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Zoophonics keyboards: A venue for technology integration in kindergarten

Marie Bess Forst

ZOOPHONICS KEYBOARDS:

A VENUE FOR TECHNOLOGY INTEGRATION IN KINDERGARTEN

A Project

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts in

Education:

Instructional Technology

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by

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Approved by:

[redacted]

Dr. Eun-Ok Baek, First Reader

3-15-04

Date

[redacted]

Dr. Amy Leh, Second Reader

ABSTRACT

Integrating technology into the early childhood curriculum can be frustrating. The question is how do you use the technology to support your teaching rather than teach the technology simply to learn about computers? Teachers need to view technology as simply another accessible tool to augment instruction. The Zoo-phonics keyboard project described below combined one school's current phonics program with technology in such a way that the literacy instruction remained at the core of design. This project provides the teacher with a technology enhanced strategy they can use today to support their teaching.

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CHAPTER ONE

BACKGROUND

Introduction

Welcome to the 21st Century. If you have been teaching for a number of years, you have seen your classroom change dramatically. Your district has probably added computers to your room or at least your school and is expecting you to use these new tools as a curricular enhancer. The question is how do you use the technology to support your teaching rather than teach the technology simply to learn about computers? For those of us working with very young children, the question is even greater. We frequently find ourselves asking if computer use can even have any relation to our day to day lessons. This author believes that the technology available can assist you in your quest for strong curricular support. The trick is to decide what is really supporting your lessons and what is simply keeping your students occupied.

Statement of the Problem

The integration of technology within the classroom curriculum can be a difficult prospect for all elementary grades. Teachers can easily find programs that diverge from their daily program of study for use in the school lab or

single classroom computer, such as drill and practice applications. The problem, however, is adapting the use of technology to support everyday instruction in the classroom. It is widely believed that in order for technology use to have an effective influence on learning, it should be strongly connected to non-technological content being explored in the classroom. This characteristic is especially difficult when working with young children who are still at a pre-reading level.

This project's problem addressed a felt need, an expressed need, and a critical incident (Morrison, Ross & Kemp, 2001). Personally, I have struggled with the adaptation of technology to fit with my early primary curriculum. My colleagues and I felt that we could do more with technology, but we were unsure of how to adapt its use to our population's age group. I frequently found myself turning to the computer only for drill and practice applications or as an "after you complete your work" activity. This was not how I envisioned true integration. I had also read many online postings by fellow kindergarten teachers who were frustrated with the lack of support for connecting current curriculum to their technological resources. As schools, districts, and states place more pressure on the use of technology in the classroom,

significant numbers of kindergarten classes now have computers within their walls. The teachers were not, however, trained in how to integrate these machines for the purpose of greater student achievement. This leads to the use of computers in kindergarten as strictly "play machines".

Purpose of the Project

The purpose of the project was to create a program of instruction that seamlessly meshed with my current emergent literacy curriculum, a popularly used phonics program entitled Zoo-phonics, which can easily be applied by other kindergarten teachers using the same phonics instruction program. In order to achieve this goal, I first created a product that could be used in any classroom, with any type of computer to provide learning support for the phonics program. After creating this product, I tested it with fellow early childhood educators to fine tune and develop lessons that were pertinent. Finally, I prepared a web-based tutorial including an implementation guide, downloadable materials, and suggested use guidelines that would disseminate this information to other early primary teachers.

Significance of the Project

Recent studies demonstrate the need for more research regarding the actual implementation of technology integration into early childhood classrooms. A 2002 study conducted by the National Telecommunications and Information Administration (NTIA) found that "ninety percent of children between the ages of 5 and 17 (or 48 million) now use computers" (p. 1). Smerdon et al. (2002) found that only half of those teachers with computers in the classroom were actually using them for instruction (p. 8). With such a large percentage of our youth population currently using technology, it seems erroneous for educators to leave it out of the daily curriculum. Teachers need to provide guidance and learning opportunities that will further the growth of those already "plugged-in" and assist the ten percent of non-technologically savvy students with attainment of the same skills.

Limitations

While this project aimed to show how technology could be used as an authentic learning tool within an existing curriculum, it did have some limitations that were unavoidable. Due to time constraints, a long term data assessment of actual student achievement gains was not

possible. Results of achievement by the students would be strengthened by conducting a study over a period of years to discover the actual effect on learning that this project hopes to attain.

Definition of Terms

1. Technology Integration:

   NAEYC's 1999 position statement, *Technology and Young Children--Ages Three through Eight*, defines technology integration in the young child's classroom as the use of computers to "supplement and...not replace highly valued early childhood activities" (p. 1). Therefore implementation of technology integration must support, rather than define the curriculum.

2. Developmentally Appropriate Practice:

   Describing developmentally appropriate practice, Finegan (2001) states that "each child should be viewed as an individual with different skills and needs, and the goal for one child is not necessarily appropriate for another child" (p. 6). NAEYC (1990), the authors of the coined term, explain that developmentally appropriate practice is based upon students learning through interactions with the world

around them, in which children make their own individual gains based upon their development (p. 8).

CHAPTER TWO

REVIEW OF THE LITERATURE

Introduction

Although research regarding the use of technology in the early childhood classroom is not nearly as abundant as that focusing on topics such as reading and mathematics, studies regarding early integration are becoming more common. As we progress through the 21st Century, computers and computer applications are increasingly part of our everyday lives. With almost every classroom in the nation at "just over four students for every instructional school computer" (Skinner, 2002, p. 53), the field of instructional technology is ripe for exploration.

Opponents of Technology Integration in Early Childhood

The current mood toward technology integration at this educational level varies between those who fully support it and those who strongly contest the use of computers by young children. The Alliance for Childhood (2001) is the most vocal opposition for technology integration in the early years of school. This group of psychologists, teachers, policy makers, and physicians feels that the introduction of computers at such a young age can be harmful both physically

and academically. They cite the need for children to participate in more developmentally appropriate activities such as play, social exchanges, and movement as a significant cause for not integrating computers into the classroom. Although their desire to keep the classrooms of young children developmentally appropriate is admirable, and generally agreed upon by educators, their focus on the uses of computers is too narrow.

The Alliance for Childhood's report, "Fool's Gold: A Critical Look at Computers and Childhood" (2001), addresses the problems of sensory overload while children are surfing the internet or exposed to "flashy" games. It makes sense that young children could easily be distracted by too much multimedia content, however, the use of a computer does not always need to include these ingredients. The report also discusses the inappropriateness of introducing abstract concepts to young children before they are developmentally ready for such thinking. This is a common feeling among many early childhood educators, yet computers are not inherently abstract in nature. The project proposed in this paper stems from a curriculum that is developmentally appropriate, including song, large motor movement. The extension of this class activity to the computer interface does not instantly make it abstract and

inappropriate, but instead provides the children with yet another modality for learning.

In an article mostly concerned with the inappropriateness of computer games in the early childhood classroom, Healy (1998), an educational psychologist, feels our rush to include technology in early childhood is propelled by the market and advertising, not a real need for the tools. Through a two year study of the actual applications of technology in classrooms and homes, this researcher found that most computer use was unrelated to curriculum and full of isolated game playing. Healy also felt that developmentally appropriate concerns regarding technology use were completely ignored. To support this statement, the author lists eight areas of early child development that are "harmed" by the use of technology:

1. Learning in a social context
2. Learning to use all the senses
3. Learning to be a powerful learner
4. Learning to pay attention
5. Learning visual imagery and memory
6. Learning to think logically
7. Learning new symbol systems
8. Learning to be an {intrinsic} motivational learner

Although Healy provides some interesting and even admirable questions about the "harm" possible with the integration of technology in early childhood, there are absolutely no citations in this article to support the statements held within. The above listed "problems" with technology integration may be valid for computer game use, but where is the research to support Healy's argument? Also, as pointed out in an earlier section of this paper, the use of games as the sole technological experience in any classroom does not really define true integration. I must agree with Healy, despite the lack of the article's evidence, "children engaging in idle clicking, game-playing, and silly surfing" is not the most valuable use of a young child's educational experience. However, I believe that the computer as a "tool" to support student learning and classroom curriculum can be an effective instrument to assist learning.

Oppenheimer (1997) looks at the issue from a developmentally appropriate stance, too, and states, "the value of hands-on learning...is that it deeply imprints knowledge into a young child's brain, by transmitting the lessons of experience through a variety of sensory pathways." This argument is difficult to dispute. However, the computer is not a replacement for hands-on learning in the early years; it is a device that can be used to support

the hands-on learning. It is simply another modality, another application of the knowledge students are building.

Along with Oppenheimer, classroom teachers fear that the introduction of technology will lead to more regimented, less exploratory instruction and therefore be less appropriate for their students. In fact, Moseley et al. (1999) found one of the most defining aspects in choosing to integrate technology lay in the teachers' perceptions of how well the technology corresponded to their pedagogical and methodological beliefs. Davis and Shade (1999) explain that this connection between teacher's beliefs about learning and appropriate technology integration can be made by:

1. Using computers in meaningful, holistic activities as an appropriate tool for accomplishing a relevant purpose;
2. Providing specific instruction in necessary skills immediately relevant to a meaningful purpose;
3. Integrating computers into an environment that values children as active participants in their learning, and as sources of knowledge and skills they bring from personal experiences. (p. 3)

Oppenheimer also attacks the view that technology raises achievement levels in student learning. This researcher discusses the issue that good teaching practices, not computer use raises achievement levels in students. I concur, but does this mean that a computer is useless as a tool? Good teaching practice requires a teacher to analyze all available resources and choose those that are most apt to assist student learning. If a technology can do this without replacing the important human interactions needed by all ages, it should not be spurned simply because it can also be misused.

In all of the articles I have read regarding the ills of computer use by young children, a single theme begins to appear. The researchers always return to the misuses of technology and how they may harm our children's imagination, their bodies, their thinking skills, and their social needs. The key word here is "misuse". Opponents of technology in the early years, often cite the fact that computers are usually used mainly for the teaching of technology in schools, not as a tool to support learning (Alliance for Childhood, 2000, 2001; Healy, 1998; Oppenheimer, 1997). These concerned writers have a valid point, when the technology is used only to further an understanding of how to use the tool. However, in this project, I intend to show

how a computer used as an instrument of daily learning can aid in student learning when it is tied directly to the curriculum.

What Effective Integration Is and Isn't

With educators around the United States being pressured by policy makers and communities to integrate technology into their curriculum, perhaps we should examine what effective integration is and what it is not. Current practice indicates that most early childhood classrooms are using technology as a reward for completing work or to insert drill and practice activities not necessarily related to the daily curriculum (Yelland, 1998). A reward system allowing students access to computer games does not conform to the description of integration discussed above. Drill and practice programs, though shown to have some learning potential, are basically "sequences of worksheet-style questions that automatically adjust their difficulty to match individual students' responses" (Smerdon et al., 2000, p. 20). Although this appears to fit nicely with developmentally appropriate practice in that it differentiates instruction, it still does not meet the qualification of being rooted in the daily curriculum. The activities the children access may or may not have any

relationship with the lessons, themes, or concepts presently being taught. Van Scoter (2001) suggests that such software "be used for limited amounts of time, not as the major focus of computer use" (p. 19).

Effective integration involves the mixture of daily curriculum with technological support. Teachers need to view technology as simply another accessible tool to augment instruction. It is widely accepted that students develop a stronger understanding of concepts when they are presented in a variety of ways. Technology can be an additional mode for reinforcement of learning. According to NAEYC (1999), early childhood teachers should "look for ways to use computers to support the development and learning that occur in other parts of the classroom" (p. 2). They also propose that teachers use technology to carry the curriculum across subject areas and make the use of technology a natural part of the daily routine (p. 3). This supports the ideal that technology should be an integral part of a classroom program while at the same time adding emphasis that the technology should not be the curriculum.

This is the heart of why teachers still struggle with integration. Teachers feel ill equipped to use technology as a simple classroom tool in the same manner they are already using common tools such as blocks, linking cubes,

and pencils. Groves, Jarnigan, & Eller (1998) found that the implementation of a strong professional development structure did not necessarily improve teachers' ability to integrate computers with their curriculum. This researcher suggested that teachers spend time getting to know every aspect of the software available to them so that they could accurately use sections of the software to extend their curriculum. This however requires large amounts of time and documentation to keep track of each concept area covered in each section of software. The cross-referencing of such a list would be unrealistic for everyday use. On the other hand, the use of the Zoo-phonics keyboard does not require an extensive knowledge of the available software. It is instead a natural extension of an instructional program that is already in place using a tool that is common to all computers.

Early Literacy and Technology

Current literacy instruction combines many different teaching and learning models. Kindergarten students are involved in various designs of literacy instruction. Many teachers use the structures of daily journals, phonemic awareness activities, prompts, and interactive, modeled, and guided reading and writing to assist their students in

preparing to read. Most of these areas can be infused with technology without changing the basic design of the lesson. In fact Davis and Shade (1999), in their discussion of the connection between literacy and technology, suggest that the computer gains its full use as a tool for learning when it is seamlessly integrated in the classroom context. They wrote that when students have many experiences using a computer they begin to "view it as a practical, problem-solving tool that is used every day to accomplish real goals" (p. 2).

The Zoo-phonics keyboard project described below combined one current phonics program with technology in such a way that the literacy instruction remained at the core of design. The technological aspects supported the concepts that were already being taught on a daily basis. The use of the keyboard to reinforce letter recognition allows students to see a purpose for learning the letters. They have the opportunity to use their new knowledge of letters even if their small motor skills have not yet developed well enough to form the letters appropriately in print. Students will be using their knowledge to create their own work, rather than simply reviewing their letter knowledge through flash card or literacy unrelated letter recognition practice. Past research has shown that the combination of literacy

instruction and technology can have very positive effects on student learning and the ability to integrate technology more fluidly. Students who have an understanding of basic literacy skills have more opportunities for computer use available to them (Van Scoter, 2001).

Summary

All of the above authors have the same goal, whether they realize it or not. Each wishes for the educators of the world to understand the importance of teaching young children in a developmentally appropriate manner. They differ only in the point of view they are taking on the use of technology in the school curriculum. However, on further review, one can see that those who oppose technology in the early childhood classroom do so for the same reasons others have branched out to find appropriate ways to integrate technology. Those who wish to implement the use of the computer in this environment desire a meaningful interaction between the curriculum and the technology. Using this model, the advocates easily refute the problems discussed by the antagonists.

CHAPTER THREE

DESIGN PROCESS

Introduction

Kindergarten and first grade teachers find it very difficult to utilize the technology available to them in a way that truly supports their day-to-day teaching. This project was designed to assist those teachers in finding a simple way to enhance their current instruction using computers rather than change their instructional goals. Although the project is found on the Internet, the actual implementation of this instructional tool has very low technological needs. The sections below describe why this project was created, how it was designed and revised, and what it looks like when implemented in an existent classroom environment.

Analysis

The birth of this project came originally from my own personal frustration with the use of technology in an early childhood classroom. I had the tools, but I did not know how to use them in a way that authentically supported my daily curriculum. This exemplified my felt need (Morrison, Ross & Kemp, 2001).

When I began teaching in a classroom with computers four years ago, I thought that simply placing the students at the computer to complete educational games was enough. I then became more and more disillusioned as to the actual gains they might be making in their educational objectives by utilizing this activity. This was the critical incident that spawned my desire to adapt the way I had been using technology with my students.

I began to express my needs by searching for more curricularly connected use of the technology. I did what all teachers do when they hit a wall of dissatisfaction; I asked other teachers what they were doing. In a way, I was not surprised to find that all of my colleagues were using the computers in their classrooms in the same manner, as independent game stations. However, I believed that there must be more that my students could get out of this tool.

My next step was to search the Internet for ideas on connecting technology to my curriculum. This was disappointing. I simply found more games for them to play. Games based on phonics, games related to our language arts series, games on every topic available for this grade level were abundant. Yet, my searches for using the computer to support my day-to-day teaching, what we are doing NOW, were fruitless. Early childhood teachers seemed to be completely

left out of the integration pool. I found many resources for the upper grades that connected directly to state standards, expanded on grade level topics using higher level thinking, and those that could be adapted to fit whatever lesson the teacher might be using at the moment, but none like these for young children.

At this point, I realized that if I was going to find a way to support my curriculum with technology, I would need to devise it myself. Thus, I began looking more closely at the lessons I was teaching. What areas would benefit from the addition of technology as a support mechanism? We were already using the computer lab once a week in addition to the computers in my classroom, but the children at this time were limited to the games available and the struggle of using a word processing program. The children loved the games, but struggled with the word processing due to their difficulty in finding the letters on the keyboard. My kindergarten teaching partner and I wanted the students to utilize the word processing program more to both practice their writing skills and teach them the importance and joy of publishing a finished product. This fit perfectly with our daily routine, met current state standards, and seemed to fulfill my desire to change the computer from babysitter to instructional tool. However, the children's frustration

level with the keyboard was enormous. Thus the idea of the Zoo-phonics keyboard was born.

After discussion of this project with other teachers, I decided that this instructional tool should be made available for others who are searching for a way to authentically integrate technology into their curriculum. The most efficient way to disseminate this information was through the Internet. For this reason, I created an online manual explaining a bit about the project and how to implement it in any teacher's classroom.

Design

The online manual format was chosen as the specific media for distribution of this project because of the vast audience the World Wide Web reaches. In this manner, early primary teachers from all over the world have access to this resource. Although Zoo-phonics is not the most popular mode for phonics instruction, it is widely used in kindergartens, preschools, and primary grades throughout the nation. The most technologically difficult task in this manual is downloading and printing the support materials, which are in .PDF format. The rest of the implementation, though it uses computers, is not based on technological knowledge or skills. At its heart, the project is based on instruction.

The use of the computer is strictly an additional resource to assist students with their emergent literacy learning, or more definitively their letter recognition skills.

In designing my project I kept the audience's needs at the forefront. Since my project was designed to be used by kindergarten teachers, I made decisions based on my own experiences and those of my colleagues. The choices I made are related to both the instructional and design needs for best communicating my ideas.

Instructional Approach

Following the opening splash page of the site, the first pages of information used the pre-instructional strategy of the pretest. In these sections, Introduction and Why Integrate, I posed questions to the viewer that they themselves may or may not have thought about and contend that they will find the answers to these in further exploration of the site. Technology integration in kindergarten is both difficult and in some communities, opposed. I addressed these issues by beginning with common questions we teachers ask ourselves when we are trying to decide upon the integration of technology into our curriculum.

The next two instructional strategies that I chose are related. Throughout the introduction and the following

sections I structured the content based on learner related sequencing. The area of familiarity in this method begins with the most familiar information and then moves to more distant concepts. My audience already has a strong familiarity with the content, but they do not necessarily have much experience with the concepts I present. This leads into the use of "interest" as a strategy for instruction. Since the viewers will already have some knowledge of the topic, the use of the pretest questions helps develop the readers' interest in learning about using Zoo-phonics in a technological way.

Organizational Approach

The organization strategy I used to present the concepts is evident in how I structured the order of the navigation. I began with ideas and questions that were familiar to the reader then drew them out from their own experience. For those teachers who have not had any experience with Zoo-phonics, I provided an explanation of its basic premise. This also used the strategy of propositional relations as associated with concept related sequencing in that it provided the reader with examples of basic Zoo-phonics use before introducing them to my own integration plan.

The section entitled "Lesson Plans" then led the learners through the procedures for using the project in their own classrooms. I provided the teachers with systematic plans for introducing the Zoo-phonics paperboards, using them on a daily basis, and then moving the children to the Zoo-phonics keyboards. I also presented a timeline for when to change the paper and keyboards based on the basic teaching strategy of Zoo-phonics instruction.

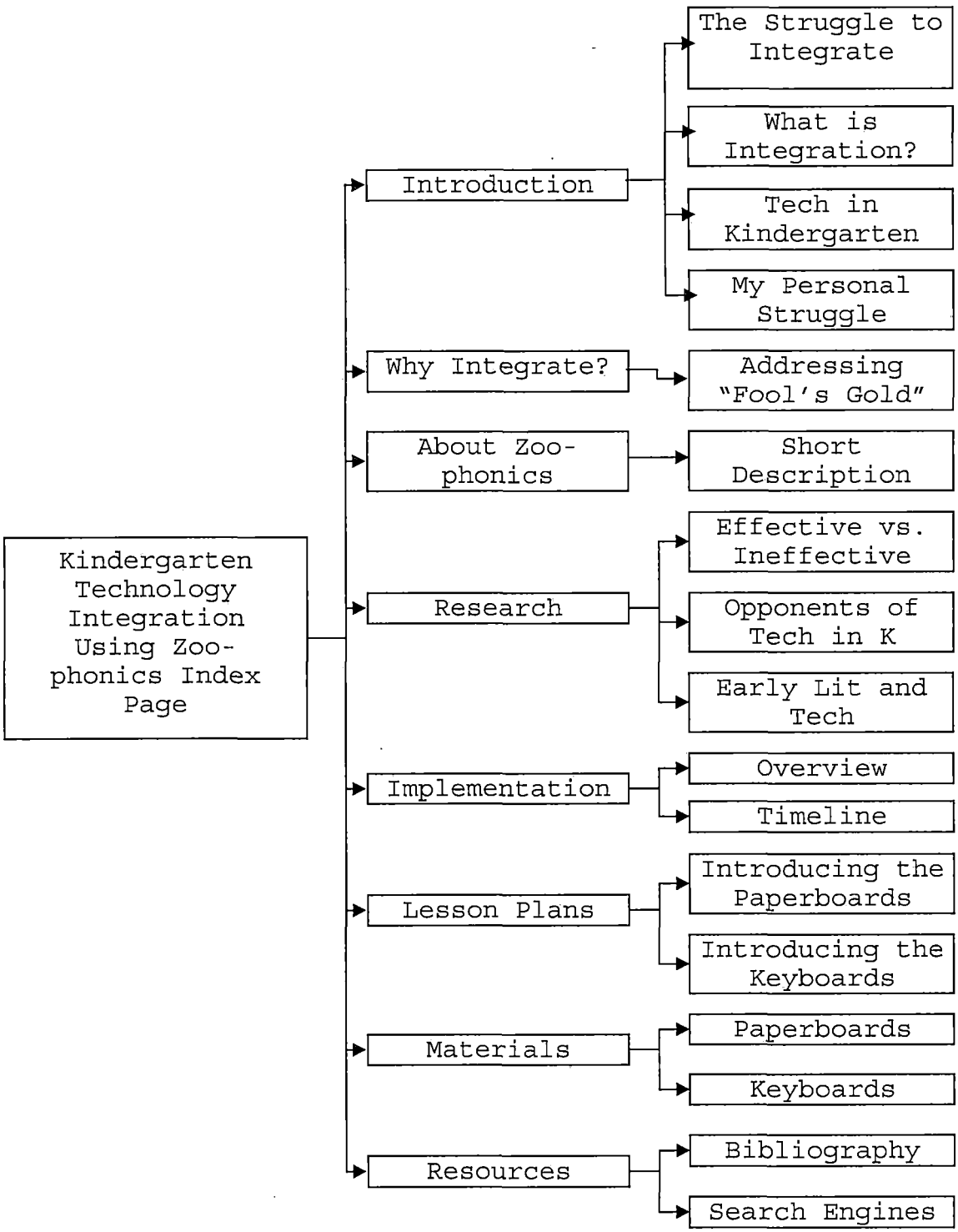


Figure 1. Project Website Tree

Elements of Design

The decisions based on the elements of design were also related to the needs of my prospective audience. I took into consideration the elements I planned to use, the relationship of the underlying layout pattern, and the arrangement of all of the elements on the page.

First let me discuss the choice of the elements included. Since visitors to my site needed to have an immediate vision of what the project was about, I chose to use the Zoo-phonics font in both the logo and the main navigational text. Although kindergarten teachers tend to use a lot of cute clip-art in the design of products for student use, I chose to make the website more formal as a sign of respect for the teachers' professionalism. The use of a door shape surrounding the navigation was chosen as a visual invitation to "come in" and explore.

The pattern and arrangement of the pages is simple to understand because it does not deviate from the regular English website structure. The main navigation is found on the left with the corresponding text popping up to its right. The sub-menus for each main section can be found within a highlighted block above the text. Visitors also find the usual repetition of the main navigation in plain text format at the bottom of the page. This is also where I

located my contact information since this is a common place for the viewer to look for it.

I utilized the element of surprise to both entice the learner and focus their attention on particular areas (Wesselhoff, 1998). On the splash screen, the circular text is a light gray, which is more like a watermark than a legible sign. However, upon scrolling the mouse over the image, the visitors see that the navigational title for a particular section appears in the center of the circle in black text surrounded by a light green glow. I have replicated this effect in the main navigation of the site. The idea is that the learners' eye will be drawn to the flash of color and thus interest them in reading the text.

Development

The evolution of this project took place over the course of two years. After deciding upon the use of paperboards and keyboards as instructional tools, I spent many hours creating and honing these using Microsoft Word, Microsoft Publisher, and Adobe Acrobat. My goal was for the paperboards to resemble a generic keyboard as much as possible. If the students did not recognize the connection between the paperboards and the actual keyboard, the project would be useless. The templates for the keyboard letter

replacement stickers were adjusted countless times to ensure that they were the appropriate size for the keyboards and were legible.

My next task was to plan the content and design the structure needed for the online manual. Macromedia's Dreamweaver and Fireworks were used in this process. The separate sections chosen to include in the manual were described above. The website was created mostly using a WYSIWYG model; however, many changes and fixes were made directly to the html coding.

The final step in the construction of this project was to test its usability with current early childhood educators. If the project manual was too confusing or ill-planned, teachers would not utilize it. Without actual use by real teachers, it would become yet another meaningless web page in cyberspace. I had to make sure that the interface and the content were easily understood, piqued teachers' interest in technology integration at their grade level, and provided them with enough assistance to enable them to feel comfortable implementing this project in their own classrooms.

Implementation

After going "live" with the web-project, I asked fellow early childhood teachers to evaluate its usefulness and design. Each of the teachers were provided with a usability survey and interviewed regarding their input. They were asked to be candid with their responses so that the project might be improved to fit their needs which represent those of teachers of young children throughout the nation. The teachers who participated had a large range of prior knowledge regarding Zoo-phonics. 75% had used or were still using Zoo-phonics in their classroom. 20% had seen this phonics program used in other classrooms, but had not tried it themselves. Five percent of the teachers had never seen the Zoo-phonics program in action before.

Evaluation

This project underwent ongoing evaluation throughout the development process. During the initial stages, feedback was received from peer teachers, those in a graduate studies IT course, and technology trainers at my district school site. The comments and suggestions specified at this early stage assisted me with the main development and design of the project. The usability surveys and interviews conducted toward the end of the

project construction provided me with the tools to fine tune the online manual.

After a quick scanning of the website, a majority of the teachers understood immediately the purpose of the project: to offer early childhood teachers ideas about how to incorporate technology as a tool to enhance their curriculum. Only one teacher misinterpreted the purpose as showing a reason for using technology in the classroom. However, after visiting the entire site, this teacher changed her opinion of the rationale for the project and decided that it was built to help her find ways to support her curriculum.

The contributing teachers showed overwhelming excitement for the project. 97% suggested that they would be interested in utilizing Zoo-phonics keyboards in their own classrooms. Three percent suggested that they would like to see the keyboards in action prior to trying them in their own classroom.

Since ease of use was one of my main goals for this project, I was pleased to find that my usability testers felt comfortable with the realization possibilities. All of the teachers felt that this project was simple to implement in their teaching. They found the lack of technical details refreshing and considered this addition to the curriculum to

be one that would be non-invasive to their current teaching strategies.

100% of the respondents stated that they currently struggle with finding ways to use technology to support their early childhood curriculum. The general feeling was that this project presented a simple solution to their questions regarding how to connect computer use to their daily classroom teaching. During interviews many remarks were made about the pressure placed upon them by district mandates and parent expectations to make use of their classroom computers. Each reiterated in their own way my own personal struggle with this bulk of machinery perched in the corner. One teacher's comment that "so much is said about changing the way we use technology, but this [project] gives us a suggestion of what to do" illustrated their current frustration with integration. Respondents felt that this project provided them with a simple solution to ease their dissatisfaction with the use of the computer in the classroom.

Summary

Creating this project filled a need in my own teaching. Technology in the classroom for the sole purpose of having a computer to play with or teach about seemed ridiculous.

Designing a plan through which the computer becomes a tool to support current instruction in an undemanding manner, I eased the frustration of others who also struggle with technology integration in early childhood. The kindergarten and first grade teachers that evaluated this project were surprised by how uncomplicated integrating technology could be. Most were, like me, excited to begin using Zoo-phonics keyboards and paperboards in their own teaching.

CHAPTER FOUR

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The Kindergarten Technology Integration Through Zoo-phonics project effectively provides early childhood teachers with the information needed to begin using technology as a tool rather than a "teacher" in the classroom. Further studies may provide a window into the learning gains made possible by using this type of instructional strategy.

Conclusions

The project produced the following conclusions:

1. Early childhood teachers struggle with how to use computers to support their daily curriculum.
2. These teachers need a simple way to incorporate technology as a tool to meet this need.
3. Young children have a difficult time using technology because their letter knowledge is varied and keyboards are designed in a non-traditional manner. (i.e. non-alphabetical)
4. Zoo-phonics keyboards and paperboards provide the teacher with a strategy they can use today to support their teaching.

5. Zoo-phonics keyboards and paperboards provide the learners with a common connection between what they are learning in class and the technology available to them.

Recommendations

Further research should be done to define the achievement gains that can be made using this instructional strategy.

1. Quantitative studies should be done comparing the letter recognition growth of those using Zoo-phonics keyboards and paperboards with those not using these tools.
2. Qualitative studies might show the learners growth in comfort levels using a computer.
3. A comparison of student writing quality could also be made between those using this tool and those not participating in the project.

Summary

The project achieved its main goal of providing a low-tech suggestion for using computers to support daily curriculum. Teachers who choose to implement this teaching strategy in their own classrooms will find that it can seamlessly blend with their teaching. Further studies may

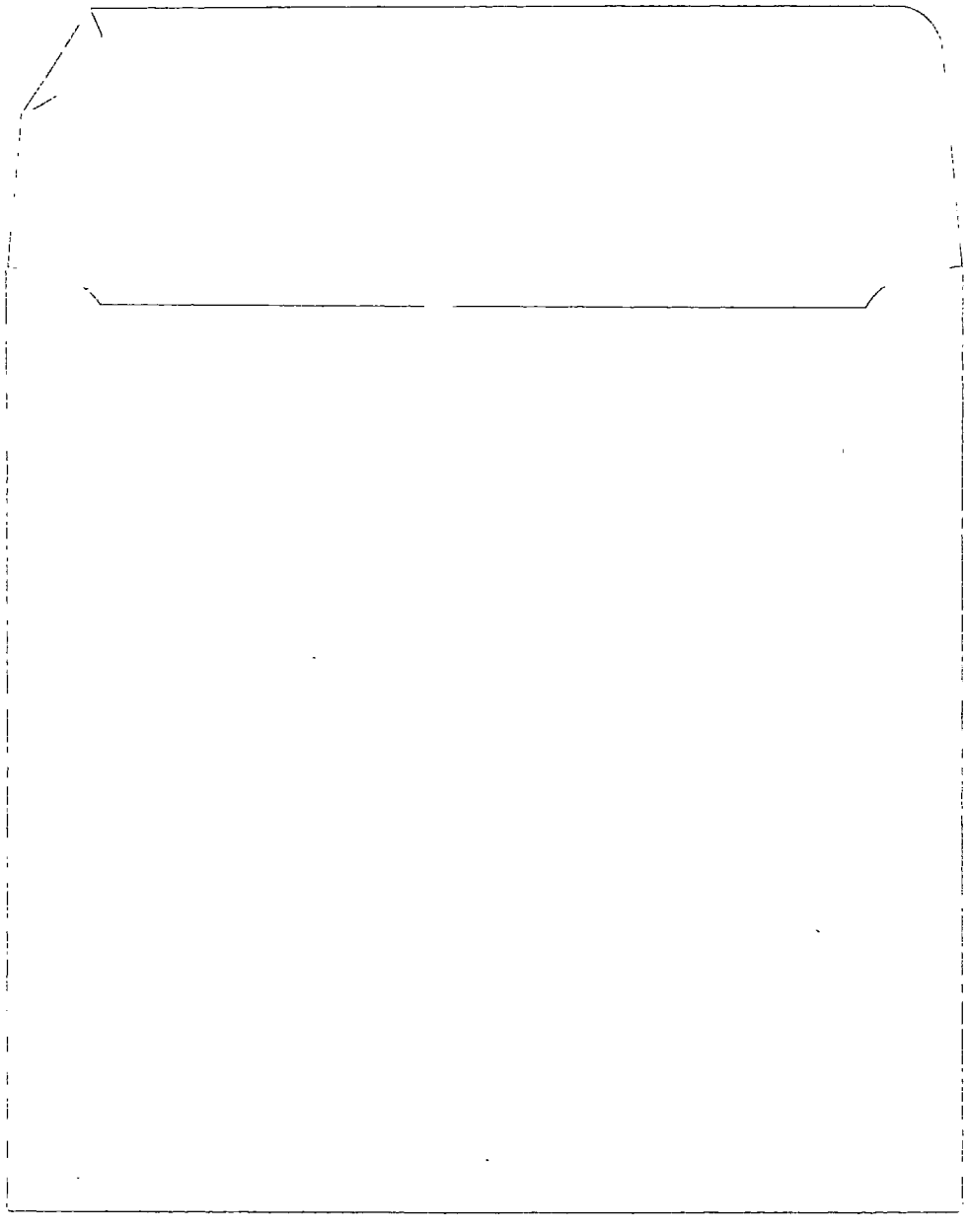
show what gains can be made in student learning using this program and in student comfort level with computer use in general.

APPENDIX A

PROJECT CD

KINDERGARTEN TECHNOLOGY INTEGRATION USING ZOO-PHONICS

CD



APPENDIX B

USABILITY SURVEY

Usability Survey
Kindergarten Technology Integration Using Zoo-phonics
Marie Forst

You have been asked to participate because you are currently an early childhood professional and are familiar with the Zoo-phonics instructional program. This questionnaire and interview will be used to refine the Kindergarten Technology Integration Using Zoo-phonics website. The site can be found at http://home.earthlink.net/~notsonear .

1. What is your initial response to this site?

_____

_____

2. After a brief examination (no more than five minutes) what is the purpose of this website?

_____

_____

3. Please rate the following on a scale of 1 to 5 where one is poor and 5 is excellent.

Ease of use:	1 2 3 4 5
Look and Feel:	1 2 3 4 5
Navigation:	1 2 3 4 5
Overall:	1 2 3 4 5

4. Do you currently struggle with finding ways to use technology to support your early childhood curriculum? Please circle your answer.

Yes No

5. If the answer to the above question is "Yes", how does this website help you with that goal?

_____

6. Do you feel that this resource would be helpful to other early childhood professionals? Please circle your answer.

Yes No

7. What particular areas in this website are confusing or need further clarification?

_____

_____

8. Does this website help you feel that this instructional strategy can be easily added to your teaching repertoire?

Yes No

9. If you answered "No" to the above question, what would make this instructional strategy more appealing to you as a teacher of young children?

_____

_____

10. Please feel free to list any additional comments and suggesting you have for this project.

_____

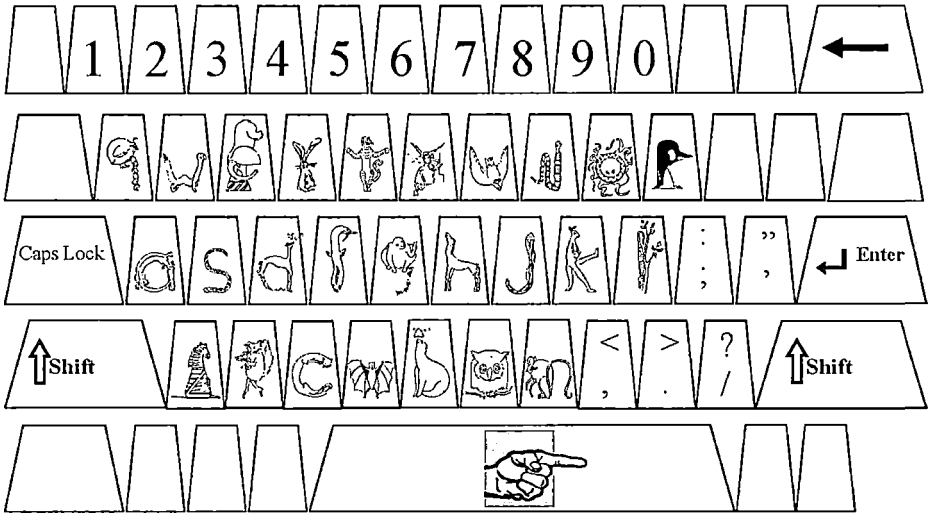
_____

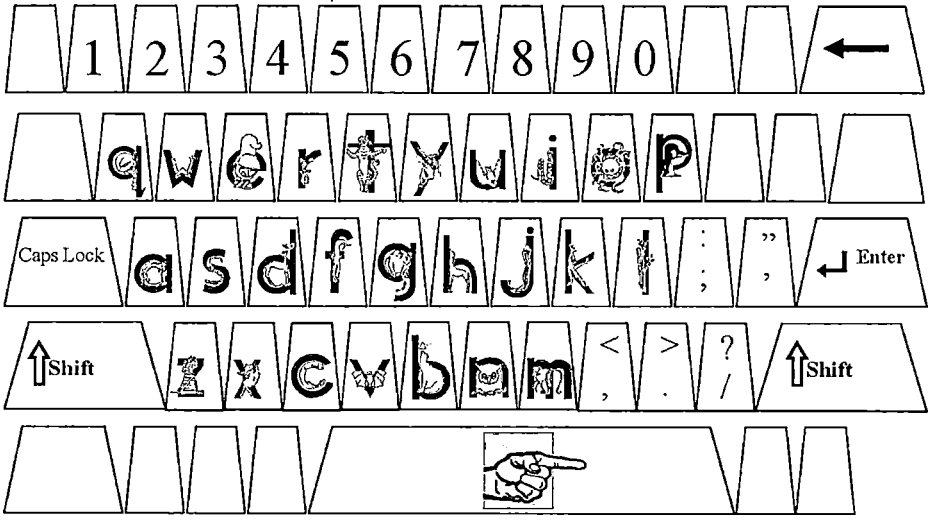
_____

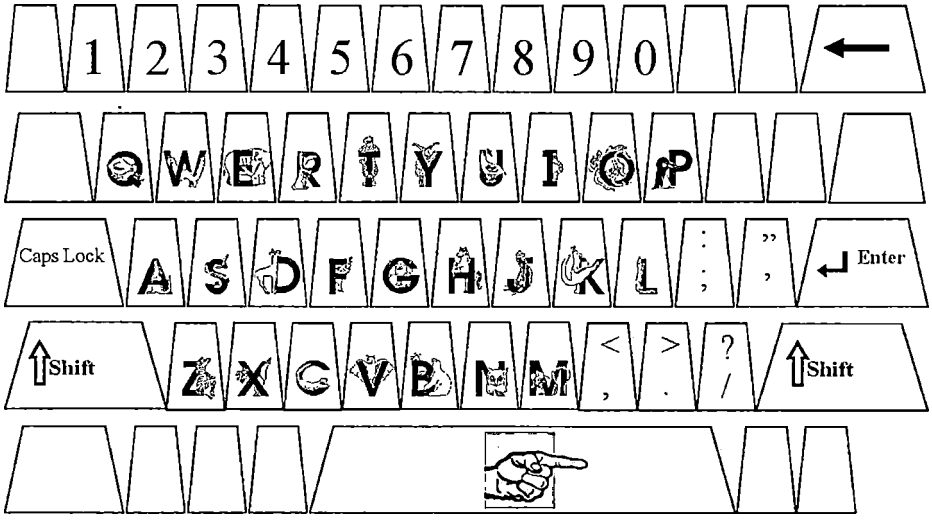
Thank you for your assistance and participation.

APPENDIX C

PAPERBOARDS







REFERENCES

Alliance for Childhood. (2000). *Children and computers: A call for action.* Retrieved October 6, 2002, from http://www.allianceforchildhood.net/projects/computers/computers_articles_call_for_action.htm

Alliance for Childhood. (2001). *Fool's gold: A critical look at computers in childhood.* Retrieved March 15, 2003, from http://www.allianceforchildhood.net/projects/computers/computers_reports.htm

Davis, B. & Shade, D. (1999). Integrating technology into the early childhood classroom: The case of literacy learning. *Information Technology in Childhood Education, 1999,* 221-254.

Finegan, C. & Austin, N. J. (2001). Developmentally appropriate technology for young children. *Information Technology in Childhood Education Annual, 2001,* 87-102.

Gregory, C. (1993). *Case study: Using Reading Recovery strategies to improve the alphabet knowledge of a kindergarten student.* (Report No. CS 011 312). East Lansing, MI: The Educational Resources Information Center. (ERIC Document Reproduction Service No. ED 358 416)

Groves, M., Jarnigan, M., & Eller, K. (1998). "But how do we use it?": Discovering hidden barriers and unanticipated successes in integrating computers in a preschool curriculum. *Families, Technology, and Education Conference: Vol.2002.* Retrieved October 21, 2002, from http://ericeece.org/pubs/books/fte/appli/groves.html

Hall, E. & Higgins, S. (2002). Embedding computer technology in developmentally appropriate practice: Engaging with early years professionals' beliefs and values. *Information Technology in Childhood Education Annual, 2002,* 301-320.

Healy, J.M. (1998). The *'meme' that ate childhood.* Retrieved July 25, 2003, from http://www.edweek.org/ew/1998/06healy.

Morrison, G., Ross, S., & Kemp, J. (2001). *Designing effective instruction* (pp.27-31). Hoboken, NJ: John Wiley & Sons, Inc.

Moseley, D., Higgins, S., Bramald, R., Hardman, F., Miller, J., Mroz, M., et al. (1999). *Ways forward with ICT: Effective pedagogy using information and communications technology for literacy and numeracy in primary schools.* Retrieved February 2, 2003, from http://www.ncl.ac.uk/education/ttaict/

National Association for the Education of Young Children. (1990). *Guidelines for appropriate curriculum content and assessment in programs serving children ages 3 through 8*. Retrieved March 8, 2003, from http://www.naeyc.org/resources/position_statements/pscag98.pdf

National Association for the Education of Young Children. (1999). NAEYC position statement: Technology and young children--ages three through eight. *Information Technology in Childhood Education, 1999*, 81-86.

National Telecommunications and Information Administration. (2002) *A nation online: How Americans are expanding their use of the Internet*. Retrieved March 8, 2003 from http://www.ntia.doc.gov/ntiahome/dn/index.html

Oppenheimer, T. (1997). *The computer delusion*. Retrieved March 15, 2003, from http://www.theatlantic.com/issues/97jul/computer.htm

Skinner, R. (2002). Tracking tech trends. *Education Week, 21*(35), 53-56.

Smerdon, B., Cronen, S., Lanahan, L., Anderson, J., Iannotti, N., & Angeles, J. (2000). *Teachers' Tools for the 21st Century: A Report on Teachers' Use of Technology*. NCES 2000-102. Washington, D.C.: U.S.

Department of Education. National Center for Education Statistics

Van Scoter, J., Ellis, D., & Railsback, J. (2001). *Technology in early childhood education: Finding the balance*. [Brochure] Portland, OR: Northwest Regional Educational Laboratory.

Wesselhoff, D. (1998). *Keller's ARCS Model - Attention*. Retrieved January 2, 2004 from http://coe.sdsu.edu/eet/Articles/attention/start.htm

Yelland, N. (1998). *A tale of the cyberostrich and how it became extinct*. Retrieved October 19, 2002 from http://www.cegsa.sa.edu.au/acec98/papers/p_yelland.htm