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ABSTRACT

This document contains the following papers on educational technology issues related to reading, language arts, and literacy: (1) "The Infusion of Technology into a Teacher Education Course: Issues and Strategies" (Mary Ann Kolloff); (2) "Project READ: Developing Online Course Materials for a Reading Methods Class" (Judith A. Crowe); (3) "Reading Methods Students' Use of a Visual Learning Environment with Elementary Aged Students: Modeling Development and Organization of Written Response to Text" (Kimberly Kimbell-Lopez); (4) "Electronic Portfolios in Reading Methods Courses" (Carla Hagen Piper and Susan Eskridge); (5) "A Study of the Effectiveness of Using Computers To Assess the Phonic Knowledge of Preservice Teachers" (George F. Canney and John C. Davis); (6) "Empowering Masters Students To Become Researchers: An Australian Case Study" (Cristina Poyatos Matas); (7) "Delivering a Distance Education Graduate and Professional Development Program: Integrating Multiple Technologies" (Nedra A. Crow and Joan P. Sebastian); (8) "Creating Technology Workshops for Modern Language Professors" (Lorraine Williams); (9) "Educating Foreign Language Teachers in Instructional Technology: A Report on Faculty Development at the University of South Carolina" (Jessamine Cooke-Plagwitz); (10) "Fostering Divergent Thinking in the Mandarin Language Classroom through IT-Enhanced DRTA" (Jackie Jing-Fong Hsu, Yin Mei Wong, and Der-Thanq Chen); (11) "Learning on the Web or Learning through the Web" (Fabienne Gerard and Mark Newmark); (12) "I-Maestro: Adaptive Writing Instruction via the Internet" (Thomas N. Meyer, Kurt Steuck, Todd M. Miller, Monika Kretschmer, and D'Anne Redmon); (13) "The Professor, the Bookie, and Technology: A Terrific Trio for Developmental Reading and Writing Students" (Rose Yesu and Jennifer Rudolph); (14) "Writing in 3-D: Using Simultaneous Media To Enhance the Quality of Student Writing" (Lawrence Baines); (15) "Technology: The Answer to Early Literacy Success in the New Millennium" (Jean M. Casey). (Contains 116 references.) (MES)

READING, LANGUAGE ARTS & LITERACY

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The balancing act of integrating technology, delivering the content, and meeting content standards in language arts and literacy classes is the unifying theme of these papers. This balancing act may require redesigning a course or an entire curriculum. Professors, classroom teachers, and students often lack the necessary technology skills, the time, and the support system to learn to use technology. These papers chronicle the challenges faced and overcome, as well as the challenges that remain. The work and effort required to integrate technology, content, and standards are well worth the effort as these papers show. Progress is being made as professors, teachers, and students work together to infuse technology into the curriculum.

Mary Ann Kolloff at Eastern Kentucky University describes her experiences as she integrated technology into an adolescent literature course for preservice and inservice teachers. She speaks of balancing needed technology skills and delivering course content. Her work highlights how important it is for professors to model technology integration for their students.

Sometimes the integration of technology requires the redesign of the course as Judith Crowe discovered. Materials for her graduate level reading methods course at California Lutheran University were redesigned and placed online. She recounts the challenges and successes encountered in this project. To assist students as they made the transition from text to electronic format for class materials, the final hour of the class sessions were spent in the computer lab where the students worked with partners to access the materials. Two measures of the success of the project are that students reported an increase in their personal technology skills and that they planned to continue to access the course site in the future.

Reading methods students in Kimberly Kimbell-Lopez's class at Louisiana Tech University had first hand opportunities to teach with technology. The preservice teachers and elementary students read and discussed several books on World War II. Then, they helped the elementary students use Inspiration, a concept mapping software program, to extend and organize the elementary students' understanding of World War II.

Carla Piper at Chapman University and Susan Eskridge at the University of the Pacific had students create electronic portfolios to assess their performance and achievement of course objectives in a reading methods class. Challenges in this project included the students' lack of technology skills and lack of time to learn to use technology, a concern voiced by others working with preservice teachers. Students reported positive feelings toward the self-assessment and self-reflection required in the project and many expressed pleasure in learning to use technology to creatively express themselves in a multimedia format. George Canney and John Davis at the University of Idaho also used technology to assess students' learning. They developed a computerized test to determine preservice teachers' knowledge of phonics. Their computerized test was found to be a valid, cost-effective alternative to the paper and pencil version of the test.

Graduate students at Griffith University in Australia wrote research grants as part of a class title "Research Issues in Technology and Language Learning." The grant writing was a simulation that required the students to learn about current research and issues in their field. Cristina Matas felt that this simulation provided her students a context for authentic learning in addition to giving them the means to pursue research in their field.

Nedra Crow and Joan Sebastian, co-directors of the Distance Education ESL Endorsement Program, responded to the growing need for English as a Second Language (ESL) teachers in local school districts. University and public school collaboration lead to an ESL endorsement program for teachers offered via distance education by the University of Utah. Distance education was deemed to be a cost-effective way to deliver a high quality program to a large number of educators. In their paper the researchers shared the challenges they faced and overcame as new technologies were implemented and teachers became familiar with learning via distance education.

Higher education faculty faced with developing technology workshops for their peers will want to read Lorraine Williams' article detailing her experiences at Saint Michael's College. A needs assessment questionnaire, formative, and summative evaluations, in addition to

discussions with faculty members enabled her to make changes in the workshops in order to meet the needs of individual professors. Some professors indicated a preference for one-on-one instruction, something deemed necessary but not often available to faculty as they learn to use technology in their teaching. Lorraine Williams presented technology workshops for language professors, as did Jessamine Cooke-Plagwitz at the University of South Carolina. A non-threatening, supportive environment is deemed essential if faculty members are to incorporate technology into their teaching.

Jackie Jing-Fong Hsu, Yin Mei Wong, and Der-Thanq Chen of Singapore discuss how technology was used to enhance learning in a Mandarin language classroom. Using rote memorization to teach the Mandarin language results in students who cannot use the language in life-based situations. To encourage students to think divergently and apply their knowledge of Madarin, a technology enhanced Directed Reading Thinking Activity (DRTA) was incorporated into the classroom. At Carey Academy Fabienne Gérard and Mark Newmark examined the Web's impact on learning in a history and in a foreign language class. They found that in the history classes there was more learning on the Web and in the foreign language classes there was more learning through the Web.

Internet resources are changing teaching and learning in classrooms as teachers and students incorporate the Web into the reading/language arts curriculum. Meyer, Steuck, Miller, Kretschmer, and Miller discuss the use of an intelligent tutor, I-Maestrol, to deliver instruction in the writing process via the Internet. This interactive system provides individualized instruction to students as they prewrite, draft, and edit their writing. Rose Yesu and Jennifer Rudolph at Massasoit Community College have successfully combined electronic resources including the Internet with critical thinking activities to enhance the reading and writing skills of students enrolled in developmental classes. Their collaborative efforts include a variety of activities that can be adapted to meet the needs of students in other reading and writing classes. Baines uses a variety of media to involve students in 3-D writing to enhance the quality of their work. Text, images, and sounds are used as students create multimedia presentations to share with their classmates. Jean Casey examines the impact of technology in early literacy learning in a project involving six school districts in Southern California. Technology equipped classrooms, technology literate teachers, and a risk free environment enhance the early literacy learning of students in these six school districts.

THE INFUSION OF TECHNOLOGY into a TEACHER EDUCATION COURSE: ISSUES and STRATEGIES

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Abstract: There is no argument that today's pre-service and in-service teachers must incorporate instructional technology into their teaching. However, institutions of higher education with teacher training programs debate the best way to train teachers to use technology effectively. The following paper examines the issues and strategies in infusing technology into a language arts curriculum at the middle grade level for in-service and pre-service teachers. The issues are discussed in view of the four areas of focus for the language arts curriculum according to the National Council of Teachers of English. In the language arts example, it is shown that the student must be able to *read* and *write* the media in each of the four areas in order to effectively infuse the technology into the content area.

Introduction

A major issue in teacher education is whether to teach the use of technology to pre-service and in-service teachers separate technology courses or within content area courses. The trend for technology to be taught along with the content area is based on the premise that the acquisition of technological knowledge, skills, and attitudes is greatest when presented in the context of a content area. It is thought that this will lead to a better infusion of technology in the teaching of a particular content. In addition, it is believed that this method will lead to a teaching style and learning environment enabled by technology. Given this position, many involved with teacher education are convinced that infusing technology can improve learning, while, at the same time, they fear that because of the amount of time needed to teach the technology, the remaining time available for content will be significantly diminished. In order to embed technology into the content area, teacher education institutions are today challenged with engendering a positive attitude toward the content/technology combination and providing an environment and resources to maintain and enhance the knowledge, skills and ability to carry out the integration task.

It is the intent of this paper to address the issue of infusing technology into a content area by using as an example a course in a language arts curriculum at the middle grade level for in-service and pre-service teachers. The two objectives for the paper are to: (a) discuss the issues surrounding teaching and applying appropriate technology in this situation; and (b) provide strategies for developing teaching styles and learning environments for a technology-rich, content-based course.

The National Council of Teachers of English (NCTE) in its document, *Standards for English Language Arts* (1996), suggests four areas of focus for the language arts curriculum. These areas include: (a) obtaining and communicating information, (b) literary response and expression, (c) learning and reflection, and (d) problem solving and application. These areas will be used as a basis for identifying and categorizing various technological applications and experiences for pre-service and in-service teachers. Each technological experience can be categorized as *reading* the media which refers to such activities gathering, analyzing, and evaluating the information, or *writing* the media which refers to synthesizing information and producing a product.

Course Description

The example in this paper is adolescent literature and related materials, a course designed to help pre-service and in-service teachers extend their knowledge of authors, literature, and related materials for middle grade students, 10-14 years of age. The course emphasizes literary criticism and the relation of the interests and needs of adolescents to literature. The course assignments focus on: (a) searching, locating, reading and responding to fiction and non-fiction books and materials, (b) interacting with adolescents in

literature circles, (c) performing booktalks, readers theatre, and/or storytelling, and (d) researching, writing, and presenting an author/issue paper. In addition, in-service teachers conduct an action-research project centering on adolescents, their nature and needs, and the literature with its related materials.

Obtaining and Communicating Information

Obtaining and communicating information is the first category for focusing the discussion of integrating content and technology. This category is a major concern of the course since the participants are to engage in such activities as identifying and locating appropriate fiction and non-fiction books and materials for adolescents, becoming familiar with the nature and needs of adolescents, and writing and presenting an author/issue paper. Obtaining and communicating information focuses on the goal of conducting research communication, and presenting the research in some form. Given this goal, the concern becomes the selection of technology activities that would be the most appropriate for the content.

Reading the Media

As a pre-service or in-service teacher *reads* various forms of technology to obtain information, some of the cognitive activities or process skills required include developing, accessing, locating, searching, watching, analyzing, evaluating, and concluding. These cognitive activities or process skills engage learners if they have ownership of the research. The issue is to engage the students in their own information needs or problems so they sustain an interest in the content. This is different from the teacher compiling research topics and students choosing a topic of interest. The underlying method in obtaining information is to engage students in information literacy skills using the Big Six Approach outlined by Eisenberg and Berkowitz (1988).

Various forms of *reading* the media to acquire information include using various software programs, CD-ROMs, still visuals, video and audio sources, databases, and web sites to access, locate, gather, and evaluate information. Of course, there are issues surrounding the use of each of the technologies, but because of space considerations, only issues associated with web sites and still visuals will be addressed.

Currently, the most popular technology used to access and locate information is the Internet. The major concern with searching for web sites is quality of content. Access by middle grade students to sites associated with sex, pornography, and hate groups is a concern. A solution to this problem is for teachers to develop *web quests* for students. These *web quests* are inquiry-based activities developed by the classroom teacher that are directed toward a clear task. Some web sites are designed specifically for students to visit and obtain information. Although this provides an immediate solution to the problem, there are drawbacks. For example, students are left without developing search strategies when real-life problems arise. Also, students may have difficulty deciding what they are interested in researching and in forming problem statements. Given these two situations, a strategy is to provide a balance by collaborating/team teaching with the library media specialist to develop skills in identifying information needs, locating appropriate sources, and forming conclusions.

Still visuals are used in non-fiction or information books to gain information. Visuals are seldom used in fiction books. Maps may appear in the front cover of a fantasy book so the reader has a sense of the area described in the fantasy. It is an unusual book that incorporates visuals to represent the storyline. Using the literary device of juxtaposition, Paul Fleischman in *Dateline Troy* successfully uses visuals to connect modern day life to the epic of the Trojan War. Leading questions by the students focused on the manner juxtaposition was used to present the story of the Trojan War. Students were asked whether by having the story presented in this style (modern headlines), if their original comprehension of the story had been enhanced. A typical student response suggested that by having the story presented in that manner, they found the story easier to interpret. Many, not being big history fans, were not looking forward to reading the book. However, after getting started they found that the modern clips helped to keep their attention throughout the story. They felt that modern clippings would make it easier for young readers to remember details because it is related to something that is happening in the present.

Writing the media

The most common form of *writing* the media is to use word-processing to compose a traditional paper. The challenge is to include other forms of media such as an acceptable means of producing a research paper. On the other hand, the writing process changes as various other media such as flyers, videos, presentation software, or web pages are used to present and communicate the information.

Although various media are read, the challenge comes when students are ready to write the paper in a different medium. For instance, pre-service and in-service students were required to prepare a web page for their author study. In addition, their web pages were to include original visuals to illustrate abstract concepts in the fiction book they read. Students were first introduced to image processing software so they could manipulate photographs or create illustrations. The students found the task difficult for three reasons. First, fleeting images of text are seldom transformed into mental images for the text. Second, students reported seeing words as their mental images. Finally, this was their first introduction to image processing software and web page authoring programs. The students were given guidelines as to the criteria needed in the author study web page. However, the learning of the technology took over the significance of the content since this was their first introduction to the software. Considering that each software program has a steep learning curve, frustration occurred among the students. After the assignment was completed, students reported a satisfaction with their learning and products and increased use of visuals in courses outside of this class.

Literary Response and Expression

Literary response and expression relates to discussing books and accessing materials that are read or viewed. In this particular course, literature circles are the prime means of discussing the books and materials. The discussion of books and materials are categorized into three areas: (a) personal response, (b) topics, and (c) interpretative responses. Pre-service and in-service teachers discuss books and materials among peers in class and with adolescents. Also, the teachers perform booktalks, readers' theatre, and/or storytelling to provide a literary expression of fiction books.

Reading the Media

Accessing databases on the Internet allows students to read postings of responses to various books. Visiting popular sites such as Amazon.com or Barnes & noble.com allows students to read reviews from sources such as Kirkus Review, Booklist, etc. Often, these reviews offer diversity in the literary criticism of the book. Interviews with various authors and reviews are also accessed through these popular web sites. A web site may include frequently asked questions about an author. Some authors have their own web sites where students may gather information. The pre-service and in-service teachers are required to use these sites for their author/issue paper. This information can provide evidence and support for students' personal

Writing the media

As students engage in the discussion of books read, materials viewed, or web sites visited, discussion takes place in a text-based environment. Students discuss the books and materials among class members and with middle grade students. Response journals are written on a personal, topical, and interpretative level. Initially, students' wordprocess papers on a weekly basis as they respond to various books and materials. A listserv is used to structure the class discussion for class members and middle grade students. Presently, web-based discussion forums are used for the conversations about books. The goal for using a listserv or a web-based environment is to provide the basis for creating a learning community of pre-service and in-service teachers, and middle grade students. This community supports a commitment to learning and recognizes that its most important asset is the diversity of the people who form the community.

In spite of the technological environment in which the response to the book and materials are prepared, students' personal and topical responses are generally well written. As pre-service and in-service teachers engage in conversations with middle grade students, the interests of the middle grade students become the focal point of the interchanges. In addition, the middle grade students identify books they are

reading in their language arts classes. The difficult task comes when students form interpretative responses; that is, a critical analyses of the text or material. Providing evidence and supporting material for their statements become more difficult. Moving students from personally responding and finding topics of interest to conducting research and to critically analyze books, materials, and web-sites is the major issue. This issue relates to engaging pre-service and in-service teachers in critical thinking skills and to the age-old question of how to teach students to be critical thinkers. Students need to further analyze responses for biases and habits, and to search for critical questions in the personal and topical responses. A strategy to provide students with such an activity is to have the students analyze data in discussion forums and to summarize the information based on biases, opinions and critical questions. Students must revisit the text, materials, and web sites to provided evidence to support statements.

Learning and Reflection

Learning content and technology skills are tightly woven together. At times, acquiring the technology abilities and skills diminishes the focus on the content, leaving the content to emerge in a technology-rich environment. *Reading* the media and *writing* the media are closely related as students in this class interact with the content and technology activities.

Reading the Media

Throughout the assignments in the class, pre-service and in-service students are required to engage in conversations that focus on effective ways to teach students to *read* the media; that is, comprehension of the visual images and verbal information. Activities for reading the media are focused on reading picture books appropriate for middle grade students, developing Web Quests to investigate sensitive and critical issues relating to the nature and needs of adolescents, and evaluating information in all media formats. To teach students to critique what they see and hear in ways that help them make informed decisions is a constant effort. These decisions focus on problem situations as they relate to an integrated curriculum.

Writing the Media

Word processors and web pages allow students to create and communicate information. Use of listservs, web-based learning environments and image-processors support the access and communication of information. Each technology offers opportunities for educators to create learning environments for middle grade students.

For pre-service and in-service teachers to reflect upon their learning of content and technology skills in this course, students are required to write professional goals relating to the content and their technology skills and abilities. The goal is for the students to create a vision as how to teach content using appropriate technology. Professional development goals are generally related to the here and now of using technology in the content areas rather than building a vision for the future. Often the debate of using the technology relates to the dilemma of technology vs. content. Pre-service and in-service teachers often state that the *time* to learn the technology is overwhelming when content is the main focus of their concern. In-service teachers often state that they feel unprepared to teach with technology. On the other hand, they also believe that technology is an important part of the workforce and teaching with technology is a necessity. Yet, finding the time to acquire the necessary technological skills themselves and then teaching the technological skills to the students becomes almost a difficult task. Their center of focus is on the content, its concepts and principles. Frustration mounts when attempting to use technology since they believe they run out of time to cover the necessary lessons and skills that will prepare students for testing and portfolios. Those teachers who report teaching with technology are, generally, pressured by principals. Some examples reported by in-service teachers include having to incorporate technology once a week in their lesson plans, or their teaching evaluation occurring in a two-way interactive environment.

The major issue of teaching with technology is time. Time to learn about the various means of incorporating appropriate technology activities into content. Time and technology present new problems for teachers as they solve conventional problems of teaching and learning. It is easier to design, organize, and deliver content in the traditional way than to form real-life, problem-solving environments where

technology is used to formulate solutions. Change from teaching in a traditional manner, disseminating information, and preparing drill and practice activities challenges the teachers. A strategy for teachers is to choose one particular technology they would like to concentrate on and use the technology with students. This one-step-at-a-time approach is more likely to enhance the confidence of the teacher than trying to master it all at one time.

Problem Solving and Application

The basic problem for the pre-service and in-service teachers is developing a strategy for finding appropriate titles of books, materials, and web sites for middle grade students to use in the language arts curriculum and in other content areas as integrated units are designed. Often, students in the class feel prepared to design lessons for books used as common reads and materials or web sites discussed in class. However, developing a strategy for finding appropriate books, materials, and web sites is an issue and challenge itself since there are many authors and titles appropriate for middle grade students. This situation can be classified as a curriculum-related problem.

Other problem solving activities for the pre-service and in-service teachers are related to societal and global problems. Violence in schools is a current problem that is highly visible. Students in this class find quick solutions to this particular problem. An approach to protect middle grade students may be not allowing them to read books considered violent such as *The Wringer* by Jerry Spinelli. The media reported *No Tolerance Rule* of the Decatur, Illinois school violence incident may appear as another quick cure for a more prominent problem. Responses such as these lead students to investigate such issues as the role of the media in prompting violence, or how our judgments about the news, its content and placement, direct our thinking about sensitive issues.

Reading the Media

Reading the media in both problem situations involves browsing and searching the Internet, newspapers, and print materials to gather, analyze, and evaluate information. A medium often overlooked in gathering information is that of databases. The Internet is considered a huge database along with libraries' on-line catalogs. Furthermore, accessing government online databases allows middle grade students to sample information sources and to choose appropriate information that serves their purposes of determining the factors associated with the prevalence of violence in schools, for example. Students sample data, analyze, predict, discuss, and provide evidence for their conclusions. In reading the media, students develop and refine their information retrieval skills.

Writing the Media

Students may construct and communicate useful insights and implications that result from using information in traditional research papers or by giving presentations using presentation software. Furthermore, *writing* the media can be accomplished by students formulating their own databases to collect information concerning violence in their schools or communities. Local community resource individuals may be contacted and interviewed. The interview may be video taped by students after gaining appropriate permissions. Creating databases and interviewing local community resource individuals give students an opportunity to practice their research skills and abilities to identify information needs as they relate to the stated problem. Skills practiced include critical thinking skills such as identifying criteria, prioritizing, finding and recognizing errors in information and thinking, and testing the accuracy of the evidence collected.

Conclusions

The instructional activities using technology to teach content in this particular course are only snippets of activities to present the content. Infusion of technology into the curriculum assumes that technology is an integral part of the curriculum for *reading* and *writing* the media. Generally, teachers want to match national and state content standards with the technology activities. Enhancing lesson plans

and activities for *reading* the media is a much easier task for pre-service and in-service teachers. The use of word processing, drill and practice software, and e-mail are regular activities for the pre-service and in-service teachers. On the other hand, *writing* the media is a totally different process. In spite of teachers, using media everyday, writing in different media formats requires new and different writing skills and attention to specific conventions for each medium. Using presentation software requires students to change their writing format. No longer are sentences or paragraphs written out completely, but phrases and ideas are outlined using bullets. Interviewing a community resource person for a video tape requires planning interview questions and deciding upon appropriate camera shots. These skills are acquired only through first *reading* and analyzing the medium followed by producing a product such as a computer presentation, video production or a web page. It is learning the writing that becomes the issue for teachers since it is viewed as a time-consuming process. Those responsible for preparing pre-service and in-service teachers need to guide the students in setting priorities for learning to read and write for the various media and putting them to use in the classroom. Each technology provides a rich environment for learning the content and for experiences for middle grade students. The most significant change in teaching with technology will come from the choices pre-service and in-service teachers make when designing and implementing lesson plans and activities that allow middle grade students to interact with content and the technology tools.

When designing a course for pre-service and in-service teachers, one has to be conscious of what might be termed *technology fatigue syndrome*. The sense of exhaustion may be a result of constantly learning the *how-to* of a particular application and embedding it in a technology-rich environment. There may be a loss of motivation to learn the skills and abilities because of the pressure to infuse technology while at the same time fearing the loss of content as the technology skills are acquired.

Offering experiences to gain knowledge of skills and abilities in technology in one course is not enough. The knowledge, skills and abilities and concepts of the technology must be addressed in several courses, over time, and required of learners to demonstrate the use of technology skills in their performances.

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Project READ: Developing Online Course Materials for a Reading Methods Class

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Abstract: This paper is a report on a study of a project conducted on a graduate level reading methods course. Course materials were redesigned and presented in electronic format. The purpose of the redesign was to increase student learning of course content through hands-on participation, electronic communication and discussion, and extension of resources related to teaching reading. Findings indicate that students increased time spent on using course materials and increased comfort with technology in a number of cases. The expectation that students would increase discussion through electronic communication was not achieved. It was noted that students plan to continue to make use of the materials in future teaching. Educators need to nurture and guide students in using technology and to model and provide time for hands-on practice.

Introduction

The use of technology, and especially the use of telecommunications tools, is changing the process of education. As college and K-12 classrooms begin to employ the latest technologies, both academic performance and student-teacher relationships can be extended and enhanced. California Lutheran University (CLU) is committed to integration of technology throughout the undergraduate and graduate programs. This commitment is extended into the Teacher Preparation program in a number of ways. All course syllabi are available on the World Wide Web through Eres, an electronic reserve system. All faculty have created a profile home page. Several professors use electronic discussion groups as a tool to enrich and expand the educational experience of the students beyond the classroom. Others are exploring the use of electronic portfolios with students. In spring 1999 an opportunity was provided through the Charles J. Culpeper Foundation-sponsored faculty development grants to further implement technology into an existing course design. The purpose of this proposal was to enhance student learning through the use of technology. The grant allowed the faculty member, together with a supporting team, to redesign course materials. The team was composed of the professor as content expert, a member of CLU's Information Systems Service, an instructional technology expert, and a student intern. This project proposed to convert all course materials into web page format. The course, Methods of Teaching Reading and Language Arts in Diverse Elementary Classrooms, is a required part of the methods block for elementary student teachers. This course redesign provided opportunities for students to experience a model of instruction that spoke to the vision of incorporating technological tools into effective teaching practices. The inclusion of interactive technology provided an opportunity to connect theory to practice by increasing hands-on participation by students. Electronic discussions provided students with opportunities to respect and respond to each other in respectful and empowering ways. Certainly the use of information technology in a course such as this provided a vehicle for students and instructor to participate in educational growth and change, as it modeled techniques that the students, as teachers, would one day use themselves.

There were a number of instructional challenges inherent in the course that could be addressed through the use of technology. Students needed to be prepared for the California Reading Instruction Competency Assessment (RICA), which they must pass in order to obtain a teaching credential. There was a large amount of content area knowledge required (phonics, assessment, diagnosis and intervention strategies for teaching reading, systematic, explicit word attack skills instruction, etc.) necessary for students to master in order to fulfill the requirements for this exam. Readings were dense and challenging, and there was never enough time to thoroughly discuss and practice the theories and connect them to practice, according to course feedback from students. Some concepts taught in this course that students seemed to find difficult to understand included content area strategies such as those listed above; lesson planning, Specially Designed Academic Instruction in English (SDAIE) techniques, and

connecting instruction to the California reading standards. Student feedback from previous semesters indicated that they felt the need for more discussion of content. Successful pedagogies already implemented in the class included modeling teaching strategies, providing handouts that directly related to teaching reading, taking time for hands-on experience with the strategies, and providing opportunities for students to share strategies across grade levels with each other. Course evaluations, coupled with informal, formative feedback garnered from the students during the semester indicated that these techniques were noted and appreciated as being effective. The challenge, then, was to redesign the course so that the use of technology would support already successful strategies while addressing the instructional challenges.

The Process

Development

The development of the course was begun in summer, 1999 and implementation began in the fall semester. The team was to provide design support through converting existing documents into html format, scanning documents, sound clips, and video clips into the pages, creating a CD-ROM, and researching useful links for the course content. In addition, the team would continue to provide support during the implementation semester by providing a smart classroom to support lecture, discussion, and hands-on work during class time as well as campus lab facilities for students to use as needed for electronic discussion and review of materials. This course had a history of implementing technology. A web page version of the syllabus was provided, along with selected readings, PowerPoint slides of lecture topics and lesson plans and links to Internet resources. Students had in the past communicated through email. The redesign made all lectures and discussion topics available in web page presentation format, increasing the interaction between student and text. This included interactive forms for students to practice hands-on strategies, pre-test themselves on concepts, and develop lesson plans connecting theory to practice. Rubrics developed by the instructor were also available electronically.

The team met for weekly planning and update sessions during the summer. The professor's files were ftp'd to the student intern, who used multimedia authoring programs to create a splash page and consistent topic pages. Topics were presented in the form of web page "chapters," the topics including the syllabus, weekly lessons, study guide access, and student work. Each weekly lesson topic, available in web format, included a sample lesson plan, strategies for teaching language arts, and links to the literature tropic of the week. The ISS team member greatly expanded the number of topical links available by researching web sites for appropriate material. The professor then reviewed the sites and passed the links to the student intern, who posted the links to the web page. The educational technologist provided hardware and software support to the student intern and began a process of converting videotapes of teaching episodes for CD-ROM or videoclip development. The last project was put on hold due to hardware limitations and has not been implemented to date. In reflecting on the effectiveness of the developmental process, a number of points were noted. First, it was critical that the team met weekly to discuss progress and revise timelines for next steps. Hardware and software constraints such as late delivery and incompatibility were addressed and understood by all members of the team. This helped to deal with frustrations that arose because parts of the project could not be implemented at this time. Secondly, it became apparent that student interns bring a great deal of multimedia expertise and enthusiasm to the project and that they are yet students and cannot be expected to perform at a level of professional development that they have not matured into. Demands from other classes, jobs, and life challenges impacted student intern performance on this project as well as some others. The level of commitment and performance from the ISS team member, on the other hand, was well matched to the role as conceived, and that part of the project was implemented effectively and in a timely manner. Finally, it became apparent during the implementation semester that team members were unable to provide the projected support because they were immersed in new grant projects.

Implementation

The project was implemented during the fall semester. Internet connectivity was available in he designated classroom, and the last hour of class time was reserved for the instructor and students to use the computer lab. There were 21 students in the class, and 12 computers, so pairing was the preferred method of computer use. At the first class meeting, students were taught to log on, access their university account, and use email and a browser. Students were able to view the electronic syllabus, and were pointed to links to online readings required for the next class. It was apparent at the first meeting that a wide variety of expertise and comfort with technology existed among the

students in the class. As the semester progressed, some students became more comfortable, while others continued to show resistance to this form of communication.

Examples and Use of Materials

For the purposes of this paper, a lesson topic example was selected for discussion. The following figure shows the format of the day's activities as presented online. The lesson included a PowerPoint presentation, links to other online sites for the topic which included lesson plans and classroom activities as well as research into the genre, and a sample lesson plan which would be analyzed for content and method, or practiced and used in the field.

Lesson Topic Example

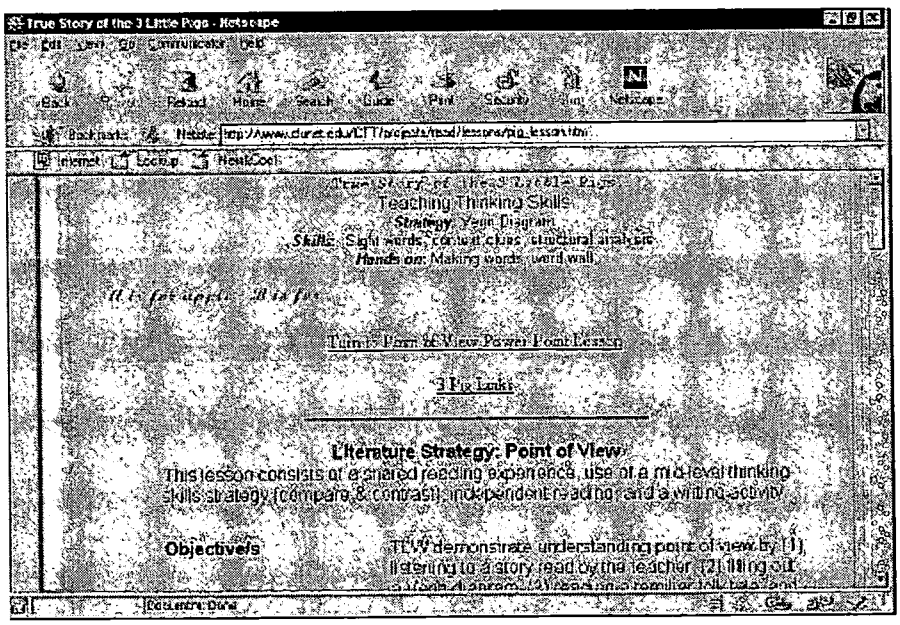

Fig. 1: Opening page for a week's lesson presented in book page format, with agenda items, links to lesson and online resources, and formal lesson plan.

In class, this page would be presented and discussed, then the PowerPoint lesson was implemented. It included opportunities for lecture, discussion, small group work and hands-on activities. For example, in this lesson a Venn diagram was used to compare and contrast the traditional and the alternative versions of the story, then students worked in small groups to read a folktale, select an alternative character, and create a Venn showing similarities and differences in point of view. A follow-up activity was to write the tale from the alternative point of view. Students could later access the PowerPoint lesson from any computer with PowerPoint Viewer and download, print, or add notes pages to the presentation. This possibility moved the use of the software from strictly a lecture aid to a process for interactive learning.

PowerPoint Lesson

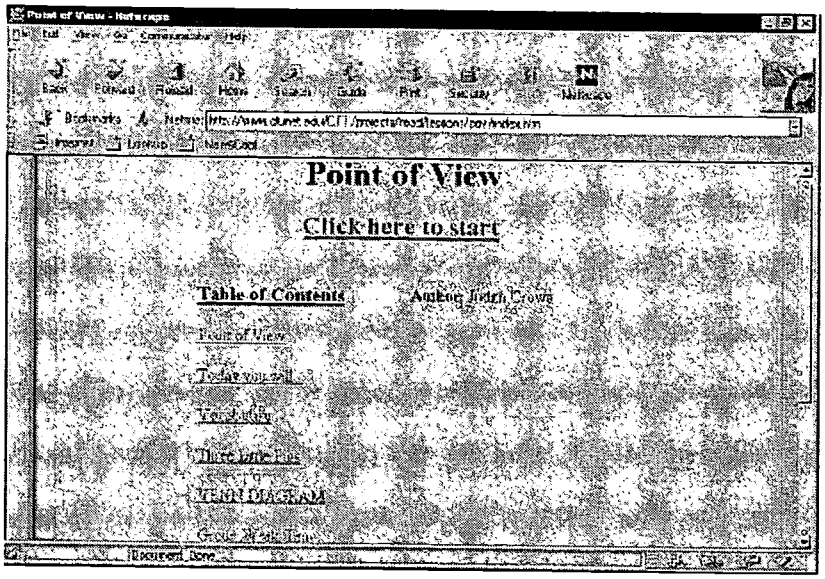

Fig. 2: First slide of the presentation. This was used in class and could be accessed online as well. The slide outline shows provision for hands-on and group work as well as lecture.

After completing the lesson and activities in the regular classroom, students moved to the computer lab for the next section of the class. There were generally two students per computer, which enhanced sharing and enjoyment of this part of the class activities. Students opened the web page for the lesson and then followed the links to online resources. Since the sites were briefly annotated and categorized, students could select a variety of sites to visit. The instructor could ask them to find a site they would use for their grade level, a lesson plan, a discussion of the genre, and a bibliography or related references. This particular set of links offered lesson plans that integrated other curricular areas gave Cajun and Spanish versions of the story, dramatizations, interactive versions of the story, and an activity for constructing the three houses.

Sample Links

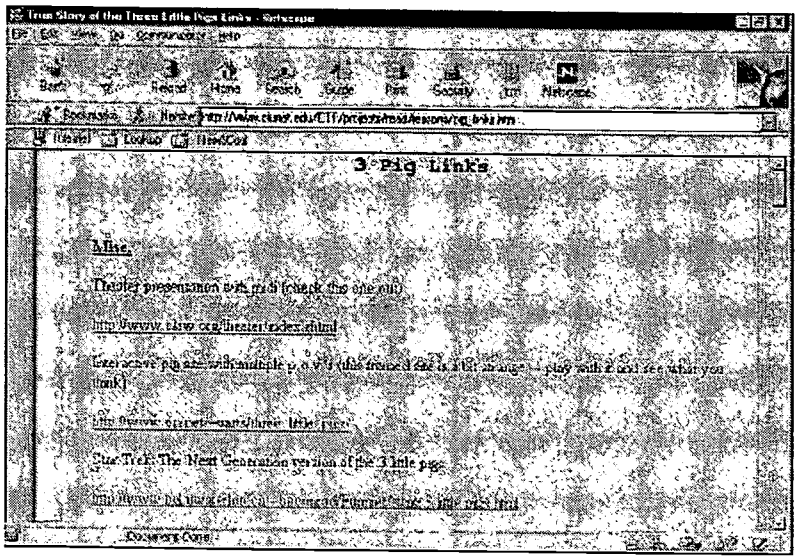

Fig. 3: This screen shows the first links available to students as part of the lesson extension.

Findings

The course redesign, then, was intended to:

- extend use of the reading content addressed in the textbooks beyond the dimension of class time;
- increase student hands-on participation related to teaching reading strategies;
- increase the number of successful, proven strategies that students shared with each other over the course of the semester;
- add student work samples to the page during the course of the semester, which will allow them to see work "published," receive collaborative feedback from each other; and
- enhance students' teaching portfolios through demonstration of technological competencies.

Students reported that they did use the electronic materials outside of class time. One student wrote, " I did use the electronic course page several times during the duration of the course - quite frequently, as a matter of fact, maybe weekly just to make sure I was still on track. " Another stated, " I did use the electronic course pages. At first, I printed out the syllabus and used that in my notebook for the class. Later, as we were assigned things to explore, I ventured through the various links that were provided."

As for increasing student hands-on participation in teaching reading strategies, the researcher expected that this participation would occur within the boundary of class time. That did not happen; it was in fact difficult to include all aspects of the planned work in the time allotted. However, it was found that students used the resources in preparing for their teaching in the field. " I felt that your inclusion of technology in your course was extremely helpful in introducing a teacher to the unimaginable wealth of lesson plans and classroom ideas available through the Internet...." and another replied, "(I) found that some of (the sites) were quite helpful, especially when it came time to write my lesson plans. I found many links to language art sites, as well as math and science." One student reported using it in the classroom, as well: " I have had some of my 5th graders in the mornig (sic) before school explore your website. They seemed to enjoy some of the sites that linked from Madeline and the three little pigs."

The study did not find that there was an increase in the number of successful, proven strategies that students shared with each other over the course of the semester; in fact, there was less sharing done in class. In past semesters, students had presented at least one strategy each to their peers. One goal of this project was to post all the strategies turned in by students to the 'student work' portion of the web page. This did not occur. It was found that the process of collecting reports in a variety of formats, from email attachments to scannable text documents, and formatting them for inclusion on a web page was too time consuming to be possible. This also impacted the expectation that students would see their work published online and receive peer feedback.

Students did report that they felt their technical competencies had improved through the course of the semester. One stated, " I felt that your inclusion of technology in your course was extremely helpful in introducing a teacher to the unimaginable wealth of lesson plans and classroom ideas available through the Internet, especially someone relatively unfamiliar with how helpful these sources can be (and we did have a few of these people in our class). Well done on your part, I believe." At this point in time it cannot be determined that students' portfolios reflect the technological competencies desired; students have not yet developed their portfolios for the course.

In addition, several students indicated that they planned to continue to use the site in future. Some said they would use the links to RICA study guides, and others planned to continue to use the lesson plans and other links and resources in their future classrooms. Replies such as "(The sites) are useful and the best part about it is that I know they will continue to be of great help to me during my career as an educator," and ", the links are useful and I do plan on using this as a resource when I am a beginning teacher." show that students expect to be able to continue to use the online course materials.

Conclusions and Recommendations

Weekly meetings helped to keep all team members accountable for the work. Even though some parts of the project had to be shelved, all team members were aware of why that happened. In addition, the weekly meetings helped to keep team members accountable for completing their parts of the project. It is recommended that any team project of this type include weekly meetings of all team members. Inclusion of undergraduate multimedia students as part of the team resulted in consistency of presentation and creative design of the presentation. It was noted that an understanding of programming languages would result in a more professional product and enhance the student's future employability. Teams also need to be aware of the difference between adult professionals and undergraduate students as far as accountability is concerned. Part of the education for the student intern could include professional development. The stated expectations for implementation of the online course materials were not consistently achieved. The expected support during the implementation semester was not available. New teams had been created by this time to work on new projects, and personnel were not available for support of implementation. A recommendation could be that funds be set aside to provide some assistance during the semester. In his case, having help to re-format and post the student work could have resulted in students' being able to share strategies during the semester. However, in considering the responses that indicate students plan to continue using the resources, perhaps it is not too late to post their lessons and strategies. Finally, it is recommended that educators planning a similar use of technology in their classes create an instrument to measure how well objectives have been met. The feedback from students in this case was informal, but did show that, although some expectations were not met, others were partially met and still others may be met in future.

Reading Methods Students' Use of a Visual Learning Environment with Elementary Aged Students: Modeling Development and Organization of Written Response to Text

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Abstract: Preservice Teachers taking a Reading Methods course as part of their elementary program requirements were introduced to a graphic presentation program called *Inspiration*. The students were shown how to utilize this program as a way of responding to books. This enabled the Preservice Teachers to be exposed to a range of possibilities in how they can use these same strategies and techniques with elementary students to show them how to organize information encountered as part of classroom reading instruction. Through this visual representation of ideas, the Preservice Teachers and elementary students were able to extend and clarify their understandings.

Introduction

The impact of technology on our language use opens up even more diverse ways that language can be showcased and displayed even as it continues to change. Through our students' construction, manipulation, and explorations with language, they illustrate how language exists in interactions with others, how language is a system of multiple signs, and how the meanings of language emerge from the social relationships within which they occur (IRA/NCTE, 1994). As a result, children within a learning community use their social relationships, their personal histories, and their collective memory in order to make sense of the language around them. Using new communication and information technologies, teachers and students are discovering more ways to communicate with others, to make things, to learn about the world, and to express themselves (Bruce, 1998/1999, p. 307). There are multiple opportunities for students to experiment with a myriad of ways to share information as they enhance their understanding of a particular topic. Bruce (1998/1999) states that the range of possibilities by which students learn (i.e. communication, inquiry, construction, and expression) are expanded as a result of these new tools.

Role of Social Constructivism

When exploring the influence technology has for students in our classrooms today, it is helpful to look at social constructivism. As a theory of cognitive development, social constructivism shifts us away from thinking about individuals who construct their own meanings through interaction within their environment to a view of a collectively constructed meaning (Carroll, 1999). Three principal assumptions of Vygotsky's sociohistorical learning theory include: a) the individual's making of meaning is influenced by the role of the community, b) tools are important in cognitive development, and c) the zone of proximal development (Willis, Stephens, and Matthew, 1996). In a Vygotskian classroom, the collaborative element in the learning process is promoted as students share background knowledge in order to construct knowledge. The use of tools in cognitive development is expanded when technology is available. There are many forms of electronic tools available by which students can construct and communicate knowledge. The use of text, sound, and images found within many programs takes literacy beyond the boundaries of simple pen and paper.

Carroll (1999) discusses two roles of classroom technology in relationship to the social-constructivist perspective. The first role relates to how opportunities can be provided to students so that they can take advantage of multiple symbolic perspectives through participation in the meaning construction process. As students learn to use language as part of their literacy development, they are making use of multiple sign systems as a means of making sense of the world (Carroll, 1990). The second role of classroom technology is for children to have

opportunities to reflect on language. In the social context of the classroom, they learn how to use different sign systems, how these sign systems can take different forms and meanings, and how technology can be used to support the use of multiple symbolic perspectives in writing.

Semiotic Mediation

A central tenet of Vygotsky's theory is the concept of mediation by psychological tools or signs (Wertsch, 1990). While engaging in activities with adults and more competent peers, children learn to use signs (e.g. language, numbers) to mediate or, in other words, to shape and define their thinking (Ashton, 1996). The semiotic mediation that occurs is evident as technology facilitates students' use of multiple sign systems to foster communication and thinking. Bruce (1997) posits a transactional stance when considering technology in relation to literacy practices.

> In the case of literacy technologies, a transactional account tells us that technologies do not transform or determine literacies, nor could they ever be irrelevant to literacy practices. Instead, they are part of the continual reconstruction of literacies. As such, they too are constructed out of the evolving literacy practices. (Bruce, 1997, p. 303)

Through her exploration of the transactional stance, Bruce (1997) states that technology within a literacy setting participates in a transaction with other technologies, text, artifacts, physical spaces, and procedures present (Bruce, 1997). She also states that we cannot begin to understand the role of technology in literacy if we set it apart as "only a tool"; instead the picture is more one of multiple literacies, each employing a wide range of technologies that overlap with those of other literacies.

Semiotics and Critical Thinking

Through their work on semiotics (i.e. how signs work), Siegel and Carey (1989) propose the notion that thinking critically is a matter of reading signs. Our understanding of critical thinking is a construction of signs, which enables us to think critically about critical thinking itself (Harste, 1989). The role of language in critical thinking is that language allows individuals to name their world, it provides the signs that make thinking public, and it allows language users to distance themselves from their knowing; ideas can be set aside, looked at, thought about, and evaluated (Harste, 1989). Gestures, pictures, monuments, visual images, finger movements, anything deliberately and artificially employed as a sign is, logically, language (Dewey, 1933). Siegel and Carey (1989) refer back to Dewey's description of reflection as involving the movement forward to possible conclusions as well as the more traditional movement back to uncover the grounds or bases for some form of knowledge. The signifying function makes it possible for the simultaneous movement back and forth.

Ways of Reading Texts

In literacy development, reading and writing visual texts is an important skill for our students to learn (Moline, 1995). It is possible for information to come in pictures and in words, which is most apparent when considering types of texts that are encountered as students read across content areas. In science, math, and social studies alone, visual texts that combine images with words can range from diagrams to maps to charts to graphs to tables and to time lines.

Moline (1995, p. 7) states that how we read depends on our purpose for reading: a) We can read it front to back leaving nothing out, b) we can browse through the pictures, c) we can search selectively for facts, or d) we can scan, sample, skip, and skim. When we read for the story we start at the front of the book and read to the end of the story, since we want to read the whole text. It is possible to put the book down and return to reading it at a later time. In contrast to this is how we read selectively to locate specific information. A certain part of the text may be chosen, and it is possible to start at the front, the back, or in the middle, since it is dependent on where the information being sought might be located.

In some cases, we may read the same book at a later time for an entirely different purpose as we search for a particular piece of information. The benefits of showing our students how to utilize *selected reading* such as this

is that they can be shown how to skim and scan as they seek certain information contained in the text. Students can find a way of recomposing as they read the information in one format and attempt to write their own account of the information in a different format (Moline, 1995). When they do this, students learn to show relationships between information through the use of various sign systems (i.e. written, graphic, pictorial, numerical). Sometimes the sign systems utilized are conventional (picture of a chair) and other times they may be invented (semi-circle to depict the chair) as students seek the best way to represent important relationships.

Representing Information

In this section, the various support structures provided by a graphic presentation program, *Inspiration*, are used to illustrate how elementary students represented information about World War II. Four groups of 5-6 elementary students were each assigned a Preservice Teacher enrolled in a university reading methods class. Over the course of five weeks, the groups met weekly with the Preservice Teacher to discuss the novel that they were reading. As part of this process, the students would also complete other response activities (e.g. journal entries, character analyses, prediction charts) under the direction of the university student.

The different ways of reading discussed by Moline are reflected in this section in a cross-textual format. These students were reading various narrative and informational books related to World War II as they participated in an in-depth exploration of this topic. Initially, the elementary students read the novels in a front to back format and met weekly with the Preservice Teacher to talk about what they had read since their last meeting. As a culminating activity to the reading of the book, the elementary students were asked to use a template (Figure 1) found within the *Inspiration* software to consider the following questions: a) what immediately precipitated the event, b) causes leading toward the event, and c) factors fighting against the event. During this process cross-textual connections were made as the students returned to the various books (e.g. narrative and informational) they had been reading to seek out and verify particular information they wanted to include in the diagram.

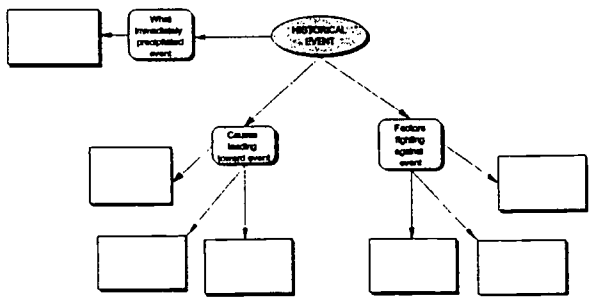

Figure 1: The *History Web 2* template used by students to discuss World War II.

Moline (1995) identifies certain elements of graphic design that should be considered when organizing information. Some of these elements include such features as highlighting, connecting, grouping, organizing and separating. The use of a graphic presentation program such as *Inspiration* serves as a model for students as it guides them into an awareness of design principles helpful in establishing relationships across related information. The following subsections illustrate how this program helped to scaffold students' organization of information through the various support structures found with the software. An important element to this process was the collaboration as the students and their preservice teacher worked and talked together about what information to include in the diagram. Students also actively sought available resources as they looked back for information in their novels as well as in the various informational books that were provided by their regular classroom teacher.

Highlighting

The use of color or shading is easily available to students through choices related to overall background, frame background, frame outline, text color, or through the use of bold, italics, or underlining. Another form of highlighting that the students found available was the embedding of a symbol within the frame itself. Students could select one already available in the graphic library or they could create their own. The following frame was used by one group to complement the text they had typed (Figure 2).

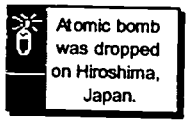

Figure 2. Example of a frame with an embedded symbol.

Organizing and Separating

In the template used by students in this activity, each of the main headings was divided into three subheadings, which helped to support students as they selected information for each of these areas (Figure 3). In addition, students could easily move frames by clicking and dragging or to enlarge frames to accommodate text.

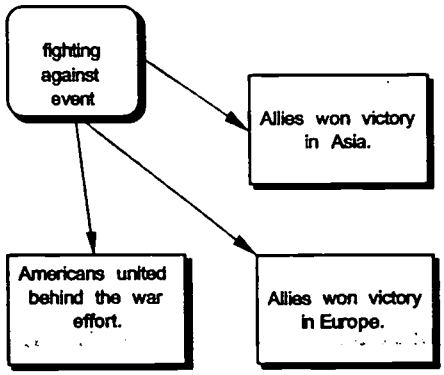

Figure 3. Organization of ideas facilitated through use of the template.

Grouping

Some groups also selected particular graphics as a way of extending thoughts within the different categories. The placement of each graphic would be grouped alongside the text frame that it best represented. The following example illustrates how one of the groups decided that a cause leading toward World War II was the bombing of Pearl Harbor by Japanese forces. As part of this information, the group went on a search through an available clip art CD-ROM so that they could include a flag of Japan (Figure 4).

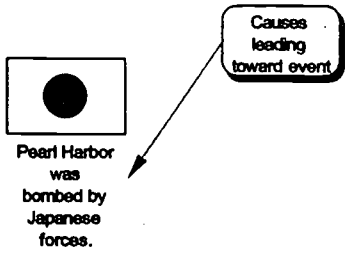

Figure 4. The use of grouping to illustrate a key piece of information.

Connecting

Basic templates are also available that have a preset structure with connecting arrows. In the previous examples, Figures 3 and 4 illustrate how arrows can link ideas within a major category. Another support feature relates to arrows automatically linking concepts through the use of *RapidFire*. When selected, this feature enables the writer to input ideas, hit the *Enter* key, and the information will automatically be connected to the main category heading in the diagram. To continue the writer simply has to type in a new idea, hit the *Return* key again, and the next idea will also be displayed.

Symbols

In addition to the design elements discussed by Moline, the students also utilized various symbols as a way to enhance or extend their thoughts. In Figure 5, the group selected a conventional symbol to represent the *Star of David* associated with the Jewish religion. This symbol also represented the main heading for their diagram.

Figure 5. Students' use of a symbol to enhance information in text frames.

A second group became intrigued with the use of flags to represent the different countries discussed in relation to the three subheadings. Overall, this group included flags to represent France, Great Britain, Germany, Italy, and Japan. One example of this group's work was shown in Figure 4. This same group also used multiple symbols to represent the topic of the *Great Depression* (Figure 6). To do so, the students selected a frowning face embedded in the text frame along with the graphic plate with a fork and knife on it. This group's example represents the use of conventional symbols to depict the feelings and experiences related to this era in American history. The same symbols standing alone might have entirely different meanings, but when grouped together with particular text a new level of meaning can be construed.

Figure 6. Use of multiple symbols to represent key ideas found within text frames.

Conclusions

As students sought to represent information, there was evidence of multiple overlapping literacies that assisted in providing essential support structures:

1. The elementary students and Preservice Teachers illustrate how technology is a literacy in itself as they worked to communicate their ideas with others in order to organize relationships between selected information. Bruce (1998/1999) has stated that the range of possibilities by which students learn (i.e. communication, inquiry, construction, and expression) are expanded as a result of these new tools.

2. The students and preservice teachers learned how to use different *sign systems*, they experimented with how these sign systems could take different forms and meanings, and they illustrated how technology can be used to support the use of multiple symbolic perspectives in writing. One point made by Moline (1995) is that children should be allowed to experiment with symbols and graphic relationships. These participants took advantage of the opportunity provided through use of the *Inspiration* program as a way to experiment with graphic and pictorial sign systems to enhance and extend particular relationships within categories.

3. In their reading and writing of texts, the students practiced use of varied *selection strategies* such as scanning, sampling, skipping, and skimming to think critically about what information to include in their diagram. They drew on their collective background knowledge and made cross-textual connections during this process. Students then utilized the recomposing strategy (Moline, 1995) to write their own account of the information.

4. Throughout this entire process, students utilized *critical thinking skills* as they made decisions concerning where to seek information, how much information to include, how to represent the information in a text format, and, in some cases, how to represent the information using other sign systems. In his work, Harste (1989) has stated that critical thinking...is what people do in an attempt to understand and act on what they see, read, hear, feel, etc. This process of critical thinking is exemplified in these fifth grade students' use of critical thinking to assist in their discussions and negotiations to represent information. One belief that Siegel and Carey (1989) hold relates to how understanding the way in which one thing signifies or stands for another is central to understanding reflection and, consequently, critical thinking.

Technology, multiple sign systems, selection strategies, and critical thinking were all overlapping literacies integral to the students' successful organization of information. The support structure provided by the *Inspiration* software program as well as the guidance offered by each Preservice Teacher helped students to construct new meanings and establish and verify relationships within the topic they were studying.

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Electronic Portfolios in Reading Methods Courses

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Abstract: The question of how to use technology effectively in the assessment of teacher candidates to demonstrate achievement of course objectives based on state certification standards led to the development of the electronic portfolio project in a small university teacher credential program. The process of preparing an electronic portfolio using computer and multimedia technology was examined from the perspective of twelve teacher candidates enrolled in a multiple subject reading methods classes. This research was a multiple case study in which qualitative data was obtained through open-ended interviews with the teacher candidates, the course professor, and the computer lab technician, as well as through analysis of the electronic portfolio product. Whether the electronic portfolio could be considered an effective tool for documenting teacher candidate performance and the achievement of course objectives was the primary question investigated in this study.

Preparing teachers for the 21st Century has been a concern for both political and educational leaders in this country during the last two decades. Public education reform was triggered a decade earlier by a report, A Nation at Risk, which claimed that U.S. students generally achieved at lower skill levels than those of other industrialized nations (National Commission on Excellence in Education, 1983). The Goals 2000: Educate America Act enacted by Congress in 1994, provided the framework for education reform for the 21st Century. This legislation called for the establishment of high-quality, internationally competitive content and performance standards for all students, promoted the use of technology to enable all students to achieve national goals, and emphasized the need for teacher education and professional development. Teachers were to be given the opportunity to acquire the knowledge and skills needed to instruct and prepare students for the next century. They were to have access to programs to improve professional skills and encouraged "to use emerging new methods, forms of assessment, and technologies" (The National Education Goals Panel, 1998).

The National Council for Accreditation of Teacher Education (NCATE) issued a report called "Technology and the New Professional Teacher: Preparing for the 21st Century Classroom" in 1997. The NCATE Task Force on Technology and Teacher Education recommended that NCATE stimulate more effective uses of technology in teacher education programs. NCATE challenged higher education to incorporate technology across the entire teacher education program, not just as a "computer literacy" class added to the existing curriculum. The NCATE Task Force stated that teacher education is in a time of transition, calling for experimentation and a new attitude that is "fearless in the use of technology." NCATE recommended that teacher education programs provide early experiences for their students and that technology be integrated into other education reform efforts. This study focused on the use of technology as a tool for performance assessment of teacher candidates who were enrolled in reading methods courses.

Three themes of significance for this study converged in recent education reform documents concerning the preparation of teachers for the 21st Century: teacher accountability to professional content and certification standards, performance-based authentic assessment for both teachers and students, and the need for educators to have technological expertise. The U.S. Department of Education's New Teacher's Guide stated: "The

highest academic standards, the best facilities, the strongest accountability measures, and the latest technology will do little good if we do not have a teaching force of the highest quality" (1997, p. 1). Providing well-prepared, technologically literate teachers who meet high professional standards has presented a challenge to pre-service teacher training institutions.

An electronic portfolio project was developed in a small university teacher preparation program to explore the possibilities of using computer technology to store artifacts as evidence of achievement of course objectives. The electronic portfolio project was the final assessment for multiple subjects credential candidates enrolled in reading methodology classes during two consecutive semesters. The portfolio provided an electronic framework for documenting the meeting of course criteria, as well as evidence of self-reflection and self-assessment. A portfolio template was designed around specific course objectives based on state standards. Students included artifacts created with computer text, graphics, sound, or video as evidence of meeting each course objective. Students provided a reflective cover sheet in which they defended their selections for each objective. The text of the reflective cover sheets was examined to gain insight into the student's perceptions.

The course syllabus, designed with emphasis on learning objectives based on current state certification standards, was prepared by the course professor prior to the electronic portfolio project. Two successive groups of teacher candidates were involved in the electronic portfolio project: the spring group of six students (Group I) and the fall group of six students (Group II). The electronic portfolio project was constantly evolving throughout both semesters due to revisions in state credential standards and technological considerations. The course syllabus was altered for Group II due to revised state standards and the implementation of the Reading Instruction Competency Assessment (RICA). In addition, an attempt was made to solve some of the technical problems that were experienced by Group I. Students of Group II were required to attend a computer training seminar at the beginning of the semester to prepare for the electronic portfolio project.

This study was guided by the following questions:

- What effect does incorporating technology have on the development of a portfolio for teacher candidates?
- To what extent does the electronic portfolio process encourage self-assessment and reflection?
- In what ways does the electronic portfolio provide evidence of student learning and achievement in line with course objectives?
- What are the problems encountered in putting together the portfolio electronically?
- What do students perceive as the strengths and/or weaknesses of creating a portfolio electronically?
- What are the course professor's perceptions concerning the effectiveness of the electronic portfolio as a tool for assessment?

Themes and patterns that emerged from interviews, portfolio reflections, and field records were examined through Ethnograph, a qualitative data software analysis program, in order to gather information concerning the teacher candidate's experience of collecting and preserving digital artifacts to be used as evidence of demonstrating competencies. The teacher candidate's perceptions of the strengths and weaknesses, as well as the software and hardware problems encountered during the electronic portfolio process, were explored. Written reflections within the electronic portfolio framework were examined to gain insight into the student's process of self-reflection and self-assessment. A computer literacy questionnaire was administered prior to the study in order to determine previous experience with and attitude toward technology. The researcher's process of creating templates in hypertext markup language (HTML) and Hyperstudio, a multimedia authoring software program, provided further insight into the design and implementation of the electronic portfolio project.

The results of this study were presented in an interactive multimedia format. Text, data, literature references, figures, tables, and graphic images were saved as HTML within a portfolio web. Qualitative data

generated from Ethnograph, including sample screens, were linked to an interactive table of contents. A Powerpoint presentation provided the framework for linking directly to the Hyperstudio and HTML portfolios of teacher candidates. The reading methods course objectives were linked to multimedia evidence within each student portfolio. Design templates, narratives, interview questions, the computer literacy questionnaire, and other research data were linked from menu options as well. Narratives were presented in audio format, as well as through interactive text.

The paper portfolio was an established means of assessment in the teaching training courses at this university before the electronic portfolio project began. When the course professor was asked why she implemented electronic portfolios into her class, she stated:

> I have worked for ten years to get faculty to infuse the use of technology into their courses and teach students to do so in productive ways--this is just another step along the way. The benefits for me? Not having to carry home 100 pounds of paper portfolios as I have been doing for several years--and seeing that students DO know how to use the technology in their classrooms when they leave--and understand not just the tech part--but the curricular uses. They have to get through the learning/uncomfortable stage before they can connect to the important parts of teaching them how to use technology in appropriate ways--and since the state does not require the computer course until 5th year--that puts all of us at a disadvantage because most do not know how to do anything but word processing and email--and now most know how to surf the net. This was my way of forcing them to learn what I wanted them to know even though I couldn't make them take the computer course.

Narratives from student interviews and portfolio reflections provided insight into the students' perceptions of the electronic portfolio process. Each individual's process varied in terms of approach to the project, the use of templates, working at home, using Hyperstudio or HTML, and the amount of time required for completing the electronic portfolio product. Technical processes varied in terms of how much technical support was needed, what technical skills were gained, and what problems were encountered. Student perceptions varied as to what they perceived as the purpose of the electronic portfolio, what attitudes they demonstrated concerning the process, how they compared electronic portfolios to paper portfolios, and how they felt concerning the use of technology in their future classrooms. Strengths and weaknesses were examined from the perspective of the participating students, as well as that of the course professor. Narratives from student interviews and portfolio cover sheets provided evidence of students' self-assessment and reflective practice. The course professor's discussion of how she evaluated students' portfolios provided further understanding of the potential for the electronic portfolio as a tool for assessment.

The process of collecting artifacts, selecting the work that best matched the course objective, determining how to get the evidence into digital format, and writing a cover sheet evaluation explaining personal achievement of each objective resulted in on-going self-assessment and self-reflection. Generally, students felt they were adequately able to present their artifacts as evidence of meeting course objectives based on standards within the electronic portfolio framework. Students demonstrated that they were guided by the course objectives throughout the electronic portfolio process and believed they were able to demonstrate achievement, competency, and proficiency in the course subject matter

The course objectives were specifically aimed at teaching reading and literacy. The artifacts included in the electronic portfolios included digitized versions of a variety of assignments from the reading methods class, as well as material from other teacher training courses. The course objectives successfully provided the students with the criteria for assessment in the electronic portfolio project. Upon the request of the course professor, Hyperstudio and HTML templates were designed to placed emphasis on the course objectives. Students provided self-reflective statements explaining the significance of the evidence they included in their portfolios. All twelve of the students in the study clearly indicated that they viewed the purpose of the electronic portfolio as a way of demonstrating that they had met the objectives.

In addition to providing evidence of meeting objectives, reflective teaching was considered one of the desired effects of the electronic portfolio project. Results of this research indicated that students were engaged in self-assessment and self-reflection as they described, explained, and defended the evidence they chose to include within the electronic portfolio framework. The student comments supported the researcher's belief that, not only were course objectives considered significant to students, but that the electronic portfolio project stimulated reflective practice:

1. It was a good way for the professor to make sure we had met all of the objectives.
2. I felt that the things in the course pretty well matched the objectives.
3. I liked reflecting on what I was doing and looking back and seeing how my assignments actually matched the objectives.
4. I understand the objectives better now that I have analyzed my work.
5. To think about once we had all this information, how are we actually going to apply it and how do the goals fit with the objectives?
6. I liked having to think about how everything was related in the class because I think a lot of times teachers give you their syllabus, you read the goals and objectives, and you never think about them again.
7. The objectives--when I read them--I thought--well I think this fits and I went back and I read my stuff again and then things that I'd written sometimes gave me a clue as to whether or not I really got the material.
8. I really felt that the electronic portfolio was a great way to organize evidence and artifacts.
9. The other purpose was to show that I had met the necessary objectives for the class and that I understood that I met the objectives.
10. As with any portfolio, I was in the position to review all my work and the initial objectives of the course.
11. If you clicked on course objectives you went to a cover page that had the objective written out and you could go to the explanation page or directly to each artifact.
12. Now I can see where the objective was to make me understand how we met everything.
13. I didn't think that I had met all the objectives...but I think after sitting down and looking at all the work I had done, that I realized that I did meet those objectives.
14. I could demonstrate competency by matching artifacts with competencies. I believe I was very careful in selecting my evidence material to be certain it was adequate--and I did a good job!

One student indicated that she felt the electronic portfolio "tied the class together and gave it a sense of closure." She said, "It was nice to see the purpose and made it personal." Another student explained that the process of reflection meant "critically examining your work to determine which way you have met the selected criteria, and how you can best example or highlight your work." She had described the process of developing the portfolio as "a constant self-assessment." Another student said that the class helped her feel prepared. She said, "I think sticking it all in one place and making connections between the objectives and the things helped me say, oh look I am prepared. Not only do I think I am, but I can tell you why."

In terms of assessment, students generally felt that the electronic portfolio was valid and useful. One student referred to the electronic portfolio as a "viable measure of assessment." Another student remarked, "I guess they [electronic portfolios] are a good form of assessment--rather than a test." Another student expressed her preference for portfolio assessment over studying for a test. The course professor indicated that she thought students selected artifacts more carefully in the electronic portfolio because they had to "go through the mechanics of digitizing their artifacts." In her assessment, she said she examined students' choices of artifacts, the explanations regarding their choices, and indications of personal reflection upon their learning.

The emphasis on self-assessment and self-reflection was considered more significant to this study than the effectiveness of the electronic portfolio as a tool of assessment in terms of course grading or evaluation. One student said, "In doing this I was able to assess my work and reflect upon how the work I completed met these objectives." Another student stated that she got more out of the electronic portfolio and enjoyed reflecting back on what she had accomplished. Another student thought that the electronic portfolio allowed her to think about what they were supposed to be gaining from the course and the purpose for every class, lecture, and activity.

Results indicated that the primary effect of incorporating technology into the portfolio process was that students gained knowledge of computers and technical skill with software

and hardware, particularly in graphics and multimedia. The total number of technical references found in interview transcriptions and within portfolio reflections provided further indication that students gained knowledge and understanding of technical processes and terminology used in computer multimedia. References to the digitizing of graphics through scanning appeared 80 times within the text of the student interviews and portfolio reflections. Eight students discussed scanning at least three times within their interviews. One student did not mention scanning, but she discussed another more complex graphic digitizing process, single frame video capture. All students participating in this study demonstrated a high level of technical understanding of the processes of digitizing their graphics. Table 1 shows the number of references to technology made by each student in interviews or within the portfolio cover sheet reflections.

Counts of References to Use of Technical Skills in Student Interviews and Portfolio Cover Sheets	#
Hyperstudio Software	89
HTML Web/Internet/E-Mail	54
Scanning/Video and Audio Capture	82
Cut/Paste/Transfer Files	50
Use of Graphics/Multimedia	36
Computer Formats and Compatibility	34
Creating Links/ Creating Interactive Buttons	27
Use of Zip Disk	20

Table 1. Counts of References to Use of Technical Skills

Most of the students were pleased with their final electronic portfolio product and were proud of their accomplishments. Students were able to personalize their portfolios, demonstrate creativity, and show their competencies electronically. Students demonstrated that they were able to self-assess and self-reflect on their learning within the electronic portfolio framework. The cover sheet reflections in which students defended their choice of artifacts placed the focus on meeting of specific course criteria. From the course professor's perceptions, the electronic portfolio project could be considered a viable means of assessment and an effective tool for self-reflection. She has continued to use the electronic portfolio in subsequent courses and indicated that students have learned to use technology successfully. Table 2 includes examples of positive student statements.

Positive Student Comments
I was really happy with the final product.
I feel competent.
It was easy, fun, simple, and I was successful at producing my own products.
It was really proud of it.
I feel more comfortable now.
It was pretty when it was all done.
I felt pretty good about my personal section.
I had fun fooling with Photoshop.
There's always a satisfaction in seeing something get built.
I'm proud of what I prepared and I will be using it as a tool.
Hyperstudio is nice to learn because I will be able to use it in the classroom.
Hyperstudio is kid friendly.
I can apply this knowledge to other areas.
I had fun.

The artistic thing was fun. I really enjoyed the drawing part.
Really good way to show off this is what I did.
That was a blast.
You can tell I got a little silly, but it was it was fun so I didn't care.
I did a good job!
The most exciting evidence is my electronic children's book.
It is so fun and fancy done electronically.
I was happy with the way things turned out.
I feel more prepared.
Another Ah-Ha for me.

Table 2. Student Comments Reflecting Positive Attitude

The primary strength of the electronic portfolio was that students could include multimedia artifacts in the form of graphics, audio, video, animation, as well as text, providing a more complete picture of their achievement. Students regarded the aesthetic qualities and the possibilities for personal creativity as strengths of the portfolio as well. The weaknesses included the demands on students' already busy schedules, the lack of previous experience with computers, the lack of time to learn the technology required for multimedia, and the need to work within the school computer lab setting. Problems included lack of time to work on the technology, difficulty with computer lab availability, broken computer equipment, cross-platform compatibility issues with home computers, technical difficulties with hardware and software, lack of computer skills, insufficient previous experience, and the need for considerable technical support.

One of the unexpected patterns that emerged from this study was the students' pleasure in being able to express themselves creatively, artistically, and aesthetically through technology. Previous to this study, the researcher believed that multimedia technology incorporated powerful tools for creativity, particularly in performance areas that are difficult to document through the traditional verbal linguistic modes of expression typically used in academic settings. Many students expressed emotions and attitudes indicating that they enjoyed being able to use multimedia means of expression. In addition, most students believed that these creative new technologies would allow them to enhance their future classroom instruction. The course professor felt that the attitude changed as students began to see the finished product. She said that students appeared to get excited about the portfolios, particularly in terms of being able to show their individuality. She said that they demonstrated personal pride in their final product and indicated that they appeared to see "the benefits of the

The NCATE technology task force suggested that perhaps the best way the teacher education faculty can inspire future teachers to use technology is "to cast themselves as learners and to experiment fearlessly in the applications of technology," making themselves "role models of lifelong learning." The task force stated that re-educating the existing teaching force would require extensive professional development, but that the problem would be compounded if future teachers were inadequately prepared to use new technology. All students who participated in the electronic portfolio project indicated that they had improved their technology skills and understanding significantly through this process. This study furthered understanding of the potential for infusing technology into teacher education through electronic portfolio assessment within a non-technology reading methods course.

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A Study of the Effectiveness of Using Computers to Assess the Phonic Knowledge of Preservice Teachers

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Abstract

For 25 years the undergraduate reading methods course for elementary and special education preservice teachers at the University of Idaho has included a strong phonics component. To demonstrate their grasp of phonic patterns, students have five chances to pass a written phonics test outside class time. The major drawbacks of this assessment led to the development of a self-scoring computerized version.

A study was conducted to address the following question: Does a computerized test with an auto-score feature enhance the assessment of students' knowledge of phonic content compared to an existing paper-and-pencil test? Students in two four-semester-credit, teaching reading in the elementary school courses formed the two treatment groups. The results indicated statistical, practical, and educational significance supporting the use of the computerized assessment as a valid, cost-effective replacement for the pencil-and-paper version.

Introduction

Background

Current research affirms the importance of phonic instruction in helping children become proficient readers. Developing readers must learn to recognize recurrent spelling patterns within words, including letter-sound regularities (Adams, Foorman, Lundberg, and Beeler, 1998), initial consonant patterns (onsets) and common vowel-consonant patterns (rimes, or phonograms) (Braunger and Lewis, 1997; Burns, Griffin, and Snow, 1999; Cunninghan, 2000; Moustafa and Maldonado-Colon, 1999; Snow, Burns, and Griffin, 1998). Most educators also agree that phonic knowledge is not about learning rules, but about learning common spelling patterns within syllables (Braunger and Lewis, 1997; Stahl, Duffy-Hester, and Stahl, 1998). Part of helping students become fluent readers is understanding both the content of phonics and various instructional approaches explicit and embedded, for presenting phonic patterns to students (Stahl, Duffy-Hester, and Stahl, 1998). The newly revised Standards for Reading Professionals (International Reading Association, 1998) states that elementary school teachers must be able to:

- 6.1 teach students to monitor their own word identification through the use of syntactic, semantic, and grapho-phonic relations
- 6.2 use phonics to teach students to use their knowledge of letter/sound correspondence to identify sounds in the construction of meaning

Given these standards, it is appropriate for preservice teachers to demonstrate that they understand both the content of phonics and methods for helping their students learn and use phonics to read fluently.

Current Program

For 25 years the undergraduate reading methods course for elementary and special education preservice teachers at the University of Idaho has included a strong phonics component. Students learn phoneme-grapheme correspondences and phonic patterns, including consonant blends, digraphs and silent letters, and common vowel patterns. The vowel patterns are clustered into five distinct groups--r-controlled, diphthongs, regular vowel patterns (au, aw, ay, ea (e), ei (a), ew, ey, oo, ui, ue), predictable patterns (CVC, CVCE, CVVC, CV), and variant predictable patterns (all, ind, old, igh[t]). This scheme addresses twenty common vowel phonemes and their spelling patterns. Students learn both analytic and synthetic methods for teaching phonics, plus ways to teach whole (sight) words,

structural analysis, and use of context to decode. During five, two-hour class periods, the preservice teachers receive information sheets and direct instruction delineating the various phonic patterns, guided practice exercises to help them identify phonic patterns within syllables within words, and individual help upon request. They discover that their ability to quickly recognize phonic patterns helps them evaluate children's use of phonics when reading aloud or in their writings. They can determine which phonic patterns children know well, know in some contexts but not others, or do not recognize. Since no one teaching method is best for all students (Braunger and Lewis, 1997; Pearson, 1998), such learner-centered, diagnostic teaching prepares them to meet the diverse needs of all learners.

To demonstrate their grasp of phonic patterns, students have five chances to pass a phonics test outside class time. The phonics test is comprised of 10 paper and pencil forms, each with a 50 running word text; half the texts are from second grade basal stories and half are from published children's books. The number of unique words within each passage varies from 32 to 38 words. The same ten test items with variant text passages are on each of the 10 test forms, yielding 10 equivalent-form tests.

Each item is worth 3 points, for a total possible score of 30 points. For example, under the item, "List all words containing r-controlled vowel patterns", students might select from the text words like February, early, awkward, organized, and steer. According to the scoring rubric, students receive partial credit if their answer is incomplete or includes incorrect words. Percentage correct is determined based upon the total number of correct words selected for an item, minus the number of correct words omitted and/or incorrect words included. If an item response is 80% correct, it earns 2 points; 70% earns a single point. Items with few correct words possible earn either 3 points or 0 points, since the base (denominator) is small. Students' single highest score becomes the points they receive for course grading purposes.

To take a test, students in the paper-and-pencil group went to the College of Education Instructional Materials and Technology Center during regular work hours, which included two evenings and four hours on Saturday. They spun a dial to select one of the ten test forms; if they had previously taken a test form, they spun again until they landed on a new form. The student would sit at a table across from the front desk (for proctoring purposes) and take the test, closed-book. There was no time limit imposed, but most students completed a test in less than 45 minutes. The test was placed in a folder for scoring that evening or the next day. Students' completed tests were kept in individual folders, which they could check out when they wanted to study from their previous tests. At this time they could study alone or with other students in the class, even if the peer had not taken that particular test. A student could stop taking the tests any time he/she decided that the highest score earned to date (from 30 possible points) was satisfactory. Most students, however, took the test at least four times. Students could take up to five forms of the test any time during a five week period, but no form more than once.

Issues and Concerns

Despite our best efforts, there were several major drawbacks to assessing students' knowledge of phonic patterns in this manner. One, the turn-around time between taking a test and receiving the scored form for study was, at a minimum, 24 hours, and typically several days. Two, students were often unable to figure out why they had missed an item, so the instructor ended up putting many hours into individual instruction--valuable, but redundant and time-consuming. Three, resources for hiring and training aides to score the tests were limited and growing harder to find. Four, scorer reliability was a problem; although the aides had scoring keys, it was easy to err, leading students to believe their answers were incorrect when they were not, and vice versa. Finally, it was all but impossible to maintain a current record on how well students were doing as a class, which would have helped the instructor examine teaching practices in light of student learning.

Several options were considered given these four constraints. Clearly, the option that emerged with the highest potential was the creation of a computerized test with an accompanying scoring feature which could reduce administration and scoring time, increase scorer reliability, significantly decrease turn-around time, and standardize results. The main concern and subsequent question for this study, then, was whether such a test would compare favorably to its pencil-and-paper counterpart to determine student achievement related to learning phonics content.

The Study

Research Question

This study addressed the following question: Does a computerized test with an auto-score feature enhance the assessment of students' knowledge of phonic content compared to an existing paper-and-pencil test? Furthermore, it is of interest to the researchers as to whether or not this computerized format increase student achievement as a result of immediacy and clarity of feedback.

Method

Students in a four-semester-credit, first course *in teaching reading in the elementary school* formed the two treatment groups. Group 1, the paper and pencil group with 52 students, was enrolled during the Fall, 1997 semester. Group 2, the computer group of 53 students, was enrolled in the Fall, 1998 semester. The composition of the two groups was comparable in gender mix, overall grade point average, and age. Most of the students were in their junior year of a four-year teacher preparation program. The previously described pencil-and-paper assessment was modified for use on the computer, with the addition of a scoring feature. A program was written and refined until students could take a phonics test within 30 minutes. The 10 computerized phonics tests were identical in format and content to the paper and pencil tests. The screen format was slightly different than the paper and pencil version, as one would expect.

Each student had a personal user name and password to access just her/his own records. A sign-up sheet permitted them to reserve a 45 minute time slot for taking a new test, or reviewing previously taken tests. The computer program randomly selected a test form not previously taken by the student. For the computer test, the 50 word passages were arrayed at the top of the screen; the unique passage words were also listed alphabetically down a left column. To respond, students highlighted the word(s) they believed contained the phonic pattern requested, then clicked on the on-screen "select" button; if they wanted to remove a word from their answer list, they highlighted it and clicked on the on-screen "delete" button. Students could select the items in any order, and return to previously answered items. When finished, the students clicked on the "score the test" button and their responses were permanently recorded (the scoring feature was designed to mirror the scoring rubric used for the paper-and-pencil test, so that the scoring was the same for Group 1 and Group 2 tests). Students received a total score, including an item by item breakdown of points earned. For each item, they were shown the total possible words correct, words they listed that were correct, and words they listed that were incorrect. After taking five tests, students were blocked from taking additional tests (similar to the paper-and-pencil testing). An electronic record was kept for every student, listing which of the 10 test forms they took, when, and how quickly. When reviewing previously taken tests, students could have course materials in hand to learn why particular answers earned less than 3 points. They could even review together during this study phase.

Both treatment groups received instruction from the same instructor using identical materials, classification system for phonics, and time frame. Students had the same number of weeks to complete the phonics assessment outside class. Upon completion of their studies, Group 1 completed the paper-and-pencil test followed by test scoring. The following fall semester, Group 2 received instruction and completed their phonics assessment via the computers in a proctored environment. In order to ensure standardization of test scoring procedures in this study, Group 1 test responses were entered into the computer as if each student had taken the computerized form of the phonics test. The result was that the scores for Groups 1 and 2 were tallied using a common metric, thereby reducing threats to internal and external validity of the comparison while meeting the necessary constraints for statistical analysis.

Results

An ANOVA test was used to test for statistically significant differences between the paper and pencil and computerized test groups in highest mean score on the phonics tests. No significant difference was determined; students taking the paper and pencil form had a group mean score of 19.38 correct out of 30 points possible (s.d.=5.31), while the computer group's mean score was 19.43, s.d.=5.66 ($F=3.28$; $p>.833$). Statistically the forms were found to be of equivalent difficulty. They used the same ten items, in the same order. Only the 50 word texts varied, and they were taken from basal and literature selections appropriate for second grade developing readers. Group mean scores ranged from 12.37 on Form VIII to 17.56 on Form III; seven of the test forms recorded group mean scores in the 14-15 point range. Post hoc analyses also suggested that the two groups of students did not vary

significantly in number of tests taken (1 to 5 trials). Students in the paper and pencil group took the phonics test an average of 4.4 times; the computerized group took the test an average of 4.0 times.

Based on these data, the computerized test version appeared to be no more advantageous in terms of students learning phonic patterns than taking the same tests in paper and pencil form. The practical significance of the computer format was the overall cost-effectiveness in terms of administration, scoring, and scorer reliability. The computer also reduced substantially the cost of test administration. In terms of educational significance, the time devoted to re-teaching individual students dropped substantially now that they were receiving more feedback about their performance immediately after completing a test. They knew the total number of correct words for an item--information they typically requested for the in-class phonic practice sheets. They also knew which words they listed were correct and which were incorrect, leaving them to study the passages for the correct words omitted in their original answer. Fewer students requested individual instruction, and did so closer to the time when they were approaching their last test trial or two. Then their questions often were about a feature of a phonic pattern, or about particular words that remained confusing to them.

This research continues beyond the results reported here. Three more semesters of students have taken the same phonics tests via computer and, according to our ANOVA analysis of their mean scores, they do not differ significantly from the original paper and pencil treatment group's test performance. Likewise, several years of collecting students' phonics tests scores in the paper-and-pencil form mirror the comparison group's mean phonics test score. A small number of students, perhaps 15-20 percent, score 26 points or higher. About the same percentage of students score below 20 points, leaving the majority of students earning from 20 to 25 points out of 30 points possible. It also appears that, when repeatedly taking the test, there is clear improvement with increase of trials--often across three trials. However, a plateau effect for many students seems to occur around 18-21 points. If they remain confused about features of particular phonic patterns, students at these times are open to instruction and often their next test score jumps several points. These observations need to be examined more closely and systematically; future studies need to include an item analysis to determine which of the ten phonic categories are proving easiest to learn, and which most difficult. An examination of test scores by item suggests that the predicable patterns CVC, CVCE, CVVC, and CV are difficult because some students struggle to remember short and long vowel sounds, especially when local dialect makes some short vowels sound like long vowel sounds (eg. the /i/ in ring, or the /a/ in bang). Students also struggle to identify vowel patterns that are irregular, such as the /a/ in wander or the /ou/ in famous. The other eight vowel and consonant patterns do not seem as difficult for students to learn well.

In summary, this study compared administering a paper and pencil test of phonic knowledge to preservice teachers with the same test presented via computer. Group mean test scores were comparable, as were number of test attempts. While no improvement in student learning the patterns was evident in these data, significant improvements in cost-effectiveness, scoring accuracy, and scoring objectivity were observed. Future study of this procedure for assessing teachers' knowledge of phonic content may lead to an economical, accessible, and reliable way for preservice and practicing teachers to check their knowledge of phonics as part of their demonstration of content knowledge necessary to effectively teach all children to read.

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Empowering Masters Students to Become Researchers: An Australian Case Study

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Abstract: This paper describes a case study in which Masters students at an Australian University, undertaking a subject on Research Issues in Technology and Language Learning (TELL), were involved in the interactive simulation of applying for a small Australian Research Council (ARC) grant in the area of TELL. Through participating in this research simulation students became aware of current research methodologies and issues in the field of TELL, as well as becoming conversant in a meaningful way with the relevant literature of this area. Students gained first class experience as potential candidates and assessors of one of Australia's major research grant schemes. The paper discusses the theoretical framework, method of implementation, outcomes and evaluation of using this type of learning experience in a Masters of Arts in Applied Linguistics.

1. Introduction

Nuthall (1999: 245) discusses that *having knowledge is as much a process of engaging in acquiring, sorting, connecting, inferring, reorganizing, using and reusing information as it is possessing some kind of knowledge object.* Somehow, in any learning experience the object and procedural knowledge can be present. In order to make more specific these terms, let's think for a minute about my own writing of this paper, a learning experience, in which I am in the first place using my initial object knowledge to write a paper to share with my audience. I am involved in the process of writing the paper and editing it to take into consideration other people's views. As a result of the process, my object knowledge is being changed as I am adding new knowledge or modifying the construction of what I already know notionally as well as about the writing process of papers in itself. The process is taking me to find out where I need to research more in the discipline knowledge to make my point more effectively. Both types of knowledge complement each other and are interrelated by the feedback, which is received from other people commenting on a draft of this paper, or myself providing feedback to myself as I read through different section and drafts of this paper. The feedback makes me think and reflect on what needs to be deleted, changed or improved at different levels to communicate my message clearly to my audience. So what is more important, the object knowledge or the procedural knowledge?

Many teacher education programs in the area of Applied Linguistics seem to have a strong emphasis on students acquiring the object knowledge of the area of study, as they are strongly influenced by teacher-centered models of instruction. According to Johnson (1999:4), "*many courses have followed a traditional model, in which the lecturer provides pre-digested course content, in the form of lectures, and all students submit their version of the same assignment*". In these traditional models the lecturer is still considered to possess some kind of knowledge object [1]that can be passed to the students and the main focus is on object knowledge. These models of teacher education fail to place learners in authentic real-life situations for active learning to take place[2]. They miss the opportunity of creating learning environments capable of engaging students in the acquisition of procedural knowledge as well as object knowledge, to allow them to become part of the research community not only as consumers but also producers. These models of teaching in undergraduate and postgraduate Computer Assisted Language Learning (CALL) programs foster passivity as students are seldom challenged to take responsibility over their own learning[3]. There is a need to encourage more autonomous learning and self-reflection on learning in teacher education, in the same way that there is a need to advance the research agenda in the effective design and use of CALL[4]. We need reflective autonomous learners who will be able to contribute to our field with their own research. But can our current Master students contribute actively to the advancement of the research agenda in the area of CALL or other areas when they finish their teacher education? And if not, what is stopping them?

[1] Lemke 1990
[2] Kolb 1984
[3] Johnson 1999
[4] Chapelle, 1997, Levy, 1997

The research performance of Masters students has been said to be affected by their lack of confidence and security, due to their limited understanding of scholarly research and writing, as well as never having had a real audience for their academic work, which has been read only by their instructor or lecturer. Moreover, writing at a scholarly level has been identified as creating anxiety and insecurity as in general postgraduate students have very little understanding of the academic research genre [5] and are afraid of academic audiences.

In recent years, we have witnessed innovations in teacher training influenced by learner-centered approaches to attempt to develop graduate and postgraduate students into researchers placing more importance on procedural knowledge[6]. The research reported here was motivated by the desire to explore the implications of using the notion of knowledge as a process as well as an object to design a Masters course in Research Issues in Technology and Language Learning. This would mean that as much attention would be paid to provide the students with the relevant and critical knowledge of the area of study (the knowledge as object), as to provide them with the learning environments necessary to develop and acquire a repertoire of research, writing and publishing skills to be able to participate and contribute to the research body of the area (the procedural knowledge). In order to achieve this, the course was designed to include more real life research simulations to promote the learning of research as a process and as an object of study. It was envisaged that this type of training would also contribute to increase the levels of confidence and security that postgraduate students might experience when considering stepping into the real research community for the first time after completing their studies in a supportive academic environment. This paper is an attempt to empower postgraduate students to become future researchers conversant with the conceptual and procedural knowledge of research by involving them in a research simulation to apply for a competitive small ARC grant.

2. The Small ARC (Australian Research Council) grant: How does it work?

The Australian Research Council is one of Australia's major research grant schemes. In order for a candidate to be successful s/he has to go through a very competitive process made of five stages:

A. **Submission Stage**. The candidate writes the application and submits it to the selection board of the ARC.
B. **The Cull Stage.** The submission goes to a general panel of assessors which makes a judgement about whether the submission is worth more detailed consideration by assessors who are expert in the field of the submission.
C. **Assessment Stage**. If the ARC board selects the application of a candidate, then it would be sent to three assessors in Australia and/or overseas, who have to write an assessment report commenting on the quality of the different aspects of the research proposal and research ability of the candidate/s, which are submitted to the ARC selection board.
D. **Rejoinder Stage.** The ARC board sends the confidential assessors' reports to the candidate to allow her/him to reply to them with a rejoinder. The reply is sent to the board for its consideration.
E. **Final Selection Stage.** The ARC board makes the final selection of proposals to be granted by taking into consideration the reports from the assessors and the response of the candidate to those reports.

3. The Small ARC grant simulation

3.1. Aims of the Process

Research can be a satisfying and stimulating experience for many people with a trained and inquiring mind[7]. Researchers contribute to the existing body of knowledge, to solve problems and expand knowledge[8] by using methodical processes to discover non-trivial facts and insights [9], and conducting the

[5] Crawford 1999
[6] Crawford, 1999; Johnson, 1999; Mumma, Bentley, & Walker, 1999; Smith & Mandlebaum; 1999
[7] Howard & Sharp 1983
[8] Drew (1980).
[9] Howard & Sharp, 1983

process with a systematic approach [10]. This learning experience aims to help students to increase their research skills, ability and confidence, and requires them to be creative, critical, methodical, communicative and reflective, and to become aware of academic genres and audiences. The use of this learning environment has been influenced by social constructivism [11], as it is trying to encourage personal learning through using a meaningful social context to create an active learning environment[12]. It aims to promote the development of critical knowledge and skills in students in the areas of TELL and CALL, as well as to create a direct relationship between what is learned in the classroom and what is needed outside the classroom, one of the most valuable principles of the situated learning approach[13]. Furthermore, it encourages experiential learning [14] through exposing students to conceptual and procedural knowledge of research in a simulated real academic situation. In summary, the aims of this learning experience are:

- to help students to learn about what makes a good research proposal in a meaningful context;
- to help students to learn how to develop a sound research grant or proposal through participating in a supportive environment;
- to increase their ability to understand better the research process[15] as they are doing it;
- to become critical about their own research proposal and other students' research proposals through conversational and reflective experiences;
- to promote awareness of an academic audience by having a real audience;
- to increase the postgraduate student's confidence and security as potential researchers by having a supportive environment for their first attempt at a grant submission;
- to increase their conceptual knowledge in the area of Technology and Language Learning through their involvement in the process of developing a grant proposal.

3.2. The Participants

There were fourteen students participating in this simulation with a diverse cultural and linguistic background including Australian, British, Chinese, Korean, Samoan and Spanish. A total of 80% of the class was made up of females. Their ages ranged between 26 and 55, eighty per cent of the class being between the age of 36 and 55. The majority of them were experienced teachers in the areas of English as Second Language (ESL) and/or Language Other Than English (LOTE). None of them have had previous knowledge of the area of Technology and Language Learning, and most of them did not have prior experience using computers to enhance language learning and teaching. The research background and experience of the participants was very limited.

3.3. The Process

A. Preparation Stage

(a) **In class (in small groups):** Students examined the guidelines provided by the ARC to write a small ARC grant proposal. Two samples of small ARC proposals were examined for the students to become familiar with the structure and to identify what were the good elements in each of them and the elements that could be improved. Out of this initial analyses the class as whole ended up writing a list of the characteristic of a good research proposal, which at the same time became the evaluation criteria to assess the research grant proposal that the students were going to elaborate.

(b) **Outside class (individual):** Students were given the assessors reports attached to one of the successful small ARC samples analysed in class. They had to write a response letter dealing constructively with the relevant and irrelevant comments made by the assessors.

(c) **In class (in small groups):** Students shared their response letters and tried to identify the strengths and weakness of each letter. Then they created a single response letter containing the best elements of each member in the group. Each group shared their outcomes with the rest of the class.

[10] Bell, 1993
[11] Vygotsky, 1978
[12] Bandura, 1986
[13] Anderson, Reder & Simon, 1996
[14] kolb, 1984
[15] Bouma, 1996

B. **Developmental Stage:** Each student developed a small ARC grant proposal on a topic of her/his interest and submitted four copies to the lecturer. The lecturer kept one copy and gave the others to the three blind assessors of that proposal.

C. **Evaluating Stage:** The assessors read the proposal and wrote a report commenting on the research question/s, critical analysis of the literature and references, and evaluation of the methodology and data collection. Their aim as assessors was to provide constructive and coherent feedback to the author on the strengths and pitfalls of their research proposal. The assessor reports were given to the lecturer who gave them to the author of the proposal to keep the refereeing process anonymous.

D. **Reflective and Responsive Stage:** The author of the proposal wrote in a clear and coherent way a rejoinder to the assessors' reports or evaluations, addressing the different issues raised in the reports in a constructive way and dealing with irrelevant comments effectively. S/he took this opportunity to reflect on the aims and content of her/his initial proposal and improve the quality of the initial proposal prepared by the candidate. The rejoinder was submitted to the lecturer, who took the role of the ARC board.

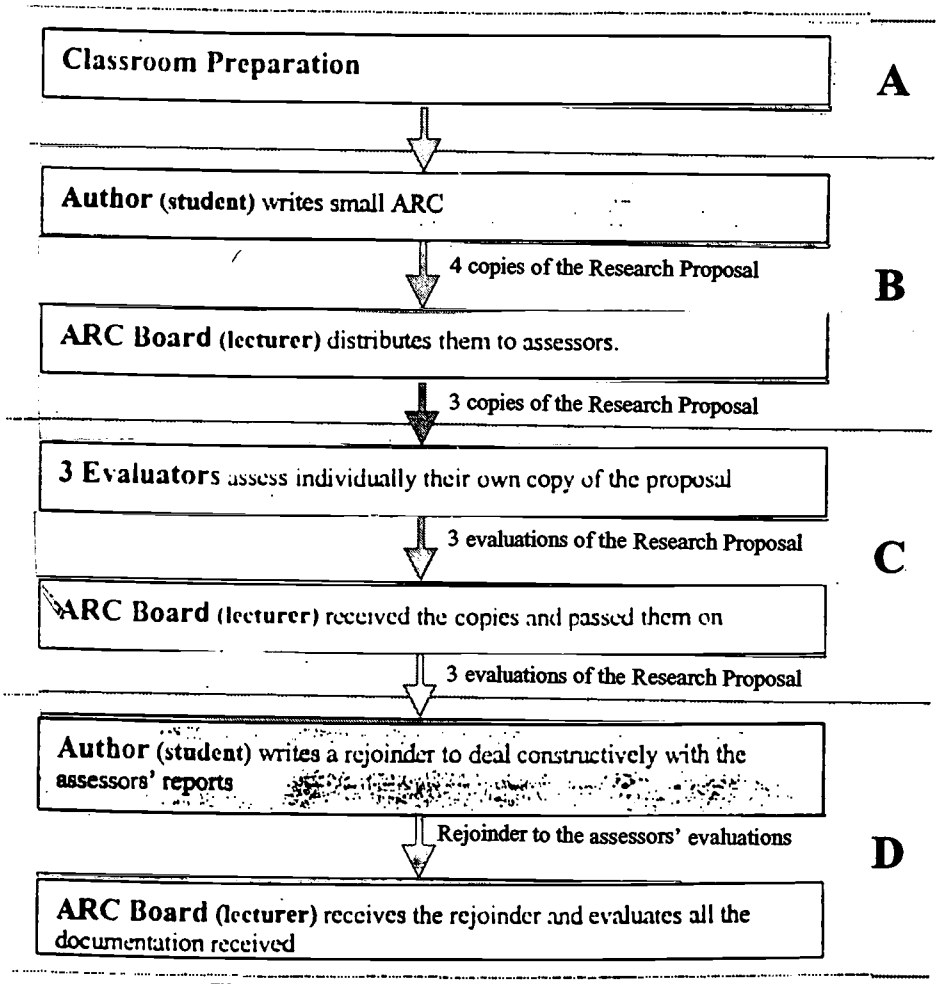

Figure 1: The ARC Grant Simulation Process

3.4. The Learning Outcomes

The Small ARC research learning experience conducted was evaluated based on the results of a student questionnaire, feedback obtained from informal conversations with the participants, lecturer's observations of the process, as well as the analysis of the different documents generated by the students as a result of this research simulation. Due to the lack of space in this paper, only the results of the questionnaires, to which ten participants replied, will be discussed in depth. The questionnaire aimed to gather information from the

participants on their research skills, their participation in the small ARC simulation, their current levels of confidence as researchers in the area of Technology and Language Learning, the place and nature of this item in the course, and the general participant profile. There were ten responses to the questionnaire. Most of the student benefited in one way or another from participating in this learning experience as represented in the following table.

What did you learn from preparing your own small ARC proposal?	%[16]
Gathering information on current research issues relevant to TELL.	100%
Stating a clear research question for a small ARC proposal.	70%
Selecting the best research methodology and instruments for a particular research proposal.	70%
Realizing the importance of good research design and timeline.	70%
Using electronic media to search for relevant literature.	60%
Elaborating a current and relevant literature review to support a research proposal.	60%
Ways of dealing constructively with the research limitations of a research proposal.	60%
Elaborating a research budget.	50%

In addition the participants reported to have benefited from having assessed constructively the research proposals of other candidates. It is worthwhile to notice how all the participants reported that they learnt to be critical towards other people's research and almost all of them to recognize the elements of a good research proposal as a result of this learning experience, as reported in this table.

What did you learn from assessing constructively the ARC proposals of other candidates?	%[17]
To be critical about other people's research.	100%
To recognize the different elements that make a good research proposal.	90%
To find out inconsistencies in the research methodology and instruments of a proposal.	80%
To assess the impact that using clear and correct language has in a research proposal.	70%
To analyse critically the theoretical framework of a research project.	70%
To determine the soundness of a research proposal.	60%
To evaluate the soundness and appropriateness of the research question/s.	60%
To see the importance of using a consistent referencing style.	60%

Replying to the assessors' reports helped some students to become more critical about literature reviews, as well as to adopt the useful suggestions received about their initial proposal, and to gain experience in having to deal with some of the suggestions from assessors with whom they disagree. This experience seemed to help most of them to see things from different perspectives (candidate versus assessor), and to learn that the quality of a proposal can be improved by the comments received from the assessors. I would like to add, based on my own observations of the process and the documentation generated by the participants, that through their involvement in this research process students improved their conceptual and procedural knowledge of research in order to put good grant proposals in place with a sound methodology and research design. Most important of all is the impact that this learning experience has had on the student's confidence as a researcher.

Confidence as a researcher in the area of Technology and Language Learning	**Average**[18]
To apply for a Small ARC grant **before** taking part in the subject (1 to 10 being best)	2
To apply for a Small ARC grant after taking part in the subject **now** (1 to 10 being best)	8.5
In ability as a researcher **before** taking part in the subject (1 to 10 being best)	3.5
In ability as a researcher **now** (1 to 10 being best)	8.5

Their confidence and security in their ability as researchers improved substantially after having participated in this learning experience during one semester. The majority of students thought that participating in this simulation should be a component of the subject ~~on~~ *Research Issues in Technology and Language*

[16] Percentage based on a total of 10 participants.

[17] Percentage based on a total of 10 participants.

[18] Based on 10 participants.

Learning, because it can be useful for their future careers and provided them with a good research experience in a safe environment. For two of the students, time was too limited to concentrate on this simulation, as there was already enough new content in the subject without the research component. Some of the students mentioned that some of the aspects they liked about the process were having to write a grant application, gaining experience that could help them to avoid any problems in the future if applying for a grant, and gaining confidence. One of the students reported that s/he found stressful having to read negative things and felt s/he did not have enough time to complete the process. Some of the suggestions made by students to improve the process were: that no candidates names should be mentioned on the research proposals, and that the lecturer's comments on the proposal should be received at the same time as the comments from the three assessors.

4. Conclusion

The ARC grant research learning simulation described in this paper has promoted experiential learning through encouraging students to become familiar with the process and concepts of research in the area of Technology and Language Learning. As a result of participating in this learning experience, their research skills and knowledge have benefited, becoming more critical, methodical, constructive, communicative, and reflective, as well as aware of academic genres and audiences. It helped them to expand their knowledge of research methodologies, design, and instrumentation, but most important of all was that their confidence and security in their ability as researchers increased dramatically as a result of taking part in this experience. This paper advocates the importance of including procedural knowledge and real life learning simulations as part of postgraduate research programs. In this way, we educators will be able to empower our students to become potential researchers able to contribute to the field with confidence and in a constructive manner, and one day being able to add to the object knowledge of us, their educators.

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Delivering a Distance Education Graduate and Professional Development Program: Integrating Multiple Technologies

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Abstract: This paper describes a three-year collaborative university and public school distance education ESL endorsement program designed to lead to a Masters degree for 450 educators in one rural and five urban school districts. The program uses multiple technologies integrated into an instructional and curricular design plan for 8 graduate level courses. The paper also describes the initial evaluation results gathered during the first year of implementation.

Introduction

With the increasing population and urbanization of city centers within Utah, the complexion of Utah's children is rapidly changing, mirroring the changes taking place throughout the United States. By the year 2005, one of every three school children in the United States will have a primary or home language other than English. These population changes created a growing demand for professional development programs to prepare educators to meet the specific needs of Utah's children. School administrators and teachers in the urban school districts surrounding the capital city of Salt Lake City became more demanding of local teacher education programs to provide quality and large scale professional development programs for the preparation of teachers of ESL (English as a Second Language) students. However, the ESL preparation programs at institutions like the University of Utah were very small endeavors incapable of producing no more that a few ESL teachers. Out of such a dilemma came a unique and innovative partnership among the five urban school districts and the University of Utah. Working together, a collaborative team created and implemented the Distance Education ESL Endorsement Program (DEEEP). Consistent with calls from the literature, "distance education has the capacity to deliver instruction to a wide array of diverse populations, but that capacity will require partnerships among institutions of higher education, and . . . sectors of the community" (Parker, 1997, p.9).

Integrating distance education design principles (Garrison, 1990 and Parker, 1997), team members created a program in which technology strategies followed pedagogical and content goals. Taking a distance education approach in an urban setting provided access for a large number of teachers to a quality university program and a more adult centered approach (Crotty, 1994). The program is organized into a three-year format, with each year using distance

education strategies (Collis, 1997). Years One and Three integrate multiple technological delivery systems into the instructional design plan.

The Program

The purpose of DEEEP is to prepare teachers to address the needs of all students in their classrooms. The program assists teachers in working specifically with children learning English as their second language. The overall goal was to develop a high quality program delivered to a large number of educators in an economical manner. The implementation objectives were: 1) to use distance education strategies to deliver an ESL endorsement program on-site to the schools and 2) use a collaborative model in program design, course development, program management, and decision-making. The brief program description below highlights these two implementation objectives.

ESL Endorsement Program: The program consists of eight graduate level courses (26 semester credit hours). These courses are delivered to different teaching sites in one rural and five urban school districts. The DEEEP school districts comprise about 75% of Utah's public school population. There are three courses in Year One delivered using satellite technology and on-site facilitators. Because of the heavy theoretical base of the courses in Year Two, the program developers decided that these courses should be delivered using on-site instruction provided by clinical faculty members from the Department of Linguistics. Year Three consists of three courses delivered to the participants through video-based instruction, web-enhanced curriculum strategies, and on-site facilitators.

Collaborative Model

In operation since 1989, the Utah Education Consortium (UEC) is funded through a joint effort by the Graduate School of Education, the Utah State Office of Education(USOE) and the participating school districts (Davis, Granite, Jordan, Murray, and Salt Lake). An executive committee governs the Consortium consisting of district superintendents and associate superintendents, coordinated from USOE, the dean and associate deans of the Graduate School of Education, and each department chair.

During the past several years, the executive committee of the Utah Education Consortium explored possibilities and guided efforts to develop an ESL program for their educators. As a result, an ESL Task Force was formed and composed of the five district bilingual/ESL coordinators, University of Utah professors from the Departments of Educational Studies, Linguistics and Special Education Program, and key university administrators. From September 1997 through June 1998, Task Force members created DEEEP by planning and overseeing the implementation of all logistical tasks, program design, course development, contract negotiations, personnel selections, and participant recruitment.

Integration of Multiple Technologies

The courses and instructional strategies were designed around several general principles. First, the courses needed to reflect the quality of university graduate level courses. Second, the

courses needed to provide educators with knowledge and strategies relevant for K-12 classroom teachers. Third, the distance education strategies should allow course instructors to teach high quality content to a large number of participants while providing consistent and manageable content and course organization. Fourth, the pedagogy should lead the technology decisions. The resulting program design provided a varied and integrated use of technology and instructional strategies. The program content and distance education delivery strategies are organized into a three-year format based on the four program design principles. The description outlines the program year by year. Additionally, a very brief section describes the program's web site.

Year One

The program participants are taught three courses. These courses are Multicultural Education, Bilingual/Bicultural Education, and Second Language Learner Methods. Each course provides 3 semester credit hours. The courses are delivered to 17 teaching sites in six school districts. Approximately 20-25 students and one on-site facilitator participate at each teaching site. Two courses (Multicultural Education and Bilingual/Bicultural Education) are taught consecutively during fall semester. Each course is 7 ½ weeks long, taught two days/week from 4:30 - 7:30 p.m. Spring semester is host to the Methods course taught one day per week for three hours. Year One courses were taught to 240 students during the 1998-99 school year. Year One courses were repeated to a new group of students during the 1999-00 school year.

Each teaching site is equipped with a satellite dish and receiver box. During the 1998-99 school year, the Year One courses were delivered through the Educational Management Group (EMG) Corporation. EMG was an educationally oriented technology company dedicated to producing and broadcasting educational programs to public schools. Because of corporate restructuring, Pearsons Publishing Corporation obtained EMG and dissolved it. After extensive contract negotiations between the University of Utah, EMG and Pearson representatives, an amended contract with Pearsons provided only satellite transmission of live broadcasts by the EchoStar Corporation. DEEEP tapes, for the Year One courses (1999-00) would be distributed to the teaching sites.

From January 1998 through May 1999, EMG curriculum designers and videographers worked closely with the course professors to create 17 Utah-based videos for a wide range Year One topics. Most of the videos are approximately 20-35 minutes in length. Course professors developed video scripts and gave final editing approval.

A 3-credit semester course at the University of Utah is composed of approximately 33 "contact hours" (university instructor and student contact). The Year One DEEEP courses consist of 10 hours of live professor broadcast time, 3 hours of video broadcast time, and 20 hours of group work and assignments guided by the on-site facilitators. Although the satellite transmission allows for only one-way audio and visual, interaction between students/facilitators and the professor during the broadcast times is achieved through the use of a dial-in 800 telephone number connected to the professor at the University of Utah broadcast studio. Students call in with questions, comments, and reactions to specific professorial directives.

Each course has a Facilitator Guide and Student Guide that outlines each class session's instructional events, group activities, assignments, expectations, and reading assignments. Master ESL teachers from the school districts serve in the role of on-site facilitators supporting student learning and developing a community of learners. The course instructor and 20

facilitators met approximately for 2 days prior to the beginning of each class for the purpose of the discussing and coordinating class objectives, assignments, and activities. Facilitators and course professors also met occasionally throughout the duration of the course as well as communicated almost daily through email interactions.

Year Two

Because the two courses Graduate Survey of Linguistics and the Pedagogical Structure of English (both 4 semester credit hours) are primarily foundation-type courses, Task Force members believed that these classes should be taught with face-to-face instruction by clinical faculty. Like all DEEEP courses, these two classes are taught on-site in designated schools. The first group of 240 students is enrolled in these courses during the 1999-2000 school year. The second group of educators/students will complete the courses during the following school year.

Year Three

The last three courses of the endorsement program incorporate a variety of distance education technologies and strategies. Working with the University of Utah's multi-media and broadcast personnel located in a division called Media Solutions, the project directors and course professors are creating the most technically sophisticated and innovative instructional components of the project. Currently, in the design and production phases, the three courses will be on-line for the 2000-01 school year. Year Three courses (all 3 semester credit hours) consist of Content-Based Language Teaching, Minority Language Issues and Materials Development/Practicum.

All three courses are being designed using Lotus Learning Space as a framework. Students access course content and resources through web-based curriculum. Interaction with course professors, on-site facilitators, and students occur in both synchronous and asynchronous environments. Video developed specifically for these courses is either streamed through the web site or provided on-site. For all three courses, there will be approximately 2.5 hours of originally produced video and 17.5 hours of edited and repackaged short and long video clips obtained from a variety of sources.

The Year One teaching sites and on-site facilitators will serve as Year Three teaching sites and personnel. While specific class dates and times for these courses will mirror the first year schedule, students will also be able to access the materials at times convenient to their schedules and locales. Email and web-site communication sectors will provide interaction between professors, facilitators, and Year Three students. In addition to the designated DEEEP teaching site, all participants will have computer access at their own work sites located in the elementary or secondary schools. Many students/educators also have computer access in their homes.

Web Site

The DEEEP web site will provide an array of information and communication links for program students and those interested individuals not directly involved in DEEEP. Expected to be on-line around June 2000, the site will enhance the quality of the endorsement courses by creating an electronically connected learning community. DEEEP students, professors, and facilitators will be able to engage in conversations through structured class activities or student

initiated chat sessions. Additionally, open web areas will encourage more free-flowing conversations between DEEEP participants, district ESL coordinators, interested teachers, university faculty, community leaders, parents and K-12 pupils. All DEEEP web participants will be able to pose questions and offer solutions to a variety of ESL and classroom issues. Furthermore, the site will act as a resource area containing K-12 topics such as multicultural education and ESL lesson plans, strategies and classroom-based activities. The resource area will also encourage the exchange of cultural activities, events, and perspectives within the larger community.

Evaluation Findings

For this paper, the evaluation design focused on three major questions: 1) the quality of course instruction using multiple distance education technologies, 2) the effective use of multiple technologies and 3) the characteristics of quality on-site educators responsible for facilitating the technologies and instructional plan. The primary methods of data gathering for questions one and two were a questionnaire completed by all course participants, facilitator focus groups, and informal interviews with a variety of students, facilitators, technicians, and district personnel. For the third question, a research assistant conducted a field study of two teaching sites involving about 50 participants. The assistant used weekly observations and participant interviews as data collecting methods. The findings centered on Year One Courses for 1998-1999.

To understand the quality of instruction and the effective use of technology, course participants completed a 20 question survey administered at the end of each course. The questions covered specific areas of instructional strategies, professor effectiveness, on-site facilitator quality, learning outcomes and technology. The questions asked respondents to show strong agreement or strong disagreement to statements by circling a number from 1-7 (1 indicating strong disagreement and 7 strong agreement). Additionally, three open-ended questions were posed to understand the participants' perspectives of their belief systems as well as the relationship between course instruction to K-12 classroom teaching practices. Finally, general demographic information was obtained from the DEEEP students.

Demographics: On the average, there were 242 student responses per course. Of these respondents, 71% were female. Thirty-eight percent were secondary educators, 59% were elementary school teachers and 3% did not declare. Concerning years of teaching experience, 43% of the respondents had 1-5 years, 19% had 6-10 years, 17% had 11- 15 years, 9% had 16-20 years, and 11% of the respondents had 21-3 1 years of teaching experience.

Course Quality: The participants' responses indicated that they perceived a moderately high degree of quality for all three Year One classes. Almost 98% of DEEEP participants agreed that courses would impact their teaching practices. There was an increased awareness of multicultural, bilingual and methodology issues. The overall mean response was 5.01 regarding the effectiveness of the course in increasing participant understanding of course issues. Additionally, the mean response was 5.7 for participants reporting on an increased knowledge of strategies. Similarly, when participants were asked to respond to the ways in which the multicultural education, bilingual/bicultural, and methods courses would impact their teaching practices, 98% provided positive remarks. Additionally, participants reported the courses would influence there teaching practices by averaging a 6.35 response, the highest response of all the questions asked.

Effective Use of Technology

Of all the evaluation questions, the technology questions consistency received the lowest ratings from students, facilitators, and instructors. Specifically, the question prompt of "satellite lectures were a useful instructional delivery approach" elicited a mean response of 3.67 on a scale of 1-7 indicating that participants were ambivalent about the usefulness of the technology. The second course respondents answered the same question with a mean response of 4.28, and the spring semester course students responded with a mean response of 3.73. In all cases, this technology question elicited the lowest mean average of the 20 questions.

Much of the dissatisfaction occurred because the satellite technology failed to function properly and consistently during the first four weeks of the fall semester course. All of the participants' complaints centered on reception issues of foggy images and poor audio reception. Occasionally, students missed the live and video broadcasts. While on-site facilitators were master ESL teachers and pedagogical leaders, they were not technically trained to troubleshoot and solve difficult satellite transmission and receive site challenges. However, working with EMG engineers, University of Utah broadcast technicians, and satellite repair people, teaching sites were fully operational by the start of the second fall semester course.

Quality of On-Site Facilitators

Several themes directly related to the use of multiple technologies emerged from the field observation work conducted at the teaching sites. First, distance education site facilitators must have cooperation and support of the school building principal and staff. Most facilitators were not classroom educators at the DEEEP teaching sites. Therefore, they needed to establish new and positive relationships with an unfamiliar building administrator sand media center coordinators (satellite receivers were located in media centers). These school personnel people were the first line of support for satellite and other technological challenges. Second, the actual teaching location must be physically comfortable and equipped with large television sets to view broadcast lectures and videos. Meeting in school auditoriums, cramped classrooms, or multi-purpose media centers distracts student learning and attention during satellite broadcast times. Third, while facilitators were chosen and should be selected because of their pedagogical leadership in adult education, they still must receive basic preparation in managing the technology. During the first few weeks of the fall semester Year One course, facilitators and program administrators were frustrated because the basic technology education received from EMG personnel seemed insufficient. Much of their dissatisfaction occurred because the satellite technology was new and not fully operationally at first. With increased familiarity and function, satisfaction increased among all participants. Throughout the remainder of Year One, facilitators were able to handle site technology problems with more confidence and ability because of increased experience and ease with the new delivery approach.

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Creating Technology Workshops for Modern Language Professors

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Abstract: This paper describes the process of developing technology workshops for language faculty. First, brief needs analyses were collected to determine faculty preferences for workshop topics. Later, informal interviews were conducted with individual faculty members to learn in more detail about their pedagogical and technological needs. Workshops were designed and taught based on those results. Following the workshops, faculty members evaluated the usefulness of each session. This feedback was then used to improve future workshops.

Introduction

By 1998, the Language Learning Resource Center (LLRC) at Saint Michael's College had been directed by a series of several employees on a temporary basis over a period of almost five years. When a new position was filled to direct the LLRC with the title Language Technology Coordinator, one of the main tasks of the job was to offer resources and services to better assist the faculty of the Modern Languages and School of International Studies' English as Second Language (ESL) departments in the use of technology. Traditionally, these two departments had not used the LLRC in the same manner as was reflected in their differing styles of language teaching and in the differences in their respective students' needs. The intensive ESL program is taught on a rolling enrollment basis with new classes beginning every four weeks, with students in classes six hours a day, while one hour, daily classes in Russian, Japanese, Italian, French, Spanish and German are taught during two sixteen week semesters. Reasons for taking language classes differ greatly as well. ESL students learn English primarily for academic purposes, i.e., to achieve a high enough proficiency level to study other subjects at an American university, whereas the American students, native English speakers, study foreign languages principally to fulfill a foreign language proficiency requirement for graduation. To determine which services and resources would meet the needs of both departments, the Language Technology Coordinator designed a needs assessment questionnaire.

The needs assessment questionnaire asked which tools instructors currently use and would like to use in the future. Questions were asked about the use of audiocassettes, audio CDs, videotapes, software, tools for materials creation, Internet tools and included an open-ended question asking about tools not listed in the questionnaire. The questionnaire was distributed to both language departments, which comprise twelve Modern Languages and thirteen ESL and MATESL instructors. Fourteen questionnaires were returned, evenly divided by department, with seven from each. Current use of technology in language teaching and expectations for future use varied widely between and among departments. Based on the questionnaire results as well as informal one-on-one interviews, the Language Technology Coordinator drew up a list of twelve workshop topics. The twelve topics were sent to instructors via email and further explained at faculty meetings so they could choose which they would like to have offered to them. In this way, the list was narrowed to seven workshops offered during the spring and fall of 1999:

- Putting a course syllabus online using a web editor
- Using tracking and revisions features of word processing programs for teaching process writing
- Using alternate character keyboards for Modern Languages
- Creating online quizzes and tests using JavaScript templates
- Evaluating the software selection process
- Integrating Internet resources in language instruction
- Using computer mediated communication: email, threaded discussion, and online chat

Preparation for the Workshops

The first three of the seven workshops involved using features of software programs offered on a campus-wide basis. Step by step instructions for using these programs, developed by Library Information Services (LIS) staff, were posted on a Help Zone web site. These instructions, as well as the date and time of all seven of the workshops were advertised by email. For those who felt comfortable working on their own, these instructions were available for self-taught tutorials. Without the workshop however, discussion of the instructional rationale for why, when and how to use these tools was missing. The idea that each instructional tool should be assessed for its pedagogical usefulness before implementation was emphasized in each workshop as is recommended in the literature of language learning and technology (Bradin, 1999; Levy, 1997; Pusack & Otto, 1997; Warschauer, 1995). The three main goals of all of the workshops were:

- to establish a comfort level with the technological tool;
- to integrate technology into the curriculum; and
- to critically evaluate the use of technology. (Kassen & Higgins, 1997)

Materials for learning to use Hot Potatoes, the JavaScript templates for creating online quizzes, are available at the web site from which one can download the free software so preparation for this workshop did not involve much writing and research. The web site includes a Power Point presentation that offers general information about using the six software programs included in the Hot Potatoes suite as well as an online tutorial that explains how to use the software step by step. The process of downloading and installing Hot Potatoes requires decompressing files using decompression software. This process proved difficult for some instructors who learned to use the templates in one on one sessions, so the workshop facilitator copied all of the decompressed files needed to install the software to a zip disk for easy installation during workshops. Faculty members then used the disk after the workshops for installation on their office computers as well.

The final three workshops involved more research and planning on the part of the Language Technology Coordinator than the previous workshops did. The basic principles of using each tool were researched beforehand and then discussed at the outset of each workshop. Next, examples of how to integrate these tools into existing classes were given, which also needed to be collected ahead of time. For "Evaluating the software selection process," for instance, individual professors requested commercial software programs for learning specific skills, such as pronunciation. Instructors evaluated demonstration copies of these programs using three different evaluation instruments. These instruments were

discussed in terms of how well they assessed both the feasibility and quality of the software. Before this workshop, the facilitator researched the appropriate software programs, ordered demonstration copies, tested the software, and found evaluation instruments for assessing the software's usefulness. Once the software programs were evaluated and compared, the faculty then discussed which particular needs would be served by these programs for achieving specific goals within the context of their classes. The "Integrating Internet resources in language instruction" workshop also required considerable preparation. Research was conducted into the various web sites available for language learning and appropriate ways to use them in the context of a given class, and an evaluation instrument was developed for assessing their usefulness in specific teaching situations, in much the same way as had been done for evaluating software.

The computer mediated communication workshop required research into the various modes of online communication, the development of written instructions for how to use them and guidelines for how best to integrate their use into existing classes. The Language Technology Coordinator made recommendations about how best to use chat rooms available to instructors, as well as how to create them. Threaded discussions can be created fairly easily using Microsoft Front Page, the web editor supported by Saint Michael's College, so instructions for adding a threaded discussion to a class web page were written for this part of the workshop. Directions for how to use some of the features of Microsoft Exchange were also written, as well as ideas for how to integrate email into language learning classes following suggestions from Warschauer (1995) and Sperling (1998).

Conducting the Workshops

The Language Technology Coordinator led each workshop in the LLRC, a computer lab with 13 PCs and a ceiling mounted projector, at a date and time that would conflict with the least number of instructors' schedules. For those who wished to attend, but could not, arrangements were made for one-on-one sessions at a more convenient time. The workshops began with presentation and demonstration, followed by opportunities for hands-on practice and discussion. Most lasted for an hour to an hour and a half. In all workshops except for "Evaluation of the software selection process," the participants came from both the Modern Languages department and the School of International Studies. The software evaluation workshop was offered to each department separately, since the respective programs evaluated were not applicable to each other. What follows is a description of the way in which each of the workshops was conducted.

Using class web pages seemed to be a daunting task to many language professors since only a few class web pages had been produced by a few of the early adopters in their departments. (Jaffee, 1998) While many instructors were adept at searching the Internet for personal and professional reasons, most did not feel capable of creating a web page of their own. To lessen the anxiety level, the workshop was advertised as "Putting a course syllabus online using Microsoft Front Page" rather than "Creating a class web page." The Language Technology Coordinator found many opportunities in informal conversation with instructors to reiterate that the workshop could be viewed as a first step toward developing a more elaborate class web page. Since most already used a word processor to create syllabi, converting these files to html format would be easy. Instructors were asked to bring their

syllabi on disks and had filled out an application for a web page before the workshop took place. The facilitator explained the basic principles of using Front Page to the participants and outlined the goals of the workshop: to create a homepage, organize information using a table on that page, add a graphic image, include a link to a syllabus page and a mail-to link. Step by step, using printed instructions with screenshots as a guide, professors were taught how to create their pages.

"Using tracking and revisions features of word processing programs" was offered to instructors teaching writing in language classes at the intermediate and advanced levels. Process writing is an approach to teaching writing that involves stages of planning, drafting, revising and publication. These word processing features allow instructors to make editing comments as part of the process of revising and draft writing without changing the original student text. Instructors are free to write as much as they wish without the restrictions of the margins or the stigma of the red pen. The comments can then be offered as a means to improve subsequent drafts, rather than an evaluation at the end of a finished product. (Grabe & Grabe, 1998) Additionally, these features create a system for keeping track of student drafts to easily review changes.

The use of different character sets for typing in languages other than English had been a source of problems for many of the Modern Languages professors at Saint Michael's. Suffering through frequent operating system changes and several word processing programs, professors had nearly given up on ever having a consistent set of keyboards to allow them to type easily in the languages they teach, much less having tools for student writing. In 1998, a set of keyboard sets for use with Windows NT 3.5 was purchased and installed. Instructions for their use, along with screen shots of the keyboards were made available to instructors. In addition, it was discovered that the proofing tools (spell check, thesaurus and hyphenation rules) for Spanish, French and German purchased for use with an earlier version of Word would work with Word 97. Instructions for using these tools were written as well. A few one-on-one workshops for using the character sets and proofing tools were offered for those who did not feel comfortable using the instructions on their own. Workshops for using these tools were again offered, this time to classes of students, co-conducted with their language teachers.

Hot Potatoes, a suite of six authoring programs based on JavaScript templates, were developed Arneil, Holmes and Street of the University of Victoria Language Centre. The programs were designed to allow language instructors to easily create their own exercises and quizzes, including cloze, multiple choice, matching, short answer, scrambled sentences and crossword puzzles. Since several instructors indicated a desire to learn how to create their own exercises with immediate feedback and had realized the shortcomings of exercises included in commercially produced software, a set of tools that allowed them to create exercises based on their own choice of content was deemed appropriate. This workshop required two 1 ½ hour sessions to cover the tutorial as well as enough time to practice using four of the six programs.

In the past, commercial software selection for use in language instruction had been a process conducted by individuals within the department of Modern Languages, and by small groups of instructors within the School of International studies. In neither department had a formal selection process with a true evaluation procedure been implemented. Budget changes indirectly forced such a process upon the faculty to some extent when the Library Information Services department became the sole purchasing center for the college and

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Educating Foreign Language Teachers in Instructional Technology: A Report on Faculty Development at the University of South Carolina

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Abstract: Foreign language instructors are some of the most innovative teachers in education today, and educational institutions worldwide are encouraging their foreign language faculty to increase their use of technology in the classroom. To that end, the University of South Carolina has created a new role for the Academic Director of its Foreign Language Learning Center. One of the key aspects of the position involves conducting a series of instructional technology workshops designed specifically for foreign language faculty. This paper is a report on the nature and design of these workshops, who is taking part in them, and how those participants are then subsequently incorporating what they have learned into their own classrooms.

Introduction

In their article, "Teacher Training for CALL and its Implications", Curtin and Shinall (1987) assert that "to ignore advances in technology is to be left behind" (p.256). This is especially true for today's teaching faculty. Not only do instructors in traditionally technological fields, i.e., physics or engineering, need to be current in their knowledge of instructional technology, but faculty in the humanities and social sciences are now equally expected to incorporate technology into their curricula. This challenge fills some faculty with a sense of dread, afraid, as they are, that the computer will sound the death knell for their profession, while in others, it incites a whole new love of teaching and curriculum design. What accounts for the formers' "technophobia" is often the result of a lack of familiarity with very basic technology. A substantial percentage of the teaching faculty in humanities programs has followed traditional "book-based" programs. This is especially true of foreign language teachers. There are still relatively few institutions in North America that offer an instructional technology component to their graduate programs in foreign language. Such programs tend to be literature-based, and, if there is any teacher training at all for graduate teaching assistants, it is often woefully lacking in any mention of or instruction in CAI or other technological applications for teaching. Nevertheless, asserts Michael Bush (1997), "ready or not [. . .], technology will play an ever-increasing role in each of our institutions. It therefore behooves foreign language education professionals to better understand technology and its potential for foreign language learning" (p. xiv).

The result of the present system is that many foreign-language Ph.D.'s enter new assistant professorships without having any real knowledge of technology-enhanced instruction. Furthermore, the pressure placed on new faculty to produce a significant amount of research in order to attain tenure does not leave them with much time to try out new technologies or to be particularly creative with their teaching. Many of the same traditional departments that do not offer adequate training in teaching with technology are also reluctant to accept research done in this area as meeting the criteria for tenure: "Without an excellent research record, one cannot expect a promotion in other than teaching institutions. However, in teaching institutions the teaching load is so high [...] that there is insufficient time" (Solomon, 1994, p.29). Thus the cycle continues.

created a mandatory acquisition procedure that includes critical questions about the necessity and feasibility of using software programs. While the decision to purchase and use a software program lies with the individual instructor making the request, assuming there are no budgetary or technical prohibitions, the role of the Language Technology Coordinator is to guide language faculty in the selection of software to meet their pedagogical goals. Workshops to assist in this acquisition process serve to demonstrate new programs as well as to involve instructors in the process of evaluating these programs.

Ongoing discussions about the kinds of software programs used in language teaching, individual recommendations, as well as the results of the needs questionnaire were used to determine which programs to order for review. Instructors were asked to read articles (Bradin, 1999; Healey & Johnson, 1997; Robb & Susser, 1999) about selecting and evaluating software before the workshop. During the demonstration of programs, each instructor was asked to answer portions of three different evaluation instruments (Bradin, 1999; Healey & Johnson, 1997; Long & Johnson, 1994) in order to assess the usefulness of each program. These instruments included questions about pedagogy, preparation, technical requirements, program design and operation, preview options, pricing options and support issues. Fewer software purchases were made after these workshops than during the previous year without the workshops, as problems were identified during the evaluation process.

It is only in the last two years that language instructors have begun integrating Internet resources into their classes. Four modern language professors have not only put their syllabi on class web sites, but have links to sites through which students complete tasks necessary for homework assignments. For example, a French professor has her students visit online French clothing catalogs and select a wardrobe appropriate to a particular geographic region and season with a limited amount of French currency. This use of authentic materials and tasks provides opportunities for language learning that are not possible in regular classroom-based settings. (Vosniadou, 1994) The impetus for searching for ways to include Internet resources in teaching language, then, like the use of other technologies, has been primarily peer-driven at Saint Michael's College.

The workshop entitled Integrating Internet resources in language instruction began with tours of the course web pages of the instructors' peers to highlight how they had integrated information from the Internet. The discussion then expanded beyond the use of email and links to reading, writing and listening practice pages to include tips for how to use the Internet as a source of authentic material for preparing lessons as well as an interactive medium for student learning. Possible uses included accessing Lexis Nexis and other subscription databases for foreign language articles, finding pictures and music, making use of online news sources, finding an authentic audience for student writing, and using online maps. Finally, textbooks designed for use with Internet sites were displayed for possible adoption and to demonstrate additional ways to integrate online resources. These included Dave Sperling's Internet Activity Workbook and Internet English by Gitsaki and Taylor, which both make use of companion web sites. The companion web site for Prentice Hall textbooks for foreign languages were also demonstrated to make instructors aware of the lesson plan ideas available there as well as additional practice material for students. For evaluation of all of these sites for language teaching, instructors were prompted to ask themselves many of the same kinds of questions they asked when evaluating software, such as those about technical requirements, usefulness in achieving student goals, authenticity of material, difficulty of level of language, etc.

Incorporating email, online chat and threaded discussion into classes recently became important to SIS professors as some began the process of redesigning their MATESL teacher training classes for distance education. As a few of these instructors started experimenting with adding these forms of communication to their face to face classes, in anticipation of conducting classes completely online, others realized the need to educate themselves about possible applications for their classes as well. Most professors already understood how to use email for sending student writing to teachers, posting to discussion groups and sending announcements to students. What teachers wanted to know was how email differs from asynchronous threaded

discussion and synchronous online chat forums. This workshop opened with demonstrations of class web sites using email and threaded discussions to illustrate how they might be used to extend in-class discussion. A hands-on session in a chat room followed, with online classroom management issues as the topic for discussion. Finally, instructors were directed to a Library Information Services web site where they could find instructions for how to create threaded discussions using Microsoft FrontPage and sites to create their own chat rooms.

Conclusions

These workshops were rated highly in anonymous evaluations for usefulness, quality of delivery and content, averaging 4.5 on a scale of 1 to 5, but suffered from low attendance. Although many professors wanted to attend and learn about these various uses of technology, they could not find time in their schedules between publishing projects, administrative duties and heavy teaching loads. Others preferred to have one on one instruction. Of these professors, some clearly indicated that they felt more comfortable learning individually, some wanted to learn more slowly and others simply wanted a different date and time. After the workshops, between one third and one half of the attendees said they were using the tool learned in their teaching.

Future workshops will be ongoing and offered each semester. Some of the original seven workshops will be repeated to reach those who want more practice, were unable to attend earlier sessions or were previously not ready to learn to use a new resource. Since many teachers preferred individual sessions, even if the number of attendees is low, the workshops will not be postponed or cancelled, as is the policy with other technology workshops offered at Saint Michael's.

The workshops will be improved in a number of ways. Although attendees often had to leave immediately after the sessions finished, they also said they wanted more time with each tool. In response to this feedback, some workshops, such as "Integrating Internet resources," will be divided into two sessions for a slower, more thorough treatment of the material, as well as to allow for more practice time. In addition, a three part series of workshops will be offered on the use of Microsoft Front Page for creating class web pages, including useful links, and adding a threaded discussion page. A three part series with workshops given every two weeks will allow for additional practice of skills that will build upon each other over a six-week period. This series will be offered during the last six weeks of a semester to prepare for the following semester. An additional change will be to include some of the language professors as co-facilitators in more of the workshops, as some feel more comfortable learning from colleagues than those they see as technology experts. The most important lesson to be learned from offering these workshops was that giving instruction in the use of technology is a process, rather than a project with a beginning and an end. This process will continue on as many different levels as there are individual professors with expanding needs and varying levels of experience with rapidly changing technologies.

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A New Approach

How, then, do we remedy this situation and assist foreign-language faculty in incorporating technology into their curricula? The University of South Carolina in Columbia has addressed this concern by creating a new job-description for the Academic Director of its Foreign Language Learning Center – a position that I have recently filled. While the position to this point has been more or less strictly administrative, the new job description calls for a foreign language professor as well. As the new director, I, myself, graduated from a literature-based program with very little technology involved in my instructional duties. However, my first post-graduate teaching position involved establishing a German program at a small, two-year college in Georgia. This first assistant professorship afforded me the opportunity to become knowledgeable in many areas of instructional technology. Not only did I do fifty percent of my teaching via interactive distance learning, but I also established a Macintosh-based foreign language lab and a German-studies Web site. The nature of my first teaching position helped me to become proficient at technology-enhanced instruction and, as such, to move into the area of faculty development, where I have held several workshops for faculty in all areas of instruction.

In addition to fulfilling the traditional administrative role of center director, the new position carries an instructional component. As director, I must teach one course per year in my area of expertise, in this case German or French language, and must design and hold a series of faculty development workshops covering a variety of topics in instructional technology.

According to the Department of Education's 1993 paper, "Using Technology to Support Education Reform", the challenges faced by today's faculty include:

- Learning to use a variety of technology applications;
- Using, adapting, and designing technology enhanced curricula to meet students (sic) needs;
- Expanding content knowledge;
- Taking on new roles; and
- Responding to individual students.
  (Means, 1993, http://www.ed.gov/pubs/EdReformStudies/TechReforms/chap4c.html)

Furthermore, Kassen and Higgins (1997) include the following necessities in their list of requirements for faculty development programs:

- Establishing a comfort level with technology;
- Integrating technology into the curriculum;
- Developing the critical skills to use technology effectively. (p.264)

These are the criteria to which I adhere in designing my faculty development workshops. In this first year of the new directorship, most of the workshops will illustrate elements of computer-enhanced instruction. In later workshops, such topics as using audio and video resources in the foreign language classroom will be addressed. The first three workshops I conducted concentrated on uses of Microsoft PowerPoint in the foreign language classroom. Other workshop topics include a series on teaching with the World Wide Web and hypermedia, web course delivery software, html editors and other web development software, authoring programs and courseware creation, and how to work effectively with email and discussion groups. My intention is to provide the foreign language faculty at the University of South Carolina with as much variety and as many topics as possible in the workshop series so that they will be able to decide for themselves which applications fit best into their curricula and teaching styles.

The Workshops

Workshops are set up in the following manner: notices are sent out a month in advance of each workshop, and faculty members are asked to sign up to participate. Attendance is generally capped at ten so that there is adequate time and space for each participant to receive individual attention. The workshops are held in the Foreign Language Learning Center Computing Lab. Participants each work on their own computer, and, depending on the subject of the workshop, are able to choose between PC and Macintosh

platforms. The instructor machine is connected to a MediaPro LCD projector, and the desktop image projected onto a screen. Workshop participants are asked to follow along with the instruction for the first half of the workshop, and are then "turned loose" in the second half and encouraged to work on their projects on their own. This format has proven to be the most effective in helping faculty to master new software applications. The hands-on structure of the workshop allows them to follow along with the instructor step-by-step, and to learn the basic functions of the new program. Having them subsequently work on their own allows them to learn for themselves further capabilities of the new program while at the same time permitting them to create language-specific materials that they can use in their teaching. Each workshop is tailored towards foreign language faculty and their specific needs. For example, PowerPoint and Web-design workshops include modules covering foreign language fonts and Web-based information sources for individual languages and cultures.

One of the more important aspects of incorporating new technologies into the foreign-language classroom involves identifying student needs and subsequently tailoring the use of technology to them. For example, the student who is a visual learner will likely respond more positively to a multimedia-based grammar lesson that includes several colorful illustrations, while a student who learns a language more easily through aural channels may prefer an application with plenty of audio examples, and so on. The workshop series takes these particularities into consideration and illustrates teaching techniques that utilize several media. Individual professors are free to design their projects using as many or as few media types as they wish. Naturally, in the area of foreign language instruction, audio is the most commonly utilized medium. Video, too, is becoming more and more popular as MPEG cameras come down in price and products such as Real Networks' Real Publisher make digitizing video easier. Naturally, the more media types an instructor can include in her educational materials, the more students she will reach and, thus, assist in language acquisition.

Evaluation

An important aspect of any educational venture is ascertaining whether, in fact, the material covered by one's students is actually learned, and, in the case of faculty development, subsequently used by instructors in their classrooms. In order to measure these criteria, the following questionnaires are distributed to workshop participants, a) immediately after the workshop (Fig. 1), and b) at the end of the semester following the workshop (Fig. 2):

1=agree strongly	2=agree	3=disagree	4=disagree strongly	5=no opinion
Question			**Av. Response (24 Respondents)**	
The workshop was helpful to me.			1	
I will use the technology covered for my teaching.			1.5	
The material covered was easy to follow.			1.16	
I would recommend this technology to my colleagues.			1	
I would like to learn more about the technology covered.			1.3	
I plan on incorporating more technology into my teaching.			1.3	

Figure 1: Questionnaire A – distributed immediately after the workshop.

In which workshop(s) did you participate?				
1=agree strongly	2=agree	3=disagree	4=disagree strongly	5=no opinion
I have used the information learned in the workshop(s) I took.				
I used the project(s) I produced in the workshop(s) in my teaching.				
I regularly use multimedia in my classroom				
Since taking the workshop(s), I spend more time in the Language Center.				
I encourage my students to submit their assignments electronically.				
I require my students to work in the Language Center.				
My students receive an orientation to the Language Center each semester.				
I plan to continue using technology in my teaching.				
I plan to take more instructional technology workshops.				

Figure 2: Questionnaire B – distributed at the end of the semester following the workshop.

As the workshop series has only been ongoing for one semester, questionnaire B has not yet been distributed to foreign language faculty. Initial results of questionnaire A are promising, however, and workshop attendance has progressively increased throughout the course of the semester. While the results of these surveys do nothing to indicate the efficacy of the various technologies used, one must recall that the ultimate goal of these questionnaires is to ascertain whether foreign language faculty are increasing their use of technology both in terms of quantity and variety. Accurate measurements of technology's effectiveness in improving language learning are notoriously difficult to attain (see Ehrmann 1997 & Trotter 1999), and will not be sought in this series of evaluations.

Conclusion

Traditionally trained foreign language faculty must be given the opportunity to develop their teaching skills in a non-threatening environment where support is available if it is necessary, and where creativity is encouraged and appreciated. All too often, faculty balk at attempting to incorporate technology into their curricula because the amount of technology available is too staggering and the amount of time necessary to learn it is simply unavailable. A program like that currently in place at the University of South Carolina removes some of the unknowns that prevent many instructors from introducing technology into their courses by letting them take the technology for a "test drive" ahead of time. Teachers are free to use the technology introduced according to their own personal instructional needs and wishes. Moreover, while individual departments often hesitate to purchase equipment such as scanners and digital cameras along with large presentation programs for only a few interested faculty, housing such tools in a central location such as the Language Learning Center, allows faculty from all language departments access to them when they need it. Ultimately, I hope that all foreign language faculty at the University of South Carolina will feel comfortable enough with instructional technology to make it a part of all of their courses. In the meantime, it is encouraging to see language professors attending the workshops, working in the faculty development center, and taking an interest in what they can do with technology in the classroom, as

well as what technology in the classroom can do for them.

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Fostering Divergent Thinking in the Mandarin Language Classroom through IT-Enhanced DRTA

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Abstract: Directed Reading Thinking Activity (DRTA) is a teaching strategy used in English language classrooms through using predicting questions to enhance students' thinking. Since it is very important for Mandarin language teachers to incorporating thinking into classroom activities, so students can analyze, synthesize, and evaluate information, instead of just drilling information. We conjecture the DRTA can also be used for the Mandarin classroom activities. In this paper, we first describe how the DRTA can be used in the Mandarin classroom to foster students' divergent thinking with the integration of IT tools. Secondly, we will discuss recommendations for implementation of this approach.

Introduction

Directed Reading Thinking Activity (DRTA) is a teaching strategy developed for enhancing students' thinking in the English language classroom. We conjecture it can also be used for the Mandarin language class. In this paper, we explore how DRTA can be used in the Mandarin classroom and how IT tools can be used to enhance this strategy and thus students' divergent thinking.

Singapore is a multi-cultural society and English is the main vehicle of communication among different ethnic groups (e.g., Chinese, Malay, Indian, Eurasians). Also, being an international business center, English is the most common language used in the commercial sector. In Singapore schools, according to Soh and Chia (1997), English is the primary medium of instruction for its practical value, and the mother tongue (i.e., Mandarin, Malay, or Tamil languages) is taught for its cultural significance.

On the issue of learning the Mandarin language, many people still perceive it primarily to be a process of information receiving. This approach has been effective for exam-driven type of learning. Pupils learn the Mandarin language by memorization, accept what they are told and do not ask many questions. However, in this learning process, little thinking is fostered, especially divergent thinking (Chen, 1998). Research has shown that pupils who did well in the curriculum-based tests fail to perform well on life-based

tests. One possible explanation of this discrepancy is that "Mandarin language lessons tend to be more teacher-centered than student-involved" (Soh & Chia, 1997, p. 82).

Lin (1997) suggested that one way to move from teacher-centered to student-centered pedagogy is to encourage students to think actively. Through active participation in the thinking process and by expressing their thoughts using Mandarin in a lively way, pupils can improve their mastery of the language, and develop their thinking ability. Therefore, it is important for Mandarin language teachers to incorporate thinking strategies (e.g., DRTA) into their Mandarin language lessons.

In addition, IT is perceived as a potential tool to encourage and promote pupils' thinking (Jonassen, 1996). This article proposes an IT-enhanced DRTA that can be used to foster students' divergent thinking in the Mandarin Language Classroom.

In this paper we first introduce what DRTA is. It is followed by the discussion of potential limitations of implementing DRTA in the Mandarin language classroom. We then suggest two IT-enhanced solutions for DRTA. Finally, recommendations for implementation of this approach are discussed.

Directed Reading Thinking Activity (DRTA)

One of the strategies used by Singapore English teachers to develop students' thinking is DRTA (Tan, 1996). The DRTA is a group comprehension activity that emphasizes the use of predictive questions at the beginning of a story and throughout the reading process (Stauffer, 1980). Many researchers agree that predicting is a fundamental part of the process of comprehending and it should be a strategy regularly used in reading discussions (Person & Fielding, 1991). The DRTA involves breaking a story into sections, and students are encouraged to predict possible outcomes before reading selected sections in the story. Students are encouraged to make use of story clues, own life experience, and prior information. After the prediction, students read the story to prove or modify their hypotheses.

In contrast with traditional comprehension questions which students have to look backward into a story, DRTA increases children's motivation to read because it arouses their curiosity and involves them actively in discussing it, rather than simply answering a teacher's question about the story. Specifically, potential benefits of using DRTA are threefold (Temple & Gillet, 1996):

- Foster divergent thinking at the outset (title, illustrations, or small parts of the text)
- Develop convergent thinking as more information unfolded
- Develop inferential and critical thinking throughout the process

Potential limitations of using DRTA in Singapore Mandarin language classroom

Although DRTA is good strategy for fostering students' thinking in English language classroom, there are some potential limitations of using the DRTA in Mandarin language classroom:

- Large class size causing lack of divergent thinking
  The average class size in Singapore primary school is forty students per class. In the predicting stage, if the teacher has to write down all the possible predictions, it will be quite time-consuming. Hence, most students may remain silent because the class size, and the time-limitation only allows the teacher to write out a few predictions on the blackboard. This would defeat the training of developing divergent thinking.

- Students' prior access to stories leading to lack of motivation
  The use of DRTA is currently adopted in Singapore English Language classrooms. The materials are pre-printed onto the students' worksheets booklet known as the PET'S worksheet. In English Language classroom situation, some faster readers are able to read ahead and know the whole story while they are waiting for the slower ones to complete the required paragraph. The nature of using predicting in DRTA is totally killed when the students already know what will happen next in the story.

IT-enhanced DRTA

IT is perceived as a tool which provides students with opportunities analyze, synthesize, and evaluate information in new ways. The tool may offers students practice with certain cognitive strategies for making use of information. These strategies may be important for developing students' thinking (Sheingold, 1991). The following points discuss the use of IT tools to enhance the effectiveness of DRTA in CL classroom:

- Fostering divergent thinking and promoting active discussion
  The SmarttSchool system is classroom management software. It allows the teacher to broadcast multimedia materials to one, selected or all students. The Mandarin language teacher may pair up the students for discussion and keying in their predictions using the same terminal. The teacher can easily view and project the students' computer screens onto all students. At that moment, all students can view other students' predictions and the teacher may ask students to elaborate or explain their thinking behind their predictions. Through SmarttSchool, the teacher could involve more students in the discussion. Therefore, development of divergent thinking is greatly enhanced through the multitudes of variations in the predictions from students, instead of the three or four using the traditional chalk and board approach.

- Restriction of student access to stories to sustain students' learning interests
  PowerPoint is a multimedia presentation package that allows teachers to produce their presentation slides including in a variety of formats, such as graphics, texts, sounds, video clips, or animations. Using PowerPoint would be a solution for preventing the students reading ahead and knowing the 'standard answers'. The story would not be printed on the students' worksheet, but stored in the teachers' computers. The teachers would present the story, already broken up into different slides through the PowerPoint and show the students only the slide they are required to read. This would maintain students' learning interest on the 'suspicion' of the story while they eagerly predict the next outcome.

Recommendations for Implementation

In order to use IT-enhanced DRTA successfully in Mandarin classroom, there are a number of recommendations for Mandarin teachers to keep in mind (Temple & Gillet, 1996).

- Prepare prerequisite computer skills and knowledge
  The teacher should have PowerPoint and Chinese word processing skills and knowledge. S/he should ensure that students are familiar with Chinese input, so they can key in their answers into their terminal.

- Select fiction rather nonfiction
  It is more difficult to ask pupils to predict what might happen next with nonfiction than in fiction, because the nonfiction is organized differently from fiction. Instead of encouraging pupils'

predictions, the teacher wants them to recall and organize what they already knew in nonfiction. Therefore, the fiction is more appropriate for the DRTA.

- Prepare key questions for prediction. Table 1 lists some key questions for predictions.

Stages	Key questions to ask
Look at the title	What might this story be about? Will it be a true story? How can you tell? How can we find out if our predictions are correct?
Look at the illustrations	What do you think now? Do you still think it is a ....? What might you find out by reading this story?
After reading one section of the story	Where does the story say that your predictions are correct? Do you like what the author is doing with the story? Would you like to change any part of the story? What would you write next if you were the author?

Table 1: Key questions to ask at different stages

- Ensure students work collaboratively
  After presenting a question for prediction, the teacher should instruct students to think about possible answers to the question for one minute roughly. Then the teacher pairs the students up and instructs students to discuss in pairs and key in their answers on their terminals. The teacher may ask students to elaborate or explain their thinking behind their predictions.

- Accept all predictions without adding any evaluation
  The teacher should not indicate which predictions are better than others. "Guessing right" is not necessary in the predicting. It is more important for students to come up with possible and reasonable alternatives

- Should not use value terms
  Instead of using terms, such as right or wrong, the teacher may use likely, unlikely, or confirmed.

- Respond positively to all students' efforts
  Most of Singapore students feel predicting is quite risk-taking. If the teachers can keep giving reinforcement for taking risk of making predictions, students will be more willingly to do it again.

- Have a postreading discussion
  It is important for students to do reflective thinking after a story is completed. Students may evaluate strategies how the group used story clues to make predictions.

- Plan follow-up activities.
  The follow-up activities could be comprehension questions, or ask students to identify events in the story in the chronic order by doing a story map.

- Use audio clues and hyperlinks for comprehension
  Inserting story audio allows students to recognize the pronunciation of the word to enhance their reading comprehension. In addition, using hyperlinks within the text, teachers can explain difficult words which students may face, so students can concentrate on the meaning of the passage.

Conclusion

In Singapore schools, traditionally, most students learn Mandarin language through rote learning, so that they may perform well in tests and examinations. However, this approach focuses less on divergent thinking and application of the Mandarin language outside the school context. Hence, it is very important for Mandarin language teachers to incorporating thinking into classroom activities, so students can analyze, synthesize, and evaluate information, instead of just drilling information. With the integration of IT tools, the DRTA has a high potential be used effectively in Mandarin language classrooms to enhance students' divergent thinking through active participation.

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Learning on the Web or Learning through the Web

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Abstract:
It is not difficult to see why the World Wide Web is the latest technological favorite of the educational literature and educational policy makers. Here is a media that can be used as a library, a publishing house, a television, a television broadcast station, a radio, a radio broadcast station, a postal service, a telephone, and as an interactive practice quizzing station. The diversity of the Web is awesome. But to what extent is the Web being used to learn in new ways and to what extent is the Web merely a case of old wine being packaged in new bottles? To ascertain the difference the Web is making in the learning process, this paper will examine the use of the Web in two technology rich classrooms, one a foreign language classroom, the other a history classroom.

Introduction

Networked communications have a fascinating pedigree. In 1961, Leonard Kleinrock published a paper entitled "*Information Flow in Large Communication Nets*". The paper essentially introduced the idea of networked communications on computers. Four years later Thomas Merrill and Lawrence Roberts set up the first WAN (Wide Area Network) between the MIT Lab and a California organization. In that same year, Ted Nelson also introduced the word "hypertext". Four years later, in 1969, the first ARPANET was created between Stanford, the University of California at Los Angeles, the University of California at Santa Barbara, and the University of Utah. In 1971 ARPANET grew to include 15 sites and in 1973, ARPANET expanded to include two international nodes: one at the University College of London in England and one at the Royal Radar establishment in Norway.

Even with an international networking of computers, no one was yet speaking of the Internet. The term Internet was first used in a scientific paper in 1974 (Cerf and Kahn). Then the break-through. In 1989 at the European Particle Physics Laboratory (CERN) in Geneva, the British computer scientist Tim Berners-Lee developed a protocol that he

called the World-Wide Web. The growth of the Web has been astonishing. In 1994 the number of pages on the Web grew at a mind-blowing rate of 341,634% per year (Anderberg 1999). The advent of Web browsers such as Netscape and Microsoft's Internet Explorer really opened up cyberspace. In the fall of 1994, there were somewhere around 10,000 Web sites around the world. By 1998, there were over 10,000,000!

For the last two decades, educational literature and educational policy makers have been singing the praises of computers. By 1992, speeches stressing the necessity of introducing computers in schools had already become firmly anchored in the political landscape as the President's National Education Goals and AMERICA 2000 Education Strategy makes clear. The goals of that program emphasize the importance of

> Preparing this nation's youth to be productive and thoughtful adults, able to compete successfully in a global economy and to exercise the rights and responsibilities of citizenship, is a key objective of the President's National Education Goals and AMERICA 2000 Education strategy. Achieving this objective will require education students in the uses of computers and other new technologies which are opening career possibilities unheard of just a few years ago.
> (U.S. Department of Justice 1992: 2)

American governmental organizations have invested heavily in the effort to place computers in the nation's schools. "There was a time when computers were a luxury item for American schools, but that time has clearly passed." (Bangert-Drowns, Kulik, and Kulik 1985 - cited from Cotton K. nd). The use of microcomputers first expanded rapidly during the 1980s (Cotton K. nd). Between 1981 and the end of the decade American schools acquired over two million microcomputers. The placement of computers in schools has escalated even further since. In 1988-89, there was one computer for every twenty-two students in America's schools. By 1995, there was one computer for every twelve students (Hayes & Bybee 1995).
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The Internet is the latest technological favorite of the educational literature and educational policy makers. In 1996 President Clinton made schools' connection to the Internet a national priority.

> In our schools, every classroom in America must be connected to the information superhighway, with computers and good software, and well-trained teachers. .... I ask Congress to support this educational technology initiative so that we can make sure this national partnership succeeds.
> (President Clinton 1996)

Clinton's Internet initiative has had mixed results. Internet access in public schools increased from 35 to 78 percent between 1994 and 1997. That said, Internet access in classrooms falls far short of Clinton's hopes. In the fall of 1997, only 27 percent of instructional rooms had Internet access (National Center for Educational Statistics 1998).

It is not difficult to see why the World Wide Web is the latest technological favorite of the educational literature and educational policy makers. Here is a media that can be used as a library, a publishing house, a television, a television broadcast station, a radio, a radio broadcast station, a postal service, a telephone, and an interactive practice quizzing station. The diversity of the Web is awesome. But to what extent is the Web being used to learn in new ways and to what extent is the Web merely a case of old wine being packaged in new bottles?

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"Historically, as Marshall McCluhan often reminded us, we tend to fill a new medium with old content. Early films seemed like recorded plays. Television was treated like illustrated radio. Word processors were thought of as fancy typewriters (i.e., as still working on paper documents." (Marcus 1999). The differences that the Web makes in education may be characterized as the difference between learning *on* the Web and learning *through* the Web. In learning on the Web, students and teachers use the Web much as they would use another vehicle. A game of concentration placed *on* the Web to drill French vocabulary items might be an example of learning *on* the Web. The exercise merely replicates a game of concentration that might be played with cardboard French vocabulary cards. In learning *through* the Web, students and teachers use the Web in quite a distinct way that is not easily replicable through other media. Take the game of French vocabulary concentration again. If that Web-based game pronounced the vocabulary items each time they came up, it might be offering students something quite distinct, namely an interactive, multi-media resource with both a visual, textual, AND audio component.

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To better ascertain the difference the Web is making in the learning process, this paper will examine the use of the Web in two technology rich classrooms, one a foreign language classroom, the other a history classroom.

Use of the Web as a library-like resource center

The use of the Web as a library is almost certainly the most common use of the Web and the experiences of the French classroom and the history classroom are quite similar. The traditional French and history classrooms rely almost completely on textbooks. The Web-connected French and history classrooms do not even use a textbook. Instead, they rely primarily on resources available through the Web.

Does this use of the Web as a library fall into the category of learning on the Web or learning through the Web?

Almost certainly the greatest impact of the Web on the history classroom experience has been in the breadth of materials students have to draw from. For instance, in the history class, the Web enable students to carry out in-depth examinations of 18th and 19th century explorers that would otherwise have been possible only with access to a fairly sizable college library. In particular, the Web enabled students to study half a dozen female explorers of that period, women assuredly less important in their immediate impact than many of their male contemporaries, but on the whole, far more remarkable and intriguing.

Perhaps more noteworthy, though, are the individualized learning experiences the Web has allowed. Rather than being limited to four core eighteenth, nineteenth, and twentieth century explorers about whom a school library has sufficient resources, there is now sufficient information to sustain studies of two dozen explorers. Students can choose who they wish to study and tailor their studies to their interests. Thus, a student intrigued by Asia might choose Sir Edmund Hillary, while a student with her eye on Africa might choose Mary Henrietta Kingsley. Finally, the Web seems to allow far greater adaptability to multiple intelligences than would otherwise be available.

A significant advantage of using the Web as a library in French class is that it offers extensive access to complete, authentic texts as opposed to "prefabricated" texts that give a false sense of the language and culture. The use of the authentic texts – and lots of them – provides exposure to a full range of authentic cultural experiences in the foreign language.

A second significant advantage of using the Web as a library in French class is that it compensates for the fact that the normal American school library will have few texts written in a foreign language. Teachers and students can now access complete French literature texts as well as secondary literature in a mouse click. See for example, the primary and secondary sources on Jean-Jacques Rousseau's *Confessions* at http://www.lettres.net/confessions/

A third significant advantage of using the Web as a library in French class involves the dynamic features of the Web. The Web creates more discovery-based opportunities than a conventional foreign language textbook offers. For instance, in one French class, the teacher created a web page with two frames. One frame contained the authentic text, the other frame contained questions that help students to pick up linguistic and/or cultural information embedded in the authentic text. An activity using this two-framed method to introduce a unit on hotels may be found at
http://faculty1.caryacademy.pvt.k12.nc.us/fabienne_gerard/cyberbook/activits/hotel/carlton_hotel.htm
An activity created to introduce a unit on politics may be found at
http://faculty1.caryacademy.pvt.k12.nc.us/fabienne_gerard/cyberbook/activits/politique/inst_default.htm

A fourth significant advantage of using the Web as a library in French class revolves around the interactivity features of the Web being used to provide quick translations. See for instance the document from AZURLINGUA de Nice et le CIEL de Brest at http://www.bonjourdefrance.com/n4/a11.htm .

Use of the Web as a teacher and student publishing house

The Web offers a rich variety of media for students to present their understandings of material. Thus, in both the history and French class, students might make a presentation on their understanding of explorers in a variety of media. One student might create a PowerPoint posted on the Web about his explorer. Another student might create a radio show reporting on the challenges faced by the explorer and on the explorer's triumphs and failures. A third student might create a pretend radio interview with the explorer for broadcast over the Web. A fourth might create a photojournalism essay on the explorer and post it on the Web. A fifth might even create a conventional essay and post it on the Web. What one sees here is a case of the Web offering the unique ability to cater to students with multiple intelligences.

The Web seems to be extremely effective as a publishing house for teachers to present assignments and supplementary materials.Ê Both French and history classes present their homework and supplementary materials on web pages. This use of the Web helps students do their work. Students lose handouts. Fifteen years ago, the in-item on school campuses was something called a Super Trapper, a Velcro notebook that promised never to lose one's papers. One might think of the Web as the ultimate Super Trapper.

Many teachers also use the Web to publish what might be thought of as flat activities, that is activities without hyperlinks and that need to be printed to be completed. These flat activities are particularly prevalent in foreign language classrooms. Examples of flat activities may be found below.

Find the errors!	http://www.ergonet.com/sdl/ques.html: Sans Faute! Service de dépannage linguistique (SDL)
Fill-in-the-blank	http://www.class.csupomona.edu/efl/french103/pronoms2.html California State Polytechnic University Ponoma
Reading comprehension	http://www.acelf.ca/of-texte/0371t.html Ministère de l'éducation (Ontario)
Crossword	http://dspace.dial.pipex.com/town/square/fk26/xwords/french/home/html/home5/french5.htm (Alcester Grammar, UK)

Use of the Web as a radio, an audio archive, a television, a video archive, and a visual museum from which to draw information

The Web is a multi-media resource. In French class, students make particular use of online audio archives and online radio broadcasts to enhance students' skills in aural comprehension. In history class, students use audio materials found on the Web for entirely different purposes. For instance, students use the Web to listen to recorded speeches and songs such as the *Marseillaise*. These uses of audio bring the history alive, though their role in many cases merely replicates that of a CD player. That said, the Web does offer the unique opportunity for students to practice materials introduced in class at home. For instance, history students in one class are required to memorize the Marseillaise in French and to sing it to the Berlioz tune. They can only get sufficient

practice to do this effectively by listening to the music through a connection to the World Wide Web from home.

The quality of video broadcasted over the Web is of less help at present as video broadcasts are still of rather poor resolution. Nonetheless, videos are of some use in foreign language classrooms where they help students' develop their skills in oral comprehension. This is especially important in that it allows students to work on their oral comprehension at home through a connection to the Web. Videos available on the Web are also excellent transmitters of cultural information. One French class has made use of a video clip of a Renault commercial that shows the sorts of cars people drive in France. An example of useful video clips filmed and posted by a teacher may be found at Marie Pontario's terrific web site at http://www.cortland.edu/flteach/civ/vacance/vacan.htm)

Both the history and French classes make extensive uses of the Web as a visual museum from which to draw information. When studying World War I, for example, history students look at Expressionist paintings posted on the Web to get a better understanding of the disillusionment that followed the war. In French class, the web pages of French clothing designers help students expand their vocabulary, as well as to develop that all-important French sensibility for fashion.

Use of the Web as a radio station or television station to broadcast information

The web may also function as a radio station or television station used to broadcast information. Few history or French teachers seem to have made many recordings of moving video images for their classes. Similarly, history teachers seem not to make many audio recordings for their classes. By contrast, foreign language teachers seem to make extensive use of this recording capability. Foreign language teachers frequently use the audio recording feature to record morphemes, phonemes, isolated vocabulary items, and texts. For examples, see Léon's web page at http://www.jump-gate.com/languages/french/french1.html, Gérard's at http://faculty1.caryacademy.pvt.k12.nc.us/fabienne_gerard/voca/novice/chp1.htm, or Scheffel's at http://anarch.ie.toronto.edu/people/patrick/site/html/SimpliciteQCM.html

Use of the Web as an interactive practice quizzing station

The Web may function as an interactive practice quizzing station. "Interactivity" is defined here as a dialog activity between the user of the computer and the machine itself through a screen. Once again, foreign language teachers find themselves using a technology little used by history teachers. In French class, multiple choices, fill in the blanks, and matching activities make use of the interactivity offered by the Web. All those activities give immediate feedback to the students. The feedback can be more or less extensive. The feedback might simply note whether the response was right or wrong. The feedback might provide the correct answer. Or the feedback might give not only the correct answer, but also an explanation for why that answer is correct. The advantage of these activities is that the student can have an independent language learning-experience.

Some examples of **multiple choices activities in foreign language may be found at the pages below.**

	with explanation	http://pages.infinit.net/jaser2/gramm11b.html Ê (Mr.Jaser)
	with answers + score	http://www.quia.com/quiz/10787.html (QUIA - Sandra Howard)
	with answers + score	http://www.nyp.ac.sg/fl/fl_fx010.htm (Nanyang Polytechnic)
	with explanation	http://pages.infinit.net/jaser2/AccAdjEpith.html (Nanyang Polytechnic)
	reading comprehension	http://www.nyp.ac.sg/fl/fl_fx027.htm (Nanyang Polytechnic)

Ê

Some examples of fill-in-the blank **activities may be found at the pages below.**

	with answers	http://strindberg.ling.uu.se/call/french/persa06.html (Uppsala University)
	with correct answer	http://www.nyp.ac.sg/fs/fs_hxex3.htm (Nanyang Polytechnic)
	whole sentences	http://www.nyp.ac.sg/fl/fl_fx008.htm (Singapore Institut)
	crossword	http://www.nyp.ac.sg/fl/fl_fx013.htm (Nanyang Polytechnic)
	with pictures	http://www.nyp.ac.sg/fs/fs_hxex5.htm (Nanyang Polytechnic)
	words in context	http://www.cortland.edu/flteach/civ/ecoles/ecoles.htm (Marie Pontario)

Ê

ÊÊÊSome examples of matching activities may be found at the pages below.

	right or wrong	http://www.nyp.ac.sg/fl/fl_fx021.htm (Nanyang Polytechnic)
	with pictures	http://pages.infinit.net/jaser2/PpavDessin.html (Jaser)
	images + words	http://www.bbc.co.uk/education/languages/french/index.shtml (BBC)
	Find words	http://www.quia.com/custom/4093sear.html (QUIA)
	Oral production	http://pages.infinit.net/jaser2/OrdIm.html (Jaser)

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Conclusion – Nouvelle Avenue or Vieille AvenueÊ?

In many ways, the World Wide Web has mimicked old ways of learning and teaching, but done so in ways that make the learning and teaching process somewhat easier. The use of the Web as a library, the posting of homework and supplementary materials on the Web, the use of the Web for so-called flat activities, the use of the Web for drills, and the use of the Web as a visual museum are all examples of how foreign language and history classes have merely married old ways of learning with a new technology.

In many other ways, though, the information highway created by the Web has opened up new avenues of learning and teaching. The use of authentic texts on the Web, the use of a range of texts which would not otherwise be readily available, the use of audio and video archives available through the Web, and the broadcasting of phonemes,

morphemes, and vocabulary items on the Web are instances in which the Web has transformed not only what may be learned, but more fundamentally, how it may be learned.

Thus far there has been more learning *on* the Web in history classes and more learning *through* the Web in foreign language classes. This may not always be so. The use of the Web by teachers and students is constantly changing. As Seymour Papert remarked, "[i]n the presence of computers, cultures might change and with them people's ways of learning and thinking." (Papert 1993: 23).

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I-Maestro: Adaptive Writing Instruction via the Internet

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Abstract: I-MAESTRO, part of the suite of tutors developed by the Fundamental Skills Training Project, is an intelligent tutoring system designed to deliver adaptive, individual training to increase writing competencies anywhere, anytime via the Internet. I-MAESTRO is an adaptive, supportive learning environment for strengthening the critical thinking skills associated with varying writing tasks. Its comprehensive instructional approach provides instruction in the three stages of the writing process: prewriting, drafting, and editing. While this instruction takes place, the computer-based tutor provides individualized adaptive advice at critical points in each workspace. Incorporating motivational features that address individual characteristics such as learning styles and interests, I-MAESTRO presents dynamic interfaces, tailored instructional modules, and tutoring advice statements. The student's writing process is monitored and coached by an intelligent advice system. I-MAESTRO supports expository, persuasive, research, and practical (business letter, cover letter, memo, and e-mail) writing styles with over 100 challenging, multi-media writing assignments.

Introduction

In recent years much attention has been spent researching the effectiveness of implementing educational technologies, especially distance learning/education. Primarily the effectiveness studies have consistently demonstrated that when used in business, military training, and adult learning, there is no significant difference in effectiveness between distance learning and traditional instruction methods, and student attitudes are generally positive about the experience (http://www.usdla.org/). However, most of this research has been conducted at the collegiate level. Unfortunately, the majority of the efficacy research conducted in the K-12 population has been extremely limited. The existing research, project evaluation, and anecdotal evidence on this population strongly suggest that distance education, in the appropriate environment, is an effective means for delivering instruction just as it has been proven effective in adult learning and training settings (http://www.usdla.org/).

In 1998, with distance learning gaining recognition and accreditation, the Air Force Research Laboratory and the Department of Labor Employment and Training Administration (DOLETA) began a collaborative effort to develop, evaluate, and transition/transfer adaptive Internet-based training systems. Motivated by three related national-level initiatives including the Department of Defense's Advanced Distributed Learning Initiative (ADL), the America's Learning eXchange (ALX) project, and the Instructional Management System (IMS) project the Air Force's Sustainable Intelligent Training Systems for Global Mission Applications (SIGMA) project was created. SIGMA seeks to provide instructors with the availability of Intelligent Tutoring Systems (ITSs) delivered via the

Internet that have been developed on sound theoretical framework, has proven results, offers instructors in the high schools and Job Corps Centers with a form of distance learning, and provides learners with the opportunity to "learn anywhere anytime."

Background

Since 1990, the Air Force Research Lab and the University of Texas at San Antonio, have been engaged in a long-term research project (Fundamental Skills Training Project) to bring state-of-the-art intelligent tutoring technology to bear on our nation's growing literacy skills problem in areas such as mathematics, writing and science. After nine years of evaluation of the local-area- network (LAN) based intelligent tutor systems, The Word Problem Solving Tutor (WPS), Maestro: the Writing Tutor, and the science tutor, (Instruction in Scientific Inquiry Skills) the Air Force has begun a new endeavor to develop intelligent tutoring systems which are delivered via the Internet.

Software Description

I-Maestro is a student-oriented writing process tutor that facilitates learning through a series of instructional presentations and writing process workspaces. Students complete the assignments in workspaces that, when properly used, help the student acquire the skills underlying effective composition (including goal-setting, generating and organizing ideas, generating a writing plan, drafting, revising, and publishing). I-Maestro guides the learner through the writing process by scaffolding expert support. During use of the I-Maestro composing workspaces, the student's writing process is monitored, and the student is coached by an adaptive advice system.

I-Maestro includes: 1) tailored instructional modules (TIMs) that are adaptive to the interests and learning styles of individual students for each stage of the writing process; 2) student-controlled workspaces designed to facilitate the development of skills associated with the stages of the writing process; 3) situated assignments that help motivate the students to use the workspaces by using multimedia-based realistic writing tasks; 4) an adaptive advisor that tutors the students by providing diagnostic advice, selecting appropriate TIMs, managing workspaces, and monitoring student progress during assignments.

Advantages of an Internet Writing Process Tutor

I-Maestro has the same instructional approach as the LAN version. In addition, I-Maestro has the capability to deliver adaptive individual training to increase writing competencies anywhere, anytime. I-Maestro operates utilizing a client-server architecture (see Figure 1). The student work is stored on the server side; therefore users can run the software regardless of their location.

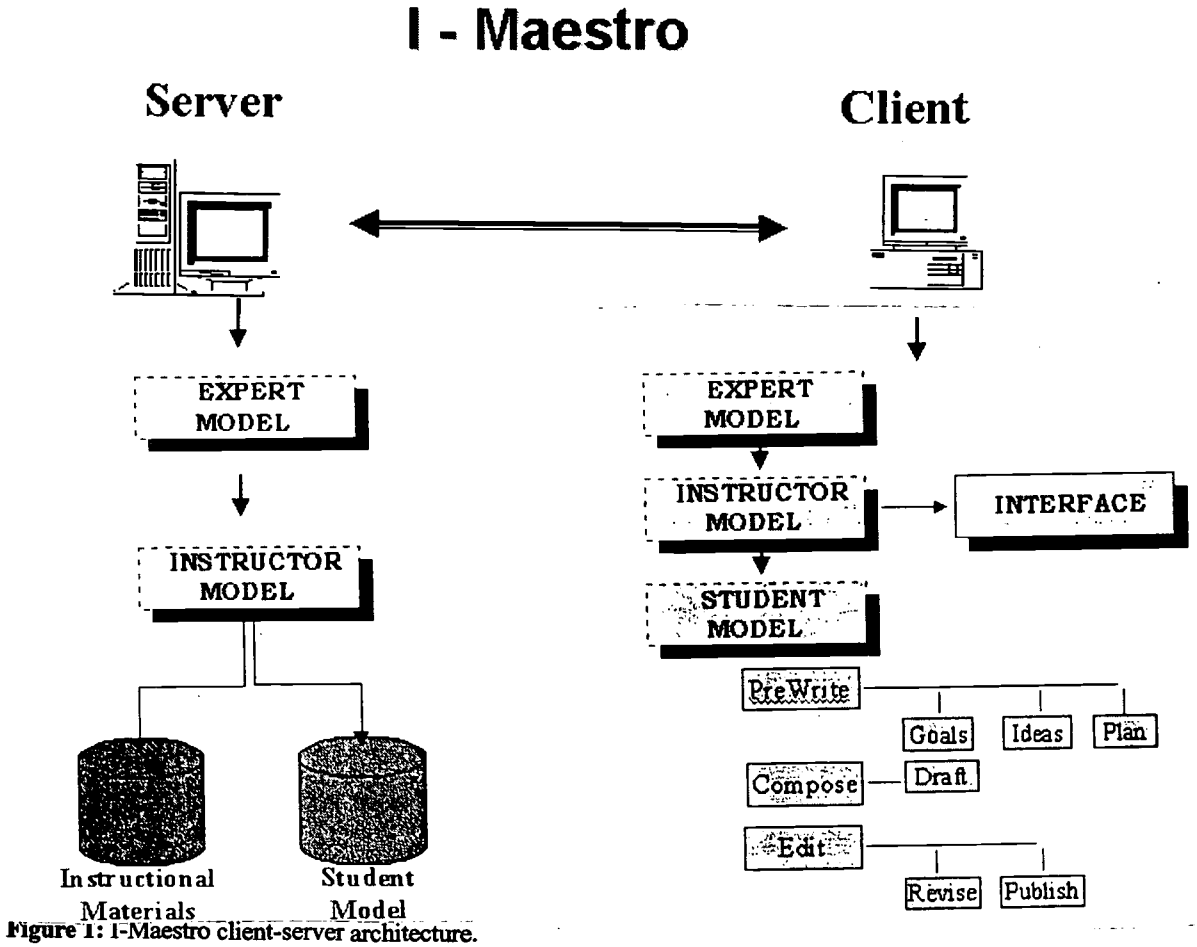

Figure 1: I-Maestro client-server architecture.

Another advantage of I-Maestro is that it is JAVA based and is therefore is a cross platform application. Furthermore, this design is consistent with the ADL initiative which seeks to ensure access to high-quality education and training materials that can be tailored to individual learner needs and can be made available whenever and wherever they are required (http://www.adlnet.org/).

A review of software industry trends indicates that many companies believe that an object-based approach facilitates software reusability needed for the large-scale development and dissemination of powerful and cost-effective applications. These factors are considered essential for the sustained investments necessary to create the kind of dynamic ADL environment that is needed to meet the education and training needs of a 21st century military and national workforce (http://www.adlnet.org/). I-Maestro fits these needs as it platform independent and the software reusable. Currently, it appears that the development of a robust object-based and platform-neutral environment, such as I-Maestro, for distributed learning will become widely implemented over the next 2-5 years.

Lastly, I-Maestro allows teachers to share assignments that they develop. The teacher tool allows the user to add, delete, or modify the assignments in the class lessons. The I-Maestro software also allows teachers to author their own assignments. The instructor may add text files, graphics, or videos to one of the one hundred existing assignments or to one of their own. Teachers will then have the option of uploading the new assignments to a server which will hold a generic pool that will be available for instructors to download and use anywhere anytime. I-Maestro will be distributed with over 100 assignments dealing with expository, persuasive, research, and practical writing assignments.

Implementation

In addition to making this new Internet ITS available to the host of Fundamental Skill Training Sites in the public schools, the SIGMA project has selected a test and evaluation (T&E) sample of 5-7 Job Corps Centers (JCCs) to participate in implementing and evaluating the software. AFRL in conjunction with DOLETA selected the T&E sites so that the entire set has a mix of characteristics. This mix includes student/client demographics, their needs for seeking training, the use and/or availability of technology at that center, and a supportive and cooperative administration towards the use of technology. The current JCCs have each sent two instructors for training and have implemented the three LAN-based FST tutors in those centers. This has allowed the centers to address implementation of technology issues prior to the use of the Internet-based version of the writing tutor. Concurrently, AFRL has been developing and testing the Internet-based version of the writing tutor. After the initial studies, the Internet-based version of the writing tutor will be installed on a Job Corps Data Center server for use by the center instructors and students.

Summary

The development and integration of instructional software has been impeded by many factors such as a lack of standards that would permit sharing across institutions and across a wide range of technical environments (http://www.imsproject.org/). In addition, finding relevant, valuable, and interesting information on the Web is a difficult process due to the lack of an inherent structure or standards for describing available content.

The future of educational software being delivered via the web is dependent on several factors including increasing access, implementing standards, improving quality, and reducing costs of learning environments. Much progress has been made on the hardware side, especially in terms of the global networking potential for linking learners, teachers, and providers of materials and services (http://www.imsproject.org/). What is needed, however, is an increase in the availability of effective distance learning software.

It is through the efforts of the Department of Defense, the White House Office of Science and Technology Policy (OSTP), the ADL initiative and the IMS project that effective software may be created. Software, as guided by the above initiatives, will ensure access to high-quality education and training materials that can be tailored to individual learner needs and can be made available whenever and wherever they are required.

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United States Distance Learning Association (http://www.usdla.org/).

The Professor, the Bookie, and Technology: A Terrific Trio for Developmental Reading and Writing Students

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Abstract: Critical thinking serves as the foundation for strong, effective reading and writing. And, as the authors of this paper discovered, technology and electronic library resources are excellent vehicles to improve the critical thinking, reading, and writing skills of underprepared community college students. After a brief overview of research on the interrelationship between and among critical thinking, reading, and writing and a mention of the research on the effectiveness of technology to improve the critical thinking, reading, and writing skills of underprepared postsecondary students, the authors discuss their collaborative efforts to implement this research in the community college classroom. The team also shares some library-based projects that incorporate electronic resources, promote critical thinking, improve reading and writing skills, and foster diversity.

Background Information

The work that the authors do as a team is based on the research that finds that critical thinking serves as the foundation for solid reading and writing skills. They've also based their work on research that demonstrates that building students' fund of general information enhances and strengthens students' reading and writing skills. In addition, their work with developmental reading and writing students stresses the interrelationship between and among critical thinking, reading, and writing. Finally, they began to emphasize and integrate more and more electronic resources into their developmental reading and writing assignments after they read a Chronicle of Higher Education article that touts the Web as an effective tool in developing students' critical thinking and writing skills (McBride and Dickstein, p. B6).

The authors build critical thinking into all their assignments through the use of Benjamin Bloom's taxonomy of cognitive skills (1956). Burmeister's adaptation of this taxonomy (1976) serves as a guide for their research and as a barometer for all their assignments.

Also, early each semester, the Professor introduces her students to Bloom's taxonomy and the need for higher level thinking skills in college and in the workforce. Throughout the semester, she refers to the taxonomy and gives concrete examples of answers, paragraphs, and essays that are or are not written at the higher level of thinking. She begins the classroom work on critical thinking by using a handout that explains Bloom's taxonomy as adapted by Lou Beimeister: memory, translation, interpretation, application, analysis, synthesis, evaluation (pp. 147-148). She stresses that short answers, paragraphs, and essays that demonstrate lower level thinking traditionally receive grades of C- and lower. Finally, she tells students that one way to guarantee that they've completed assignments that reflect higher level thinking skills is to include references outside of themselves in each written assignment. Further, she insists that each written assignment include at least one current event – an example from the news that is no more than six months old. At this time, the Professor suggests that students visit the TIME, Newsweek, Boston Globe, or New York Times websites to find and stockpile current events for future reference.

The team builds students' fund of general information through a wide range of print-based or electronic-based assignments. Both work. However, one of the major benefits of electronic library references is that students gravitate to materials at their independent reading level.

Because the Professor stresses the interrelationship between and among critical thinking, reading, and writing, her writing students often remind her that she's teaching a writing, not a reading course, and her developmental reading students often complain about the amount of writing they're required to do.

Birthday Assignment

In 1982, the Professor developed her very first electronic-based library assignment. The birthday project asks students to find a copy of either The Boston Globe or The New York Times on the day they were born, read it and then either write one paragraph summaries of the front page and two other pages or write an essay that summarizes the front page and two other pages, or write a comparison and contrast essay that compares and/or contrasts the newspaper on the day the student was born and the students' last birthday. This particular project has had many lives. The Professor first introduced it to her developmental reading classes, then to her English Composition I classes, then to her developmental writing classes. She uses this assignment to introduce students to the library and its many resources and to make sure that each student has a library card.

The Professor and Joanne Jones, a senior reference librarian at Massasoit, developed the birthday assignment before the Bookie's tenure at Massasoit Community College began. Their objectives were to incorporate the technology of the time - microfilm - into class assignments, to involve students in locating information, to provide an assignment with student interest, to give students library experience, and to encourage critical thinking.

Considering the giant leaps the form of knowledge has taken over the past few years -- CD's and online sources -- it seems strange now to think of microfilm as "technology." However, this one assignment became so popular with instructors and students alike that it was, and still is, used in many courses at the College.

Newspapers provide a current source of information and are particularly suited to developmental reading and writing assignments. The articles in the papers are short with a lower level vocabulary, giving students early success in their course work. And, for the birthday assignment in particular, the College's newspaper backfiles to 1851, leaving no one's birth date out.

In addition, using the newspapers in the Professor's birthday assignment create interest and a different assignment for each student. On occasion, students find a film reel missing, so the Bookie suggests substituting a different date for the birthday. Because the assignment loses something in this, students prefer a substitute date, a first birthday, for example.

Over the years, Massasoit looked at newer technologies -- CD-ROM's, online sources, subscription services, the Internet, and the Web. Like other college and university libraries, Massasoit had trials with different vendors and discussions about products in the library and at Board of Trustee meetings. Like other colleges and universities, some administrators were not sure that they wanted to spend the money needed on products they saw as relevant only in research universities and libraries.

However, because the librarians and faculty persevered, the College acquired newer technologies - some CD products, online subscription services, and Internet access. As the College acquired these formats, the library staff and faculty saw a rise in student interest. The new technologies did not, however, affect the birthday assignment. There were limited backfiles for the birthday assignment until a few years ago. Now, the Library's CDs and some online sources include access to information back to 1980 - the birth year of the College's traditional entering freshman class!

With this first library assignment, the Professor gives a lesson on plagiarism and citing references using material from Diana Hacker's Rules for Writers (1996) and a lesson on evaluating website sources. All electronic resources must meet the Professor's approval and be turned in with the completed assignment. If the Professor suspects a student has plagiarized, she simply checks the material attached to the assignment. Finding plagiarizers is easy: students who plagiarize usually highlight, underline, or circle the material they're copying.

When the Professor's classes go to the library, the Bookie reinforces the idea of crediting sources. The Bookie also feels strongly that if students search online, they should learn how to tell the difference between good and bad sources of information. Therefore, the team worked with the idea of source evaluation. Although important when using a print source such as a newspaper, evaluation becomes critical when electronic sources are added to the mix. Students need to be fully aware of the idea that online sources provide a vast array of information -- some are not good choices for a college paper; others excellent. While subscription services have a built in safety -- reliability -- as the sources used are recognizable publications, the Web includes information from everywhere and from everyone.

The College's library home page includes a link to several evaluation sites - a good beginning for students. Some Massasoit professors have created evaluation sheets for their classes and the library has put

together, from several sources, an evaluation checklist. Students who carefully evaluate their sources improve their computer skills, critical thinking skills, and their reading and writing skills.

Five-Year Career Plans

The team's second tried, but true and about to be retired library-based assignment focuses on three, five-year career plans. After students complete the Harrington-O'Shea Career Inventory (1998), they select three careers that interest them and research them for the following information: specific career title, education required, area colleges which offer the appropriate courses and/or degrees, skills required, work experience required, demand now and anticipated demand in five years, and annual income now and expected income in five years. Again, this assignment has many lives: the first in the Professor's developmental reading classes, then in her basic writing classes, then in evening English Composition I classes, then back to her developmental reading classes, now in her freshman seminar classes. Although the Professor has had her students write a five-paragraph essay for this assignment – the three different careers in the body of the essay – she generally has them write a paragraph for each career. She recently added an interview paragraph and found it so successful that she's decided to incorporate it into the assignment. In this paragraph, the students summarize an interview with someone in their chosen fields that includes the following information: official job title; time in service; required training, education, and experience; personal qualities and skills need for the field; specific responsibilities; salary range; what interviewee likes most and least about his/her job.

As the Professor's career assignment evolved over time, library sources kept pace. From the beginning, the College's library included new career sources in its acquisitions. The College is, after all, a community college and found that, in addition to enrolled students, community groups needing access to career materials used the Library as a resource. The College's counseling center acquired the Discover (1999) database that allowed students to take an interest inventory and skills profile to determine a good career fit. The same database provided career exploration for students.

The library put together a career guide - first for print sources. Then, as the library acquired computers with online capabilities and as the librarians became more and more computer literate, they included both print and online sources to assist students in their career searches. The guides included web addresses that linked students to the online Occupational Outlook Handbook (1999) and the Dictionary of Occupational Titles (1999) The address plug-ins are a safe way for students to explore the web.

National/International Issue

The third library-based assignment revolves around major national or international issues. The Professor asks students to select a major national or international issue that interests them, to read extensively on the subject, to formulate a position on it. Then, students must write a well-organized 350-400-word essay in which they clearly state the issue and argue their position on this issue. Both members of the team caution students that they must base their arguments on fact, not emotion. The facts for their argument must come from at least three newspaper and/or magazine articles, and these articles must be stapled to their papers. Students' essays must include in-text citations and a Works Cited page. Traditionally, this assignment serves as a final examination.

Evaluating Journalists

The next two library-based assignments are relatively new and inspired by Alexander and Lombardi's Community of Readers (1997) and Brenda Smith's, Bridging the Gap, texts the Professor uses with her lower and upper level developmental reading classes. The first – evaluating journalists – received raspberries from students — much too hard and long, they whined until the Professor thoroughly reviewed the difference between fact and opinion and denotative and connotative meaning of words. Also, the team and their students discussed vacuous papers: shallow, hollow, superficial essays and paragraphs. To help students with this assignment, the Professor had the students examine journalists' objectivity and subjectivity by critically analyzing various

newspaper and magazine articles. After much reluctance, students settled into the assignment and submitted, for the most part, well-documented, strong essays.

The Professor's use of newspaper and magazine articles for research in this assignment means a class visit to the library for instruction in the use of our on-line subscription services. This is also a time to reinforce the difference between searching subscription services and surfing the web. When using a subscription service, such as InfoTrac Searchbank, students access information from recognizable sources – the New York Times, U.S. News and World Report, New England Journal of Medicine, etc. When surfing the web by using a search engine, such as Altavista, students access information from familiar and unfamiliar sources. If, for example, a student were to search the term "Y2K" in Searchbank, the results would include an article from the Washington Post entitled "A Glitch That Won't Steal New Year's?" Because the search was done in a subscription service, the student should feel comfortable with the source and the article. However, a similar search using Altavista brought up the "Y2K Survival, Food, Water and Protection Site". This site advertises a one-page "kit" of information, has little information about the author(s) and appears biased. Students are encouraged to use a variety evaluative techniques to assist them in making good choices.

Diversity in the Armed Forces

The diversity assignment, the final library-based assignment discussed in this paper, received an A+ from students. In this assignment, the Professor asks students to use print or electronic library reference materials and research diversity in the US Armed Forces during any three of the following military conflicts: the American Revolution, the Civil War, World War I, World War II, the Korean Conflict, the Vietnam Conflict, or the Persian Gulf Operation. Then, students must write a 350-400-word essay that answers the following question: During each military conflict, did the nation's Armed Forces reflect the diversity of the country?

This is another assignment that uses Web address plug-ins. However, students, accessing the sites, find that there are many links to additional information about their topics. This assignment requires computer skills to move around the web sites and critical thinking skills to determine the relevance of information.

The first time the team used this assignment, the Professor and the Bookie found that students refine something besides their computer and critical thinking skills. When classes visit the Library, there are always more students than there are available workstations. Therefore, the Bookie assigns groups of students to workstations, making sure that each group has at least one computer competent student. In one class, Amelia, an insecure, but computer literate ESL student became the leader in her group and showed others how to manipulate the mouse, where to plug in the web addresses, how to move from link to link, and how to print information. By the end of the period, a beaming, confident Amelia realized that she became a star for that day and the team made its first accidental step into collaborative learning. With the Professor's encouragement, Amelia's confidence at the computer screen transferred to the classroom where she became more willing to contribute and a more successful student.

The Professor, the Bookie, and Technology: The Future

Gradually, the Professor plans to move away from developmental reading texts like Brenda Smith's Bridging the Gap (1997) and Alexander and Lombardi's A Community of Readers(1997) to nonfiction books and a study skills book for her developmental reading classes and a grammar text and nonfiction books for her developmental writing courses. More and more, library-based assignments, specifically electronic reference-based assignments, will serve as the core for all of these courses.

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Writing in 3-d: Using Simultaneous Media to Enhance the Quality of Student Writing

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Abstract: The traditional "process approach" to writing popularized in the early 1970s restricts students to two-dimensional conceptualizations in which the student must translate abstract thoughts into language. Students who are not particularly successful abstract thinkers do not improve the quality of their writing much using this model. Instead of the two-dimensional model, a group of "remedial" adolescents were given the opportunity to compose using a variety of visual, auditory and other sensory appeals. By utilizing stimultaneous media, these "remedial" students were able to transcend the limitations of the two dimensional box and add depth and substance to their writing.

Despite the myriad recent advances in technology, most teachers still follow the process approach to teaching composition made popular through the National Writing Project some thirty years ago. Students brainstorm, draft, peer edit, then turn in their papers for a grade. Obviously, there is much to recommend such an approach. However, as a teacher, even the writing process was not sufficient to reach many of my students, especially those students who seemed to struggle with fundamental aspects of vocabulary and syntax.

For many students, writing is an arduous, frustrating process in which they are constrained by their current grasp of the language and their ability to build words into sentences, then sentences into paragraphs. From years of asking students to revise and reconceptualize their papers, I have come to understand that many students perceive that changing the word *large* to *big* or *brave* to *courageous* constitutes significant revision. For struggling writers, the process of revision seems even more unfathomable. Once when I asked a group of ninth graders to write a paragraph describing a pizza as accurately as possible, one earnest boy named Jake wrote, "It tastes great!"

I called Jake up to my desk and asked him, "If I told you this pizza tasted great, would you know what kind of pizza it was?"

"All pizza tastes great," he said.

"But does it have pineapple on it or does it have pepperoni?" I asked.

"I like sausage and mushrooms," he said.

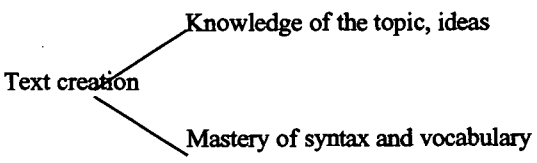
"Aha! See, I couldn't tell you were thinking of a sausage and mushroom pizza it was unless you told me that with words," I said, convinced that I had finally broken through.

For five minutes, I noticed Jake at his desk thinking and writing. Finally, he brought his paper up to my desk.

"The pizza had sausage and mushrooms on it," is what Jake had written.

Writing in two dimensions

A traditional two-dimensional diagram for the teaching of writing, the one that most teachers use, might look as follows:



The difficulty with the two-dimensional approach to teaching writing is that it relies upon talents that struggling writers have somehow never managed to develop over the course of their academic careers. To break out

of this routine, we performed a little experiment with a class of juniors in high school that utilized simultaneous media as a way of getting students to truly reconceptualize their thinking about word selection and placement.

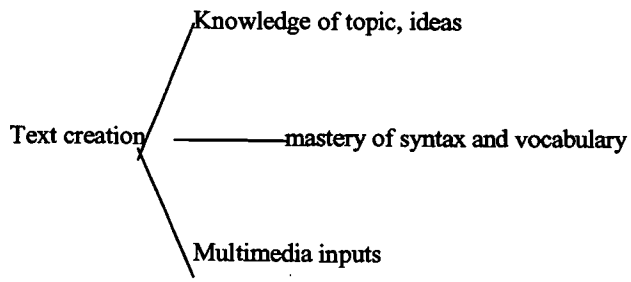
The class with whom we chose to work was the lowest level English class at a high school in northwest Georgia. In terms of standardized test scores, these students ranked in the lowest 20% in the state. Although the class had an enrollment of 18, although only between 12 and 15 students would show up regularly. In this article, we will describe the experiment step-by-step and focus upon the works of two students, Derkis and Titus, who showed up for every period during the two weeks we worked with the class.

Derkis was a short, ebullient, young man who played halfback for the football team. Although he was the smallest player on the team, he carried the ball often and was so successful that he had become somewhat of a celebrity within the school. Although Derkis could be cooperative, he had much energy and would often get out of his seat and walk around the room just to expend energy. Sometimes, he broke into spontaneous raps in the middle of class. His teacher, a smart and innovative man, attempted to get Derkis to put his powers of rap to good use by creating and performing a song based upon Poe's "The Raven," which the class had studied earlier in the year. But, Derkis said that he preferred making up his own songs and declined.

Like Derkis, Titus had some major difficulties with writing and reading. However in addition to his obvious distaste for writing, Titus was one of the worst spellers we've ever seen. Although he seemed to have a relatively sunny disposition, Titus often acted bored and, at times, tried to sleep through class. At the time of the experiment, Titus was the only student in class who had not passed the composition exam with a score high enough to earn him a high school diploma.

The sequence of activities

The idea behind the experiment was to ascertain to what extent students could enhance the quality of their writing through the use of simultaneous media. In other words, we wanted to change the traditional approach to writing so that these students would draw on some of their talents outside of the purely linguistic realm. We wanted the students to write in 3-D. The 3-D approach might be diagrammed as follows:



To get students to write at all, we knew we had to choose a topic to which they could relate, as well as one that they would want to share with one another. Also, we wanted a topic ripe for artistic interpretation, something that could be performed. After some discussion, a scripted poem was created with the topic of HOMETOWN. The format required students to write one line of text per prompt. The prompts were as follows:

Name of hometown
Two verbs that fit it
The landscape (hilly? Dry? Buildings?) – 4 words
Smell/tastes of your hometown – 6 words
Music, song, or sounds that remind you of your hometown – 8 words
King of people who live there – 10 words
An important event in your life – 12 words
Another important even (repeat the previous line if you can't think of anything else) – 12 words
A dream or nightmare – 10 words

An influential person – 8 words
Specific advice – 6 words
Weather – 4 words
Your hometown plus and adjective

After a discussion in which I reiterated that poetry used very descriptive words and pared down expression to the bare bones, I read the prompts aloud one at a time, giving all students ample time to respond before reading the next one. After I'd say the line, I'd write the prompt on the whiteboard as well. Sometimes students asked questions and I walked around the room to see what individual students were writing as they wrote.

When all students had finished the poem, I asked them to share what they had written with two other students. Next, I handed out a purposefully bad poem that I had written about my hometown of Dallas.

Dallas

Big, dusty
Flat and gray land
It smells like a bowl of soup
An old, out of tune guitar that plays
Nice people, old people, smart people, and friends
I got my driver's license there when I was 16 but not before
I got a job that paid me $250 per week part time
A man with an axe was chasing me around a park
My dad used to be 6'5" and mean
Don't do anything stupid, stupid
It's cool
Dallas cools.

I asked students to find all the "wimpy words" in my poem *Dallas* and to suggest revisions.. With students' help, most of the nondescriptive words were replaced with more appropriate terms and some lines were rewritten completely. Then, I asked students to re-examine the HOMETOWN poems that they had just written and revise them individually as we had just done as a class with *Dallas*. I passed out thesauruses and encouraged students to "make every word pack a punch."

Using the HOMETOWN format and this revising strategy, Derkis had written the following poem:

Rome
Cheers, bores
7 hills, small, nice weather, smells
sewage, rivers, chitlins
whopper, big mac, pancakes
dumpster beep, birds, sirens, barking, cats, screaming car horns, bus
mean, ghetto, friendly, talkative, nasty, tough, rough, poor, crazy, outrageous
scored my first touchdown of the year on a 58 sweep for 14 yards
I scored my second touchdown of the year when we played ringgold on 59 sweep for 28 yards
My dream is to go to FSU and play football and go to the NFl and play for the Dallas Cowboys.
An important person that I like is Bobby Bowden because he is the best college football coach alive
Never let anybody talk down on you, keep your faith.
Summer when it's hot
Small rome.

Derkis felt pretty good about the quality of his poem. When I asked him if he needed to revise anything, he said, "It's perfect, ain't it?"

Titus' poem is as follows:

Rome Southside
Small

Gray bumpy street curve
Fresh cold waltmelon with hot coca
Dogs, cars, winos, train, radio, and the shower
Kind, friendly, outgoing, happy, relax, smooth, bout-bout, and fighting people
On a hot summer day when I first start to take my drive lessons
I first got my three wheeler and phone line for my thirdteen birthda
My head was in a shoe box and someone were sticking knifes in it
Martin luke king who sacrifice his life for all people.
Don't go outside with your shoes off
Summer hot steaming weather
Wonderful georgia

As did Derkis, Titus felt fairly confident that he had created a solid poem, though when I asked Titus if he needed to revise anything, he said, "Is it bad?"

Infusing simultaneous media

To begin the next part of the sequence, I told students that I wanted them to illustrate each line of their poems. I brought in several stacks of magazines from the public and college libraries that were going to be thrown out, bunches of scissors, and told students to cut out images in the magazines that fit the descriptions from their poems. Also, I asked each student to draw at least one image themselves. For a day and a half, students scoured through magazines, cutting out photos, making drawings, trying to find images that could fit the lines from their HOMETOWN poems.

After they matched images to lines from their poems, I asked students to paperclip the line number to each image they found. They handed in their collected and numbered images on a Friday. Over the weekend, each set of images was scanned into computer images (either JPEG or GIF files) and inserted into a Powerpoint presentation in the appropriate order. The following Monday at school, we divided the class into four groups. One grad student (Fishel) took those students who had been absent the following week (only one student, it turned out) to catch up with the assignment, while I and two others worked with laptops, showing individual students how their images had been put into the Powerpoint slide format.. The students were asked how they wanted to place the text on the screen, about font choice and size, and other matters of aesthetics. About half of the high school students inserted the text themselves. The other half asked me or one of the graduate students to do it.

At the end of the day, we told students that they would be presenting their poems in two days. For their presentations, we told them that they would be reciting their poems to the rest of the class while the images and the words from their poems were cast against a wall. We mandated that all presentations had to have some background music and that presentations should be dramatic and appealing. Students could bring their own music (though songs could contain no cursing or lewdness), or they could select from a variety of CDs that we would provide.

The next day was a final rehearsal day for students. No one brought their own music, so they all chose from among the CDs I brought with me – Bob Marley, Celtic Harp, DJ bass, guitar and drum mixes, Beethoven, and other (mostly) classical music selections. Students fiddled with the final details for their presentations, listened carefully to a variety of musical selections, and rehearsed. We printed each student's Powerpoint presentation (six slides per page) and handed them out so that they could practice. Every student in class seemed deeply immersed in the tasks.

For the presentations, we brought in a mini-amplifier and a microphone so that even those students who liked to whisper could be heard. The lights were lowered, the appropriate CD was played, and students recited their work while the images they selected shone against the wall – a scholarly bit of performance art.

In transferring his poems into a Powerpoint presentation, Derkis changed several of his later lines to better match the images that he found – the person he admired changed from Bobby Bowden to Michael Jordan for example because he couldn't find any photo of Bowden. When learning that his words would be cast against the wall with a projection device, Titus became very conscientious about his spelling. He corrected *waltmelon* (watermelon), *luke* (Luther), *knifes* (knives), *coca* (cocoa), and deleted *winos*. For their soundtracks, Derkis chose the bass, guitar, and drum DJ mix and Titus chose a Bob Marley CD.

A return to words

For the final piece of the experiment, we asked students to consider their poems, the images they selected with their poems, and the music they selected to play in the background together. Then, they were asked to communicate the content of the images and the feel of the music back into their poems so that, through the meanings of the words alone, someone reading their poem could visualize the images and sense the sounds that might go with it. Surprisingly, students took to this task with much enthusiasm. They rifled through dictionaries, asked questions, worked very intensely for a day and a half to complete this task.

For his revised poem, Derkis wrote the following:

Rome vaults
Camper searches for the seven hills
Twang of Aunt Jemima's pancakes in the a.m.
Nimbleness of cars on the highway out
Fastidious and pleasant, a token of remembrance
Milestone celebrated
Carrying pigskin for the seminoles
Hard worker, the desire to win
When people talk, I listen
To pick up stanzas
Hot sun, outstanding looking women
Atom-sized rome

Unfortunately, a day and a half were insufficient time for Titus to completely revise his poem. Although he worked constantly and meticulously during the class time, he never finished revising the second stanza. Still, the changes he made in his initial poem are striking. For his revised poem, Titus wrote the following:

Yearning rome
Small, stainless
Gray impulse street curve
Newness, cold pungent watermelon
Dogs barking, radio playing, shower raining
Smooth and relaxed
Excited when I first began my driving lesson
Thirteen with a three-wheeler and my own line

My head in a shoebox and someone sticking knives through it
Mlk who sacrificed a life
Don't go otuside with your shoes off
Summer hot steamy
Astonishing rome

Advantages of a Third Dimension

In today's media-enriched environment, the attention cues of many students begin with the eye and simultaneously engage the ear. Although movies, music, video games, and TV are often perceived as antithetical to students' intellectual development, aspects of these media could actually enhance learning. During our experiment, using images and sound during the writing process stimulated student interest in writing and revision.

As students created HOMETOWN poems, they focused upon the prompts and their linguistic responses to them. In the next step, they made sure to select images that were reflective of what they wanted to communicate. In essence, the pictures served both as a bridge in the revision process and as a reference point between teacher and student. Instead of having no idea where to begin revising, students were able to use their self-selected images as focal points for the reconsideration of linguistic choices. Students would ask each other and the teacher how exactly to capture aspects of the images that they had selected into words.

Music enhanced the writing process in two ways. First, the music seemed to make it easier for many students to read their poems aloud. Shy or reluctant students who had not read aloud in years seemed fairly comfortable when they were accompanied by background music of their choosing. Second, the music added an intangible emotional quality to the experience that seemed to give students even more opportunities to attach nonlinguistic responses -- emotions, memories, and ideas -- to the existing work.

Although this experiment in using simultaneous media to enhance student writing was dependent upon technology – laptops, a projection device, Powerpoint software – much of the same effect could be accomplished through cutting and pasting paper or using videotape. The important lesson to be learned from the experiment with this class of remedial writers is that using simultaneous media seems to enlist students' visual and auditory senses in the cause of the written word.

Somehow, by using visual and auditory appeals, students were able to think in novel ways about their uses of words and the real meaning of what they wanted to communicate. Some teachers routinely go through the stages of the writing process as if it were some kind of inflexible process that will magically transform bad writing into good. Yet, the transformation in the quality of writing done by Derkis and Titus came about only after the use of multimedia prompts. Through their exposure to multisensory and simultaneous media, Derkis and Titus were able to reconsider their uses of language in ways that purely linguistic appeals would never permit.

Technology: The Answer to Early Literacy Success in the New Millennium

Dr. Jean M. Casey

"Imaginative progressive teachers who had computers in the classrooms and were prepared to give students the time and support to learn often created wonderfully fertile learning environments--children can learn to use computers in a masterful way; learning to use computers can change the way they learn everything else." (Seymour Papert,1993, Mindstorms)

The first question administrators, teachers and parents ask is, "Will computers make a difference in the learning that occurs in the classroom? Past studies failed to answer this question or answered it negatively because they used standardized reading test scores as their only measure. The Simi Star Project, a collaborative grant between six school districts and IBM tested the effectiveness of computers in the classroom and effects of integrating technology into the curriculum. As a University researcher and reading professor, I was asked to be the evaluator of the Simi Star Project. It resulted from a grant between IBM and Simi Valley, Ventura, Oxnard, Santa Barbara, Orcutt and Point Hueneme school districts all located in Southern California. Six networked computers were placed in 24 kindergarten and first grade classrooms to test integration of technology in the curriculum and measure the effect on writing and reading development of the students. I worked with a team of educators and developed a qualitative study to examine these classrooms. The software used in the study was Writing to Read, Stories and More, Children's Writing and Publishing. The teachers were carefully trained, parents were informed as partners, students were given daily access to the computers for writing their own language experience stories. The students also were given phonemic awareness and systematic phonics support. The researchers used observations, interviews, questionnaires, portfolio assessment as well as reading attitude tests to measure the students writing and reading development. The experimental classrooms were compared to control classrooms without computers but a similar approach to teaching.

The results were significant. All students in the experimental classrooms using Writing to Read, averaged at least two writing levels higher based on a holistic evaluation than those in the control classrooms. The experimental group had a significantly higher positive reading attitude score than the control group. (Casey 1997) Teachers and parents all rated this program excellent on a 5 point rating scale.

These classrooms became writing, reading and publishing labs; the teachers kept samples of the children's daily writing in portfolios that were used as assessment and in parent conferencing.

That was just the beginning. One computer in each room was connected to the Internet and children chose pen pals from other states and Europe. One kindergarten child proudly wrote his daily message to his friend in Alaska. A fifth grade classroom was working on a project about the world environment online with a fifth grade classroom in Paris, France. Children were not only experiencing the meaningful use of writing and reading, but developing life long friendships and understanding of children like them all over the world.

The teachers quickly were caught up in the enthusiasm they saw in their student writers. They produced more communications and newsletters for their parents than teachers in the control classroom were able to do; they also designed lessons and modeled stories that they wrote specifically on the computer and shared on the projection monitor with their students. Teachers became hooked on E-mailing each other, finding lesson ideas on the Internet, asking questions of

the university people pertaining to certain theories and ideas. The teachers spent time reflecting on their teaching with the university researcher and also building a community of support with their peer teachers in the project.

The 6 computers were busy all day. When the language arts block was over and children had written their own stories, it was time to use the computers with HyperStudio, a software authoring program for children to design their own multi-media research reports in science and social studies. Math, art, graph making was all a part of the daily curriculum, there never was an empty seat in front of a computer. Children received 90% more time using computers then those who visit a lab once a week for an hour.

The teachers also discovered that the daily writing of their students offered the best assessment possible of the skills the child had already mastered and those that were needed. Look at Brandon's work in the figure below. He is a first grade student. Without the computer, based on his immature drawing, a teacher would conclude (using Gesell Developmental Scales) that he was at a 3-year-old maturity level. He would be mislabeled and misplaced. But given the use of the computer we can see that Brandon has the phonemic awareness skills, sentence structure, punctuation and story sense of a six-year-old or older. How many students have we misjudged in the past based only on their underdeveloped motor coordination with a pencil. Giving them a new tool unlocks the intelligence they have and allows them to express it for all to see.

Insert Fig 1 diagram here

At What Grade Level Should We Have Computers in the Classroom?

Some administrators and parents might think that high school is the time to start computer use, some third grade. As the evaluator of the Simi Star Project, reading one thousand writing samples from five and six-year-olds was enlightening and taught me a valuable lesson. These young children could write much more than we ever imagined that children that age were capable of doing. It proved that they had many more ideas than they had been able to express with pencil and paper.

The time to have computers in the classroom is the first day children enter school. The computer is a sophisticated writing tool that gives the student auditory feedback, a visual display and control of their learning. A tool that can allow any student to feel like an author on the first day of school!

When I taught first grade twenty years ago and a child entered the classroom and said, "Teacher when will I learn to read?" We had to say not until you have mastered the three hundred fifty skills on our district reading scope and sequence chart. The first one is consonant b; there are three hundred forty nine more. The discouraged child went back to his seat.

Today when a child enters kindergarten and says, "When will I learn to read?" The professional teacher says, "Today!" Using KidWorks Deluxe (Knowledge Adventure) the talking word processor, a child can sit down write his name, mom's name, his dog's name, letters of the alphabet, whatever he wants to write. He prints it out and has immediate proof of his literacy and authorship. He can take home his printed piece that very day and have it posted on the refrigerator for all to see, he can write, he can read!

Another important aspect in integration of computers into the curriculum is meeting the needs of the mainstreamed students. Some are students who in the past, because they had not yet developed adequate motor coordination were often mislabeled learning disabled, dyslexic, or attention deficit disorder (A.D.D.) The computer really is essential for changing the lives of these children. The following stories are about two of the many children I worked with using the talking word processor.

Dyslexic Nicholas: The heavy label

Nicholas taught me the next lesson. He was coming to the remedial reading clinic at the university. He was flunking his subjects at school, his parents were frantic. I trained the reading clinicians and then they worked weekly one hour a week with the children labeled "remedial readers." Rose was Nicholas's tutor and she came to me distressed. She felt she had been trying all the ideas we spoke about in class but they were not working with Nicholas. I agreed to work with him at the next session and Rose would observe through the two-way mirrors. The next week I was waiting for Nicholas, when he arrived I told him I would be his tutor for this one session and asked him to tell me about himself. He said, "My name is Nicholas and I am twelve years old." "When I was six they told me that I have dyslexia and would never learn to read and I have not ever learned." "I not only cannot read, I get an F in handwriting and math." He couldn't understand it because he liked math. He was good at it and knew all the answers through mental calculation and could respond with them orally. However, the teacher insisted on written responses on timed tests. This approach made Nick nervous and with his poor handwriting he was always destined to get an F. Because of these grades his dad would not let him play with his friends after school, he was ordered to stay in his room and do homework. Nicholas was a very depressed twelve year old as he stated, "I hate my life; I wish I was dead!"

Amazingly, Nicholas had just diagnosed his problem. He was not learning to read because he believed he could not, he was bright and could respond orally but had trouble with handwriting and got tense under pressure. My first step was to work on this attitude of failure that he had held on to for the past six years. I told him about Albert Einstein, Nelson Rockefeller, Tom Cruise, to name a few who were dyslexic. Nicholas was very surprised to hear that and certainly did not think those men were dumb. I reassured him that he was not dumb either, but had not been given opportunities to learn the way he could most effectively. Nicholas was a case just like Patrick in Denny Taylor's book, *Learning Denied*; the school system had failed him (Taylor 1991).

As we continued to work together, I asked Nicholas if he had ever used a computer? " No," was his reply. I introduced Nicholas to the talking computer with KidTalk software. (Casey 1983) He immediately began to compose his life story. Then he was able to read it and print it out. "You are a very bright boy Nicholas, you just needed a more sophisticated writing tool to help you put all your great ideas down on paper," I told him. It took more than a talking computer, it took a teacher who understood Nick's particular learning strengths and needs and cared enough to encourage him and help him learn in other ways. But it was definitely a breakthrough and turned Nick on to learning once more.

David was a student in the first grade at one of the Simi Star Project schools, I entered his classroom and saw a 10-page story on the bulletin board, and I began to read it. David walked up to me and said, "Do you like that story? It's mine?" Follow me to the computer and I will show you more, it is twenty-six pages long now. I followed him with great interest. He took me to a computer, put headphones on my head and proceeded to play the story for me. I listened in awe as the computer began to read his long story of the Dinosaurs' lives, George Washington's life and his grandma's life.

At recess I could hardly wait to go to the teachers' lounge and speak with his teacher. "Mary," I said to her, " David must be a gifted first grader, his story is outstanding, well above what you would expect from an average first grader." She laughed, "Oh no, she said. You should have seen him at the beginning of the year, he was identified A.D.D. and he couldn't hold a pencil or write and he hated school. Now he doesn't want to go out even for recess when he is in the middle of one of his great stories!" I drove home thinking about a technology that had made a student write in a gifted manner even though he had been labeled a poor writer. A technology that

compelled a student, who had been labeled attention deficit disorder, to sit for long periods of time thinking, creating, imagining a twenty-six page story. If he could sit that long writing something of interest to him then sitting still was not the problem, having something worthwhile to attend to seemed more probable. Something is wrong with the labels, I concluded, the students are fine when given the right tools and environment.

Thomas Armstrong, psychologist, teacher, and consultant has years of experience working with children who have attention and behavior problems. He has the belief that these children are at core fully intact, whole, and healthy human beings...that the best way to help them is to provide the kinds of nurturing, stimulating, and encouraging inventions that are good for all kids.(Armstrong 1995) The computer provides the motivation, stimulation and control in the learning environment. All you need to provide is nurturing and encouragement. I worked with ESL, LEP, Down's syndrome students and the computer was equally empowering, an essential learning tool for them. For Gifted students the computer finally freed them from the boredom of classroom work too easy for them and allowed them to create, imagine and write far beyond anyone's expectations.

In summary, the time has come for us to integrate computers as tools in every classroom. Six networked computers worked well in a classroom of twenty-five students, but one per student as envisioned by Seymour Papert (Papert 1993) should certainly be our goal. We must help teachers recognize the power of the computer as a problem solving tool when used by the learner to construct his own literacy. They are as empowering to five year olds as they are to you once you discover you can use PowerPoint to produce a presentation that will impress your staff and parents. They need to be in every classroom, in every school. Money must be set aside for training to help teachers understand that this is a new paradigm, one in which students create stories directly from their mind into the computer and then have the control and power for easy editing. Untrained teachers think stories must be written out in pencil first, then corrected and then laboriously typed by the child into the word processor. There is no surer way to make children dislike technology than to use the approaches designed for the pencil. It is as if you had to wash your clothes on the washboard by hand before you put them in your washer! Wouldn't you hate that?

John Henry Martin, educator and creator of Writing to Read summed up the benefits of computer use for literacy for all students, he said," "The computer can give the learner the world's most beautiful feeling, the Greek "Eureka:" I got it, I know it, I can see it, I can understand it! That's a transforming feeling; to be awakened from dormancy, from sadness to strength, to dignity. I can write, I can read! Do this for your students today!

A 21st Century technology equipped classroom, trained teachers, a risk-free learning environment and you are ready; when the three and four year olds doing Broderbund's Living Books on their home computers today come to your classroom door next year and ask, "Where is the CD-ROM?" "When do I learn to read and write?" Your teachers will say, right over here! right now!

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- Early Literacy: The Empowerment of Technology
- TeacherNet: Supporting teachers on-line
- Reading Acquisition: K-8, RICA, technology integration

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Chancellors Distinguished Teacher Education Scholar on CALSTATETeach development team, co-developer of CredentialNet reading on-line course.

Recent Presentations:

May 8, 1999- Spring Computer Using Educators (CUE) Conference, Featured Speaker- Emergent Literacy: The Empowerment of Technology, Palm Springs, CA.
May 3, 1999- International Reading Association 44th Annual Convention, Featured Speaker-Technology Lab Session, How Computers in the Classroom make a Difference in Reading Development, San Diego, CA.
March 20, 1999 – Hope of the New Century: Early Literacy, the Empowerment of Technology, 66th Annual Claremont Reading Conference, Claremont, CA.

February 13, 1999 – The End of the Reading Wars, Early Literacy Success: The Empowerment of Technology, 1999 Aloha State Reading Conference, Honolulu, Hawaii.
January 29, 1999 - Literate Lives: Empowering At-Risk Learners For Early Success in 21st Century Literacy, Featured Speaker, Technology, Reading & Learning Difficulties, San Francisco, California.
January 28, 1999 – Alameda County Education Office, Distinguished Scholar Presentation on Early Literacy, California Technology Assistance Center, Alameda, California.
October 24, 1998- Computers in the Classroom Promote Literacy, South Bay Area Reading Council, Conference on Literacy, Torrance, CA.
May 16, 1998- **Keynote Speaker**, Writing to Read for Literacy Success, Writing to Read Spring Fling, Los Angeles Archdiocese Conference, Los Angeles, CA.
November 5, 1998-Early Literacy: Leading the Way to the 21st Century, California State Reading Association Conference, **Featured Speaker**, Sacramento, California.
October 30, 1998-Connections to Literacy-Emergent Literacy: The Empowerment of Technology, Transparent Technology, Computer Using Educators National Fall Conference, **Featured Speaker**, Santa Clara, California.
October 24, 1998- Computers in the Classroom Promote Literacy, South Bay Area Reading Council, Conference on Literacy, Torrance, CA.
May 9, 1998- Do Computers in the Classroom Make a Difference in Literacy Development? CUE National Spring Conference, Harness the Winds of Change, **featured speaker**, Palm Springs, CA.

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