed that the patterns were yet to be found. Perhaps they will be found not from an outward design, but from the process of navigating in and through the documents. As with life in general, hypertext requires a balance between planned design and organic process.

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VITA

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