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USING TECHNOLOGY IN LANGUAGE ARTS TO
MOTIVATE STUDENTS

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

by
Tonya Cherie Coats
December 2003

USING TECHNOLOGY IN LANGUAGE ARTS TO
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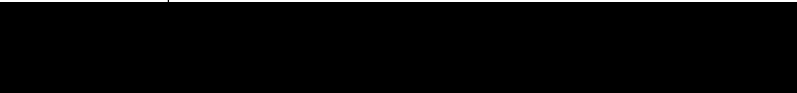
by
Tonya Cherie Coats

December 2003

Approved by:


Eun-Ok Baek, Ph.D., First Reader

12-2-03
Date


Amy S. C. Leh, Ph.D., Second Reader

ABSTRACT

This project will serve as a media rich tool to aid students and teachers in the classroom. The importance of this project was to create an effective interactive learning environment to engage, motivate, and deliver instructional information to students. The target audience is fourth grade students who are identified as Students At Risk. This project produced a computer based learning environment that addresses if technology motivates and helps fourth grade students in vocabulary development. I carried out this project by creating a guide to help educators develop a multimedia environment using Macromedia Authorware.

ACKNOWLEDGMENTS

The development of this project would not have been possible without the support and help I received from many people in my life. This project is dedicated to my family and my husband Leamon, for their support and patience that they have given me throughout my educational endeavors. Thanks also to Amy Leh, Eun-Ok Baek, and the entire Instructional Technology Department at CSUSB, for their teachings, guidance, and support.

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CHAPTER ONE
INTRODUCTION

Statement of Problem

Students who are identified as At-Risk tend to need additional resources to engage them in meaningful learning. These students may need alternatives to the traditional teaching methods to ensure the acquisition of content standards and provide motivation. To capitalize on students varies learning styles; classroom instruction should provide multiple ways of learning. Multimedia is one tool that can provide additional support to guarantee students receive instruction that caters to their needs.

Purpose of the Study

The mission and purpose of this project is to create an interactive learning environment to engage, motivate, and deliver instructional information to students at-risk in fourth grade. Students at risk are students that are performing poorly or failing in school. They are at risk because they have not been able to successfully take advantage of a regular school program and will likely fall further behind or drop out. An emerging body of research suggests that technology used in classrooms can be especially advantageous to at-risk children. Means,

Blando, Olson, Middleton, Morocco, Remz, and Zorfass (1993) note that multimedia can engage students in challenging, authentic learning. But more specifically, multimedia increases the complexity of the tasks that at-risk students can perform successfully, raises student motivation, and leads to changes in classroom organization. This project hopes to raise student motivation in vocabulary development by addressing various learning styles and learning strategies.

In addition to meeting the needs of students, this project also addresses the needs of teachers. This project serves as guide to aid teachers in motivating their students in language arts. Many teachers cannot imagine a practical use for multimedia in the classroom. This project will attempt to help teachers develop the knowledge and skills to integrate multimedia into instruction.

To create the multimedia environment I used Macromedia Authorware. This software is used to create engaging e-learning environments. Macromedia Authorware provides an easy to follow graphic user interface to create effective and customized environments to meet the array of student learning needs.

Significance of Study

The infusion of technology into the classroom is several decades old, with film, radio, and television being some of the first forms of media technology that were incorporated into the school curriculum (Cuban, 1986). The increasing interest in educational computing has many researchers interested in how technology affects the teaching and the learning process, and how it can be incorporated in the educational system (Bober, 2002). It's evident that technology has become an important part in society, especially in the way we learn. Technology can make learning in all subjects easier, and especially valuable when developing children's language and problem-solving skills. The ability of technology to provide students with a sense of control in their learning environment, encourage problem solving, and allow students to self-pace the presentation of information has had a positive influence on student motivation. This subsequently has changed the way in which teaching and learning processes take place in schools today. Computerized instruction can provide a rich array of experiences for students outside and the classroom. It can be used to supplement traditional instruction or as an alternate approach to a unit.

Student learning styles and motivation seem to be associated with achievement (Shih, & Gamon, 2002). Identifying students' learning styles helps educators understand how students perceive and process information in different ways. Garger and Guild (1984, p. 11) described learning styles as "...stable and pervasive characteristics of an individual, expressed through the interaction of one's behavior and personality as one approaches a learning task." Students learn in a variety of ways. The four basic styles of learning includes, visual, auditory, kinesthetic, and tactile. Visual learners benefit from illustrations and visual presentations. Auditory learners learn best when listening to instructional content. Kinesthetic learners benefit most from hands-on instruction. Tactile learners like to use their hands and fingers to learn. When teaching students, teachers should have a variety of demonstrations of instruction, so that students can utilize their individual strengths to succeed in school. Multimedia is one way to address these learning styles with the use of text, graphics, animation, pictures, video, and sound to present information.

Strengths and Limitations

This project serves as aid to provide motivational instruction to fourth grade students at risk. The strengths of this project are that it offers teachers a variety of instructional uses. The information can be altered weekly to mirror teacher instruction. This project can also be used across the curriculum to motivate students in a variety of subjects.

Due to the lack of system support and hardware requirements at this school site, it was difficult to get the program installed on a compatible system. Since teachers are not allowed to install software on school computers, I'm not sure how long it would take to integrate this application into the curriculum. Another limitation that I encountered was the number of computers per classroom. If time permitted, a two-user option would have been added to work with the limited computers. This option would also be a good idea to enable students to work together in groups.

Definition of Terms

At Risk Student - This is a student who is in danger of failing to complete their education with sufficient level of skills.

Auditory Learner - Students who learn primarily through listening.

California Content Standards - California State Board adopted principles that help teachers identify what skills students should obtain at each grade level.

Graphical User Interface (GUI) - This is a program that allows users to interact with a computer system through the use of graphics. Users can communicate with the computer system by clicks on a visual screen that has windows, icons, menus, and labeled buttons.

Kinesthetic Learner - Students who learn best with hands on activities.

Macromedia Authorware - Visual authoring tool that creates multimedia applications.

Module - An independent part of a software program.

Motivation - The factors that inspire people in achieving a desired goal.

Multimedia - Information presented in more than one format, such as text, audio, video, graphics, and images.

Tactile Learner - Learners who learn best by touching.

Visual Learner - Learners who learn best by seeing.

Vocabulary Development - The growth of a person's accumulation of known words and meanings.

CHAPTER TWO

REVIEW OF THE LITERATURE

Student Motivation

A student's motivation stems from a desire to participate in the learning process (Lumsden, 1994).

Motivation influences how and why people learn as well as their performances (Pintrich & Schunk, 1996).

There are many reasons that are associated with the involvement or noninvolvement in classroom activities. The primary source of student motivation varies among students. Although students may be equally motivated to perform a task, the sources of their motivation may differ. According to Bandura (1986), motivation is goal-directed behavior instigated and sustained by expectations concerning the anticipated outcomes of actions and self-efficacy for performing those actions.

Student motivation is often divided into two categories. A student can be described as intrinsically motivated when he or she is motivated from within. Students who are intrinsically motivated actively engage themselves in learning because of naturally curiosity, interest, or enjoyment, or in order to achieve their own intellectual and personal goals (Brewster & Fager, 2000).

According to Dev, (1997), "A student who is intrinsically motivated will not need any type of reward or incentive to initiate or complete a task. This type of student is more likely to complete the chosen task and be excited by the challenging nature of an activity" (p. 13). A student who is intrinsically motivated to complete an activity does it "for its own sake, for the enjoyment it provides, the learning it permits, or the feelings of accomplishment it evokes" (Lepper, 1988, p. 4).

Extrinsically motivated students engage in learning in hopes of receiving reward or for avoiding some sort punishment (Lepper, 1988). Certain school procedures that help motivate students include, award assemblies, rewards such candy and stickers; and withdrawal of special privileges based on students performance (Brooks, 1998).

Some theorists view that sound, graphics, and animation presented with multimedia is intrinsically rewarding to students and encourages on task behavior. Research has also indicated that multimedia has the ability to present visually complex stimuli that creates individual curiosity to form coherent understandings of information (Wishart, 2000). Multimedia software minimizes fear of failure and embarrassment due to mistakes, and

encourages students to take more risks and persist through difficulty (Meece, 1997).

Additionally, developmentally delayed students usually experience a higher level of motivation when using educational software because it allows students to have some control over their learning experience. This can result in increased self-esteem, a greater sense of self-efficacy, and improvement in social status among peers (Thorp, 2003).

Interactive Educational Systems Design Inc. (2000) conducted a research report on the effectiveness of technology in schools. They found that educational technology has been found to have positive effects on student attitudes toward learning and on student self-concept. It also found that it has significant positive effects on student attitudes for special need populations. Students in this report felt more successful in school, and were more motivated to learn. They had increased self-confidence and self-esteem when using computer-based instruction. The evidence of these effects were the strongest in the areas of:

- Language arts and writing instruction
- Mathematics instruction
- Video technology

Effects of Multimedia

Research shows that learning environments that are rich in visual and auditory resources facilitate in language acquisition and vocabulary development (Cognition and Technology Group at Vanderbilt University, 1998). Based on this assumption, using multimedia is meaningful when integrating language arts concepts. Multimedia has tremendous power to help students obtain, organize, manipulate and view information. Multimedia computer systems present various opportunities for involvement in language activities. These activities have been regarded as more effective than traditional methods (Altman, 1989; Herron & Moos, 1993). With multimedia, the communication of the information can be done in a more effective manner and it can be an effective instructional medium for delivering educational information. This is because it enables the teacher to provide a variety of annotations for words in the form of various media, for instance, sound, text, animation, video and images. The result is a stimulating environment for learning and retaining the information delivered. The combination of content and multimedia technology results in materials that can be delivered to students, in teacher-centered, student-centered, or mixed teaching and learning styles.

Multimedia "provides a means to supplement a presenter's efforts to garner attention, increase retention, improve comprehension, and to bring an audience to agreement, which consequently results in people remembering 20% of what they see, 40% of what they see and hear, but about 75% of what they see and hear and do simultaneously" (Lindstrom, 1994, p. 4).

Haugland (1992), states that it is important to understand how technology can affect learning when different types of learners use it. Although several studies have documented the benefits of computer use in schools, this is highly dependent on the particular context being studied as well as the manner in which computers are being used in the classroom. If used appropriately, Haugland (1992) emphasized that multimedia use can have a positive effect on the development of many important skills and abilities in young children. In addition to enhanced cognitive abilities, computers also can improve children's self-efficacy, confidence in their leadership abilities, and sharing and cooperation (Haugland, 1997).

Chun and Plass (1995) developed a multimedia application program called CyberBuch that offered vocabulary annotations through pictures, text, sound and

video. From 1993 to 1995 they conducted three studies involving 160 students. Students were introduced to the program and watched a video that provided an overview of a story before working with the multimedia application. After reading the story and using the annotations, participants took a vocabulary test. The vocabulary acquisition and reading comprehension assessments were linked to students' visual and verbal learning preferences. Results showed a higher than expected rate of vocabulary learning as well as an improvement in reading comprehension.

There are many advantages in using multimedia in order to promote vocabulary development among fourth-grade students. One reason is that the glamour of computers and video captivate and hold's children's attention (Lesser, 1989). Another reason is using educational technology promotes both reading literacy and technological literacy (Lesser, 1989). And lastly, teachers can use multimedia to personalize instruction in order to meet student's individual needs (Lesser, 1989).

Design/Development of Multimedia

The development of multimedia capabilities has made it possible for just about anyone to create computer-based

learning environments. These environments can handle, graphics, music, animation, video, and speech. Multimedia systems can provide learner controlled environments, which allows the teacher to control the path of study. It can also provide environments that can adapt to the learner, which can provide customized interfaces for each user, with varying levels of guidance (Allred & Locatis, 1988). Various multimedia elements can be used to convey information and instructional tasks. But the complexity and abundance of multimedia elements can lead to problems if the needs of the student are not consider. Norman (1988) points out, for any design to be successful the design must be based on the needs and interest of the users.

Designing multimedia environments involves consideration of both student and computer interaction and how students learn. Failure to take theses points into consideration can lead to a poorly designed multimedia application that does not meet the needs of students. Effective multimedia applications consist of two major stages. The design stage requires the collection of content. In California, a set of content standards must relate to all grade level language arts activities. Content should be organized and presented with these

standards in mind. Content should be valuable and needs to match the necessities of the user. Content that is too simple or too complicated does not facilitate learning (Holzinger, 2000). In order to create effective vocabulary applications and increase literacy skills, the following should be considered (Cognition and Technology Group at Vanderbilt University, 1999):

- Flexible technology. Technology should meet the needs of all students.
- Representational literacy. Students should be able to use multimedia resources to communicate via words, sounds, pictures and video.
- Mental model building. Students should be able use technology support to practice high-level verbal production and deep comprehension.
- Conceptualized development of phonemic awareness. Student should be able to learn to put sounds and letters together in meaningful contexts.

The development stage comes into play when the product is materialized. Creation of the graphic user interface begins at this point. This includes creating or inserting pictures, text, animation, and video.

Programming also begins at this stage. Programming is the

process of creating steps for a computer to perform a desired task. To run successfully, the program must be logical. The developer must develop the logic of how to do it. Clicking and dragging icons on a page or by writing instructions for the computer in a programming language can create logic.

Before presenting multimedia to students, teachers must test and evaluate the effectiveness the application has on the set educational objective. Objectives should be clearly defined in order to assess student's performance. In Bloom's hierarchical taxonomy, Bloom suggests appropriate student objectives include (Bloom, 1956):

- The learner recalls and recognizes specified information.
- The learner comprehends and absorbs the information.
- The learner applies what they have learned.
- The learner examines the subject, with an understanding of the component parts and their.
- The learner synthesizes the subject
- The student evaluates their knowledge, and understanding.

CHAPTER THREE

GOALS AND OBJECTIVES

The goal of this master's project is to design and develop a multimedia-based environment. In order to create an effective interactive learning environment the following objectives were researched and carried out.

- Analyze various student motivational theories
- Examine various learning styles
- Establish significance for technology in the classroom
- Explore the meaning behind "At-Risk" students
- Analyze the need for training and professional development for teachers.

The goal of this project is to help students distinguish and interpret word meanings. Vocabulary development is crucial to a student's education. A direct relationship exists between vocabulary, knowledge, reading comprehension, and academic success. This application will serve as aid to assist students at-risk in their vocabulary development. This application will help improve motivation and conceptualization skills.

Specific Instructional Objectives

After using this application the student will be able to:

1. Identify vocabulary words and clarify why they are important.
2. Students will successfully answer questions about vocabulary words.
3. Students will be able to use newly learn words in their writings.
4. Students will be to comprehend vocabulary words in their readings.

CHAPTER FOUR

PROJECT DESIGN AND DEVELOPMENT

Description of Project

To produce a computer based learning environment that will help fourth grade students in vocabulary development, I had to find a tool that would meet the needs of my project. The tool I selected to create this project is called Macromedia Authorware. Authorware is designed for constructing pieces, not necessarily for creating media elements. Some media assets can be created in Authorware, but rich media assets such as graphics, sounds, video, etc, are usually created using other tools. Authorware can be used for a variety of purposes, including interactive presentation, simulations, even games, but it's primary use is computer-based training. Authorware provides models for tutorials, drill, practice and simulation. Provides continual monitoring of user progress; scripts for testing, judging answers, tracking the percentage of right answers, and tracking time spent on pieces.

Design and Development

The key to creating an effective multimedia application is planning. In planning a multimedia project one should have a strong strategic plan. The following

steps were carried out for the design process. The design sheets for this process are provided in Appendix A.

The plan included a list of objectives, the target audience, a schedule, and hardware and software requirements. This project is to be used by fourth grade students who are identified as Students At Risk. It serves as a media rich tool to aid students and teachers in vocabulary development. This application examines student knowledge of vocabulary terms covered in the terminology module. Students are asked to enter their name before they take the quiz so that teachers can keep track of their progress.

The design process includes the functionality of multimedia presentation and the overall look and feel. This should include not only how each button or content area will look but also how they will function and interact with other screens and panels. To gain users attention is an important part of any communication act. It is important to try to keep your message as simple as possible (Schwier & Misanchuk, 1993). Some studies indicated that pictorial information is remembered much more easily than text (Levie & Lentz, 1982). The dual code theory states people store information in two ways depending on whether it is verbal or pictorial

information. Because text accompanied by pictures or animations is actually saving information in two separate ways in the brain, (encoded verbally and as a picture) there is more likelihood that people will remember the information if it is presented in both formats. The following findings are some examples to gain and keep users attention.

- Use only the amount of text and graphics as is absolutely necessary to get your point across Superfluous graphics can interfere with understanding (Anglin, Towers, & Levie, 1996).
- An overabundance of fonts or colors can distract rather than assist learning.

The development step is the actually work. This may include the development of media elements such as audio, video, graphics, text, and animation. In this phase the graphics are developed for each screen, as well as audio and video.

The key elements to Authorware are the design Window and toolbar, this is where the authoring is done. The design window contains the flow line, which starts out empty. This flow line organizes all application screens and actions. An application can have many design windows,

each containing its own flow line. Authoring starts by dragging icons from the tool bar onto the flow line.

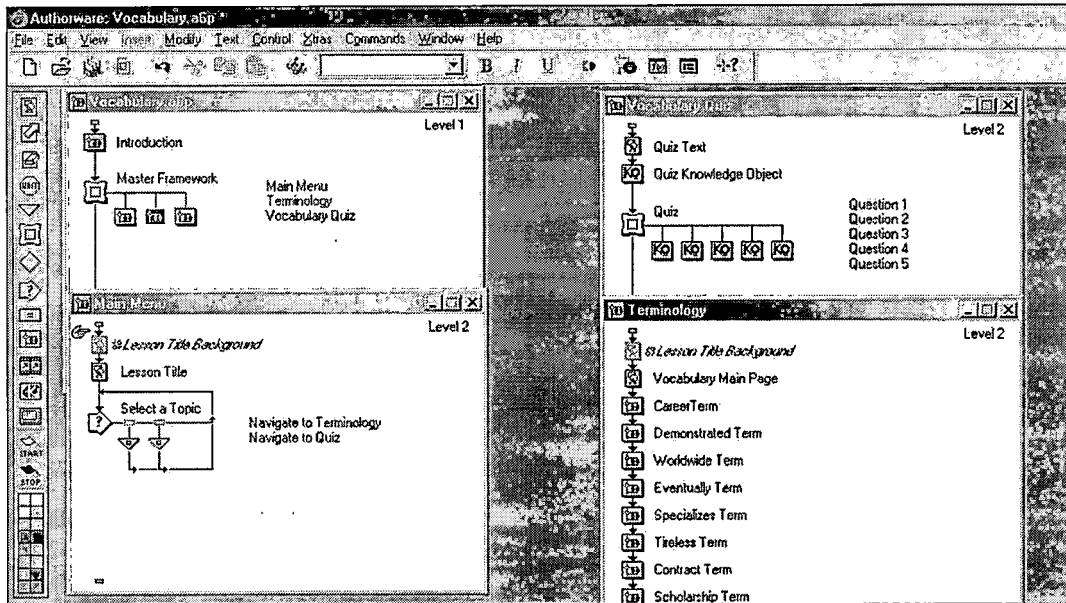


Figure 1. Design View

Vocabulary Tutor

For this project I created an introduction screen for the application. I included only one graphic and very little text. The purpose for this page is to introduce users to this application. I created the overlook to seem fun and exciting. There is only one option for users to click on this page, which is next.

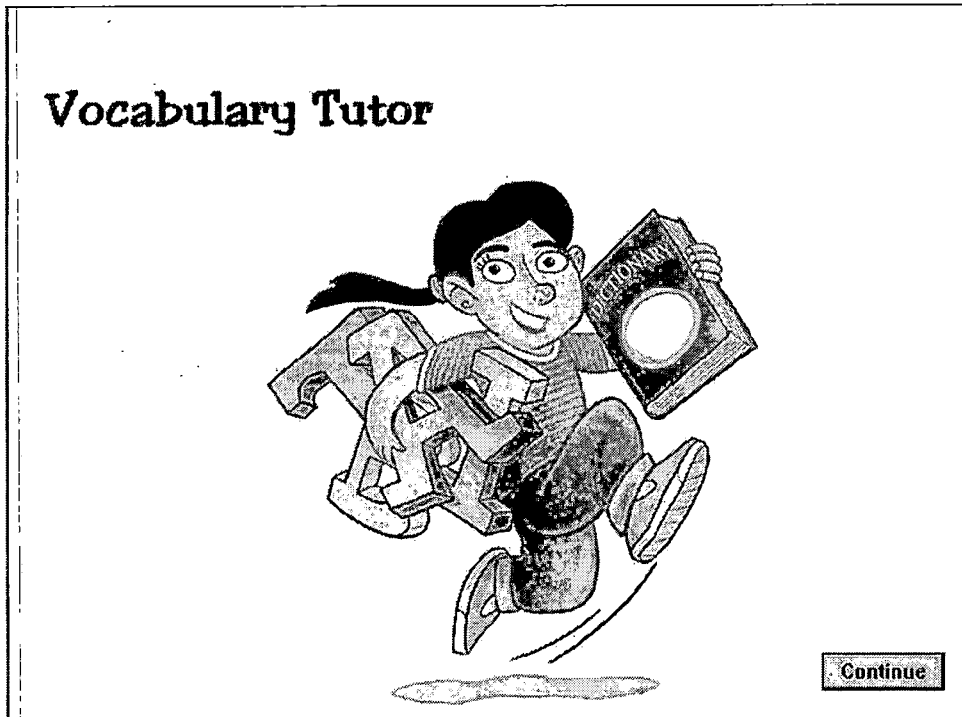


Figure 2. Introduction to Application

Main Menu

The main menu contains two modules that students can navigate through. An unlimited amount of modules can be added to enhance the application. For this project I created two modules to keep it simple and easy for beginning users to navigate through.

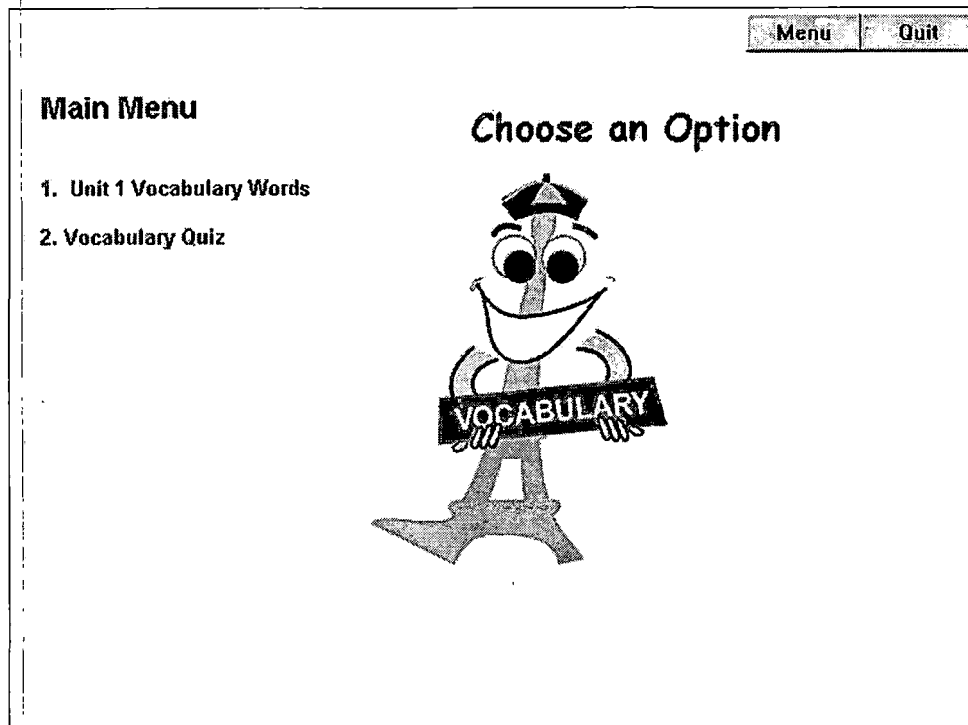


Figure 3. Main Menu

Terminology Module

The following pictures are screen shots of the terminology module. Students should navigate through the series of screens to reinforce or learn new vocabulary words. On some screens students will have to read and respond to questions in order to move on. And on other screens students must watch a short movie clip in order to proceed.

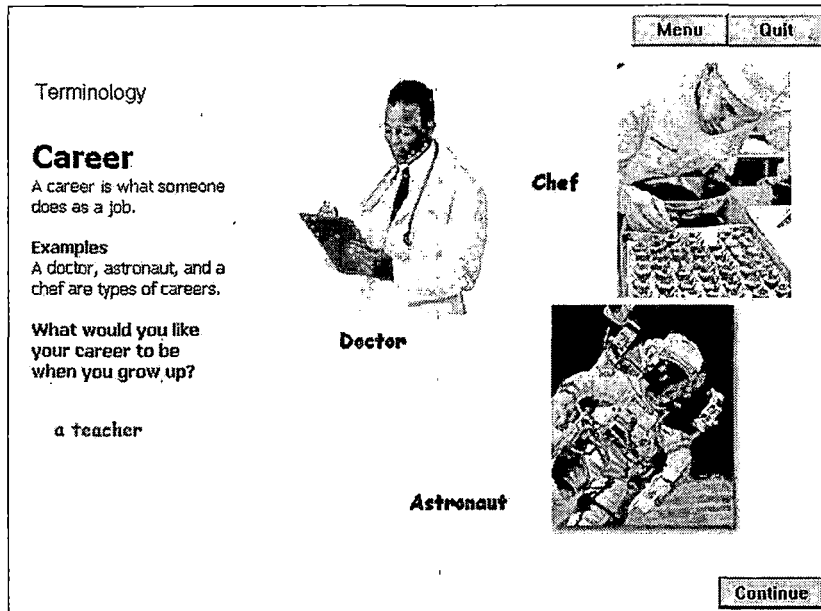


Figure 4. Terminology Module 1.1

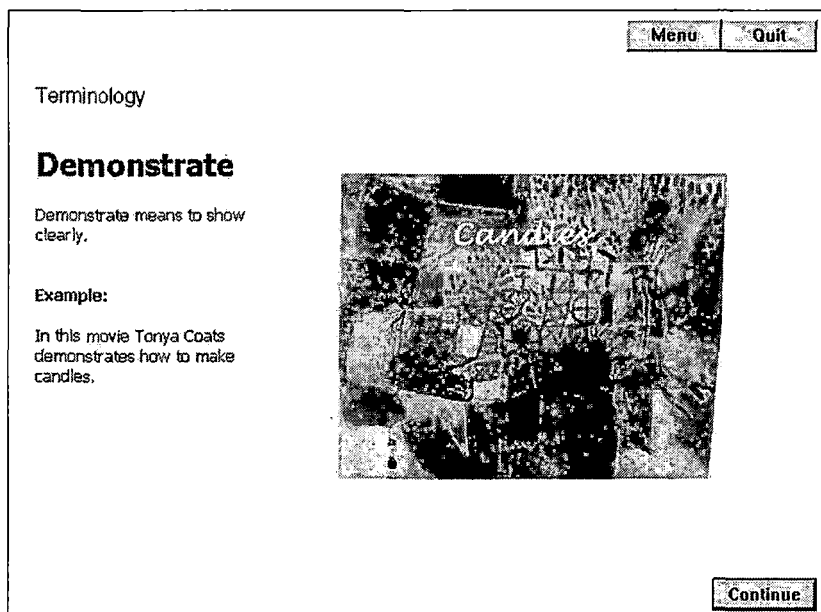


Figure 5. Terminology Module 1.2

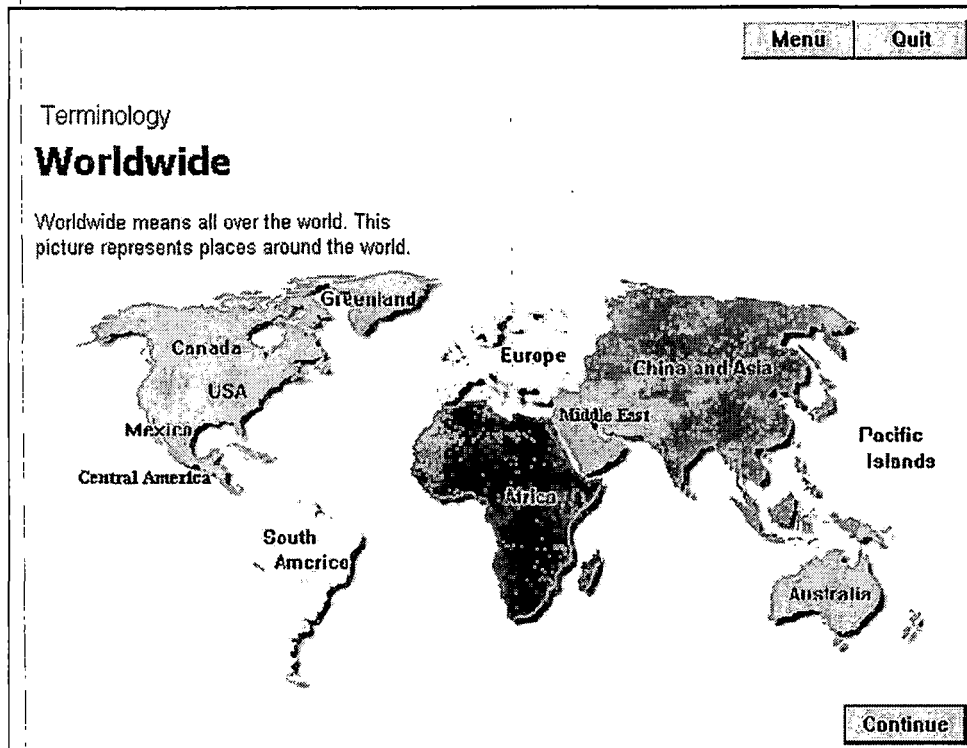


Figure 6. Terminology Module 1.3

Vocabulary Quiz Module

This application includes a quiz module to test student's knowledge of vocabulary terms covered in the terminology module. Students are prompted to enter their name before they take to quiz so that teachers can keep track of their progress.

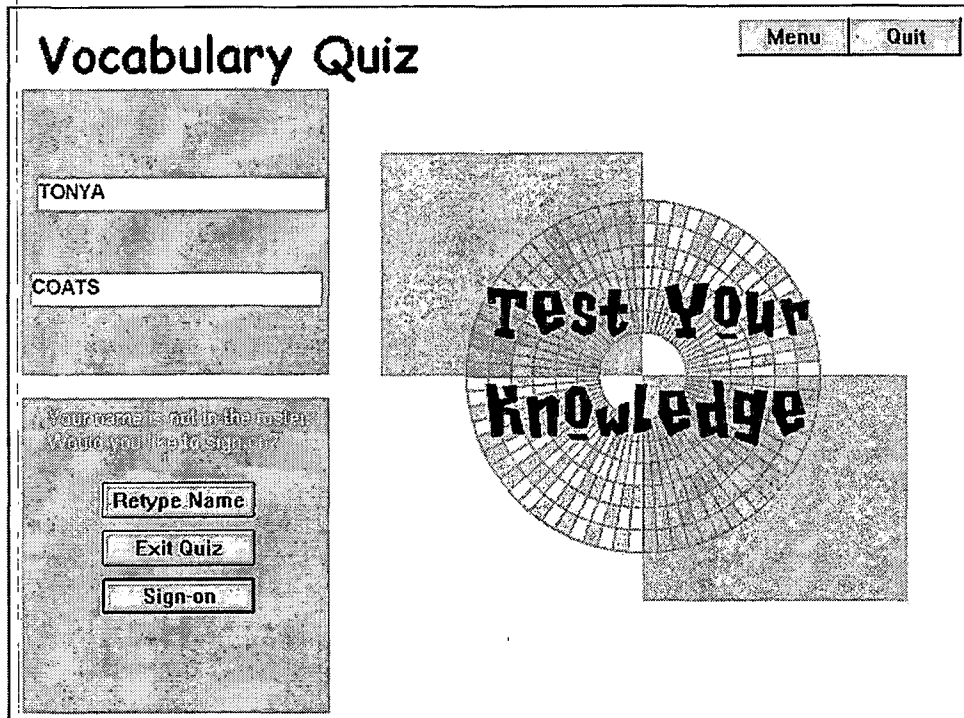


Figure 7. Vocabulary Quiz Module 2.1

The quiz module is made up of five multiple choice and true/false questions. Students are provided with immediate feedback on their responses. They are given two chances to find the correct answer. The following figures are examples of the various screens within the quiz module.

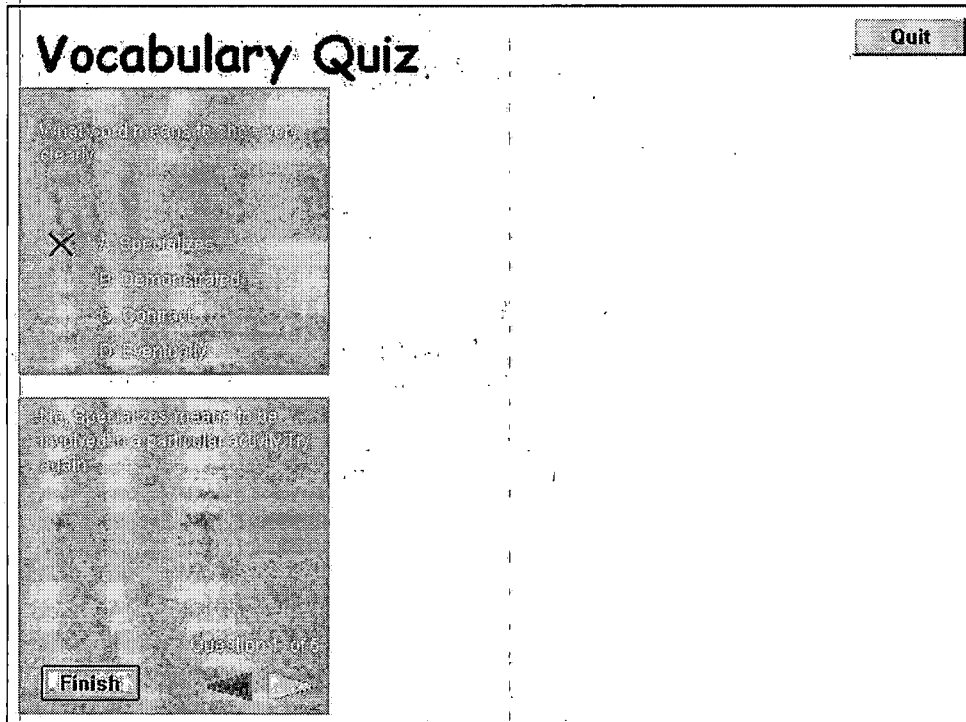


Figure 8. Vocabulary Quiz Module 2.2

The following screen provides a summary on how the student performed. This is stored in a database for future analysis of student progress.

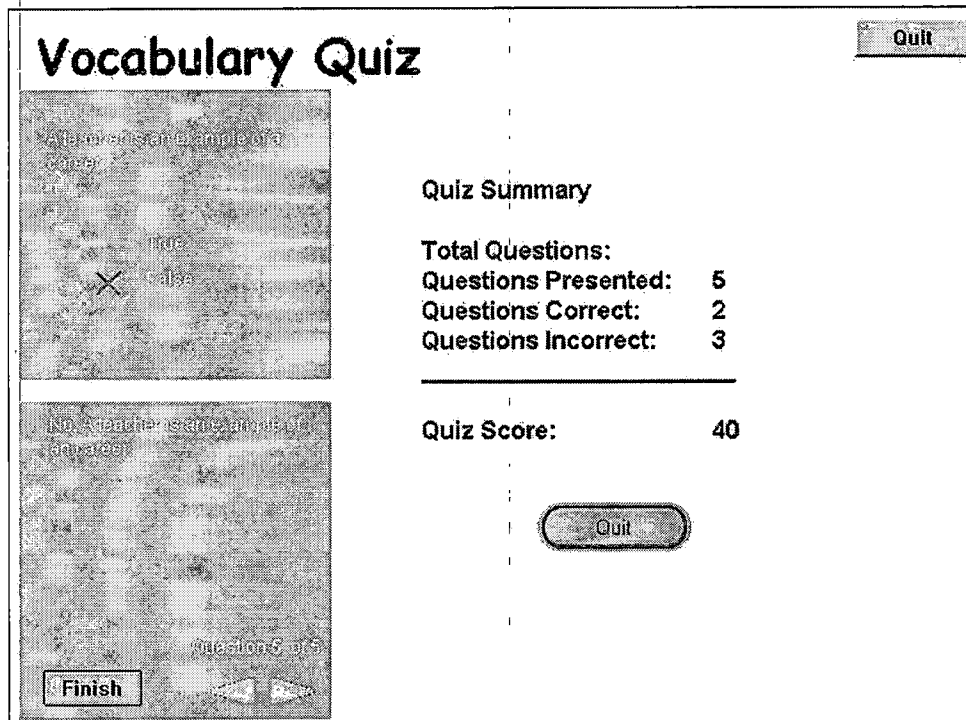


Figure 9. Vocabulary Quiz Module 2.3

As you finished various sections it is important to review, test it and try to break it. One should then look at what has been created in relation to original the objectives. It is important to make sure that each branch is functional and did what it was supposed to do.

Evaluations

After presenting the multimedia application to two fourth grade teachers, I asked if they would provide feedback to further evaluate the application. Based on the surveys taken by the teachers they provided the following recommendations:

- Provide a screen to view California Standards for each standard being taught. This would help justify the reason the students are using the software to meet language arts standards.
- Provide a hands-on training module that helps teachers learn how to create this type of environment. Teachers felt they needed additional training in multimedia to learn how to create effective multimedia applications.
- Compact software so that it can fit on a floppy disk.
- Create a multiple user option so students can work in groups. Teachers felt this would be an important feature since classrooms have a limited amount of computers in each classroom.
- Compatible hardware to run this software.

Teachers also had a number of concerns affiliated with this multimedia application. They felt that software might be too expensive for their school. Since schools have limited funding for technology, they were uncertain on how their school district would embrace it. And because all software had to be installed by the district, they were unsure about support from the school district to get the software loaded on the computers.

Overall teachers felt this software would be very effective in teaching vocabulary concepts to at-risk students in fourth grade. They really liked the idea that they had the capability to change the software content to cater to each individual child. Teachers also liked that the software was able to assess the students and determine if they understood the lesson. Teachers felt this tool could be used for all students at various skills levels in a range of subjects.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

In education today teachers must discover ways to spark and motivate at-risk students. In researching how multimedia affects at-risk students, I discovered students become more involved in the learning process by exploring multimedia elements such as CD-Rom based software. With the development of video games and other technological advancements, students have become comfortable and captivated with technology. Therefore communication of information is presented in a way that engages student involvement.

Many researchers have concluded that motivation is a major concern in getting students to participate in the learning process. And, one way to capture student interest and motivate is through multimedia. To get students involved, two factors drive student motivation. I've learned students can be intrinsically motivated, which means a student's motivation comes from within. Students can also be extrinsically motivated, which means an exterior item, such as a reward or other item drives student's motivation. Because students are motivated in a

variety ways, multimedia can serve aid to catch student's interest to meet a desired goal.

The possibilities seem endless with the use of multimedia in the classroom. The imagination and determination of the teachers and students involved can result in a stimulating environment in which students learn and retain language arts concepts. I hope this examination of how multimedia in language arts helps teachers meet the needs of fourth grade at-risk students, in engaging students in meaningful, fulfilling learning.

Recommendations

A successful multimedia program will include detailed planning and set objectives. This will ensure that information is presented in a clear, logical, manner in which students can understand. It also creates a guideline to keep teachers on target in achieving their desired objectives. Before implementing multimedia technology into educational instruction, one should consider how to assess student participation in order to evaluate the effectiveness of the program. To ensure that the software will run correctly, teachers should make sure they have all the hardware requirements before installing the software. Teachers should also contact their district to

find out what the rules and procedures are for buying and installing software onto their classroom computers.

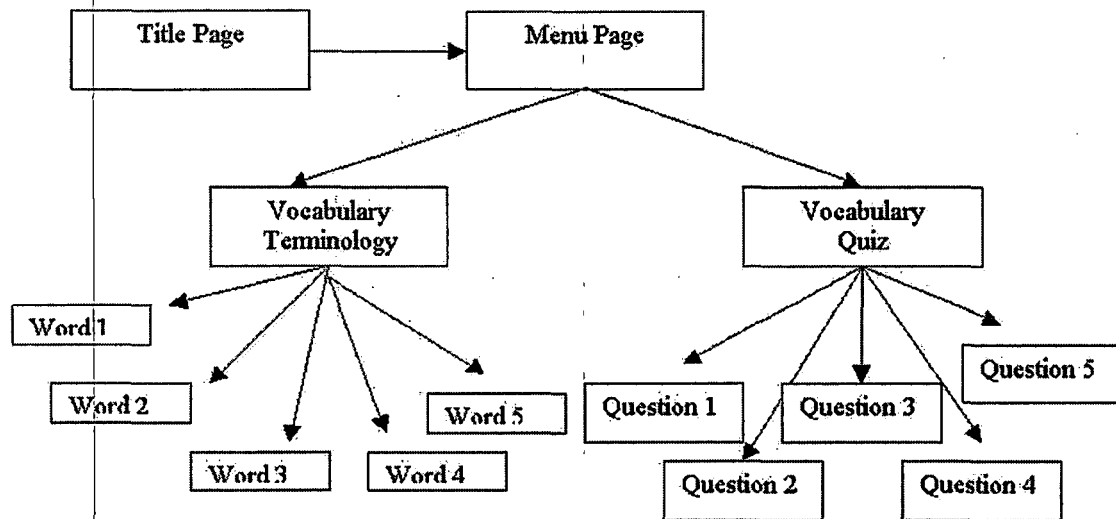
Understanding how to use the various features in Macromedia Authorware is necessary before using the product. Teachers should understand how to navigate through the various screens and functions. When developing applications in Macromedia Authorware it is crucial to understand the toolbar and design view windows. This will ensure that applications are created correctly and run systematically. Teachers should also understand how to insert media elements such as graphics, text, audio, video, and animation to ensure that the software is meaningful and engaging.

APPENDIX A
DESIGN SHEETS

.....



Vocabulary Tutor Flowchart



APPENDIX B

SURVEY

Technology Survey

Participant # _____

1. Do you use any multimedia applications in your instruction?
2. Are you familiar with creating multimedia applications?
3. Do your students have computers at home? If so, what is the percentage?
4. How comfortable are you with using technology in the classroom?
5. How do you feel your students will respond to this application?
6. Do you use any multimedia applications in your instruction?
7. Are you familiar with creating multimedia applications?
8. Do your students have computers at home? If so, what is the percentage?
9. How comfortable are you with using technology in the classroom?
10. How do you feel your students will respond to this application?
11. Does this software meet your teaching standards?
12. Do you think this software will motivate your students?

APPENDIX C
IRB APPROVAL LETTER



**CALIFORNIA STATE UNIVERSITY
SAN BERNARDINO**

5500 University Parkway, San Bernardino, CA 92407-2397

Date: 05/19/2003

Ms. Tonya Coats
c/o: Prof. Eun-Ok Baek
Department of Educ., Science, Math, & Technology
California State University
5500 University Parkway
San Bernardino, California 92407

**CSUSB
INSTITUTIONAL
REVIEW BOARD**

Exempt Review

IRB# 02110

Status

APPROVED

Dear Ms. Coats:

Your application to use human subjects, titled, "Using Multimedia for Interactive and Conceptual Learning" has been reviewed and approved by the Institutional Review Board (IRB). Your informed consent document is attached. This consent document has been stamped and signed by the IRB chairperson. All subsequent copies used must be this officially approved version. A change in your informed consent requires resubmission of your protocol as amended.

You are required to notify the IRB if any substantive changes are made in your research prospectus/protocol, if any unanticipated adverse events are experienced by subjects during your research, and when your project has ended. If your project lasts longer than one year, you (the investigator/researcher) are required to notify the IRB by email or correspondence of *Notice of Project Ending* or *Request for Continuation* at the end of each year. Failure to notify the IRB of the above may result in disciplinary action. You are required to keep copies of the informed consent forms and data for at least three years.

If you have any questions regarding the IRB decision, please contact Michael Gillespie, IRB Secretary. Mr. Gillespie can be reached by phone at (909) 880-5027, by fax at (909) 880-7028 or by email at mgillesp@csusb.edu. Please include your application identification number (above) in all correspondence.

Best of luck with your research.

Sincerely,

Joseph Loxett, Chair
Institutional Review Board

JL/mg

cc: Prof. Eun-Ok Baek, Department of Educ., Science, Math, & Technology

APPENDIX D
CD OF PROJECT

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