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ABSTRACT

This document contains the following papers on diversity/equity from the SITE (Society for Information Technology & Teacher Education) 2002 conference: (1) "Modeling and Developing Technology Integration with Pre-Service Indigenous Teachers" (Shadow W. J. Armfield and Marilyn Durocher); (2) "Integrating Diversity in Children's Literature into the Elementary School Curriculum Utilizing Internet Technology" (Joyce C. Armstrong and Martha M. Hanlon); (3) "Web Accessibility for Diverse Learners" (Laurie Ayre and Marian W. Boscia); (4) "Bridging the Digital Divide in South Florida" (Tom W. Frederick and Mary Kay Bacallao); (5) "Integrating Technology in the Pre-Service College Classroom and Beyond by Developing Exit 'E-Portfolios'" (Mary Kay Bacallao and William Halverson); (6) "Community Mapping: Learning and Teaching in Context" (Gina Barclay-McLaughlin); (7) "School District Websites: An Accessibility Study" (Marty Bray and Claudia Flowers); (8) "Distance Learning: Eliminating the Digital Divide" (Sheryl Burgstahler); (9) "A Window of Opportunity: Computer-Mediated Communication and Multicultural Education" (Lucretia O. Carter); (10) "Field-Based Technology and Critical Friends Principles in Teacher Preparation" (Viola Garcia and Irene Chen); (11) "Gender Bias in Software: Issues, Implications, and Considerations" (Jennifer Groendal-Cobbs and Jennifer Patterson); (12) "Critical Race Theory and the Digital Divide: Beyond the Rhetoric" (Patricia Randolph Leigh); (13) "Bridging the Digital Divide: A School's Success Story" (Edmundo F. Litton); (14) "Equity Lenses: Diversity-Responsive Use of Advanced Technologies for Math and Science Education" (J. David Ramirez, Kim Williams, and Kevin Rocap); (15) "'Facelessness' and Its Impact on Democracy and Diversity in Virtual Communities" (Carol Reid); (16) "CLMER Telementoring: Diversity-Responsive Teaching and Learning with Technology" (Kevin Rocap, Yolanda Ronquillo, and Joe-Feria-Galicia); (17) "Self, Visual Representation, Voice and Online Social Identity" (Sharon Tettegah); (18) "Bridging the Differences on the Web through Effective Communication and Collaboration" (C.Y. Janey Wang); (19)

"Together We Form a New Culture; Students' Perspectives on the Influence of Diversity in a Web-Based Collaborative Learning Community" (C.Y. Janey Want); and (20) "Teaching and Learning in Intergenerational and Intercultural Classrooms: Report on a Classroom-Based Research Project." Several brief summaries of conference presentations are also included. Most papers contain references. (MES)

Diversity/Equity (SITE 2002 Section)

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Educating a diverse population for the future through technology is the major theme of this section. Technology is the tool used for increasing diversity in the teaching /learning experience. Proponents of multicultural education feel that mutual respect and harmony among ethnic and racial groups is essential for the future. Local school districts and teacher preparation programs have made strides in opening the world to diverse populations. Thoughtful and creative technology use in the classroom has brought the world into the classroom for many students and adults.

So many good articles grace this section that only a few are highlighted to demonstrate the theme of educating the future through successful school projects, the revamping of teacher preparation programs and accessibility laws and issues. Examples of successful school projects could be seen through the articles written by Litton and Beckett. Edmundo Litton in his article " Bridging the Digital Divide: A School's Success Story" documents the progress of ethnic minority females from a low socioeconomic background. He describes what the school is doing correctly, to bridge the digital divide by interviewing and observing students and teachers in a technology setting. He presents the qualities that can make all high schools a success. In the article "Integration for ESL Success: TESOL Standards, Multiple Intelligences and Technology" Carol Beckett focuses on how a school can build upon the strengths of English language students by acknowledging their differences while developing their English language proficiency. She discusses how developing computer literacy and the information technology skills prepare these students for the increasing technological job market. She concludes with demonstrating how the integration of technology TESOL standards for Pre-K - 12 students and the theory of Multiple Intelligences can support learning differences and develop English language skills across the curriculum.

The progress of teacher preparation programs and technology is phenomenal. A sample of five articles among many shows the keen efforts being made in this area. In an article by C.Y Janey Wang " Bridging the Differences on the Web Through Effective Communication and Collaboration" explores how effective communication and collaboration among online learners of diverse backgrounds are encouraged by design. In addition, communication techniques utilized by members in the Web-based learning community in bridging differences, achieving group goals, and optimizing individual learning are explored. The researcher suggests that the ideal curriculum bridges diversities by encouraging, inspiring, and inviting multiple perspectives within a highly flexible environment of multiple communication methods, learning styles and approaches. Shadow W.J. Armfield and Marilyn Durocher in " Modeling and Developing Technology Integration with Pre-Service Indigenous Teachers " discuss how a site-based traditional elementary and special education programs are taken to a reservation so that aides can continue their employment in schools while earning their degree and certificate. The authors discuss how the courses were interwoven to help students have a clear understanding of elementary education curriculum while simultaneously gaining an understanding and an ability to effectively integrate technology for learning and teaching. Also in "Gender and CS1: An Approach that Benefits Males and Females" by Thad Crews, Jeff Butterfield and Ray Blankenship, the project goal was to teach novice teachers to write computer programs through a series of short design activities focused on fundamental logic structures that transcend hardware and specific languages. Then "Integrating Diversity in Children's Literature in the Elementary School Curriculum through the Use of the Internet Technology for Preservice Educators" by Joyce Armstorng focuses on assisting preservice teachers in learning about current diverse literature through the Internet. The Internet, what an invaluable tool!

On the other hand, as we celebrate the success, we also realize that we still need to continue stepping toward progress through Chloe Rose's "Expertise and Access: Teachers Accounts of Technology Dis/use." She explores the pressing concerns of teachers who are faced with recent and ongoing demands made by provincial policy-makers, administrators, and parents to implement and integrate computer technology in k-12 schools in Canada. She focuses on the ways in which these concerns

are complicated and shaped by gender inequalities among teachers, within the school system, and in society, especially in relation to their competence with and usage of computers. In a diverse world *her* concerns become *our* concerns.

Finally, there are articles that teach us about web accessibility for diverse learners.

"Web Accessibility for Diverse Learners" by Laurie Ayre addresses educators' concern for making Internet materials available to all students, including those who are physically challenged or hearing impaired. Standards for web design, and implementation strategies are discussed, and a list of Internet sources that provide support, information, and free testing of existing materials are presented. Also in the article "Distance Learning: Eliminating the Digital Divide" by Sheryl Burgstahler, access, legal and policy issues are presented. An overview of design considerations for assuring that a distance learning course is accessible to potential instructors and students with a wide range of abilities and disabilities are presented. She leaves readers with information that can be used to help develop policies, guidelines, and procedures for distance learning programs. A course accessible to everyone is what diversity means.

Diversity and technology are the future. The articles above are only a few of many interesting projects in this section that show *progress in motion.*

Modeling and Developing Technology Integration with Pre-Service Indigenous Teachers

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Abstract: This paper discusses how two pre-service teacher education courses were interwoven to help students have a clear understanding of elementary education curriculum while simultaneously gaining an understanding and an ability to effectively integrate technology for learning and teaching. Furthermore, the paper will detail the successes and challenges of combining these courses for a site-based teacher-training program in a rural, indigenous community where various levels of expertise and access to technology were prevalent. The paper will also describe how the students constructed knowledge through the creation of meaningful and germane artifacts.

Introduction

"In a community of learners, teachers and students are role models, not 'owners' of some aspect of knowledge. They are acquirers, users, and extenders of knowledge in a sustained, ongoing process of understanding" (Norton and Wiburg, 1998).

Northern Arizona University (NAU) is located in Flagstaff, Arizona, only 50 miles from the Navajo Reservation and 75 miles from the Hopi Reservation. Because of it proximity to these two cultures, NAU has put great focus on working with the members of both tribes to help them attain college degrees regardless of their location. Through site-based programs, the Center for Excellence in Education has focused on providing face-to-face instruction to indigenous people who wish to become certified teachers. One such site-based program occurred in Tuba City, Arizona during the fall semester of 2001. The twenty-five students enrolled in this program represent the Navajo, Hopi, Anglo, Apache, and Acoma cultures. All of the students are non-traditional in the fact that they have returned to school as mature adults and three have already obtained bachelor's degrees in areas outside of education. Because of the diversity of the population, it was important to create a community of learners from which the students could take a sense of connection with other educators while at the same time maintain their individual cultural identities.

In accordance with Piaget's theory of situated learning, "knowledge is not a commodity to be transmitted. Nor is it information to be delivered from one end, encoded, stored and reapplied at the other end. Instead, knowledge is experience in the sense that it is actively constructed and reconstructed through direct interaction with the environment" Ackerman (1996). This site-based program takes the traditional elementary and special education degree and certification program to the rural areas so that students can continue their employment in schools while earning their degrees and certificates. In this way, students are learning about teaching, while working in classrooms, actively constructing and reconstructing knowledge as they participate in the program.

The Dilemma

Rural communities throughout Arizona are at an educational disadvantage due to their distances from the three university campuses in the state. The program in which these students are involved provides face-to-face instruction, but has not provided on-site support resources such as the physical availability of instructors, peers, and reference materials usually found on university campuses. As a result of this inequity, it is paramount that students in these communities have technological access and skills in order to utilize the same resources as students on the university campuses. Upon examination of the program components, it was found that two courses could be combined in order to help the students acquire skills necessary to access resources for their learning, while transferring their new abilities into methods for curriculum implementation.

The two courses used in this project were Technology in the Classroom, and Elementary School Curriculum. The Technology in the Classroom curriculum is based on the idea that "When learners actively construct knowledge, it is more meaningful, applicable, and memorable." (Jonassen, 1996); students in this class participate in and create technology-integrated activities, which they can use with their future students. Elementary Curriculum is a course in which students learn various methods of teaching and then create lesson plans to model what those methods would look like in the classroom. Traditionally these two courses have been taught independent of one another. The goals of the two courses lent themselves to a natural integration (See Table 1, Goals 1 through 3). In the fall of 2001 the traditional system was set aside and the two courses were combined so that students would have the opportunity to enhance their skills in technology for both teaching and learning through practice and modeling.

ETC 447	ECI 321
Students will 1. Have an understanding of the use of technology and how to integrate technology as a tool in the learning environment. 2. Have knowledge of the difference between teaching about technology and teaching with technology. 3. Have an understanding of the impacts of technology on changing teacher roles, changing student/teacher relations, and changing learning environments and values. 4. Have some knowledge of theory and research as it applies to educational technology. 5. Have knowledge of the impact technology has on society.	Students will 1. Examine methods of teaching and their relation to curriculum. 2. Examine various classroom models that reflect and impact curriculum. 3. Examine characteristics of teachers that interact with curriculum implementation. 4. Examine the impact that parents and community has upon elementary school curriculum. 5. Examine different models of schools, including magnet, Comer, private, charter, special purpose, Montessori, and BIA, analyzing the interaction of curriculum and school model. 6. Examine child development theories, student diversity, and student learning styles, analyzing the impact of these areas upon elementary curriculum.

Table 1: Course goals.

The Process

The program was set up so that each course would be taught in a three-week period, four nights a week, and four hours a night. Elementary Curriculum was scheduled to be taught the first three weeks of the semester and Technology in the Classroom was scheduled for the final three weeks of the semester. As a combined course, the time allowed remained the same, but the content was interwoven and taught by both instructors.

The Foundation - the first three weeks

Because a strong sense of community was culturally appropriate and educationally desirable, the students and instructors participated in classroom experiences and assignments designed to connect students with one

another, the instructors, elementary curricular content, and the technology. Activities progressed from face-to-face sharing of beliefs, experiences, and values to creating an online community of learners and practitioners. During icebreaker activities, students and instructors shared elementary school experiences. Internet research was introduced and e-mail accounts were created to facilitate communication between and among students and instructors. Then students used a computer to create a metaphorical image of themselves. These images were shared on a class web page. At this stage, the students were ready to do further research about elementary learning and teaching, and to be able to share this information electronically with each other and the wider educational community. Assignments included finding and sharing information about characteristics of elementary schools, children, and teaching methodologies, including the integration of technology into both learning and teaching. They created PowerPoint presentations to share the information they had found in their Internet research. Students were then asked to incorporate the information into an electronically produced parent newsletter in which they described their educational philosophy, and classroom procedures and expectations.

At the end of the first three-week period, the students were prepared with the research, communication, and technological abilities they would need for the subsequent courses of the semester. Over the next twelve weeks the students completed four more of the required courses for the program. These courses covered assessment, special education, and educational psychology.

Putting It All Together - the final three weeks

When the students returned to the Elementary Curriculum and Technology in the Classroom combined courses, they had been exposed to the information they would need to complete the culminating assignments. The theory of Constructionism purports that learners are more likely to internalize and utilize information and skills gained through the construction of meaningful artifacts (Kafai and Resnick 1996). In alignment with this theory, the students were asked to create a web portfolio and an integrated thematic unit.

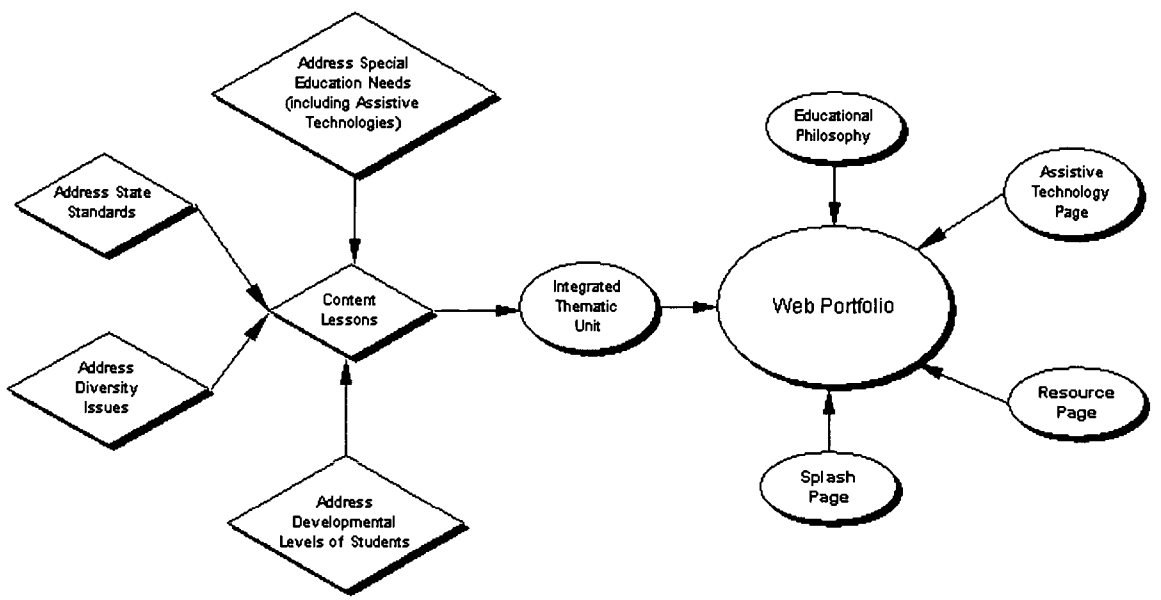

Figure 1: Graphic representation of the culminating assignments.

The web portfolio that the students were creating had a number of components including the integrated thematic unit (see figure 1). Below are the descriptions of each of these components.

- Splash Page –Serves as an introduction to the website and includes a graphic, contact information, and links to the other pages.

- Integrated Thematic Unit –The students demonstrated their knowledge of developmental levels, diversity issues in the classroom, and use of state standards in lesson planning, and the ability to adapt and accommodate lessons for students with special needs.
- Educational Philosophy –The students were to reflect upon the educational philosophy created in the first three weeks of class and use their new understandings to expand and clarify their educational values and beliefs.
- Assistive Technology Page – This page is a summary of research about assistive technology and a description of specific assistive technologies used when creating the integrated thematic unit.
- Resource Page – During the semester the students had gathered various Internet resources about educational topics. On this page, each student included at least five of the most useful resources they had found, along with a brief description of the contents of the site.

Conclusion

This paper has two conclusions, that of the students, and that of the instructors. At the end of the semester, students were asked to write to the instructors their perceptions of the things that worked and didn't work for them individually. Quotes from these responses are included in the student section.

Students: what didn't work

- "My suggestions are that if you plan to put two classes together, they need to be all at once, not spread out the way we did."
- "The only change I would recommend is to allow more time for each class."
- "The class was not very effective-very stressing especially for those of us who do not have computers."
- "Saving the thematic unit plus others until the end."
- "When classes are combined it's very hard for us and the instructor. It should be separated. We could have learned more about technology."

Students: what worked

- " I can honestly say I have learned and grown beyond my expectations. Although we started off slow, we ended pushing ourselves harder than we ever have before."
- "In the integration we were allowed to make technology useful in our prospective teaching careers."
- "Even though it seems like there were some parts untaught in the texts, it integrates and fits in with other courses taught in the semester. I do believe I learned quite a bit and increased my knowledge in an educational environment."
- "I really enjoyed having the two classes together because it really showed me what integration of two subjects as one unit is really like."
- "I thought this was tough, but it taught me how we as teachers intend to push our kids to do something new."

Instructors: what didn't work

One problem with the course design was communicating with students the interrelatedness of content for the two courses. The students came to the first class with expectations of a traditional separation of content matter. Their educational experiences had not prepared them for a course in which multiple subjects were being taught simultaneously. As the instructors, we failed to provide the students with the necessary scaffolding to be prepared for what lay ahead of them. This lead to frustration, and confusion about specific content expectations

As many of the students responded, time was a stressor for both instructors and students. By dividing the courses between the first and final three weeks of the semester, the issue with time was magnified. Without this configuration, though, the students would have not have had the benefit of the instruction in technology at the first of the semester, and would not have been able to use all of the courses' information in the culminating assignments. Along with the issue of time is the availability of technology to rural communities. A number of

students had to travel long distances on unimproved roads to use technology for creating assignments and communicating with instructors and peers. Not only did students have problems finding available technology, but also had to contend with the capricious nature of rural Internet service both inside and outside the classroom.

Instructors: what worked

Upon reflection, we realize that many of our initial goals have been achieved. The students were able to experience class activities both as learners and as educators; translating the things that they were feeling and doing into what their student would also feel and do. They immediately used new knowledge to create artifacts that can be used in their own classrooms. The students became a community of learners, sharing resources and ideas. As some students mastered ideas and skills, they shared their expertise by teaching their peers. In the culminating activities, they left the traditional isolationism of teaching to work together in creating units that integrated content material in a realistic, culturally specific manner.

All things considered, we feel that this is an effective model for helping pre-service teachers understand how content specific curriculum, individual student needs, technology, cultural diversity and a sense of community can be interwoven to construct dynamic classrooms of their own

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INTERGRATING DIVERSITY IN CHILDREN'S LITERATURE INTO THE ELEMENTARY SCHOOL CURRICULUM UTILIZING INTERNET TECHNOLOGY

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Abstract: Teacher training in most colleges and universities include training in current genres of children's literature. These courses typically allocate much time in demonstrating how to locate appropriate literature and in presenting teaching ideas to preservice teachers. However, diversity within the different genres is often overlooked. This paper presents pedagogy for the preservice teacher in the development of current diverse literature in the elementary curriculum utilizing numerous Internet sites.

Children's Literature classes are very popular courses in elementary teacher training programs. Course descriptions include objectives such as reviewing relevant literature for preschool and elementary students, examination of different genres to compliment the elementary school curriculum, and the development of an appreciation of the literature created for children. Time is devoted not only to the evaluation of children's literature but also to the teaching techniques employed to involve the elementary students in the literature. There are also numerous courses offered at colleges and universities on internet technology. However, future teachers need to incorporate their internet knowledge into their own teaching. (SITE, 1998) This integration should not be restricted to a single college course about technology but integrated into all methods courses in elementary education.

In the past, Children's Literature courses focused on a canon of exemplary 20th century children's books. (Goldstone, 2002). Hearne (1998) compiled a list of 35 books to act as examples of the historical pattern for quality children's literature. This pattern details the relationship between text and art. Today's authors do not always adhere to this pattern. There is not always a clear, traditional, linear story structure or a sugary happy ending to the story. Along with this newer type of story, diversity has become a theme in children's literature. Moll and Greenberg (1990) infer that everyone lives in families and communities that draw on cultural diversity. If we view all children's literature from this point of view then our task is to create a collection of children's literature that is a balance of many different cultures.

Galda and Cullinan (2002) present the statistics that, "approximately one-third of the students entering schools are of African-American, Asian-American, or Latino backgrounds." (pg.277). As educators we need to expose children to quality literature about many ethnic groups and the diverse cultures. Literature and the internet are the means that many people learn about the uniqueness of each group of persons and the universal experience of being human. (Huck, Hepler, Hickman, Kiefer, 2001) Preservice teachers need the skills to evaluate culturally diverse literature and to include this literature within the curriculum.

To assist preservice teachers in learning about current diverse literature, the internet becomes an invaluable tool. Search directories and engines that are useful include Yahoo, Looksmart, and AskJeeves

for Kids. Utilizing Banks' (1998) four-step model of integrating diversity content into the curriculum a teaching pedagogy can be developed for the preservice teacher. Banks' lowest level for integrating diversity into the curriculum is the "contribution approach". At this level preservice teachers can explore the web sites of The Children's Literature Web Guide (www.acs.ucalgary.cal/~dkbrown/) or Vandergrift's Children's Literature Page (www.scils.rutgers.edu/special/kay/childlit.html). Preservice teachers should focus on literature that describes the contributions made by various ethnic groups to culture.

The second level of Banks hierarchy for integration of diversity is the "add on" approach. At this level content, concepts, and themes are added into the curriculum (Banks, 1998). Web sites to locate literature include New Years Around the World (www.coe.wayne.edu/~mpettap/lesson/newyr.htm) and Religious Holidays (www.adl.org/ctboh/old/holidayactivitiesguidelines.html). These sites describe ideas and children's literature that adds extra information to the elementary curriculum.

The third level of Banks' model is that of the "transformation approach". At this level the curriculum is actually changed, not more added. This third level enables students to develop an understanding of problems, concepts, and concerns of an entire culture, not just from the majority point of view. Web sites to explore for literature includes Connecting Students to the World (www.guilford.k12.nc.us/webquests/) and A Celebration of Diversity: Immigration and Citizenship (www.libsci.sc.edu/miller/diversity.htm).

The "social action approach" is the highest level of Banks' model. (Banks, 1998) At this level students identify problems and develop solutions to these problems. Web sites include Racial Profiling (www.horizonmag.org/6/racial-profiling.asp) or Yahooligans/Around the World/Activision and Volunteering/Peace Corps. (www.ourdays.com/old/tour).

The above mentioned sites are only a very small sample of the possibilities of the internet. When introducing the various genres to preservice teachers it is important that cultural diversity is not a separate unit. It should be include in all aspects of the curriculum and the internet is a tool to inform teachers of children's literature that can be used in all aspects of the curriculum. Lesson plans, award-winning books, pen-pal sites, sharing of children's writing, and reviews of new books are only a sampling of what is available for the preservice teacher.

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Society for Information Technology and Teacher Education, Statement of Basic Principles and Suggested Activities – April 1998.

Web Accessibility for Diverse Learners

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Abstract: This paper addresses educators' concern for ensuring that Internet materials are available to all students, including those who are physically challenged or visually or hearing impaired. One salient example is the controversy that arose related to the inaccessibility of the Sydney Olympic Games Website for visually impaired persons (Carter, 2000). Teacher educators should not produce, distribute, or support Internet materials that are in violation of the 1990 Americans with Disabilities Act (Public Law 101-336). Only through making sure that online materials adhere to a set of standards for web development, such as those established by the World Wide Web Consortium (W3C), can educators ensure accessibility for students with disabilities.

Introduction

There are 20.9 million Americans aged 15 and over with work disabilities. Although over 2.1 million people with disabilities make use of the Internet either at home or in another environment, they are less than half as likely as non-disabled individuals to have access to a computer at home and three times less likely to have the ability to connect to the Internet at home (Kaye, 2000). The Americans with Disabilities Act (ADA), which celebrated its eleventh anniversary in 2001, has prompted an enormous amount of litigation in schools and the workplace. On November 4, 1999, the National Federation of the Blind filed suit against America Online in the Federal District Court under the ADA (Wingfield, 1999). The National Federation of the Blind, a nonprofit organization of 50,000 members nationwide, took the position that America Online and the Internet must provide public accommodation for persons with disabilities. This was the first legal action taken against an Internet company. The suit was settled on July 26, 2000, when the National Federation of the Blind and America Online reached an agreement to work closely together to ensure continued progress on accessibility for individuals with disabilities. In addition, America Online reinforced this commitment to accessibility by posting an accessibility policy on its Web site. This anecdote serves as a cautionary tale for Internet and Web site developers. Furthermore, teacher educators must become familiar with issues of accessibility, striving to support compliance with standards that promote universal access to online materials and to educating future teachers about them. This paper will describe standards for web design under *Section 508—Web Accessibility* of the Workforce Investment Act of 1998 (Public Law 105-220), and implementation strategies for computer accessibility and web content. It will also provide an annotated list of Internet sources offering support, information, and free testing of existing materials.

Legal Requirements for Internet Accessibility

Some of the important accessibility issues pertaining to Web page design relate to the way in which individuals interact with computer technology and to the accessibility of the information itself. For instance, certain individuals with disabilities might find it impossible to use a keyboard or mouse. Some users may require appliances that have a text-only screen, a small screen, an older browser, or a slow

Internet connection. Others might have difficulty reading or comprehending text or may not be fluent in the language of the document.

Limitations to Internet accessibility have been addressed through two major pieces of legislation, The Americans with Disabilities Act (PL 101-336), and the Workforce Investment Act of 1998 (PL 105-220). The Americans with Disabilities Act (ADA) provides that institutions subject to the act must furnish appropriate aids and services to ensure effective communication with individuals with disabilities, unless doing so would result in a fundamental alteration to or in an undue burden on a program or service. Examples of aids include audiotapes of texts, Braille materials, large print materials, and captioning and text readers. Furthermore, on September 9, 1996, the U.S. Department of Justice issued a policy ruling extending ADA requirements to include communication through the Internet.

Two years later, the Workforce Investment Act of 1998 (Public Law 105-220), based on the ADA, significantly fortified the technology access requirements of Section 508 of the Rehabilitation Act of 1973. Effective August 7, 2000, Section 508 requires that when Federal agencies use electronic and information technology, they must ensure access to people with disabilities, unless it would pose an undue burden to do so. The level of access must be comparable to the same available to non-disabled Federal employees and members of the public. States receiving Federal funding under the Assistive Technology Act of 1998 are also subject to Section 508 provisions. [See Waddell and Urban (2000) for an in-depth discussion and links to government publications related to this legislation.]

Implementation Strategies for Computer Accessibility

Three major organizations provide extensive resources for ensuring computer accessibility to individuals with disabilities. These include IMS Global Learning Consortium, specifically Specifications for Accessible Learning Technologies (SALT) Project, Microsoft, and Apple Computers Worldwide Disability Solutions Groups (WDSG).

Specifications for Accessible Learning Technologies (SALT) Project, a joint venture among the IMS Global Learning Consortium members, has as its goal to make online learning resources accessible to people with disabilities. One half of the project's funding is provided by the U.S. Department of Education, with the other half coming from contributions from project partners, Blackboard, Educational Testing Service, and WebCT. These project goals are to:

- Promote awareness of accessibility issues, especially within the e-learning community
- Create development guidelines and best practices for inclusive design of software applications for learning, education, and training
- Advocate for the development of e-learning software applications that meet or exceed accessibility legislation requirements
- Contribute to IMA specification development, with a focus on accessibility extensions to existing IMS specifications. (SALT Detailed Overview, 2000, p. 1)

The IMS Accessibility Working Group published IMS Guidelines for Developing Accessible Learning Applications, Version 0.6 in October 2001. This white paper discusses current accessibility solutions that are available for implementation as well as unresolved access issues that affect educational technologies. This document will continue to be expanded, updated and revised.

Microsoft provides resource guides for ensuring computer accessibility based on the nature of specific disabilities, including vision, hearing, mobility, and cognitive and language impairments. These guides are made available to educators and the public at http://www.microsoft.com/enable/default.htm Microsoft lists assistive technology products for each impairment. Organizations should consider which of these products should be provided to its members or constituents. Furthermore, Microsoft supplies an impressive set of links to papers covering access issues, which are organized by impairment type. Another important feature of Microsoft's Web site are the step-by-step tutorials for enhancing the accessibility of each of its products. A designated member of an organization can use these tutorials to make certain that impairments will not bar users from having access to Microsoft products.

Apple Computer's Worldwide Disability Solutions Group (WDSG) supports the development and distribution of Apple's *Macintosh Human Interface Guidelines*, which is freely available at

http://developer.apple.com/techpubs/mac/pdf/HIGuidelines.pdf These guidelines specifically address issues involving people with seizure disorders, as well as accessibility for individuals with physical, visual, hearing, and speech or language disabilities. These guidelines provide the design requirements to achieve universal access for all people, including those with disabilities. An important feature of this book is that it includes numerous examples of the guidelines applied for the Macintosh platform.

Implementation Strategies For Web Content Accessibility

At the foundation of a strategy for assuring Web content accessibility, each organization must establish a set of priorities for which accessibility issues receive primary and immediate attention. In 1999, The World Wide Web Consortium (W3C) established a useful set of priorities for implementing accessibility standards for a Web site (see URL under Internet sites). Web design elements that enhance accessibility have been assigned to one of three priority levels. For each priority level, W3C has listed a number of checkpoints for individual design elements. These checkpoints can serve as a basis for evaluating the overall accessibility of Web content. For items given *Priority 1* status, guidelines must be followed to ensure all disability groups will be able to access the information contained in a Web document. An example of a *Priority 1* checkpoint is as follows:

> Provide a text equivalent for every non-text element (e.g., via "alt," "longdesc," or in element content). *This includes:* images, graphical representations of text (including symbols), image map regions, animations (e.g., animated GIFs), applets and programmatic objects, ascii art, frames, scripts, images used as list bullets, spacers, graphical buttons, sounds (played with or without user interaction), stand-alone audio files, audio tracts of video, and video. (Checklist of Checkpoints for Web Content Accessibility Guidelines 1.0, 1999, p. 3)

A Web content developer should comply with *Priority 2* guidelines to prevent disability groups from having difficulty accessing information in the document. For example, *Priority 2* guidelines require that foreground and background color combinations provide sufficient contrast to be easily viewed by someone having color deficits and when displayed in black and white only. Further, the designer should clearly identify the target of each link.

Priority 3 guidelines may or may not be addressed, but still can cause access difficulties for one or more disability groups. To comply at a *Priority 3* level, the content developer must specify the expansion of each abbreviation or acronym in a document where it first occurs, the primary natural language of a document, a logical tab order through links, form controls, and definitions of objects. Organizations are encouraged to adopt the W3C guidelines and checklists as a means of improving web content accessibility.

Internet Sites

The following list of Internet sources provides support, information, and free testing of existing materials:

1. *Disability Information Links.* The National Information Center for Children and Youth with Disabilities (NICHCY) is an information and referral center focusing on disabilities and disability-related issues of children from birth to age 22. Their information is targeted for families, educators, and other professionals. This site offers an extensive set of links to PDF-format publications. The NICHCY home page is located at http://www.nichcy.org/.
2. *Web Content Accessibility Guidelines.* The World Wide Web Consortium (W3C) provides a comprehensive set of Web design guidelines at http://www.w3.org/TR/WCAG/. W3C's Web Accessibility Initiative is supported in part by the U.S. Department of Education's National Institute on Disability and Rehabilitation Research, the European Commission's Information Society Technologies Programme, Canada's Assistive Devices Industry Office, Microsoft Corporation, IBM, and Ve rizon Foundation.
3. *Quick Tips.* Department of the Navy Web Information Service provides *Quick Tips on How to be Section 508 Compliant* located at http://lej-www.med.navy.mil/section508/tips.htm. These tips

address specific html code requirements for images and image maps, multimedia, page organization, table and frame layouts, and hypertext links.

4. *Website Design.* The Trace Center of the College of Engineering at the University of Wisconsin provides a comprehensive set of links dedicated toward building more usable Web sites at http://trace.wisc.edu/world/web/. These links include valuable Web access tools for both users and authors.
5. *Page Checker.* Validate your pages with an ADA validation tool such as *Bobby*, sponsored by IBM and downloadable from http://www.cast.org/bobby/DownloadBobby316.cfm for a $99 charge. A second alternative is A-prompt Test Program available at http://aprompt.snow.utoronto.ca/as a free download. W3C HTML Validation Service is freely available at http://validator.w3.org/. This service checks documents for compliance with W3C accessibility guidelines and makes recommendations for improvements.
6. *Model Programs.* The Family Center on Technology and Disability (Family Center) is a project funded by the Office of Special Education under the U.S. Department of Education. One of its goals was to identify exemplar programs that provide technology support and services to families of students with disabilities. The Family Center Web site at http://fctd.ucp.org/fctd/htm provides a brief description of six model technology support and service programs, including sources of funds, populations served, and services provided, as well as contact information. These can be used as templates that an organization can use in establishing its own program.

Conclusion

It is clear, given the resources now available, that educators can begin to address the issue of web accessibility for diverse learners. Any society will strengthen itself by recognizing and supporting universal access to instructional materials for all people. While facilitating the participation of individuals with disabilities, awareness of emerging accessibility issues and work towards full Internet access must increase to improve the participation of individuals with particular learning preferences as well (visual, auditory, kinesthetic). It is the hope of the authors that this article will encourage educators to become more aware of the issues and resources surrounding access to the Internet and promote a desire within them to ensure equal access for all learners.

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Bridging the Digital Divide in South Florida

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Abstract: This paper will focus on the efforts over the past two years of the South Florida PT3 group to Bridge the Digital Divide. Success stories with African American and Hispanic pre-service teachers will be shared. PT3 collaboration with an African-American elementary school will be discussed from the viewpoint of the teachers and administration of Golden Glades Elementary School in Opa Locka, Florida.

The St. Thomas University Plan to Bridge the Digital Divide in South Florida

A consortium of schools with St. Thomas University in Miami, Florida as the lead partner was awarded a PT3 Capacity Building grant during the first year of the PT3 program. The teacher education program at St. Thomas University serves students of many ethnic groups. It is located in an urban area with a large African American population along with immigrants from many Hispanic countries and the Caribbean.

The purpose of the initial grant was to work with area elementary schools, such as Welleby Elementary, to train the pre-service teachers at St. Thomas University and Trinity International University to use computers effectively in classroom instruction and thereby impact the diverse students in Miami-Dade County. The grant sought to train teachers who will not only teach in the inner city schools but stay in the inner city schools. By serving pre-service teachers who represent these underserved populations, the program sought to impact inner city classroom instruction.

What Do the Administrators and Teachers at Golden Glades Elementary Have to Say About Their Involvement with PT3 and Universities?

Golden Glades Elementary is a small PK-6 elementary school in Opa-Locka (Greater Miami), Florida. Its 520 students are predominately African-American and 90% of its students qualify for free or reduced school lunch.

The use of technology to increase student performance had been a high priority at Golden Glades since 1994. Through numerous grants and commitments from both the school's regular and Title I budgets, the school had been retrofitted and its infrastructure

expanded with both hardware and software acquisitions. Every classroom was equipped with 4-7 internet ready computers, a local area network equipped with diagnostic/prescriptive software, an instructional management system, and a media center with a fifteen station computer lab. Teachers were mandated to involve students with computer assistance instruction for a minimum of 140 minutes a week.

Yet student performance continued to wane. Technology was used by teachers as required but little integration occurred between the curriculum and that technology. There were few technology experts on staff, and their roles were so diversified that little innovation was in evidence.

Then PT3 occurred. Given the opportunity to partner with Saint Thomas University and Florida Gulf Coast University in a collaborative effort, seven members of the Golden Glades Elementary staff became technology experts. With this diversity of expertise came the beginnings of curricular change. WebQuests and "integrating computer software to match curriculum" became catch words. LCD panels and computer/television hook-ups became necessary. Teachers began asking for different software programs and they began using them in different ways. True curricular change had begun.

The effects of true curricular change cannot be measured in short blocks of time. Yet the test scores of Golden Glades Elementary showed great gains in 2001. Anticipation for further test gains in 2002 is great. PT3 hopes to improve public education by training future teachers for the technology of tomorrow. Yet, when organized properly, it can also influence the public sector today. Golden Glades is a living example.

On-Line Presence

Information about our project may be viewed at: http://garnet.fgcu.edu. To view these discussions, one may register for the PT3 Fall and/or spring courses and create an identity. Once this is done, posting will be enabled for the viewer. Our website also contains information that documents our workshop activities with our partners. Our website is located at: http://coe.fgcu.edu/PT3/home.htm.

National Educational Technology Standard-Based Lesson Plans Are Written

The technology enhanced lesson plans for the Fall 2001 Semester are written and can be viewed on the BEACON database. The website for BEACON is www.beaconlc.org. Selected lessons will be shown at this session.

Integrating Technology in the Pre-service College Classroom and Beyond by Developing Exit "e-portfolios"

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Abstract: The PT3 project, "Bridging the Digital Divide in South Florida" has proposed a module comparing outcomes of pre-service teachers that produce electronic portfolios to outcomes of pre-service teachers using traditional paper portfolios. Also, pre-service students will be evaluated on the degree and quality of technology integration into the field experience and internship experiences in the K-12 classroom. But first, the PT3 project will incorporate in one existing pre-service educational technology course; the creation and implementation of an e-portfolio project. This project will be implemented by using collaborative initiatives, online communities, and student initiated ideas incorporated within a pre-service Introduction to Computers in Education EME 2040 course.

History of the Project

In 1996, the Florida Department of Education introduced the Educator Accomplished Practices (EAP). These EAP standards "recognize the relationship between a strong foundation of content and pedagogical knowledge and the ability to apply this knowledge in practice while exhibiting professional behaviors." To demonstrate these standards, many institutions now have pre-service students develop, and present, in a formal review, an exit portfolio. An exit portfolio helps these pre-service students organize and show accomplished practice evidence. At Florida Gulf Coast University, for the first time, in one course called Introduction to Computers in Education, EME 2040, during the Spring 2002 Semester, pre-service students will be developing and implementing an electronic portfolio. An "electronic" exit portfolio (e-portfolio) hopes to take the student learning process a step further by integrating appropriate technology throughout the pre-service experience and beyond.

Purpose

This presentation will be a collaborative session examining the challenges and successes of the several components in integrating an e-portfolio project in an existing pre-service college course.

On-Line Presence

Information about our project may be viewed at: http://garnet.fgcu.edu. To view these discussions, one may register for the PT3 Fall and/or spring courses and create an identity. Once this is done, posting will be enabled for the viewer. Our website also contains information that documents our workshop activities with our partners. Our website is located at: **http://coe.fgcu.edu/PT3**

Interdisciplinary Partnerships

We have fostered relationships among other departments by recruiting professors from other disciplines to be participants on the subject area teams. We began with professors from Communication, Guidance and Counseling, Math, Science, and English. Several of the professors we originally recruited have resigned due to the differences between their professional fields and teacher education at the elementary level. We have, however, retained a few professors from other departments.

Professors Collaborate with Pre-Service Teachers

We have addressed the need for collaboration with K-12 teachers by placing eighteen K-6 teachers from five elementary schools on the subject area teams. This has been an essential part of our project as professors and pre-service teachers relate with classroom teachers on a regular basis. Four of these K-12 teachers serve as team leaders.

The Foundation Standards in the Curriculum Guidelines for Teacher Preparation Programs in Computer/Technology Literacy developed by International Society for Technology in Education for NCATE will be included within the e-portfolio project.

The completed e-portfolios will be hosted on the student.fgcu.edu domain for the students to use during their studies and for one year or so after they graduate. It is the authors hope to host all of the students' e-portfolios on the College of Education domain when it is feasible to do so. This would showcase our students Education Technology Proficiency. The domain for this database of student e-portfolios would be located at www.coe.fgcu.edu. Selected e-portfolios in progress hope to be shown at this session.

Community Mapping: Learning and Teaching in Context

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Abstract: This paper is designed to share efforts used to p repare pre-service teachers and practicing teachers to work more effectively in urban schools with diverse populations. Pre-service and practicing teachers use community mapping methods and integrate technology skills to increase their understanding of the contexts within and beyond the classroom that influence their students' learning and development. Additionally, community mapping methods and technology skills support teachers to identify, examine and make maximum use of nontraditional learning opportunities.

Introduction

In every community there are opportunities and assets to support and improve instruction and learning (McKnight and Kretzman, 1993). Urban inner city communities often generate negative images and are perceived from the outside as contexts of crime, despair and hopeless (Mead, 1986). Little attention has been devoted to capturing the natural and available opportunities and assets that might support growth, learning and development. In these settings many untapped assets exist. They are reflected in individuals, formal and informal groups, organizations and institutions, traditions and customs, and the many artifacts within a given context. Too often, teachers focus narrowly on the learner or traditional resources of the classroom setting. Some lack a real sense of the full range of gifts and resources, even within their own classrooms, that can help to motivate students and support desired learning outcomes. Resources of the school are sometimes underutilized, forgotten, and in too many cases, unknown. Instead, substantial attention is centered on student deficiencies and the inadequacies of their families and neighborhoods/communities. This paper is an attempt to capture strategies used by pre-service and in-service teachers to increase their understanding the contexts, processes and mechanisms that contribute to desired behaviors and positive outcomes for students in their classrooms and schools.

Community Mapping

McKnight argues that far too much attention has been devoted to the negative aspects of declining communities. He (1993) popularized the notion of community mapping when he published with John Kretzman, Building Communities from the Inside Out. The authors demonstrated through their neighborhood work in Chicago that communities are filled with assets, which are substantially overlooked and underutilized. Similarly, the work of Dunst, Herter, Shields, and Bennis (2001) offers a focus on community-based mapping natural learning opportunities to support the inclusion of children with disabilities and other special needs. The authors describe community mapping as methods and procedures used by practitioners and parents to locate and compile

information about everyday learning opportunities. The focus is on opportunities for learning. Thus it is a shift from barriers to assets. Community mapping can serve as a viable process and method of identifying such opportunities and resources.

Community Mapping and Technology

Community mapping is now emerging as a powerful tool for teachers and technology can be used to facilitate and enhance this process. This integrated approach for identifying contextual assets and influences on children's learning also enables teachers to capture and examine a range of ways to start from the familiar in order to facilitate and broaden student learning. Examining the various contexts in which children interact in daily life offers teachers greater depth in understanding their students and their needs. . As a growing number of teachers in urban schools live outside of the communities of their students and have different cultural experiences and histories, it has become increasingly important to bridge the gap. This kind of understanding is essential for maximum use of natural learning opportunities. Technology is a useful tool for capturing the information and documenting its occurrence.

The Mapping Process

In this section we offer a brief description of the community mapping process and examples of the ways teachers explore and identify learning opportunities. Participating teachers are required to work in groups for a number of reasons. First, the notion of community suggests social interaction and engagement. Second, it is often helpful to explore new and unfamiliar territory with feedback from others. Third, it helps to have support in using equipment and making decisions about what to capture and how to best do so. Finally, group projects provides multiple perspectives and serves as a check and balance system.

Participants have available to them an array of tools to capture and present their work. They have access to still and video digital cameras, audio tape recorders, laptop computers, and projection machines. Additionally, they have the benefit of a variety of software materials to support their attempt to capture and present their work and experiences during and after the investigation. This includes, but is not limited to, power point, word, photo shop, hyper-studio, inspiration, media player, i-movie, and pinnacle.

The process officially begins with teachers forming groups. Participants of the group meet initially to plan the process; determine roles, tasks, and responsibilities; and to make plans for a final class presentation. Mapping begins with a focus on the classroom and available opportunities for learning in this context. Teachers sometime shadow a student to get a sense of social interactions in the setting. The physical setting and social and emotional climate of the classroom are also important features of the classroom to capture.

The next phase is center on the school context. This phase of the process is often a surprise to practicing teachers who find assets they have never used. Shadowing a teacher and a student in this context offers important insights. We have found that teachers use resources in different ways, even at the same school. Phase three provides a

focus on the family context. Capturing the home and family contexts requires trusting relationships. Nonetheless, teachers feel they have gained valuable insights to guide their practice.

The final phase of this process is the community. Participants create a map of the community and attempt to identify available services and resources. In each phase there is an attempt to shadow as least one individual to gain a sense of a typical day in the life of the individual.

Throughout the process teachers write reflections about their experiences and continuously document the role they each play within the group. Group members share with each other a description of each person's role in the group during the process. A group reflection is required at the end and is designed to capture and summarize their collective effort in the process.

In groups, participants collect and document artifacts to collectively construct their reflections of classroom, school, home, and community contexts. The tools allow individual and groups to capture evidence of the natural environment, maximize opportunities and resources to support instruction, and take advantage of a range of activities and experiences. Though a continuous process of reflection, participating teachers in training create slideshows to formally share their constructions. These constructions include relationships and experiences that are connected to their students' daily lives.

Conclusion

Group presentations and class evaluations demonstrate the value students place on this learning experience. It includes sights teachers feel they have gained about their students and the contexts that influence their behaviors and learning. More important, teachers share how new knowledge and insights inform or change the work they do with children, families, and the community. The work of participating pre-service and practicing teachers illustrates the stages of the process for preparing teachers to connect with the natural environment of children. This new or increased level of understanding guides their teaching practices and maximizes opportunities for learning and achievement. The use of technology throughout the process is a useful and objective source for capturing learning at each phase. It is also a source for continuous reflection and reference.

School District Websites: An Accessibility Study

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The Americans with Disabilities Act (ADA) of 1990 provides the same civil rights protection to individuals with disabilities that apply as a result of race, gender, national origin, and religion (Button & Wobschall, 1994). Title III of the ADA directs that public facilities make reasonable modifications to control discrimination and support accessibility in policies, practices, and procedures (Council for Exceptional Children, 1994). As a result of this landmark legislation, accessibility alterations such as providing ramps to elevated areas and providing accessible signage through height adjustments and raised lettering have become commonplace across the United States.

The Perkins Vocational Act of 1984 called attention to America's need to support individuals who were less fortunate by birth or economic circumstances. The Act underscored the need for improving vocational programs and serving special populations of students. The Act created an awareness of the population of people that had gone unnoticed with little or no training.

The World Wide Web (WWW) has become an invaluable resource for many people with disabilities. Accessibility across platforms and geographic distance makes the WWW an ideal universal tool for gathering and disseminating information (Heflich & Edyburn, 1998. Many school districts use the Internet to disseminate a wide variety of information to students and parents. Wong (1997) discussed using the Internet for increased self-advocacy by individuals with physical impairments. It is ironic, however, that while technological developments have enhanced and provided new exciting opportunities for the WWW, they have, at the same time, complicated and limited the accessibility of the content and resources for individuals with disabilities.

Physical barriers are obvious accessibility concerns. Web page developers need to be just as aware that on-line barriers can create significant problems for some users. The Americans with Disabilities Act requires that all organizations make reasonable accommodations for individuals with disabilities. Even though there has not been a judicial ruling on WWW accommodations for individuals with disabilities, home page developers should work towards designing and building Web sites that are accessible to all individuals. It is important that Web page developers use and follow standards that allow accessibility to all WWW users.

To examine the accessibility of school districts' home pages a descriptive study was conducted. The population Web sites for this study were school districts located in the United States and Canada. A list of 567 School District Web sites was randomly selected from an online school web directory. Each home page was analyzed using the software package Bobby 3.2 (Center for Applied Special Technology, 2000), which allows researchers and other professionals to evaluate Web pages in accordance with the W3C Web Accessibility Initiative's guidelines.

Approximately three-fourths (74.3%) of the home pages were not approved by *Bobby 3.2*. This indicates that at least one Priority 1 error (seriously affects accessibility) was detected on these pages. There was an average of .91 Priority 1 accessibility errors on the School District home pages. In addition, the average number of Priority Two and Priority Three errors was 2.33 and 1.64 respectively.

Web developers at school districts need to examine their Web sites for accessibility problems. It is strongly recommended that validation methods be used in the early stages of Web development, which will help make problems easier to correct and assist developers in avoiding many accessibility problems. In addition to evaluation tools such as Bobby 3.2 expert and novice users with disabilities should be invited to view home pages and provide feedback about accessibility or usability problems and their severity.

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Distance Learning: Eliminating the Digital Divide

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Abstract Today, distance learning is the fastest growing mode for the delivery of instruction. Distance learning programs desire to bring learning to anyone, anywhere at anytime. However, some students, including those with disabilities, cannot fully participate unless design features are employed to make distance learning courses accessible to them. Designed well, distance learning options create learning opportunities for students with a broad range of abilities and disabilities. Designed poorly, they erect new barriers to equal participation in academics and careers. This paper summarizes strategies and lists resources for developing distance learning courses that do not create a digital divide.

New distance learning courses seem to be appearing everywhere. However, the idea of learning at a distance is not new. It has been around for a long time. Instructors have used printed materials and the postal system to deliver correspondence courses for hundreds of years. Televised courses were offered soon after televisions began to appear in homes. Today, in specially equipped facilities, instructors teach several classrooms full of students brought together through interactive television. Delivery of courses via the Internet is now common. Many distance learning courses use multiple modes of delivery. For example, class discussions may take place using electronic mail; course content may be delivered via the World Wide Web, printed materials and television; and the class might occasionally meet in a televised instructional facility. Distance learning programs often have as a goal to reach as many students as possible. While they almost always consider people separated by distance and time, they rarely consider issues faced by potential students and instructors with disabilities. Many distance learning courses erect unintended access barriers for students and instructors with disabilities, creating a digital divide between those who can participate and those who cannot.

Ethical grounds can be used to argue that courses should be designed so that individuals with disabilities can fully participate. Many people simply consider it to be the right thing to do. Others are more responsive to legal mandates. The Americans with Disabilities Act (ADA) of 1990 requires that people with disabilities have equal access to public programs and services. According to this law, no otherwise qualified individuals shall, solely by reason of their disabilities, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination in these programs. The United States Department of Justice clarified that the ADA applies to Internet-based programs and services by stating, "Covered entities that use the Internet for communications regarding their programs, goods, or services must be prepared to offer those communications through accessible means as well" (ADA Accessibility, 1996). It is clear that distance learning programs have a legal obligation to make their courses accessible to qualified students who have disabilities.

The following paragraphs give examples of access challenges faced by people with disabilities and present design considerations for assuring that a course is accessible to potential instructors and students with a wide range of disabilities. The field of universal design provides a framework for this discussion.

Barriers Encountered by Students with Disabilities

Specialized hardware and software products, often called assistive technology, allow individuals with a wide range of abilities and disabilities to fully operate information and networking technologies (Closing the Gap, 2001). However, assistive technology alone does not remove all access barriers. Listed below are examples of access challenges faced by students in typical distance learning courses.

Mobility Impairments: Some potential students may not be able to move their hands. They may use alternative keyboards, mice and/or speech input devices to gain access to Internet-based course content and communication. Sometimes people with mobility impairments do not have the fine motor skills to select small buttons on the

screen. If their input methods are slow, people with mobility impairments may not be able to effectively participate in fast-paced "chat" communications. Participants may face access challenges if place-bound meetings required in a distance learning course are not wheelchair-accessible.

Hearing Impairments: Most people who are deaf or hard of hearing face few challenges in accessing the Internet since most resources do not use sound output. However, when Web sites include audio output without providing text captioning or transcription, a student or instructor who is deaf cannot access the information. Course videotapes that are not captioned are also inaccessible to these students. They may also be unable to participate in telephone conferences or videoconferences unless sign language interpreters or other accommodations are provided.

Blindness: Individuals who are blind often use a computer equipped with screen reader software and a speech synthesizer. Basically, this system reads with a synthesized voice whatever text appears on the screen. They may also use a Braille refreshable display that presents screen text line by line in Braille with small plastic pins. To navigate the World Wide Web they may turn off the graphics-loading features of a standard Web browser. Students who are blind cannot interpret graphics (e.g., pictures, charts, drawings, image maps) unless text alternatives are provided for their speech output systems to use. Printed materials, videotapes, televised presentations, projected slides, and other visual materials also create access challenges for people who are blind. These barriers can be overcome with alternate formats such as audiotaped printed materials, Braille printouts, electronic text, tactile drawings, and audio descriptions or transcriptions for videotapes.

Low Vision and Other Visual Impairments: Students with limited vision can use special software to enlarge computer-generated screen images. Using this software, however, means that they may see only a small portion of Web pages at a time. Consequently, they can become confused when Web pages are cluttered and when page layouts change from page to page. Standard printed materials may also be inaccessible to them. They may require large print or electronic text that can be enlarged or accessed with a screen reader. When Web pages are designed in such a way that students must be able to distinguish between colors, individuals who are colorblind cannot successfully navigate the pages or understand the content.

Specific Learning Disabilities: Some specific learning disabilities impact the ability to read, write, and process information. Students with some types of learning disabilities may need to use audiotaped books. When accessing a computer, some use speech output and/or screen enlargement. They may have difficulty understanding Web sites when the information is cluttered, when confusing vocabulary or grammatical structure is used, and when the screen layout changes from one page to the next.

Speech Impairments: People with speech impairments may not be able to effectively participate in interactive telephone conferences or videoconferences. However, modes of participation, such as electronic mail and chat, that do not require the ability to speak, are fully accessible to them.

Seizure Disorders: Flickers at certain rates (often between 2 to 55 hertz) can induce seizures for people who are susceptible to them.

Principles of Universal Design

For some students, visual, hearing, mobility, speech, and learning disabilities can impact their participation in distance learning classes. If a course developer designs a course to maximize access as the course is being developed, fewer access challenges will arise when the course is offered. It is much easier to plan ahead than to create accommodation strategies once a person with a disability enrolls in the course. Simple steps can be taken to assure that the course is accessible to participants with a wide range of abilities and disabilities.

"Universal design" is defined by the Center for Universal Design at North Carolina State University as "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design." (http://www.design.ncsu.edu/cud/univ_design/ud.htm) At this Center, a group of product developers, architects, environmental designers, and engineers established a set of principles to apply in the design of products, environments, and communication and other electronic systems. General

principles include: the design is useful to people with diverse abilities; the design accommodates a wide range of individual preferences and abilities; the design communicates necessary information effectively, regardless of ambient conditions or the sensory abilities of the user; the design can be used efficiently and comfortably, and with a minimum of fatigue; and appropriate size and space is provided for use by people with a wide variety of body sizes and physical skills. When designers apply these principles, participants can use their products and services with a wide variety of abilities and disabilities. The next sections provide examples of how employing universal design strategies can make distance learning courses accessible to everyone.

Place-bound Instruction

Some distance learning courses include interactive videoconferences, proctored examinations, and other on-site instructional sessions. In these cases, the facility should be wheelchair accessible and the furniture should be able to accommodate wheelchair-users. Accessible restrooms, telephones, and parking should be available nearby. Instructors should speak clearly; face students when speaking (to facilitate lip reading); and describe all visual materials (for those who cannot see them). Standard disability-related accommodations, such as sign language interpreters, should be provided when requested.

Internet-based Communication

In some distance learning courses students and instructors communicate via real-time chat systems, where, students and instructors communicate at the same time. Besides imposing scheduling challenges for everyone, this type of communication is not effective for people who type very slowly. This includes people with some types of learning disabilities and those using alternative input devices because of impaired hand use. Instructors who use such tools should be prepared to allow an alternate method of communication (e.g., e-mail) for students with disabilities. Text-based electronic mail, bulletin boards, and electronic distribution lists generally erect no special barriers for students with disabilities. E-mail communication between individual students, course administration staff, the instructor, guest speakers, and other students is accessible to all parties.

Web-based Materials

Applying universal design principles to the design of Web pages makes them accessible to individuals with a wide range of disabilities. In 1999, guidelines for making Web pages accessible were developed by the Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C). Effective in 2001, the United States Architectural and Transportation Barriers Compliance Board (Access Board) developed standards for Web pages of Federal agencies as mandated by Section 508 of the Rehabilitation Act Amendments of 1986. Although the legislation is targeted at Federal agencies, the standards provide a model for other organizations working to make their Web pages accessible to the broadest audience. Both of these sets of guidelines can be found at Web sites listed at the end of this paper.

To make Web page content and navigation accessible, certain types of inaccessible data and features need to be avoided or alternative methods need to be provided for carrying out the function or accessing the content provided through an inaccessible feature or format. For example, a distance learning designer can avoid using a graphic that is inaccessible to individuals who are blind, or he can create a text alternative for the content that is accessible to the screen readers used by those who are blind. Web pages for a distance learning class should be tested with a variety of monitors, computer platforms, and Web browsers with the graphics- and sound-loading features turned off. Testing to see if all functions at a Web site can be accessed using a keyboard alone is also a good accessibility test. Special programs (e.g., A-Prompt, Bobby, WAVE) are available to test Web pages for accessibility.

Printed Materials

Braille, large print, audiotape, and/or electronic formats may be required by students who are blind or who have specific learning disabilities that affect their ability to read. Making the text of printed materials available on-line is a good solution for students who cannot read standard printed materials.

Video Presentations

It is best if videotapes or televised presentations are captioned for participants who have hearing impairments and audio described (that describes aurally the visual content) for those who are blind. If the publisher does not make these options available, the distance learning program should have a system in place to accommodate students who have sensory impairments. For example, the institution could hire someone local to the student to sign audio material for a student who is deaf. Real-time captioning (developed at the time of the presentation) or sign language interpreting should be provided when requested by participants in videoconferences.

Telephone Conferences

Standard telephone conferencing is inaccessible to students who are deaf. Instructors who use telephone conferencing for small group discussions could allow e-mail communication as an alternative. Students who is deaf may be able to participate in a telephone conference by using the Telecommunications Relay Service (TRS), where an operator types what the speakers say for deaf students to view on a text telephone (TTY) and translates printed input into speech, however this system might be too slow to allow participation in lively conversations. A similar videoconferencing system is available in some regions. Another accommodation involves setting up a private chat room on the Web. A transcriptionist types the conversation for the deaf students to view. Students can also type contributions into the chat room that can be voiced by someone monitoring the chat room.

Benefits for Everyone

Distance learning courses are designed to reach out to students no matter where they live and no matter what schedule they are on. If universal design principles are used in creating these courses, they will also be accessible to any students who enroll in them and any instructors who are hired to teach them, regardless of the abilities and disabilities. Applying universal design principles assists people with and without disabilities. For example, using clear language and navigational mechanisms on Web pages facilitates use by those whose native language is not the one in which the course is taught as well as people with visual and learning disabilities. People who have turned off support for images on their browsers in order to maximize access speed benefit when multimedia features provide text alternatives for the content, as do people who are blind. Similarly, people who cannot view the screen because they must attend to other tasks benefit from speech output systems that are often used by people who are blind. Captions provided on videotapes and video clips assist people who work in noisy or noiseless surroundings and people for whom English is a second language along with people who have hearing impairments. Making sure that information conveyed with color is also available without color benefits those using monochrome monitors in addition to those who are colorblind. When carefully designed, distance learning courses do not need to create a digital divide.

References and Resources

The following resources are useful to those who wish to research this topic further.

Americans with Disabilities Act of 1990, http://www.usdoj.gov/crt/ada/adahom1.htm

ADA accessibility requirements apply to Internet Web pages. (1996). The Law Reporter, 10(6), 1053-1084.

A-Prompt, http://aprompt.snow.utoronto.ca/

Captioned Media Program, http://www.cfv.org/

Center for Applied Special Technology (CAST), http://www.cast.org/udl/

The Center for Universal Design, http://www.design.ncsu.edu/cud/

Closing the Gap 2001 Resource Directory, http://www.closingthegap.com/

DO-IT (Disabilities, Opportunities, Internetworking and Technology), http://www.washington.edu/doit/

EASI (Equal Access to Software and Information), http://www.rit/edu/~easi/

International Center for Disability Resources on the Internet, http://www.icdri.org/

National Center for Accessible Media (NCAM), http://ncam.wgbh.org/

Recordings for the Blind and Dyslexic, http://www.rfbd.org/

Section 508 Standards of the Access Board, http://www.access-board.gov/sec508/508standards.htm

Trace Research and Development Center, http://www.trace.wisc.edu/world/

Vanderheiden, G.C. (1990). Thirty-something million: Should they be exceptions? Human Factors, 32(4), 383-396, http://www.trace.wisc.edu/docs/30_some/30_some.htm

WAVE (Web Accessibility Versatile Evaluator), http://www.temple.edu/inst_disabilities/piat/wave/

Web Accessibility Initiative, World Wide Web Consortium, http://www.w3.org/WAI/

WebABLE, http://www.webable.com/

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A Window of Opportunity: Computer-Mediated Communication and Multicultural Education

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Abstract: This paper is a report on the findings from a study I conducted on the integration of multicultural education and computer-mediated communication (CMC). A qualitative approach was used to collect and analyze data. Analysis of the data allowed me to build logical connections of evidence in relation to the integration of multicultural education and CMC based on the recognition of a shared pedagogy. Parallelism in the pedagogies of the two areas—CMC and multicultural education—created a window of opportunity for unique practices and instruction. The outcomes are presented.

Introduction

Due to the features and innovative uses of computer-mediated communication (CMC), some educators (Appelbaum and Enomoto, 1995; Cummins and Sayers, 1996; McCormick, 1995; Riel, 1992; Roblyer, Dozier-Henry and Burnette, 1996) are exploring its significance to multicultural education. A popular perception is that because of its capabilities of linking, expanding, and interacting, CMC is an ideal technology for fostering some goals of multicultural education. Essentially, this ideal rests on a belief in the pedagogy that multicultural education and educational technology have in common. With a common pedagogy serving as the basis for the two, it is asserted that certain CMC practices can support certain practices in multicultural education while simultaneously, the principles of multicultural education can inform the educational use of CMC.

Damarin, in "Technology and Multicultural Education: The Question of Convergence," (1998) compares electronic pedagogies with emancipatory pedagogies, concluding that the two are parallel. Damarin ascribes the parallelism to two primary ideas:

1. the rejection of student accumulation of preselected facts as the driving mode of education and
2. the assertion that the social organization of the classroom must change in ways that not only displace the authority of the teacher as a dispenser of all valuable knowledge but also disrupt the traditional hierarchies (pre)determining who succeeds in school (p.17).

Damarin provides the following table to illustrate the parallelism of the two pedagogies which allow them to support each other.

Emancipatory Pedagogies	Electronic Pedagogies
Reject 'banking system' of education	Knowledge shared by student and computer-based resources
Decenter the teacher	'A guide on the side, not a sage on the stage'
'From margin to mainstream'	Recognized multiple ways of knowing

The parallelism portrayed in Damarin's table illustrates a "pattern of consistencies and sameness across areas of practice that do not share common elements" (p. 18). Damarin contends that

> These consistencies can create a window of opportunity for practitioners (including instructional developers, curriculum planners, and teachers) who focus on educational technology to join those who focus on equitable multicultural education in an effort to define and devise curricula and activities that serve their common purpose. (p. 18)

This window of opportunity created by the consistencies between the emanicipatory pedagogy of multicultural education and the electronic pedagogy of CMC was the starting point for this study.

The Study

Through this particular window of opportunity, multicultural education and CMC were brought together to foster an on-line forum. The on-line forum, purposed to facilitate discourse construction on critical pedagogy, supplemented a graduate English course on U.S. multiculturalism and the composition curriculum. The nine graduate students enrolled in the course interacted, via web conferencing, with five experienced teachers. While the graduate students were located at a predominantly white university in the mid-west and had little experience teaching students of color, the experienced teachers were located in different cities throughout the U.S. and taught courses whose enrollment was predominantly that of students from underrepresented groups.

The objectives of this setup were to help students prepare to address the demands of educational reform, engage in collaborative critical inquiry, and make reflective decisions regarding multicultural education pedagogy in the composition curriculum. By helping to overcome time and space boundaries between students and teachers, CMC was employed to facilitate a democratic environment where

- the participatory construction of discourse could take place among the graduate students and experienced teachers;
- attention would be devoted to the practices of experienced teachers so that educational research could be linked with reflective practices;
- and students and experienced teachers would collaboratively develop materials and activities that promote a critical pedagogy for composition classes.

A qualitative approach was used to collect and analyze data. Data were collected through the transcripts of the on-line discourse, audio-taped interviews conducted at the end of the course, field notes, course artifacts, and user profile information (provided by the web conferencing system). Because CMC is a medium of medium of written discourse, the online activity was archived and then the written exchanges observed. Also, interviews were conducted using Anderson and Jack's (1991) interview and analysis techniques which entails shedding greater agendas of convention and listening for meaning in the participants' moral languages, meta-statements, and attending to the logic of the narrative. Analysis of the data allowed me to build logical connections of evidence in relation to the integration of multicultural education and CMC.

Findings

Patterns of interactions and exchanges relevant to the philosophy, purpose and objectives of the course emerged. They can be categorized into two types of interactivity and interactions: designed and unplanned.

Designed interactions corresponded with the objectives of the course and electronic forum. These exchanges were required of the students and experienced teachers and were mediated, usually prompted by a general question to everyone. For example, to prompt discourse among the participants concerning linguistics issues, the instructor posted the following questions: " Should students have the rights to their own languages? And what are the implications?" Such was done

to stimulate dialogue, critical thinking, and reflection on pedagogical practices concerning issues of linguistics. Designed interactions were further categorized into the following:

(1) Establishing Presence, designed to unveil the backgrounds, experiences and perspectives of the participants, and which was essential to constructing discourse informed by multiple perspectives;
(2) Linking Educational research and reflective practices, which allowed students to compare critical theory with the practices of the experienced teachers; and
(3) Collaborating and Sharing, where participants asked questions, raised issues, and shared ideas about resources, materials and activities.

Unlike designed interactions, unplanned interactions and exchanges were not mediated, prompted, nor necessarily anticipated. However, when the transcripts were analyzed, unplanned interactions appeared to be just as significant to the relevance and application of the forum as the designed interactions. These interactions seemed more democratic because the students initiated them. There were three categories of unplanned interactions and exchanges:

(1) Responding to Course Readings, in which students introduced, commented on, and asked questions about specific topics and issues from the course readings that were of specific interest to them;
(2) Supplementing In-class Discussions, where students revisited and elaborated on in-class discussions; and
(3) Lending Personal Testimonies, where participants went beyond sharing professional practices and academic thought and revealed personal narratives making potentially abstract participants become more personable and human..

Evident in unplanned interactions and exchanges is the participants' interest in and invested ownership of the forum.

In this particular window of opportunity, the consistencies between the emanicipatory pedagogy of multicultural education and the electronic pedagogy of CMC provided a concrete foundation for determining the purposes, structure, and activities of the on-line forum and a unique environment for supporting them. Through interviews, the participants reported that their on-line experience stimulated thinking, provided models and ideas, and added legitimacy to the importance of gaining multicultural scholarship. Essentially, they welcomed this opportunity.

While the consistencies between the two pedagogies supported this unique window of opportunity for the participants, interpretations of their experiences shed light on issues and limitations that stem from the elements that multicultural education and CMC do not have in common. Three major issues emerged as participants described their experiences.

1. *Equitable Access*. CMC was used to access the perspectives of educators who are currently immersed in issues related to the course content, but because of time and distance were inaccessible. However, technological inequality permitted only those privileged with Internet access to participate. Equitable access research shows that Internet access is available less in schools with large numbers of students of color and of low-economic status than in schools whose students are predominantly white and who are of high economic status (Doctor, 1992; Leigh, 1999; Novak, 1998; Romiszowski and Mason, 1996). Therefore, the on-line discourse was shaped by the perspectives of those teaching in environments that are predominantly white while the perspectives of those teaching where there are large numbers of students of color did not have the opportunity to contribute.

2. *Software Capability and Design*. Also, interviews revealed that participants that did not possess the skills to overcome technical difficulties seemed to remain on the periphery of participation. Consequently, the central members of the forum were those who are technologically proficient. CMC is not for the "technically timid" (Ruberg and Sherman, 1992). One of the participants stated: "Why can't we use the software to reconstruct race relations...? Well, because the only software available for us to do that is too difficult..."

3. *Electronic Atmosphere.* Furthermore, because of its absence of nonverbal status cues, CMC is noted to render a democratizing effect on communication and discussions (Harasim, 1993). However, according to participants' interpretations of their experiences, the exclusion of nonverbal status cues seemed to contribute to a falsified, abstract, imperceptible community where they did not feel totally comfortable with making proclamations, rendering judgment and sharing beliefs and practices. Such a community can have an ostracizing effect on participants who don't feel they meet with the perceived conditions of the forum's environment.

Conclusion

Traditionally, the agendas of multicultural education and technology have been pursued separately. However, as evident in this study, parallelism in the pedagogies of the two areas creates a window of opportunity for unique practices and instruction. Integrating multicultural education and CMC allowed us to create an environment where unique learning opportunities were available. Graduate students were able to correspond with teachers who were immersed in the issues outlined in the course. Together the participants constructed discourse on critical pedagogy in composition, and shared and developed resources and materials.

While parallelism in the pedagogies of multicultural education and CMC provide opportunities, the elements that they do not have in common can leave a gap in activities and practices. As shown in this study, the limitations or shortcomings of this particular integration of multicultural education and CMC were related to the socially and culturally based assumptions of technology designers, developers, and implementers (Damarin, 1996). Future integrators should seriously consider issues of equitable access, software design and compatibility, and the abstractness of the electronic atmosphere as they influence participation.

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Field-based Technology and Critical Friends Principles in Teacher Preparation

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Abstract: For several decades video technology has been used in teacher education for self-improvement, assessment, students feedback and various other purposes. Digital video technology allows teacher educators to videotape snapshots in urban schools that capture student and teacher demographics, teacher-student interactions, collaborative, flexible grouping of diverse student populations, best practices in teaching, and general characteristics of urban school settings. Selected digital video clips can be integrated into the course curriculum by teacher educators to explore urban culture as the dominant form of community life in contemporary schools. The edited video clips can be disseminated to all students via the Internet, CD-ROMs or videocassette formats. The students in the SOSE3306Culture of Urban Schools course can view the video clips for discussion and reflection with the entire class. The paper will discuss how a collaborative relationship between an ISD and a University helped design and develop an online Multicultural Education course using a field-based approach and digital video technology. The topics of the paper include: the collaboration of the ISD and the University Teacher Education Program, planning and scheduling the use of digital video, video taping sessions, selecting of clips, matching the clips with the curriculum and schedule, and final dissemination of the clips via CD-ROMs.

Introduction

Many teacher education programs offer at least one course on multi-cultural education with a strong emphasis on authentic experiences and exposure to different school cultures and ways of thinking. However, delivering the multi-cultural education course over the Internet while maintaining the same degree of rigorous critical thinking is a considerable challenge.

Beginning from Spring 2002, students taking the online Web-based course SOSE 3306 at the University of Houston Downtown thus assemble a realistic snapshot of urban school settings in the greater Houston area. Typically students at UH-D come from diverse backgrounds: some are current school teachers while others are traditional undergraduate students; some grew up in another country and culture, while others graduated from high school some time ago and become teachers as second careers. It is important to provide a realistic perspective on current urban issues in public education for those entering the teaching profession.

In looking for a good model for online discussion when designing the WebCT online course, SOSE 3306 Cultures of Urban Schools, the authors incorporated the Critical Friends Group (CFG) principles into the various field-based technology activities of the course. One of the designers of this course has worked with CFG for over a year and is also teaching educational technology courses. The other designer of the course is the Director of Field Experiences for the Teacher Education Program at UHD. The online course is offered for the first time in Spring 2002 with maximum of 25 students. The purpose of the paper is to explain how technology is used to enrich students' early field-experiences and how CFG processes have been implemented into the interaction of the online course.

Early Field Experiences

Through field experiences, teacher candidates observe and work with real students, teachers, and curriculum in the natural settings of K-12 schools. Common sense alone dictates that pre-service teachers who participate in field experiences in school settings are better prepared to understand and deal with the complex realities of today's schools, classrooms, and students.

The rationale for field experiences in teacher preparation is grounded in the work of John Dewey (1904; 1938). He was a strong advocate for the experiential training of teachers. Dewey viewed the teacher as learner, and thus the need for that learner to be provided experiences for constructing his or her own learning.

A study conducted in Texas (Fleener, 1998) provided evidence that candidates who receive increased amounts of field experiences in their teacher preparation programs are retained in the profession at significantly higher rates than those prepared through traditional campus-based programs.

According to nationwide survey results, the vast majority of teacher candidates first engage in field experiences prior to their junior year in college. A total of 77% of elementary programs and 70% of secondary programs require candidates to first participate in field experiences in PK-12 settings during their first or second year of college (Huling, 1998).

Field experiences prior to the student teaching experience are commonly referred to as early field experiences. Teacher candidates participate in early field experiences in a variety of schools and classrooms. In elementary preparation programs, according to Huling (1998), 77% of the candidates work in more than one PK-12 setting while 73% of secondary candidates participate in early field experiences in more than one PK-12 setting.

The online course SOSE 3306 which is a prerequisite course to the field-based "blocks," attempts to provide students, who are typically juniors, with early field experiences. Instead of participating in lectures in a university classroom, the intention is for students to watch interviews, classroom snapshots via technology, and conduct investigations by physically visiting and conducting local school investigations. In designing the course, the CFG model has been integrated by the authors' into the course activities.

The Professional Development Model of Critical Friends Groups

Critical Friends Groups, although practiced in K-12 for some years, has only recently been incorporated into higher education through coach training. For several years, the National Coalition of Essential Schools and The Annenberg Challenge Institute have devoted efforts into formalizing an approach to school staff "self-analysis," through a program called "Critical Friends Groups," or CFGs

> CFGs are the product of a simple idea: providing deliberate time and structures to promote adult professional growth that is directly linked to student learning. A CFG consists of eight to twelve teachers and administrators who agree to work regularly together to define and produce improved student achievement. As a group, the members establish and publicly state student learning goals, help each other think about better teaching practices, look closely at curriculum and student work, and identify school culture issues that affect student achievement. Each CFG chooses a coach who is selected either from the school staff or from the ranks of trusted outsiders. The coach helps the group build the sense of trust that must exist if they are to work together in a direct, honest, and productive way. The coach also helps the members learn and master techniques that sharpen self-insight, promote creativity, and encourage candid, usable peer feedback.
>
> (http://www.harmony.pvt.k12.in.us/www/cfg_p1.html, accessed on Dec 15, 2001)

To summarize, a CFG is a group of six to twelve educators working with students everyday within a school or district who meet on a regular basis to explore and change their teaching practices in order to improve student learning. More and more schools and districts are using "CFG processes" in other settings as well, such as in staff meetings, in-service workshops, cross-school study group meetings, administrator's meetings, and department and team meetings, etc. Most CFGs in the Houston area meet on a monthly basis to share teaching practices, collaboratively examine student work, and reflect on how teaching practices impact student learning. Participants also engage in regular peer classroom observation and occasionally discuss readings to inform their reflections and practice.

Administrative Aspects of the Online WebCT Course

The following WebCT features have been employed to facilitate Critical Friends Groups (see Figure 1):

Syllabus: A syllabus is used to inform students of the general course requirements.

Welcome Page: This page is sent out to the students' personal e-mail addresses prior to the semester to greet the students. It is also included in the course homepage for review purposes.
Classroom Norms: Students taking online courses have special challenges such as new classroom rules, due dates, correspondence, emergency contact methods, interaction with peers, etc. These pages attempt to explain the classroom norms so that students are more comfortable and confident and so that they can have a rewarding learning experience.
Calendar: Since the online students may not come to the University campus at all, they may not be familiar with the university routine. The calendar informs them of the scheduled readings, assignments, due dates of major project, etc. using a format for weekly work.
Bulletin Board: To encourage virtual interaction, the electronic bulletin board function is also used. All bulletin board topics are referred to by week number to assist students in locating the area and content for a specific week.
Course Module: The course module feature of WebCT has been modified as the Table of Contents. This starts with general instructions for the week and displays weekly activities below the weekly introduction as explained in the following section.
WebCT Mail: The WebCT Mail is used for instructor-student and student-student correspondence. Some projects are received as e-mail attachments.

The Content of Course Modules

The Table of Contents (or Course Module) serves as the major point of contact for students' work on projects (see Figure 2). Each week starts with an Introduction that informs the students what to work on and how to complete the assignments. This is unlike the lecture-type format and attempts to integrate the messages and lectures into the various projects. Under weekly titles, project descriptions together with handouts in digital format (HTML, MS Word, RTF) are posted. Since this is a projects-based course, each week the students have to complete 2-4 projects. Some projects are as easy as reading a short chapter and posting comments through the mail, while others are more complex, semester-long projects that require investigation of the topic by interviews, Web searches, observations, team collaboration, etc.

Technology Field-Based Activities: The school district requires that Internet use and image consent forms be signed by parents to release snapshots of students for instructional purposes in university classes. Through the University's collaboration on the Partnership for Quality Education (PQE) project, the Department of Urban has these parent consent forms for taking video snapshots of students on file. The classroom snapshots were taken in natural classroom settings (see Figure 3). The content of the activities was natural and was not pre-arrange for the videotaping. The teacher interviews were also taken in the teacher lounge, again, to provide a natural setting for student understanding (see Figure 4).

Critique of Classroom Activity Snapshots: At the beginning of the semester, students in the online course are provided with video clips in PowerPoint format on the course CD. The classroom snapshots range from two minutes to seven minutes. The video clips include classroom activities taken in a local urban elementary school. Students watch the video clips and evaluate the classroom activities by applying the five dimensions of multiculturalism discussed in the Banks' book. They post their critique on the electronic Bulletin Board. To encourage students to refer back to the textbook, the five dimensions of multiculturalism are used as a framework. The five dimensions of multiculturalism include 1) Equity Pedagogy, 2) Prejudice Reduction, 3) Empowering School Culture, 4) Content Integration, and 5) the Knowledge Construction Process. The text-based discussion principle of CFG, reminds students to refer back to the exact page or section in a text to enhance communications and understanding of the text. When critiquing the classroom activities, the students are required to give exact examples of what they have seen to support their argument or point. The online posting activity is a good model for critical thinking, interactive online discussion, and CFG. Other CFG discussion principles were built into the electronic Bulletin Board activities as well.

Developing Reflective Practitioners: Reflection is a strong emphasis of CDF. On the same course CD, there are interview clips of four teachers of different genders, years of teaching experience, teaching subject areas, and cultural backgrounds. The interviews range from two minutes to seven minutes. For each teacher interview, the students are to complete a rubric that asks them to gather information from the snapshots about the teachers' background, examples of teachers' cultural shock when they first started teaching in urban schools, and teaching

strategies for different learning styles. The rubric ends by asking the student to reflect on which are the most touching remarks and why, what they agree and disagree with, and other aspects of the teacher interviews.

Critical Friends Groups Implications: Strengths and Weakness

Nationally, CFG is one of the approaches used in providing professional development in schools learning communities (http://www.usm.maine.edu/smp/projects/cfg.html). The National Commission on Teaching & America's Future (1996) has recommended that future teachers have more rigorous preparation and more authentic field-based experiences to enable them to cope with the increasing complexity, challenges, and diversity of current schools and classrooms. What has been advocated is a more holistic conceptualization of the preservice teacher experience and increased collaboration between universities and public schools (Guyton & McIntyre, 1990). This class CD used for technology field-based is a exactly a product of increased collaboration between universities and public schools.

Given the technological scenario for the future that has just been painted, it is fair to ask whether such future systems are capable of delivering an appropriate level of quality of teacher preparation. Research on distance education by and large has shown that, when appropriately planned, distance education can be as effective as conventional classroom based education. While there are some exceptions in terms of certain types of content or certain groups of students, the move towards integrated multimedia networking may be expected to extend the range of effective distance education applications (Collis, 1991).

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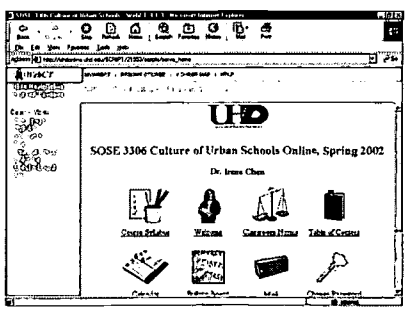

Figure 1: SOSE 3306 online through WebCT

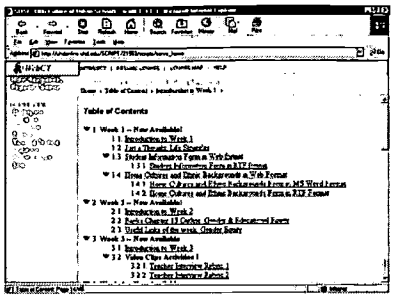

Figure 2: Table of Content for easy navigation

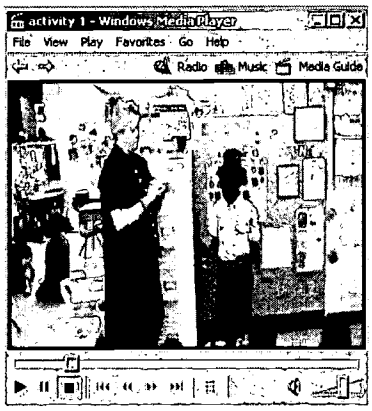

Figure 3: A snapshot of classroom activities

Figure 4: A snapshot of teacher interview

Gender Bias in Software: Issues, Implications, and Considerations

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Abstract: The digital divide encompasses not only race and socioeconomic status, but gender as well. The gender gap in technology is a result, in part, due to biased software that has been made accessible to females. This paper will provide a brief history of the gender gap in technology, review the available literature on gender-biased software, and explore the ramifications inherent in its use. In addition, recommendations will be offered that are designed to assist teachers in selecting and implementing gender equitable software into their classrooms.

Although technology is playing an increasingly important and omnipresent role in our society and the world, inequities continue to exist in access and manner of use within various groups throughout society (Clark & Gorski, 2001). Race, ethnicity, age, socioeconomic status, education, disability, language, and gender are factors associated with what is called the Digital Divide. Initially, the Digital Divide was primarily related to a lack of access to technology, but more recently the Divide has been further deepened by disparities in technological usage (Clark & Gorski, 2001).

Since the early 1980s, much research has been conducted on the existence of the gender gap in technology, which continues to be a pervasive and persistent problem (AAUW, 2000; Fiore, 1999; Gehring, 2001; Koch, 1994; Mark, 1993; Sanders, 1993; Sanders & Stone, 1986). The gender gap is evidenced at home, in schools, throughout media and society, and in the workplace. A number of complex factors are attributed to the gender gap in technology. There are psychological, social, attitudinal and environmental components that work in concert that affect females' attitudes, interest, and use of technology (Mark, 1993). Females receive inadvertent and implicit messages that the computer is not for them, and avoid it accordingly. As a result, females suffer from lower self-confidence about their technological abilities as well as a lack of self-esteem (Sanders, 1993). Furthermore, this lack of experience leads to negative attitudes toward and disinterest in technology-related endeavors, both of which have serious implications for females' educational and professional opportunities. As the number of jobs in technology-related fields grows exponentially, the opportunities for women to participate in that field will be decreasing. The end result of the gender gap is that women will be ill prepared for a world that is becoming increasingly technological (Sanders, 1993). Because technology permeates society in numerous ways, it is imperative that issues of gender equity in technology be confronted and resolved.

Factors contributing to this gender difference are perhaps the most important part as well as the most difficult part of achieving technological competence. As stated earlier, studies have shown that computers are more attractive to boys than to girls and the literature reports several factors that might attribute to the gap in both access and usage. In many cases, both electronic games and home computers are the primarily vehicles of entertainment for children. Unfortunately, these vehicles reveal stereotypes and promote misrepresented conceptions of gender roles that can lead to a gender gap in technology.

While the video game business has grown to become a $10 billion industry in the United States, it remains an industry overwhelmingly geared to and supported by men and boys (DeBare, 1996a). Industry analysts estimate that no more than 30 percent of all video game players are female (DeBare, 1996a). The reason why these numbers are so low, is because video games are not being created to interests girls. Studies have shown the digital divide within gaming started in video arcade back in the early 1980s and has continued to exist today (Kiesler et al,1985; DeBare, 1996a). These studies addressed issues and implications related to girls' interest in electronic games, preferences of software and their opinions on using technology either as a source of education or as entertainment. Although there was evidence of girls' genuine interest, there emerged themes of misrepresentations or misconceptions of the use of computers.

As there has been concern to games being a product to widening the gender gap in technology use, there also has been concern toward educational software. Over a decade ago, only a few educational software programs were being developed, but times have changed. Everybody is making software, which includes interactive storybooks, multimedia reference works, animated adventure games; and application type programs,

word processors and spreadsheet programs. Some educational software incorporates simulations or exploration and others are designed to teach and/ or drill specific facts or academic skills. Whatever the technique, it is crucial that software designers understand the way children view gender and work to develop software that does not perpetuate gender stereotypes or bias. The literature shows supportive evidence that educational software, as do games, is presented in a format that adheres to violence and war and more traditional male sports (Lepper & Malone, 1987; Chappel, 1996).

In addition to games and educational software, gender bias exists in clipart programs. In the past, researchers have investigated media images harmful to females in media and instructional materials, (e.g. textbooks), and have looked at the quality and content of pictorials and content in written instructional materials. As technology becomes more pervasive both in our classrooms and in the business world it is important to examine for any gender disparities that might exist in computer software. Researchers are turning to analyzing images from art files in software programs for evidence of gender bias (Dyrud, 1997; Milburn et al, 2001). Dyrud (1997) examined over 14,000 clipart images in different Windows-based programs and found that only 4.54% of the total images depict women and they are typically represented in stereotypical roles, e.g., secretaries, nurses, and teachers. In addition, Milburn (2001) investigated two top-selling computer clipart packages and found that more males were shown in more diverse/active roles than females, which again perpetuates misperceptions of gender roles, as females taking a more passive role versus the males being more assertive.

The world of computing is inescapable and inextricably tied to children's socialization. As it is the responsibility of educators to help reduce the bias that exists within accessibility of use and the software that is available for children, it also lies with society as a whole. Beginning in the early years of females' lives, equitable software needs to be introduced to generate interest in technology. In order to improve the situation, open-mindedness must be encouraged and the cultural stereotypes, which perpetuate the inequalities, must be eliminated. By increasing the number of women in the computing field, this will encourage young females and other women to pursue the profession. Unless issues of equity and fairness are promoted, females will continue to be at a disadvantage in an increasingly technological world, which will have serious repercussions for the world itself.

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Critical Race Theory and the Digital Divide: Beyond the Rhetoric
Patricia Randolph Leigh

"Crossing the Great Divide": A tale of inequity

Long ago in a faraway, harsh, and barren land lived two groups of troll-like beings known as the Binefs and the Uninefs. How these creatures came to inhabit this land had long been forgotten and the history of how the Binefs came to rule over the Uninefs was similarly lost to both groups. The feeling was, especially among the Binefs, that this was how things always were and how things should, in fact, be. The two-headed Binefs believed themselves to be superior in every way to their one-headed 'cousins', the Uninefs. This inferiority myth was passed on from generation to generation and was widely accepted by both groups of Nefs. In fact inferiority myth justified many things, especially the enslavement of the Uninefs by the Binefs.

The land inhabited by the Nefs was hard and rocky and required brutally intense labor and much sweat and toil to prepare the soil for food production. The Uninefs worked in the fields year after year, generation after generation, planting and harvesting food for their masters, receiving only leftovers for themselves. This food, called knowledge, had in fact been altered under the direction of the Binefs and a hybrid was created. Hybrid knowledge food could only be easily digested by the Binefs, and since it was the only legally produced food in the land, it left the Uninefs in danger of starvation. The enslaved Uninefs did manage to sustain themselves, but their inability to fully digest the food took a toll on their physical abilities. Even those Uninefs who had not fully accepted their alleged inherent inferiority, were weakened after years of compromised nourishment and were unable to effectively resist and win out over the Binefs.

The ancient land of the Nefs lay south of an enormous chasm referred to as the Great Divide. Nef mythology held that the northern border of their land marked the end of the world for physical beings and further claimed that the lush green land on the other side was occupied by gods and goddesses. Many Uninefs had plunged themselves into the chasm in attempts to escape their oppressive existence while numerous Binefs perished in their attempts to discover a means of crossing the divide. However, after countless failed attempts, the Nefs were successful in developing a mechanism for reaching the mythical lands. Of course the tools needed to make such a journey were initially available only to the wealthiest of Binefs and to none of the enslaved Uninefs. After all, there was no reason to provide for the escape of the ruling Nefs' free labor. In addition, because of their compromised diet, the enslaved Nefs were physically weaker than their masters and unable to endure the long, arduous journey across the Great Divide.

The Binefs were truly amazed at what they found in the mythical land of the northern region. To them, the fertile rich soil was truly enchanting and magical. With little effort they grew fields and fields of their hybrid knowledge crops and the new settlers flourished without the help or need of slave labor. They became comfortable and fat. The passing years brought new groups of Nefs to the region and, in addition, many generations were actually born in the land north of the great chasm. Most Nefs of any means had long ago escaped the southern region, leaving that harsh land primarily to the Uninefs, who, incidentally, had been freed from slavery as a result of the massive migrations of their masters. A few Uninefs did manage to make it across by hook or crook, but for the most part, though free, the Uninefs were physically too weak to make

the journey and still lacked access to the mechanisms, regardless of how rudimentary or advanced, necessary to venture across the chasm. The small number of superior Binefs that remained in the harsh southern region did so also because of economic reasons. After all, not all ancient Binefs had been wealthy slave owners, just most.

The Nefs that tilled the rich soil of the northern region began to take pride in their labor and accomplishments and soon forgot how they eschewed such work in their ancient lands. These new generations of Binefs, in fact, put a high value on hard work and rugged individualism. Moreover, they publicly claimed to have put aside their feelings of superiority over the few Uninefs that were living among them or the many that remained in the barren southern region. Furthermore, they claimed no responsibility for how their ancestors had enslaved the Uninefs and had treated them badly. The fact that generations of Uninefs, though few in number compared to the Binefs, were flourishing as their neighbors was evidence that past enslavement or ill treatment was no longer of any consequence. Even the Binefs that held on to the ancient inferiority myth had come to believe that it was wrong to enslave fellow Nefs. But all that was in the past and this was a new time and day. It was widely believed that any Nef with the wherewithal could escape the southern region and was free to work the rich soil across the divide. In fact, for those who still held fast to the inferiority myth, the large numbers of Uninefs that failed to make the journey or who perished in their attempts was further proof of their inherent inferiority.

Even after Uninefs on either side of the divide were free to produce food crops of their choosing, they continued to plant and harvest only the hybrid knowledge food. This was all they knew. Though this food still was not easily digested by Uninefs, over time their systems began to accommodate it more readily. Having adequate amounts of food that the rich soil so graciously yielded and being released from the rigors of slavery allowed the Uninefs to gain physical strength. These Uninefs who had an abundance of hybrid knowledge food did, however, discover some side effects not reported by their enslaved ancestors. After ingesting a full meal of hybrid knowledge they would experience hallucinations wherein negative, grotesque, and often demeaning images of themselves and fellow Uninefs would appear. At other times they would recall or have visions of life south of the divide as being just, democratic, and ideal. Still yet, if they overate or indulged in extremely rich varieties of the food knowledge, they would have bouts of amnesia about the past life of Uninefs and forget about their brothers and sisters still residing south of the Great Divide. When they relayed these strange incidents to their neighboring Binefs they found that, generally speaking, the Binefs felt and thought that way much of the time. Binefs viewed the negative visions and images of Uninefs and the altered recollections of the past (or the lack of recollections) as normal and healthy. In fact, they credited the food knowledge for keeping things in perspective and for keeping their thinking in line with reality. In any case, the Binefs believed that the past was not so bad after all and, even so, why dwell on the negative.

Hybrid knowledge crop production became as important in the northern region as it had been in the south. It continued to be the economic base for Nef societies and ultimately gave rise to experts who, in later years began to focus their attention on the tools and means of crossing the divide. After all, it was obvious to all, crop experts included, that the rich northern soil produced the hardiest crops. Yet many Nefs remained stranded in the ancient lands and needed to avail themselves of the opportunities that

awaited them elsewhere. The most radical of northern Binefs and Uninefs wanted to close the divide altogether. They believed that the ravages of slavery, poverty, and/or poor diet and health had taken its toll on the southern Nefs, especially the Uninefs, leaving them unable to recover well enough to cross the divide. However, this was a radical view held only by a small number of northern Nefs who had not been affected so profoundly by the amnesia inducing knowledge. They remembered the strength-sapping labor that most ancient Uninefs endured and acknowledged the fact that no Nef would have had the strength or resources to cross the divide and explore the mythical lands without the benefit of slave labor. They argued that all generations of Nefs owed a great debt to the enslaved Uninefs of past ages and believed one way to repay the debt was to close the divide, making the journey to the fertile northern lands easy for the feeblest of southern Nefs. But because the Great Divide was ever so expansive, their ideas were dismissed as illogical, impractical, and, most of all, too labor intensive. Most of the northern Nefs, on the other hand, who voiced concerns about their brethren in the southern region looked for other ways to allow them to share in their bounty. Special groups of these crop experts across the northern region would travel miles and miles to council meetings concerning the theory and practice of crossing the Great Divide. However, despite their best rhetoric, nothing really changed from year to year. This is not to say that some Nefs did not benefit from the concerns and efforts of their cousins to the north and succeeded in journeying over the chasm. The overwhelming majority of Uninefs remained in the harsh land of the south while more of the unfortunate southern Binefs were able to make their escape. In either case, the most robust of the Binefs and Uninefs were able to take advantage of the opportunities and aid offered by the northern council. The departure of the strongest Nefs increasingly left the burden of southern crop production on the weakest Nefs. The Uninefs that were repeatedly left behind because of their lack of physical strength continued to struggle with the unrelenting soil to produce the hybrid knowledge food that, unknown to them, served to keep them in a weakened state. Their systems never had a chance to adapt so they were unable to gain the strength that the fortunate few northern Uninefs enjoyed. But despite the lack of progress in remedying the situation and because of the historical amnesia that flourished in the northern lands, the Nef council continued to meet year after year and talk about the unfortunate conditions that continued and were worsening in the ancient lands, proposing new and innovative means of transporting the southern Nefs across the Great Divide.

Deconstructing the Divide

Critical Race Theory maintains that racism is endemic and pervasive in American society to the extent that all but the most blatant, egregious racist behaviors and attitudes are considered normal. Thus, Critical Race Theorists, most notably Derrick Bell (1987) and Richard Delgado (1995), have used storytelling to bring into focus issues of race and racism in American society. The use of allegory allows the reader to view all too familiar issues and situations from new angles and perspectives. In 'Crossing the Great Divide' the author uses allegorical storytelling to illuminate issues of racial inequality in the United States and to explain why the gaps in educational opportunities, including access to information technology, persist into this century. In this story, the Uninefs are faced with these insurmountable gaps in the form of a vast and expansive chasm. This chasm represents the enormous inequalities in access to information technologies that exists between racial, ethnic and social-economic groups; a phenomenon that has come to be

known as the digital divide. However the chasm or Great Divide is also a symbol of the many inequities that began and were nurtured long before the information or digital age. This immense chasm represents an 'analog divide' wherein historically disadvantaged racial groups, specifically Black Americans, have been denied equal access to economic and educational opportunities. Thus the stage was set for the digital divide, which widened the gap or compounded the problem, once this nation and globe passed into this age of information technology. One cannot understand why the Uninefs in this allegory are unable to cross the divide without understanding their history of oppression. By the same token, one cannot effectively address issues digital inequity as it pertains to African Americans without understanding the history of their oppression and how that oppression initiated and continues to support and foster inequalities in educational opportunities and achievement. One cannot in fact offer viable, long lasting solutions to the digital divide without seriously looking to alter attitudes and institutions in the general society. There is little hope of closing the digital divide while leaving the analog divide untouched.

The hybrid knowledge food represents a dominant epistemology that is riddled with theories of inferiority and consists of a body of 'knowledge' and 'truths' that support the superiority of the dominant group. African Americans have had a steady diet of education grounded in this dominant epistemology that has served to influence their views of themselves. In "The White Architects of Black Education", Watkins (2001) describes the role of philanthropies in the establishment of Black educational institutions not long after slavery was abolished. He maintains that some of the most influential philanthropic organizations served to maintain the social order that found Blacks at the bottom. Blacks schools were used as instruments of social engineering wherein the curriculum prepared students for occupancy of the lower layers of society only. Furthermore, the curriculum was absent of any African history or experiences that would engender a sense of pride in the African American student. In his work concerning reparations, Robinson (2000) states, "[f]ar too many Americans of African descent believe their history starts in America with bondage and struggles forward from there toward today's second-class citizenship. The cost of this obstructed view of ourselves, of our history is incalculable. How can we be *collectively* successful if we have no idea or worse, the wrong idea of who we were and, therefore, are? We are history's amnesiacs fitted with the memories of others.... America' contemporary racial problems cannot be solved, racism cannot be arrested, achievement gaps cannot be fully closed until Americans—*all Americans*—are repaired in their views of Africa's role in history. (p. 16)."

Like the Uninefs in the tale, African American children know little about their history beyond enslavement and therefore cannot truly understand the predicament they are in. Their history and even their oppression is blatantly left out of American art and history. There is little to comfort them in their struggles. There is no past to take pride in or to foster self-esteem. Furthermore, they have little to counteract the negative images of themselves and their innate abilities that have been ingrained for decades, even centuries, by means of their educational experiences. Robinson further states, "Blacks and no less whites, need to know that in centuries preceding that Atlantic slave trade and the invention of a virulent racism to justify it, the idea of black inferiority did not exist (p. 17)". However a dominant epistemology that supports racism and inferiority theory severely alters and omits the accomplishments of those from oppressed groups and the

history of their oppression that would explain why they fall short in almost every measure of economic and educational achievement. Many Black Americans are trapped in the most impoverished urban areas in this nation without truly understanding the ongoing effects of slavery and the social and economic discrimination that followed slavery and prevented the escape of all but a relative few. Wilson (2001) states, "[o]ne of the legacies of historic racial and class subjugation in America is a unique and growing concentration of minority residents in the most impoverished areas of the nation's metropolises (p. 15)" He further explains that "[i]f large segments of the African-American population had not been historically segregated in inner-city ghettos, we would not be talking about the new urban poverty (p. 23). However, according to Wilson, segregation alone does not explain the emergence of what he defines as the new urban poverty. " I mean poor, segregated neighborhoods in which a substantial majority of individual adults are either unemployed or have dropped out of the labor force altogether (p. 19)." Job discrimination, residential segregation, public policy that allowed for the concentration of low income housing, in addition to the absence of effective labor-market policy have all contributed to blight of the inner city and the continued entrapment of the ghetto resident. Like the weakened Uninefs who were unable to journey into the mythical northern regions, many African Americans are living in a cycle of poverty without the resources or strength to pull themselves up the socio-economic ladder. They attend poorly funded schools, with poorly trained teachers, and with uninspired curricula. They are not told that they are the victims of decades institutional racism that created their dire situations. Rather they are told to look to the growing Black Middle Class as proof that it is possible to 'be anything you want to be'. The message is that failure to achieve means one is inherently unable to achieve. How else would one explain the incredible numbers of African American children that find themselves in impoverished homes and who fail or drop out of school. If a history of racism and truncated opportunities do not account for the schools described in Kozol's (1991) "Savage Inequalities", then inferiority theory must. That is the message that poor African American children are ingesting and internalizing daily. The analog divide must be faced for what it is and American institutions challenged to accept responsibility for closing gaps that they were complicit in creating. The fact remains that most minority children attend schools with high minority enrollments and limited and often scandalously absent resources. Educators interested in closing the digital divide for some of America's poorest and most despised children should perhaps first look at the true source and nature of the problem. If one cannot or will not get to the root cause of a problem, it is unlikely that one will uncover the most effectual solution.

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Bridging the Digital Divide: A School's Success Story

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Abstract: This study is meant to contribute to the discussions on the digital divide. The goal of this project was to study the role of technology in the educational experience of diverse learners. "Diverse learners" in this study refer to students who share one, two or all of the following characteristics: female, an ethnic minority, or economically poor. This study explores issues surrounding the digital divide and documents what a high school has done to encourage their female Latina students to see the importance of computer technology in their lives. Data was gathered though observations and interviews with students, teachers, and administrators of the school. The results show school leadership and parental involvement are among key factors that can assist students see the importance of computer technology in their lives. Interviews with students also revealed that having access to a computer at home has an impact on computer literacy.

Introduction

Many educators believe computer technology has the power to improve the education of diverse learners in elementary and secondary schools. This belief has led to major investments in computer technology in schools. Massive amounts of money are being spent on purchasing equipment, connecting classrooms to the Internet, or providing professional development for teachers. "The investment in technology for schools resembles the investments being made in many 'dot-com' Internet companies. In both cases, the investments are based on the *potential* of new technologies, in the hope that this potential will be fulfilled in the coming years" (Kleiman, 2000, p. 7).

While computer technology has improved the educational experiences of many students, research has shown that there are still members of the educational community who are not included or represented in the technology agenda. Computer technology has fallen short of its promises to students who are female, ethnic minority, and students who are poor. The gap between those who are able to fully participate in the technology agenda and those who are not is often referred to as the *digital divide* (Bracey, 2000).

My goal is to study the role of technology in the educational experience of diverse learners. Diverse learners in this study refers to students who share one, two or all of the following characteristics: female, an ethnic minority, or economically poor. For this study, I explored issues surrounding the digital divide and I documented what a Catholic high school in the Los Angeles area is doing to encourage their students to see the importance of computer technology in their lives.

Background

Computer technology allows students of different backgrounds to arrive at a solution to a problem by sharing diverse viewpoints. Despite this major benefit of using computers in teaching, research has shown that some students are not benefiting from learning through computers.

Female students are less likely to see the importance of computers in their lives than male students. Gender inequity in education is nothing new. Sadker and Sadker (1995) first showed how schools perpetuate the underachievement of female students, especially in Mathematics and Science. Gollnick and Chinn (1997) explain that the underachievement of females in school is a product of a system that perpetuates the belief that female students are not as academically capable as male students. Teachers expect less of their female students. It is therefore not surprising that female students are less interested in computer technology. Kelly (2000) states, "one of the first indicators of this gender disparity may be the Advanced Placement exam in computer science. Girls accounted for only 17 percent of the test takers on

the A exam and 9 percent on the more difficult AB exam" (p. 155). Huber and Schofield (1998) studied the attitudes of male and female elementary school students in Costa Rica. Their study revealed that female students have a less positive attitude towards computers than the male students due a number of factors: male biased software, the stress on competition in most computer classes, stereotypical view of computer use as a male activity (even by female computer teachers), less teacher assistance for female students, and less computer use of female students outside of the classroom. As a result of these school experiences, female students are less likely to seek a career in the computer industry and are not able to enjoy the same economic prosperity as their male counterparts.

Economics also plays a role in how computers are used in teaching learning. Access to computers is a major factor that prohibits all students from learning through computers. The high cost of computers still prevents many schools from making computers available to students. Schools in affluent neighborhoods are also more likely to have a full-time technology coordinator and teachers in less affluent districts have less access to professional development (McAdoo, 2000). Furthermore, students in poorer communities use computers for drill-and-practice type of activities while students in affluent communities use computers for inquiry-based lessons and collaborative learning (Kleiman, 2000). Thus, in poor communities, the computer leads the student. In rich communities the students control the computer for their own purposes. In order to bridge the digital divide, researchers and educators need to come up with ways to make computer usage meaningful for people who are poor.

There is belief that the digital divide will fade due to "market pressures, with decreasing hardware and connectivity costs inevitably leveling the digital playing field" (Carvin, 2000, p. 3). However, some researchers have been able to show the members of ethnic minority communities may not see computer technology as important to their lives even if they have the money to purchase computers. Holmes (1997) notes that many African Americans do not see the Internet as a relevant part of their lives. Hoffman and Novak (1999) show that the absence of relevant multicultural content on the Internet makes surfing the World Wide Web less interesting to ethnic minority communities.

Schools can play a major role in bridging the digital divide. While access to computers in schools have increased dramatically, Becker (2000) notes that most the most creative and frequent uses of computers in schools are still not related to the general curricula. Most usage of computers is still only a part of specialized classes, such as computer classes. Becker (2000) discusses several factors that affect computer usage of schools. First, access to computers in the classroom often dictates how much work a teacher may assign a student. Becker points out that teachers with at least one computer in the classroom are more likely to assign computer work more frequently than those teachers who have to bring their class to a computer lab. Teachers who also had computers in the classroom, were also more likely to use various software (e.g. spreadsheets for Math and Science teachers, word-processing for English teachers) than those who had access to computers in a lab. Secondly, Becker shows that teachers must have the necessary expertise to use computers effectively for teaching. "To use computers effectively in their classroom, teachers must have certain levels of expertise in basic computer operations" (Becker, 2000, p. 54). Teachers must also believe that the use of computers can really make them more effective educators.

Computer technology has the promise of making learning and teaching a more meaningful experience for diverse populations. No one has quick solutions to the problem of the digital divide in schools. However, "as a society, we need to establish a comprehensive strategy that addresses it from all angles. Access, literacy, content, cultural relevance, and community needs are just a few of these factors" (Carvin, 2000, p. 13).

There have been institutions that have addressed the problem of the digital divide. Furger (1998) discusses the success of "The Odyssey Project", a project designed to integrate computer skills and activities across the curriculu m at the Albany Academy for Girls, New York. The project was specifically for middle school students because "there's no more critical time than middle school years to expose girls to the many and varied uses of computes, to give them rich opportunities to explore their capabilities, and to lay a solid foundation that will give girls the skills and the confidence they need to explore other aspects of the technology during their high school years and beyond" (Furger, 1998, p. 142). The project was successful because he students were empowered to select the appropriate technology to complete the activity. The use of computers was not the focus of the activities. Technology was a tool to complete the activity.

The Computer Clubhouse (organized in collaboration with the MIT Media Laboratory) in Massachusetts sought to provide access to technology to inner city youth. "The Clubhouse is based not only on new technology, but on new ideas about learning and community – where young people and adult

mentors work together on projects, using new technologies to explore and experiment in new ways" (Resnick, Rusk, and Cooke, 1999, p. 266). Children who came to the clubhouse where given the tools that were necessary to learn how to design and create computer based products. They were not merely consumers of the technology.

Methodology

This project is an ethnographic study of an educational institution that is attempting to eliminate the digital divide. . St. Matthias High School in Downey, California is an all female Catholic high school. About 90% of the students are Latina and fall at or below the poverty guidelines set by the government. Despite the fact that these students fit the profile of people who are part of the "have nots" in the digital divide, an initial analysis of the documents presented to me reveal that the school is doing many things to ensure ethnic minority female students who are poor are benefiting from the technology revolution. My goal is to describe what the school is doing correctly to bridge the digital divide by interviewing students and teachers and observing technology classes at St. Matthias High School. Interviews with key administrators were conducted.

Results

My case study of St. Matthias High School in Downey shows that schools can bridge the digital divide. 90% of the students who attend this all-female high school are Latina and come from low socioeconomic backgrounds. Yet, 100% (n = 30) of the students who were interviewed (representing different levels of computer proficiency) all stated that they felt comfortable using computers. These students were also able to describe how they use computers for their schoolwork and believed that knowledge of computer skills are important for their future. The students appreciated the computer training they are receiving at their school.

St. Matthias High School is able to bridge the digital divide because of the following qualities:

a. *Vision for Technology*: The school created a multi-year plan for technology. The plan is updated every year and is revised in consultation with a technology committee composed of school administrators, students, community representatives, and higher education professionals. In 1995, the school did not have a single computer. By 2001, the school had over 100 computers (purchased and donated), a server, digital cameras, and a satellite connection for the Internet. All the teachers in the school have a computer in their classroom. All of the classrooms are wired for the Internet and have software appropriate for the teacher's content area. The school also has several labs that teachers and students can use.

b. *Leadership*: The school has an administration that is an advocate for technology. The administration and teachers in the school truly believe that their students need to be computer literate in order to have a better future. Technology is a priority and the administration continues to set aside resources for equipment and professional development. The administration also spends time developing partnerships with all of the school's stakeholders. The community shares leadership for technology. The school has established an advisory board composed of students, parents, teachers, parents, university professors, and community leaders.

c. *Professional Development for Teachers*: Teachers were given the opportunity to attend seminars and training sessions related to technology. The school administration set aside money for teachers to attend national conferences. Teachers were given paid time-off to attend conferences and workshops. In the questionnaire administered for this study, the teachers stressed in their responses that the professional development that was provided to them by the school was invaluable. The professional development allowed them to explore how computers can improve

their teaching. The teachers also stated that the school administration empowered them to learn about computer technology at their own pace based on their individual needs.

d. *Parent involvement*: The school administration knew that the parents of their students had to believe in the importance of technology. In order to do this, the school created an opportunity for parents to see how technology can change their lives. The school began offering tuition-free Microsoft Office certification classes for the parents. Parents attended classes in the evening and on weekends. At the end of the training period, the parents received a certificate of proficiency. They were then able to use these certificates to get better paying jobs. The parents have now become advocates for the use of computer technology.

e. *Successful fund raising*: The school administration knows that they need money to purchase equipment or professional development. Every year, the school hosts a carnival that raises about $50,000 for technology. The entire community is involved in the carnival. Aside from the carnival, the principal writes several grants every year.

f. *Meaningful computer use in the classroom*: Both teachers and students used computers in meaningful ways. The use of computers is integrated in the curriculum. Teachers used computers for attendance, grades, research, and preparing lessons. Students can connect to the Internet to check their grades or look at assignments posted by the teacher. Students used computers to complete school projects. In an Art class, students created web pages to display their photographs. In one Religion class, students used PowerPoint to present their reports. In all instances of computer use in the school, the curriculum drives the use of the technology. In one Spanish class, students used language software to practice vocabulary exercises.

g. *Leadership opportunities*: Students who decide to take the advanced level computer classes, become technology leaders in the school. They assist teachers and other students. These students also maintain the school server and web sites. Whenever a contractor comes to the school to do routine maintenance on any computer equipment, these students are asked to observe the work that is being done. These students, in many ways, receive technology training that is beyond using computers for school projects.

St. Matthias High School is doing an exemplary job of bridging the digital divide. However, many of the students felt that the absence of a computer at home prevented them from becoming even more computer literate. Students who do not have computer access at home are less likely to use the Internet for schoolwork. Students who have computers at home often spend time learning software on their own time. This "anytime, anywhere" access is important for empowerment.

Conclusion

Schools can be a catalyst for bridging the digital divide. "Schools play a critical role in ensuring equal opportunity for less-advantaged children by providing access to a wide range of enriching experiences including exposure to computer technology" (Becker, H. J., 2000, p. 45). Schools have the power to motivate or discourage students from participating in the technology revolution. It is clear that schools must be willing to make the necessary commitment in personnel and finances. Schools must also start with a vision of technology use that includes use of computers by all members of the school community (administrators, teachers, students, and parents). Involving all stakeholders will lead to ownership of the technology vision of the school. Lastly, schools need to make an effort to assisting students to have access to technology at home.

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Digital Equity Toolkit

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The National Institute for Community Innovations (NICI) in collaboration with the PT3 program's digital equity task force, has developed a free toolkit pointing preservice and inservice educators and teacher education faculty to free resources enabling them to address the digital divide in their classroom and community.

Inequitable access for students and educators in low-income communities to learning technology resources remains a vexing and substantial problem in the US and in many other nations. At the same time, foundations, corporate philanthropies and public sector initiatives are investing enormous sums to reduce the digital divide in classrooms and communities. Yet, future and current educators and those who provide teacher preparation and professional development remain almost entirely unaware of these resources, how to tap them, and how to integrate them into educator inservice and preservice.

NICI has developed a free web-based ***Digital Equity Toolkit*** to point educators to free resources to reduce the digital divide. The Toolkit currently focuses on US-based resources but will become a more internationally oriented resource over time. NICI is working with several national educational organizations to assist in bringing the Toolkit's resources to the attention of educators and teacher education faculty.

In this session, participants will learn about the toolkit, explore how to use it in teacher preparation, and recommend enhancements in the toolkit's format, contents and usability.

Embracing Critical Perspectives on Multicultural Pedagogy in Teacher Education: An Online Intercultural Exchange

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The multicultural literature clearly documents the challenges teacher education programs face in preparing competent culturally responsible teachers for our nation's schools. Many educational researchers support the notion that teacher education programs are not doing enough to prepare predominately White, female, and middle-class teachers who come from homogeneous settings to embrace emerging critical perspectives on multicultural pedagogical practices in schooling. The literature also suggests that numerous socialization factors affect preservice teachers perspectives on race, ethnicity, gender, social class, and ability. The purpose of this ongoing project is to explore how computer mediated communication (CMC) can be used to create new and varied opportunities for prospective teachers to explore, and as a result, broaden their own perspectives on critical issues facing cultural diversity in education.

This paper reports on a work in progress that will share information about the design, implementation, and evaluation of an asynchronous eight-week online intercultural learning exchange between two distinct groups. These two groups consisted of 44 preservice teachers enrolled in a teacher education program at a Midwestern university and 18 preservice and inservice teachers enrolled in a teacher education program at a college located in an urban setting on the east coast. A web-based course management software program, WebCT, was used to support this online intercultural learning exchange between both groups of students. WebCT's discussion board feature was used to create a learning environment that promotes reflective discourse and interaction among the participants. After exploring the process of creating a culturally diverse online community of educators; this paper identifies specific strategies for enabling predominately White preservice teachers to understand powerful socialization factors that influence the way in which they think, feel, and behave. Furthermore, preservice teachers explore how their participation in various social systems help to construct their own perspectives on multiculturalism and schooling through reflecting critically on their collaborations with inservice teachers who live and work in an urban populace. Observations on the inservice teachers' reactions to this multicultural experience will also be shared. Finally, this paper calls for further research on how computer mediated learning environments can help teacher education programs prepare competent culturally responsible teachers for the multicultural classroom.

Creating Accessible Powerpoint Presentations for Students with Disabiliites

Tamara L. Pratt, Mercyhurst College, US

Description

Learn how to incorporate Power Point with instruction for students with physical disabilities in order to enhance their learning experiences

The intended objective of this poster presentation is to expose teachers to the many adaptive uses of Power Point as a teaching tool. Participants will see how Power Point is used to assist students with disabilities. Participants will be able to think ahead of adaptations needed for their students with disabilities, to make students active participants of their learning. Prerequisite skills participant skills include basic knowledge of computer use, how to import and export files, and the use of a scanner.

The presenter is a current graduate student in the field of Special Education at Mercyhurst College working with the PT3 grant. She has experience developing accessible Power Point presentations for students with multiple disabilities.

I. Universal Design – means it's accessible to most students with disabilities.
   - A. Visual Disabilities
     1. Less distracting environment
     2. Color reversal
     3. Large font – simple
     4. Mouse over to describe pictures, buttons, directions...
     5. Consistent placement of buttons
     6. Text voice over
     7. Screen reader for web browsing
   - B. Hearing Disabilities
     1. Minimize background distractions such as music, animation.
     2. Minimize excessive noise levels in work area such as other students.
     3. For students with partial hearing loss use headphones to listen to presentation.
     4. Limit text to clear and large –bold key ideas, phrases, and vocabulary words.
     5. If you import an iMovie make sure you have closed captioning.
   - C. Physical Disabilities
     1. Use mouse over to eliminate need for mouse click to progress to next slide.
     2. Consistent button positioning to eliminate too much mouse movement.
   - D. Learning Disabilities
     1. Highlighting text, key points vocabulary words.
     2. Voice over for reading text
     3. Minimizing background distractions
     4. Headphones
     5. Consistent placement of buttons
     6. Larger text
     7. Color reversal
     8. Chunking content (short sections)
     9. Ability appropriate text, age appropriate content

II. Achievement of Objectives
   - A. Mouse over
   - B. Voice over
   - C. Button placement
   - D. Slide transitions
   - E. Voice recording
     1. slide narration
     2. inserting voice on a slide
   - F. Changing font size, color

G. Bold or highlighted words, phrases
H. Cursor speed
I. Automatically open as presentation or does student need to start presentation
    1. show begins automatically
    2. slide begins as an outline

Equity Lenses: Diversity-Responsive Use of Advanced Technologies for Math and Science Education

J. David Ramirez, CLMER/CSULB
Kim Williams, Northwestern University
Kevin Rocap, CLMER/CSULB

The work to be shared in the proposed SITE paper was supported by a seed grant from the Center for Innovative Learning Technologies (CILT), as part of an NSF grant administered by SRI. CILT is an organization made up of partner institutions and individual members nationally involved in the design, development, implementation and evaluation of advanced technologies in math and science. Apropos to the "Digital Divide" theme of the CILT2000 conference the goal of this seed grant project was to help inform an agenda for equity and diversity-responsiveness within CILT and with regard to educational technology efforts in IT and educational associations similar to CILT.

CILT has a commitment to addressing the digital divide, yet there is a recognized need within CILT to define criteria for what we mean by equity, diversity and action in a CILT context. Without a framework for identifying issues and strategies, it's difficult for us to move forward with this commitment strategically and to support and inform CILT members about approaches to addressing equity in R&D efforts. The paper authors facilitated the development of equity lenses, guidance and criteria, through the use of which we may view, assess, recognize and transform, as appropriate, CILT-type endeavors with regard to their contribution to addressing issues of diversity-responsiveness and equity, particularly with regard to the Digital Divide.

To accomplish this, we involved key technology, math/science and community leaders as well as collaborating partners in the development of an "equity lenses" framework for identifying issues and strategies synergistically, across the four CILT

themes - Visualization and Modeling; Ubiquitous Computing; Community Tools; and Assessments for Learning. The equity lens project was initiated with the overall goal of identifying promising research and development, educational and community-based activities and other programs that consider issues of equity and diversity as integral to their work. Members of the equity lens group, though bringing different experiences to this project, all held a collective belief in the importance of developing helpful rubrics or guides for considering equity and diversity issues in the research design of CILT-type projects.

We engaged in several key activities in order to draft key issues, rubrics and guidelines. 1) We queried colleagues about projects that they were aware of which consider issues of equity and diversity in at least one phase of their work (e.g., design, piloting, data collection); 2) We met with SRI researchers (February, 2001) to obtain permission to review CILT seed grant abstracts. Our goal was to examine the abstracts to see if, or where, diversity and equity issues were addressed. We also considered how equity and diversity issues could have naturally been included. 3) We met as a group in late February to discuss our projects and what we'd learned. 4) We met in June, 2001 to develop a broad-based survey designed to query the CILT membership and members of the advanced learning technology community and the educational research community about equity and diversity issues. 5) We presented our platform to a group of IEEE conference attendees in Madison, WI. We also asked these attendees to review our survey and provide feedback about the questions we proposed to ask of those described in #3. 4) Through on-line discussions and phone conferences we planned a focus group meeting in California for Fall 2001. 5) We are gathering and analyzing surveys to further

the development of criteria, guidance and rubrics that will be shared through this SITE presentation.

This paper will share the findings and the guidance and criteria of this CILT seed grant effort and will engage participants in considering specific issues in the design, implementation and evaluation of advanced learning technologies in K-12 math and science education.

'Facelessness' and its Impact on Democracy and Diversity in Virtual Communities

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Abstract: This paper investigates the relationship between new technologies, pedagogy and cultural diversity. The importance of this research for teacher trainees cannot be underestimated. Teachers are expected to use new technologies in classrooms often without any critical understanding of their impact on the social and cultural dynamics of classrooms (Lankshear and Snyder, 2000:121). In this paper, the contradictory socio-cultural dynamics produced by 'facelessness' in an on-line community are examined.

Introduction

The research project on which this paper is based was entitled *'Framing Technological Literacy: an ethnography of social space in teaching and learning on-line*". It was an ethnographic study of the socio-cultural dynamics - including pedagogical frameworks - when using Information and Communication Technologies (ICTs) in an undergraduate subject - *Cultural Diversity and Learning*. This was a first year social science subject that I authored and taught to primary teacher education students. Students used a discussion board and email as well as a subject website and other materials within the teaching platform called 'Blackboard'.

In focus group discussions at the end of semester, students talked about their experiences of using ICTs in this way. All four focus groups, in addition to many of the discussion threads, made reference to the absence of visual clues, and in particular to the absence of face. For some this was liberating and for others it created a sense of vulnerability. To contextualise these socio-cultural dimensions, the elements of the subject *Cultural Diversity and Learning* need to be outlined.

The subject Cultural Diversity and Learning takes a critical approach[1] and has two strands. The first is concerned with developing concepts and understandings about the ways in which cultural diversity is constructed at the national, local and global level. There is an examination of traditional, liberal and critical ideologies and pedagogical frameworks in education and how they shape space for cultural diversity (Solomon, 1995).

These understandings are then applied to cyberspace to critically analyse knowledge and information found on websites, as well as the material contexts from which they have been produced. Two main approaches are introduced: neo-Marxist and feminist post-structuralist. Neo-Marxist theories regarding the commodification of information and entertainment are used to explore the potential for democratic use of the Internet. This is not only about production but also about the way in which children are being turned into consumers as the defining principle of childhood. Feminist post-structuralist analysis of the same sites shifts the focus to textual analysis - the design, representation and reproduction of identities in cyberspace. Indeed, the design of the website incorporates a background visual metaphor of a brick wall on every page. This idea was borrowed from Pink Floyd's album, "Another Brick in the Wall"[2].

Part of the subject is an on-line module in Weeks 7-9 entitled 'Cultural Literacy'. Cultural literacy is understood in this context as "a connection between the recognition, production and retrieval of what is constituted as information, on the one hand, and its use or deployment as a communication practice on the other" (Schirato and Yell, 2000:36). Students use on-line readings from journals and other cultural studies websites worldwide[3] as well as film reviews provided by Paul Byrnes, a Sydney Morning Herald journalist. During the three weeks, students discuss focus questions around readings - individually - in on-line forums. Once a week they respond in groups to a substantive question on all the weekly readings, which is an assessable item.

[1] See Reid, 2000 for full discussion of this approach.
[2] In the lyrics, education in general was seen as 'thought control' with the outcome being conformity and loss of diversity.
[3] Particular thanks to Douglas Kellner of UCLA for permission to link to his very useful website.

Disney is used as a focus for critique as Disney enterprises are strong examples of the commodification of entertainment and information. In addition, Disney is widely critiqued by academics - and everyone knows Disney. Disney images and characters largely convey a homogenised view of the world by erasing or crudely stereotyping the diversity of sexualities, genders and ethnicities found globally. Perhaps not surprisingly this erasure is often understood more by those marginalized than other groups. For example, Arabic teacher education students are quite critical of Disney Enterprises as the Disney studios were well known for their anti-Arab sentiment during the Gulf War as well as the fact that Arabs are often portrayed as the bad guys in Disney films for children. For other students there is dismay that their beloved Disney is the object of critique!

When students have completed this module, they search for their own sites, then compare and contrast their findings (in pairs) using the analytical skills and concepts derived from the on-line module and understandings developed earlier. Students combine visual, communicative and technological literacies with social and cultural theory to critically analyse information and entertainment on the Internet. In this way, they develop pedagogical understandings about the way in which ICTs can be used to teach critical literacies. The knowledge gained from both forms of literacy practice - communicative and socio-cultural - frames their exploration of the Internet and enables a socio-cultural analysis of websites for children. Analyses are presented using PowerPoint slide shows or constructing websites thus learning practical skills and knowledge about the pedagogy of software in the context of socio-cultural analysis.

In the remainder of this paper, there is an exploration of the students' responses to the on-line component of this subject. Their responses reveal the connections between the knowledge or content of the subject, the medium - in terms of the communication literacies employed - and the nature of the interactions, in terms of whether or not they were democratic and inclusive.

'Facelessness'

In the [embodied] tutorial you might think ' oh this person might think I'm a bit of a dropkick', but if it's on the Internet people are less inhibited and they're going to write what they think. [Young woman - focus group]

The analysis of discussion threads in this subject, and focus group discussions at the end of semester, revealed the centrality of 'face' - both its presence and absence - in social relations. The decoupling of faces and names, and time and place, appears to afford students a perceived degree of anonymity despite the fact that their names appear next to their contributions. The fact that peers are not able to judge them appeared to be more important than the fact that the lecturer was able to do so. This indicates a perception about social relations - indeed power relations. Are we, for example, more afraid of judgement when it is faceless? Is judgement harsher when those we judge are unknown to us? In an attempt to answer these two questions, the paper examines the tensions created by 'facelessness', in particular how 'facelessness' shapes democratic space in a culturally diverse community.

'Othering' versus 'deliberating'

I think it must be a personality thing. People being hard on the strangers that they didn't know, because they haven't developed friendships and they don't all know what everyone's like...(woman -focus group)

The 136 students involved in this project were largely unknown to each other as they were in their first semester of study in primary teacher education. In a sense then, they were unable to construct an image, or face, of authors who contributed to on-line debates, nor were they able to do so in other classes since their tutorial groups were different for every subject. For some this caused anxiety but for others a lack of knowing the embodied Other appeared to provide opportunities for a more deliberative democratic ethos (London, 1995). Deliberative democracy, London argues, "is rooted in the ideal of self-governance in which political truths emerge not from the clash of pre-established interests and preferences but from reasoned discussion about issues involving the common good" (ibid: 34). As argued elsewhere (Reid, 2000) the desire to "read off" difference (as in the process of "Othering") as opposed to negotiating difference is hegemonic among undergraduate teacher education students. A shift from a focus on the presumed identities of students appears to have been enabled when the relationship between the subject content, the student demographics[4], and the medium, merged in sometimes-powerful ways.

[4] See end of Reid, 2000 for graphs of local population in terms of religion and number of overseas born.

I think the online really suited cultural diversity – the online part of it - because it [reality] is like that. There are lots of different points of view and I don't think you would have got as much out of the subject in a tutorial situation, face-to-face.[mature woman - focus group]

This particular observation was supported by another student, a mature-aged female, who commented that some students spoke more *for themselves* [my emphasis] on-line than in embodied space. She explains:

They are quiet [in embodied tutorials] —Muslim ladies are quiet, very quiet. Their names on the discussion board... had a lot to offer. It must have been incredible for them too, to voice their opinions. It was easier for them...

It certainly appeared that some students felt comfortable drawing on their own cultural knowledge and sharing it with their fellow students. At times, this appeared to be an outlet for pent up resentment or frustration for those who had felt themselves subjected to the ignorance of others. For example on one discussion thread:

- An Islamic student expressed the annoyance she felt when people assumed that wearing a scarf [sic] was 'a Turkish thing, and not an Islamic one.'
- Another Islamic student agreed, protesting against the ignorance and stereotyping which often insists that all Arabic speakers must be Lebanese, that all women who wear a scarf [sic] must be Lebanese, and that all female followers of Islam must be oppressed. This student insisted that 'the solution here is pure and simple - education.'

A large number of students exchanged information about their personal biographies in order to explain their different reactions to their learning experience. This sort of exploration was of great relevance in a subject like *Cultural Diversity and Learning* where the students are encouraged to explore the intersection of their own biographies and their ideological positions in relation to the social construction of difference and diversity. This positionality became evident when students considered their audience and whether or not they felt constrained on the discussion board.

Definitely –because it is so—it's a touchy subject, and everybody is so multicultural, here especially.[young fe male - focus group]

That was the point that I had, but also too, to make sure that I didn't offend anyone, that I had said the exact thing that I wanted and it couldn't be taken out of context I suppose. It made me concentrate a lot more on what I was actually thinking and what I really felt about the subject.[mature female - focus group]

The tension created by 'facelessness' is also assisted by certain literacy practices. Students disagreed over what text types are liberating in terms of on-line discussion. Some like the fact that you can use a narrative approach and state your own ideas drawing on personal experience while others found this tone acted to filter or exclude their voices because they felt uncomfortable with personal revelation. This has considerable implication for literacy practices in terms of text types but also cultural literacy in terms of the social and cultural dimensions of the Internet, as a cultural field. The apparent 'search for voice' is typical of the new ways in which those with cultural capital in one context have to learn new forms of literacy (Lankshear and Snyder, 2000), as cultural capital in one field is not necessarily as powerful in another cultural field (Shirato and Yell, 2000).

Productive Literacy Practices

You can say more, and you can tell people off more. You can write a load of waffle, you can be rude, you can have a considered response, but yeah it's different, it's very different. [Mature woman - focus group]

Agger's (2001) tentative social theory of the Internet suggests that authoring (websites, homepages, hypertext) is an essential part of struggle in the democratisation and humanisation of the Internet. The text types students use are very diverse as the woman above astutely observes. Creating democratic spaces requires openness to a range of literacy tools that people use to connect to new knowledge. However, not all literacy practices are productive. Two mature male students in this project discussed some aspects of what they saw as productive literacy practices.

That critique of each other [on-line] is good...sometimes, it puts people back in their places so to speak whereas in tutorial sometimes...you just let it go...sometimes you can say real crap and people agree with you...they don't even listen, they're not even there.

I thought about what I was going to say, which maybe you don't do in a normal tutorial. You don't know what questions necessarily are going to come up, but I can remember definitely thinking you know—maybe I perhaps started tending to think, you know, should I or shouldn't I say something radical, you know what I mean?

However, while this direct type of literacy practice was productive in terms of providing a much broader dialogue of ideas across the student body, the 'faceless' aspect of the discussion created a rebound effect in ways that were not predicted. One of these was related to the use of peer-based assessment.

Some Effects of Recoupling Names and Faces

...we came together and we didn't know anyone... I think peer marking became a bit hard, but then again I guess it was good too because you did it genuinely.[mature male - focus group]

Despite the fact that many students were liberated by 'facelessness' it was not necessarily because identity was removed. The fact that others are complicit in the construction of our identities, embodied and virtual, is evident when the removal of an embodied identity was replaced by a cyber identity in the on-line discussions. For example, one all female focus group had a prolonged discussion on the relationship between the cyber identities they had come to know and the emotions they attached to the names based on these cyber identities. When the recoupling of names and faces occurred it produced effects of power that in the context of face-to-face peer marking became difficult for some students who had been outspoken on the discussion site. One student commented:

You learned all these names and now you'd go 'oh yeah, you put a name to a face'. Not that you'd remember what they spoke about, you just remember the feelings.

Others found that a lack of personal embodied knowledge produced an almost 'ferocious objectivity':

You just took everything that they said and you marked them on what they'd said. Critical, I think.... Ferocious is a strong word, critical I think because you didn't have that personality, like the personal side.

While this sense of alienation was not felt by all students, the effects of recoupling names and faces demonstrates the unintended consequences of 'facelessness' in teaching and learning on-line, in particular its link to technologies of power such as assessment and profiling activities (Robins and Webster, 1999).

Conclusion

'Facelessness' in this social science subject produced socio-cultural dynamics that were enmeshed in both virtual and embodied communities (local, national and global). This created an environment of greater risk whereby strategies of negotiation, dialogue and deliberation were most valued. Literacy practices which best supported the ability to produce such complex texts were based on knowledge of social and cultural structures and processes. Such knowledge framed technological and communicative literacy. This critical approach demonstrates that pedagogically, science (including social science) "is a social and historical activity" which cannot ignore "the social and communitarian dimensions of cognition based as they are in language" (Olssen, 1996, p.289).

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CLMER Telementoring: Diversity-Responsive Teaching and Learning with Technology

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Since 1996 the center for Minority Education Research (CLMER) at California State University, Long Beach has worked closely with multilingual, multicultural, critical educators to develop professional development communities of practice meaningful, diversity-responsive uses of computer and telecommunications technologies in K-12 teaching and learning and teacher preparation. This work was initiated as a K-12 inservice teacher and parent professional development program with CLMER as the lead agency for the Pacific Southwest Regional Technology in Education Consortium (PSRTEC) and has been expanded and enhanced to address pre-service preparation issues as part of a PT3 Catalyst grant. Our purpose is to work in partnership with cadres of 20-30 teachers, parents, pre-service teachers and/or faculty as communities of practice, to learn together what we can do to improve access to information and communication technologies, to develop high-quality multilingual, multicultural learning approaches and to develop critical pedagogical strategies. We draw on theories and practices of multilingual, multicultural and anti-racist educators that include Paulo Freire, Alma Flor Ada, Sonia Nieto, Gloria Ladson-Billings, Jim Cummins, J. David Ramirez, KimOanh Nguyen-Lam and others.

The design of the CLMER Telementoring model has been to ensure that all participants engage as a community of practice around the following key CLM ER Telementor "lenses:"

- Critical Pedagogy
- Language (multilingual education and language rights)
- Anti-Racist Education
- Standards
- Community Learning Theory (relates to school-home-community collaboration, as well as to adult learning, community organizing and diversity-responsive approaches, e.g., culturally-based approaches such as Razalogia, born out of Chicano/Latino organizing strategies and culturally-responsive community wellness approaches).
- Technology Fluency

CLMER Telementoring goes beyond teaching about technology and is about improving critical approaches to teaching and learning while understanding, applying and critiquing issues of meaningful technology integration in the context of participants' practices.

CLMER Telementoring Methods

We have several ways that we make the lenses above a concrete part of the process. We engage in readings drawn from such sources as our own Virtual Power publication and the Beyond Heroes and Holidays anti-racism-across-the-curriculum text that we helped to produce. We also draw, as mentioned, from practitioners and theorists of multilingual, multicultural education such as Sonia Nieto, Jim Cummins, Alma Flor Ada, Paulo Freire and others (including making use of a critical pedagogy framework for planning learning activities and agendas). We also draw on sociocultural learning theories and practices associated with Computer-Supported Collaborative Learning. We then use technology communication and collaboration tools (e-mail, listserv, WebBoard, ICQ, etc.) to develop K-12 learning projects and to encourage reflection on diversity-responsive teaching and learning in the context of participants' current and anticipated practices. Participant learning projects may be as small as a learning activity and as large as the creation of a Community Learning and Technology Center, with most reflecting participants developing diversity and equity-themed project-based and/or problem-based thematic learning activities. Participants also have specific responsibility for mentoring others, making use of online and face-to-face approaches.

CLMER Telementor Requirements

There are some requirements of Telementors:

- Active participation in all planned professional development activities

- Agreement to create a project or unit of practice to be carried-out in one's own classroom/learning environments (these have varied from project-based learning activities to the formation of Parent Centers or Community Learning and Technology Centers. We don't have a cookie-cutter requirement for these except that they reflect integration of the CLMER Telementor lenses).
- We expect administrator support at a participant's site for their work as CLMER Telementors, for providing 8 days of paid release time and free professional development opportunities we ask administrators generally to grant 6 days of release time to their teachers at a later date to allow them to mentor and support others, as a way of sharing their knowledge/experiences.
- Participants give back by agreeing to a plan to mentor others, in their own schools, communities, or in other venues. Some of our sessions engage participants in dialogue about the purposes and practices of mentoring in order to strategize and action-plan together on their own mentoring plans.
- Active participation in planned online communication between face-to-face meetings.

Workshop Purpose

This workshop will share readings, resources and strategies associated with the CLMER Telementoring community of practice approach to professional development, as well as engage participants in active review and critique of learning projects designed by CLMER Telementors and invite sharing among participants of issues and promising practices for developing technology-enhanced, diversity-responsive teaching and learning approaches that target success and participation for underserved K-12 learners. Strategies and purposes for integrating visual and creative hands-on arts activities while developing critical multicultural approaches and developing technology fluency will be shared. Further, we will share the experiences and processes of working across diverse stakeholders, including teacher education faculty, teachers, low-income parents, pre-service teachers and others to "level the playing field" in the development of high-quality, diversity-responsive, community-connected learning projects.

The Robot League: Lego Mindstorms RIS in Schools

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The Robot League is a bootstrap initiative of Kansas State University. The concept is to encourage interscholastic and intramural competition using Lego® Mindstorms™ Robotic Invention Systems™, RIS, kits. Participants, in classes, clubs, other school groups or homeschool groups, build autonomous robots that compete in pre-defined events. While all students are invited to participate, special emphasis is given to members of groups traditionally underrepresented in engineering, including females, minorities and low SES students.

Membership in the league is self-selecting. An open invitation was sent to area schools and those who asked to join were admitted. Teachers signing up were provided with one or more RIS kits. The two main requirements for accepting the kits were participating in one or more interscholastic competitions hosted by Kansas State and a 1-2 page written evaluation at the end of the year.

Participation ranges from 5th grade to high school. Some teacher initiatives pair high school students as leaders with middle and elementary school groups. Some participants are identified as gifted while most are not. At least one participant has been identified as marginally learning disabled.

The fundamental purpose of the league is to change attitudes among students. Many of the participants do not view school as particularly relevant or engaging nor do they view fields requiring higher education as viable options. By providing manipuables that require higher order thinking to accomplish well defined goals in a competitive environment, the league hopes to encourage students to take more math and science classes in high school and be better prepared for college. In addition, the league hopes to foster better feelings towards the school and encourage school spirit by having both intensely competitive but also light-hearted competitions.

This presentation will focus on how to set up a robot league and what were the short-term effects on the students participating. Other issues include multi-age classrooms and the relevance of technology in schools. The hands-on workshop includes building and programming a robot and participating in one of the league tests.

Bridging the Digital Divide through Technology Integration in an Urban Elementary School: A Study Report

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Teachers who possess strong content knowledge and embed technology across all aspects of their teaching as a central means of creating active, engaging, and challenging learning communities have the potential to close the perennial gap in achievement between students in urban schools--who typically are members of minority, and often lower socioeconomic, groups--and their counterparts elsewhere (Children's Defense Fund, 1999). Statistics show that children of color in urban environments have fewer opportunities to access technology than their Caucasian counterparts of comparable income (Hoffman and Novak, 1998). Further, Caucasian Americans are more than twice as likely to own a computer than their peers of color (Hoffman and Novak, 1998). Even when children are placed in schools with computer technology, children in urban environments tend to engage in drill and practice activities rather than more meaningful activities which entail higher order thinking (CEO Forum, 1999). This finding may be due in part to teachers' feelings of inadequacy regarding effective technology use (NCES, 1998). NCES (1998) reports that only 20% of teachers feel well-prepared to integrate technology into their teaching.

In an effort to ease the digital divide, faculty and staff from the Schools of Education (SOE) and Library and Information Sciences (SLIS) at the University of Wisconsin-Milwaukee (UWM) and faculty at Starms Discovery Learning Center (DLC) in the Milwaukee Public Schools (MPS) forged a collaborative effort to address three key issues: teacher preparedness, technology availability, and technology integration. Students and teachers participated in a community-based project designed to narrow the digital divide through increasing students' knowledge of the local community and civil rights movement via the construction of a multimedia documentary.

Subjects in the study were kindergarten through fifth grade students in an inner city school, 80% of whom qualified for free or reduced lunch, 80% of whom were African American, and 20% of whom had disabilities. In other words, children who, due to their race, socioeconomic status, disability, and location of residence, are the very children who are typically excluded from enrichment programs such as the one herein. Teachers received staff development in various technologies and consulted with technology staff regarding the conceptualization of classwide projects which integrated technology. Students used digital cameras, digital video cameras, scanners, and various software tools to learn and share information about the civil rights movement in their city

and nation. Information was obtained through traditional print resources as well as interviews with notable public activists, prominent local individuals, and neighborhood families, visits to the Black Holocaust Museum, and presentations by journalists who documented and archived the civil rights movement. Teacher and student attitudes, skills and beliefs surrounding technology were surveyed via questionnaire, interview, videotape, and worksample review.

The proposed presentation will discuss the projects and share findings, including student technology projects.

Considering Digital Equity in Teacher Preparation Programs: A Framework for Integrating Issues of Equity Across Content Disciplines

Nancy Allen, Paula Hamm, Patricia McIlveen, Martha Martini, David Ramirez, Paul Resta, Amy Staples, and Joy Wallace

The Preparing Tomorrow's Teachers to Use Technology (PT3) initiative sponsored by the Department of Education funded Schools of Education (SOE) across the country to support the integration of technology into teacher preparation programs. This funding affords SOEs the opportunity to reform or revise their teacher preparation programs in a number of ways including: revising or offering explicit technology coursework; integrating technology into existing methods courses; and helping faculty increase their technology skills. The goal of this work seems clear. The intent is that new teachers will be better prepared to integrate technology into their classrooms, to the betterment of the education for all of their students. In order to better the education for *all* students, the notion of digital equity must be addressed.

Digital equity exists when two conditions are met. First, every student must have equal physical access to technology tools, computers, and the Internet. Secondly, and equally important, this access must be occur with a meaningful teaching and learning context that directly responds to the needs of diverse students with regard to gender, race/ethnicity, culture, language, language proficiency, and special educational needs. How can we help teacher candidates develop this sensibility.

In this session we will present a Digital Equity Framework that SOEs can use as a guide to develop and assess the extent to which technology and equity issues are successfully integrated in their teacher preparation program. This framework draws upon the collaborative experience and expertise of representatives from PT3 projects with a commitment to digital equity and who have formed the Digital Equity Learning Community. .

The Digital Equity Framework can be used with faculty and students to facilitate the systematic integration of technology and equity issues across teacher preparation courses. The Framework allows teachers to plan instructional activities within subject areas, determine appropriate uses of technology and review the degree to which student diversity is being considered. Examples of how this model might be used will be provided.

Self, Visual Representation, Voice and Online Social Identity

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Purpose

This paper documents key issues in electronic mediated visual representations of social identity, based on the teacher's psychological capital, in an online web-supported teaching and learning environment. Visual representation is very important because of a teacher's psychological capitol. Psychological capitol is defined as the memories, attitudes, experiences, and beliefs, which serve to provide the foundation for behaviors and practices. How teachers talk about things, do things and practice things in a classroom.

The constructs of social identity embedded in electronic visual representations of voice are new and recent phenomena. The first question I pose deals with, how does culturally embedded social identity emerge from textual representations of the person who is expressing their voice? If the visual as a mode of representation is systemic, rule governed, and an effect of the values of the culture and social identity in which it is used, then can we as researchers come to know what culture someone is from or their social identity merely by there visual representations in electronically online mediated environments (Bruner, 1977; Kress, 1998)?

Online studies on social identity (SIT) will become a very important issue in education. According to the research on SIT, social identity theory is defined as that part of an individual's self concept that is based upon the value and emotional significance of belonging in a social group (Jones, p. 214). Abrams and Hogg, 1990, defines social identity as 'the individuals knowledge that he belongs to certain social groups together with some emotional and value significant to him of the group membership (p. 7)(Tajfel, 1972a). Many other researchers contend that communication, talk and discourse are all culturally embedded (Trudgill, 1974; 1983). For example, Wertsch presents arguments using Bakhtin's notion that utterances and utterance meaning are inherently situated in sociocultural context. He states, because the production of any utterance involves the appropriation of at least one social language and speech genre, and because these social speech types are socioculturally situated, the ensuing account assumes meaning is inextricably linked with historical, cultural, and institutional setting (Wertsch, 1991), p.66.

As we immerse ourselves in on-line text production, different modes of representation will be extremely important relative to issues of culture and social identity. Many educators and researchers in online education claim that the online teaching and learning environment removes such variables such as gender, race, class, ethnicity, etc. The change in landscape is here, moving from voices being seen and not heard, as would occur in a classroom where education courses are taught (Kress, 1988; Paton & Neilson, 1999).

Methods

Subjects

Data were obtained from sixteen intern teachers in an online web supported multiple subjects credential program in California. A qualitative methodology was chosen for investigating the text relating to on line discussion forums. Various qualitative methods such as discourse and content analyses were used.

The six teen participants in this study are enrolled in a statewide California web supported multiple subjects pre-intern and intern credential program. The participants are in a cohort directly under the supervision of learning support faculty. The learning support faculty directs, supervises and mentors the intern teacher through four stages until completion of the multiple subjects program. The intern teacher completes all of their assignments online in an activity forum. The primary method of communication between the intern and learning support faculty is through the activity and discussion forums. Some other forums are also used to communicate, such as, synchronous (chat) rooms and a virtual teacher's lounge. The participants' ethnic background, sex, and age are diverse.

The main objective was to conduct exploratory and descriptive research methods that addressed the following research questions:

1) Does an intern teacher's psychological capitol influence how they begin to discuss and facilitate volatile issues on race, gender, ethnicity, sexism, ableism and ageism on-line? 2) Are intern teachers more or less likely to freely discuss issues related to social justice on line? Can patterns be distinguished in the textual representations of voice depending on the gender, age or ethnic group of the intern teacher? First the researcher sought to see how the participants responded to the general question on what is multicultural to determine what prior knowledge the teachers held on this social construct. Next, the researcher sought to determine if the teachers would discuss the issues stated above openly and freely. The results follow from threaded on line discussions. I write the words exactly as the teachers wrote them on line. I believe that it is best to represent the textual print from the teacher's own voice. Therefore, this paper discusses visual representations of voice by selected intern teachers.

Data transcript from asynchronous forums (online discussion forums) required methods of analyses that would yield a higher resolution of detail, much of which was descriptive in nature. Qualitative methods described in Kvale (1996), Miles and Huberman (1984) were thus used to examine transcripts of focus group discussions. Content analyses and meaning condensation were conducted to note patterns and clustering of responses. Two independent raters coded the transcripts first using "open coding" techniques that determined logical groupings of responses, and then "focused coding" methods that identified emergent themes (Emerson, Fretz & Shaw, 1995). Coding of transcripts was accomplished collaboratively, as raters deliberated emergent themes and any discrepancies until a consensus was achieved.

Written comments on transcripts were also analyzed for content and themes. The researcher developed and then applied codes to the discussion forum transcripts and revised the codes to capture the essence of what was revealed in the data. These data was used to develop individual and cross-case narratives of the participants and to identify the sources of changes on participant's

visual representations of voice. The same qualitative process of analyses used for focus group data was used to examine responses from the surveys. Results are reported as content "themes" and patterns.

Results

The intern teachers were asked what is multicultural education the following responses were stated contextually on-line. The following responses were

Teacher #1.

Multicultural education covers two areas: 1) education that is aimed at reaching students from all cultures and 2) education about all cultures. I believe, we, as teachers, need to educate ourselves about the cultures represented by our students. We need to try to understand nuances of the cultures. For example, what a teacher's status is in the eye s of that culture and whether it makes a difference if that teacher is male or female. I also believe our students need to learn about cultures that may be different from their own. They need to realize that, though culture may be quite different, it is not better or worse than their own...just different. I believe conflict often comes from ignorance and/or misunderstanding. If our students know something of each other's cultures, I think they will understand each other better and, hopefully, get along better now and as adults.

Debra

Teacher #2

Multicultural education to me is two ways of communication underscored by a respect for diversity of all people. I mean two ways in that students and teachers bring their varying cultures, experiences, preferences, language, dress, religions, etc. to a common place with the result that all students and teachers may become familiar and more aware of other cultures. In turn they take away a better understanding of other backgrounds.

Understanding and respect need to be stressed, when discussing various cultures and traditions. We don't have to argue all the merits and deficiencies of each culture. To find the best culture is not the object. There is no such thing. We may remind students that a bouquet of flowers is much more lovely and more interesting if there are many types of flowers in the arrangement. In our diverse school populations, the students make up an excellent multicultural pool to draw from.

Frances

Teacher #3

I don't have a lot of experience or understanding of multicultural education, per se, so I am glad we are focusing on it in our discussion. This said, to me also, multicultural education is more than heroes and holidays. It includes awareness and understanding of the cultural backgrounds of our students and members of the larger community. When referring to culture, I include ethnicity, language, heritage, religion/spirituality, and ways of interacting. Regarding our classes, I think we should be prepared to expose our students to multiple perspectives and be prepared ourselves to be exposed and accept multiple perspectives. More importantly have students analyze why the perspectives of oppressors and oppressed differ.

Janet

Education Significance and conclusions

The teachers engaged in ongoing textual representations of social identity and social justice issues begin to generate questions that occurred in their classrooms and apply the concepts of social identity and social. For example, one teacher said, " I had an interesting 'aha' day where I was able to apply what I was learning on-line. I work in an urban school district, and this question comes up more often than I ever expected it to, from white teachers, parents and teachers of color and the community in general. I had yet another experience with the question, " Do middle-class, white teachers have any business teaching students of color in an urban, low socioeconomic level school? Can they be successful? Or are they doing more harm than good? These questions generated many on-line discussions regarding issues of diversity, social justice and bilingual education. One teacher responded, " This is a very good question..." In fact, my dad and I were discussing this very issue over the holidays. My dad is a retired, over 65 Jewish, white male. He commented that most volunteers and teachers, who help children read, are white and that there needed to be more diversity." From this comment many other teachers got into the pros and cons to teaching in such environments. Another teacher commented, that she believed that if we had more teachers of different races teaching it would be wonderful, but not based on the fact that the children have cultural needs or culturally relevant pedagogy, but just by virtue of the fact we needed diversity.

The benefits of this research are numerous. In our current age of electronically mediated environments such as on-line courses and degree program, this research will explore the possibilities of developing specific curriculum that deals with issues on social identity in a web-supported (on-line) environment. It may also allow for a more in depth discussion of social constructs, such as, volatile issues as race, class, gender, and disabilities since the participants are not engaged in face-to face interaction. It also allows for immediate responses to classroom issues because the teacher can immediately get on-line to engage in a threaded discussion without having to wait for next week's class.

The author concluded that an on-line environment provided a different method of communication about such issues, but in general individuals were still reluctant to deal with issues particularly around race. I found that more people were able to freely express themselves without having the sneers, rejection and embarrassment that sometimes occurs when in a face-to-face classroom environment. Research in this area also targets populations who would normally not be able to engage in such discourse due to limited access to colleges and universities.

This study only touches on a minute aspect of voice as it relates to web-supported online teaching and learning environments; it generated more questions than answers. Some others questions, which may be investigated in the future include: Is psychological capital so embedded that changing environments from face to face talk to online textual representations will not matter how the others may see or experience the person's voice? How much culture can emerge from the textual representation of the person who is expressing their voice? If the visual as a mode of representation is systemic, rule governed, and an effect of the values of the

culture in which it is used, then can we as researchers come to know what culture (race, ethnicity) someone is from merely by there visual representations (Kress, 1988; Paton & Neilson, 1999)?

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Bridging the Differences on the Web Through Effective Communication and Collaboration

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Abstract: This paper explores how effective communication and collaboration among online learners of diverse backgrounds are encouraged by design. In addition, communication techniques utilized by members in the Web-based learning community in bridging differences, achieving group goals, and optimizing individual learning are explored. The researcher suggests that the ideal curriculum bridges diversities by encouraging, inspiring, and inviting multiple perspectives within a highly flexible environment of multiple communication methods, learning styles and approaches.

Introduction

Globally, market expansion and course offerings are increasingly assisted by use of the Internet. In education, the Internet has been widely used in preparing learners for "future responsibilities" and "success in life" (Dewey, 1938, p. 17). Cross-nation collaborative projects on the Internet across disciplines have exponentially increased internationally in recent years. Amidst the hype of cutting-edge technology, however, it is often overlooked that computers do not think, only humans do; computers do not have agency, humans do; technological difficulties do not limit intellectual advancement, humans do. Technology potentially provides an array of resources, but also presents constraints. Indeed, humans ultimately decide how to utilize new technologies, and these decisions are often based on both proven (or unproven) and discovered strategies. To integrate technology into instruction and learning, it is essential to focus on human needs, strategies, perceptions, and experiences communicating and collaborating in the cyber-learning environment — rather than solely on the functionality of technological tools.

As Web-based learning communities and online school partnership projects exponentially expand globally, effective communication and collaboration is, as never before, of vital significance. Web-based instruction provides opportunities for a diverse body of individuals to interact. In order to optimize individual learner's strengths and talents, Confucius said, instruction should be tailored to meet individual learner's needs. While instructors are challenged to understand and be sensitive to the needs of learners in their design and implementation of Web-based courses, learners' success hinges not only on their willingness, attitude, and devotion to achieve shared goals in a sea of information, but also on how they handle the challenges of consolidating fellow learning community members' multiple views, perspectives, and approaches.

Based on my experiences as a student, researcher, course moderator, instructional designer, and teaching assistant in a Web-based collaborative learning curriculum model, this paper explores how effective communication and collaboration among members of diverse backgrounds may be encouraged in the design and implementation process and what intercultural communication techniques may be or have been utilized by members in the Web-based learning community in bridging differences, achieving group goals, and optimizing individual learning. This paper examined a Web-based collaborative learning course model at the University of Texas at Austin. In this course model, multiple perspectives are valued and group diversity was considered in forming collaborative virtual teams. Factors such as ethnicity, gender, computer skills, and geographic locations were also considered in building virtual teams. Students engaged in activities where knowledge is constructed through negotiation among collaborators from diverse backgrounds.

Diversity, Communication, and Web-Based Instruction

The Internet is a global society involving users of diverse backgrounds, and this global society is comprised of various communities with unique cultures. This Internet society is constantly evolving due to the evolution of tools and stakeholders involved. In this society of communicating collaborators, the methods of

communication and collaboration evolve along with technological tools and human interaction dynamics. Web-based instruction has often been implemented to supplement, enhance, and transform existing curriculum. Some instructors use the Web to post syllabus online, to supplement face-to-face class teaching, to broaden the scope of their instruction, or to deliver courses in their entirety. Many distance-learning courses, however, have encountered high attrition rates (Galusha, 1997), unequal participation and individual commitment, role ambiguity in group contexts, absenteeism, inattention to social relationships, and students feeling overwhelmed (O'Hara-Devereaux & Johnasen, 1994). The viability of effective communication and collaboration in the absence of face-to-face interaction has been questioned (Handy, 1995). Students may feel isolated, unmotivated, or unchallenged when they find course content irrelevant, perceive the environment as impersonal, can not obtain immediate technical or instructional feedback, and feel disconnected from fellow learners,. These shortcomings originate from a lack of understanding and sensitivity to the dynamics of human interaction and the nature of human learning.

Communication in this Web-based collaborative learning environment includes both task and social aspects. Due to communication limitations, online collaborators easily spend a large portion of time understanding, checking, confirming, coordinating, and negotiating to obtain mutual understandings and to construct shared knowledge. With the limitations in Web-based communication tools and the resultant reliance on interpretations and assumptions, effective communication among learners of diverse backgrounds is very challenging. A few examples of Web design that may be open to cultural interpretation include: various expectations for communication, the amount and type of information desired, communication styles and preferences, level of task orientation, variation in understandings, group orientations, and group dynamics.

Communication among people of congruent cultures, societies, and backgrounds – or even from the same family – is challenging. Communication among people of different cultures, societies, and backgrounds is even more challenging. Collaborative communication across cultures in the online learning environment requires the willingness of community members to listen, respect, and accept different perspectives and to accommodate and negotiate to reach shared meanings. Community members must also be flexible in accepting ambiguities; provide mutual respect, trust, and support; and develop cultural sensitivity and understanding of the value of multiple perspectives. Finally, community members must negotiate shared meanings in obtaining mutual understanding in order to reach consensus for the achievement of shared goals and needs.

Conclusions

Given the diversity of the global Internet society, cultural sensitivity and flexibility are essential to collaborative virtual classroom success. Future studies should focus on in-depth understanding and analysis of the needs of learners from diverse cultures. Web-based instructional designers, instructors, and moderators should employ multiple approaches and strategies in designing, developing, and implementing their courses and in assessing students in order to meet the needs of learners from diverse backgrounds and to inspire and encourage constructive communication and collaboration. Cultural sensitivity may assist in bridging the cultural diversities and contributing to overall course success. Building global communities of diverse learners requires that courses not simply represent an autocratic instructor's curriculum in the absence of consideration of multiple needs and resources; the ideal curriculum should encourage, inspire, and invite multiple perspectives, provide a highly flexible environment where multiple communication methods, learning styles and approaches are invited.

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Together We Form a New Culture: Students' Perspectives on the Influence of Diversity in a Web-Based Collaborative Learning Community

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Abstract: This paper investigates students' perspectives on how cultural diversity impacts learning in an online collaborative learning course. Specifically, how students successfully achieve optimal learning in this online learning community as they collaborate with members of diverse backgrounds was explored. Study participants were eight Instructional Technology Planning and Management (ITPM) students. ITPM was offered in Spring 2001 at the University of Texas at Austin (UTA), and was conducted within a Web-based collaborative learning environment. Findings suggest that collective and individual successes are enhanced by the formation of a collaborative group culture within this setting. Evidence that diverse views on culture and that new cultures evolve within the Web-based collaborative learning environment were found. Results suggested that Web-based collaborative learning course instructors should consider group diversity in their collaborative team assignments in order to further facilitate group dynamics and optimize learning.

Introduction

The development of computer network technology provides opportunities for dynamic human collaboration. Educators of all instructional levels are learning and integrating technology into curriculum and instruction. Internet access in public schools and instructional sites in America has increased from 35 percent in 1994 to 89 percent in 1998 and is expected to grow further. Student computer use has also increased from 27.3 percent in 1984 to 68.8 percent in 1997 (U.S. Department of Commerce, 1998). Major reasons for this rapid growth include technology's capacity for reaching remote locations while providing immediate and engaging communication, its promise of collaborative opportunities, and the human need for connection and interaction. Given the increasing opportunities and challenges for global communication and collaboration among members in the learning community, it is essential to assess methods of bridging the differences among community members and to establish curriculum that facilitates meaningful interactions and collaborations among members of divergent backgrounds.

The current study is an extension of a previous exploratory study conducted by Wang (2001). The four participants of that exploratory study represented four different ethnic backgrounds (American, Chinese, Latino, and Southeast Asian) and were all Computer Supported Collaborative Learning (CSCL) students, which was offered at the University of Texas at Austin (UTA) in Fall 2000. Based on the same course model and offered by the same instructor, participants of the current study were from another course, Instructional Technology Planning and Management (ITPM), offered in the following semester, Spring 2001 at UTA. The CSCL 2000 and ITPM 2001 courses both employed Web-based collaborative learning to both on-campus and tele-campus students. A major finding of the previous exploratory study was that, due to the overwhelming reliance on text communication and concomitant lack of non-verbal communication cues in the Web-based collaborative learning environment, collaborators relied on their own assumptions and interpretations in communicating and interacting with the instructor, staff, and peers. As a result of these missing non-verbal communication cues, misunderstandings frequently occurred while group success relied on individual's communication and management skills. Culture, as described by participants, impacted communication and collaboration within this setting. Yet, cultural-related communication factors were largely taken for granted, perhaps because communication is so routine.

The Study

The current study sought to include diverse views. In recruiting prospective participants, diversity in participants' course accessibility (on-campus and tele-campus students), gender, and ethnicity were striven for. In all, four on-campus and four tele-campus ITPM students were recruited on a volunteer basis to participate in this study. Participants (five European-Americans, one Korean, one Mexican-American, and one Chinese) were all 25 to 55 years of age and evenly divided by gender, and were interviewed either face-to-face or by phone. To ensure data triangulation, three types of data were collected: individual interviews, online discussion archives, and focus group audio conferences. Participants were asked to define cultural diversity, to describe how diversity affected their

communication, collaboration, and learning in this ITPM Web-based collaborative learning course, and to discuss strategies they have used or may use to bridge in-class cultural, social, and individual differences in order to achieve optimum collaboration and learning. The individual and group interview tapes were transcribed, categorized, and analyzed. The online discussion archives, e-mail responses for follow-up questions, and online chat transcripts were also analyzed.

Findings

Findings suggest that diversity is viewed as being beneficial but challenging in that group diversity, while providing collaborators opportunities for exposure to multiple perspectives, views, and approaches in which to further reflect on their own learning also challenges collaborators with divergent views and personalities, ways of communicating, approaching issues, and work styles. Results indicate that certain communication, management, and social skills are essential in order to achieve effective group collaboration while optimizing individual learning. Study participants viewed group diversity as necessary for meaningful interactions and endorsed the idea that group diversity provided multiple perspectives and "reality-check" opportunities. Participants thought collaborative group intellectual exchange was facilitated by the diversity of members in regards to gender, geographical region, community, work, personality, and frames of minds.

Participants said dialogue is essential in drawing strength from diverse expertise within the learning community. An emerged theme expressed by participants is that a unique online collaborative learning culture forms within these settings. This new culture entails unique approaches to communication, interpersonal skills, information management skills, and knowledge about global cultures and values. Further, this environment spurs new manners and need to multi-task, to interact with others of multiple and diverse backgrounds, and to not simply obtain information, but manage, make connections, apply, and reflect. This requires an infusion of variations in expertise, frequent information sharing and exchange, positive and constructive feedback, and knowledge construction, co-construction, and re-construction. Participants reported that learning is more meaningful when collaborators identify themselves to the group and find their contributions useful for group success. In order to work online to achieve goals and produce joint effort products with those of divergent cultural or socio-economic backgrounds, worldviews, values, and interests, communication skills in expressing, negotiating, and decision-making are essential, participants indicated. Further, the willingness to be committed, accountable, and responsible to group success, as well as information, time, and people management skills are also essential to success within this setting, respondents indicated.

Conclusions

While successful collaboration within the cyber environment is impossible without interfacing with a computer, it is equally reliant on effective human interaction and cooperation. Results indicate that an unique collaborative culture in the online learning environment arises, based on mutual respect, effective communication and management skills, cooperation, positive interdependence, commitment to a collective goal, and amalgamation of strengths from diverse expertise among community members. The challenge within the cooperative and collaborative environment is to discover how individual members' strengths can be melded into collective outcomes that are greater than the addictive contributions of individual members. The instructors, instructional designers, and online moderators/ facilitators should be aware of and avoid imposing or framing their values on learners when designing and implementing courses. Collaborative learning community members should learn to not only express and respond to ideas, but to also listen and facilitate fellow members' ideas in order to enhance overall group success while simultaneously optimizing individual successes.

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Teaching and Learning in Intergenerational and Intercultural Classrooms: Report on a Classroom-based Research Project

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Abstract: This study describes and relates the experiences of Dr. Wu, a junior, female foreign-born faculty member at a west coast U.S. university. Dr. Wu and her students faced the challenges of a culturally diverse classroom in her first teaching assignment, "Technologies for Teaching," a graduate-level course offered for in-service teachers and students enrolled in teaching credential coursework. We will address issues of intergenerational and intercultural communication and suggest effective strategies to facilitate communication and learning in classrooms with instructor and student diversity. The paper discussion format will offer the opportunity for sharing this information with those interested and involved in college classroom research, as well as provide feedback to our research efforts.

Purpose

College classrooms are becoming more complex in nature. Changes in the professoriate, the student population, and rapidly developing technology contribute to this complexity. Finkelstein, Seal, and Schuster (1999) suggest that radical changes are occurring in the academic profession as more women, foreign-born, and minority scholars become college professors. In regard to technology, students have diverse backgrounds, levels of expertise, and learning needs. Kellner (1998) writes that faculty face the "challenge of providing people from diverse races, classes, and backgrounds with the tools to enable them to succeed and participate in an ever more complex world," (p. 211). This study describes and relates the experiences of Dr. Wu, a young, female foreign-born faculty member at west-coast U.S. university. Dr. Wu and her students faced the challenges described above in her first teaching assignment, "Technologies for Teaching," a graduate-level course offered for in-service teachers and students enrolled in teaching credential coursework.

In this paper, we address issues of intergenerational and intercultural communication and suggest effective strategies to facilitate communication and learning in classrooms with instructor and student diversity.

Theoretical Framework

The authors hold the social constructivist belief (Ernest, 1995; Rogoff, 1990; Vygotsky, 1978, 1986) that shared knowledge develops through joint activity and communication. This belief accords classroom communication a central place in the study of teaching and learning (Barnes, 1976; Edwards & Mercer, 1987; Edwards &Westgate, 1987). Diversity also impacts communication and attitudes in the technology classroom (Chamberlain, Guerra, & Garcia, 1999; Freedman & Liu, 1996; Kay et al., 1983).

Intergenerational and intercultural classroom dynamics affect pedagogy. Kay et al. (1983) report that an intergenerational classroom had greater student participation than a comparable classroom. Wlodkowski and Ginsberg (1995) report ways to motivate people in culturally diverse classrooms, emphasizing fairness and respect as they suggest strategies that facilitate diverse people's learning together.

Methods

The interpretive paradigm (Maykut & Morehouse, 1999) provides the methodology and directs the case study method (Yin, 1989, 1994) used in this study. In the case study, two class sections are considered two holistic cases, and the groups and individuals are considered the embedded cases.

Participants

Dr. Wu taught two sections of the required course, "Technologies for Teaching" (Section 1, n= 19; Section 2, n= 18). Both sections included in-service and pre-service educators, ranging from 23 to 60 years in age. The age range in Section 2 was larger (ages 22-60) than in Section 1 (ages 23-33). Section 2 was also more ethnically diverse.
Dr. Wu was born in a small village in northern China. She attended Beijing University, receiving her B.A. in Chinese Literature. Dr. Wu then earned her Master's degree in Comparative Literature at a major U.S. east-coast university. She received her Ph.D. in Information Science and Learning Technologies from a large mid-western university, where she embraced a constructivist approach to teaching and learning. At present, she is an assistant professor at a U.S. west-coast university.

Course Description

"Technologies for Teaching" is an introductory course that provides hands-on experience with computer technology in education. The goal of this course is empowerment of pre-service and in-service teachers as users of computer-based technology with instructional and professional applications.

Data Sources

In this study, multiple data sources were used. Web-based Incoming and End of the Semester Surveys, administered in Week 1 and 16 are data sources for assessing learning outcomes and students' perceptions of the classroom environment. In Week 9, the students completed an informal, voluntary email survey on diversity awareness. The email survey provides information regarding students' perceptions of cultural and generational diversity.
Dr. Wu, assuming the role of participant-observer, took notes during the students' in-class group activities and wrote reflective memos of classroom communications. The structure of the class, a combination of instructor presentation and students' hands-on activities, made observations possible.

Part Two of the End-of-Semester survey and Dr. Wu's determination of students' grades assessed learning outcomes. Determinants for evaluation were (a) portfolio projects, (b) journal entries on readings from the textbook and the course website, (c) a PowerPoint presentation related to teaching and learning (with an emphasis on technology), (d) degree of development in a web-based learning unit, and (e) classroom participation. For grading purposes, all students submitted a one to two page reflection on their collaborative process. The students completed their written reflections at the end of the semester.

Data Analysis

Quantitative and qualitative methods were combined in data analysis. Initially, we analyzed the quantitative survey data from the two web-based surveys. These data are accompanied by description of the themes and patterns discovered in line-by-line and axial coding of the narrative data (Strauss & Corbin, 1998).

Results

Results are reported for incoming student data, students' learning and attitudinal outcomes, student-written reflections, and learning outcomes. Part Three of the End-of-Semester survey assessed students' attitudes about the "Technologies for Teaching" curriculum. The e-mail survey produced limited, but interesting results regarding students' awareness of generational and cultural diversity. Written reflections regarding students' perceptions of collaborative group work revealed three major themes.

Incoming Student Survey

The Incoming Student survey showed that the students in the two Sections were similar in enrollment status. No statistically significant differences were found between the entering self-rated computer skills, awareness of ethical use of computer or technology, and the integration initiative of the students in the two sections.

Learning Outcomes

An independent t-test ($p=0.5529$) performed on response data indicates no statistically significant differences between the two sections' self-perceived technological skills at the end of the semester. However, the average grades of the two sections were significantly different ($p<0.005$).

Attitudinal Outcomes

End of Semester Survey

Part Three of the End-of-Semester survey assessed students' attitudes about course curriculum. Students' attitudinal outcomes are related to the level of their engagement and the learning outcomes. Section 2 students had a more positive ($p<0.005$) reaction to the course.

Email-Survey on Students' Diversity Awareness

Three Section 1 students and five Section 2 students responded to the non-obligatory email survey. Six themes emerged. Themes identified in Section 2 responses are (a) respect for the instructor (b) sympathy with the challenges of teaching in a foreign country (c) enjoyment of the intergenerational and intercultural diversity and (d) appreciation of the instructor's cultural background. Section 1 students' responses resulted in two identified themes: (a) their lack of recognition of classroom diversity and (b) Dr. Wu's position as a role model for Asian American students.

Students' Written Reflections on Group Collaboration

Dr. Wu encouraged students in both sections to work in collaborative groups. Individual differences in students' attitudes towards learning and each other shadowed their teamwork orientations. The reflections reveal that Section 2 students' collaborations were motivated by common interest, and Section 1 students collaborated to complete assignments.

Discussion

Based on interpretation of the data, we consider the impact of cultural and generational diversity on communication. We also reflect on the influence of intercultural and intergenerational communication on learning outcomes.

Cultural and Generational Diversity's Impact

Cultural and generational diversity in these classrooms could have been an obstacle for effective learning. In this case, the instructor and students used their diversity to develop a supportive learning environment. Dr. Wu provided the opportunity for students to form groups based on their own criteria. As a consequence, some of the groups had members of similar backgrounds, while others reflected the diversity of the section. The groups discovered their own ways of communication and collaboration.

One group reports that they formed a group based on the strength of each member in designing, developing, researching or gathering information. The members disregarded age and ethnicity when looking for collaborators. Through his comments one student in this group implies that he is a member of a culture that transcends age and ethnicity, a teacher culture based on effective and open communication.

Communication's Impact on Learning Outcomes

It seems that diversity was not an obstacle but motivated students' engagement in learning tasks. In Section 2, the students formed groups that were diverse in both culture and age. They admitted there were differences in their styles, how they approached cooperative learning group tasks, for example, but also agreed that being able to openly express conflicts in opinion led to resolution. Resolving conflicts regarding learning tasks clarified their thinking and affected the quality of their work. They recognized intergenerational differences as well, but were able to arrange a "comfort zone" so that experience contributed to their projects as much as expertise.

Educational Importance

This research has implications for teaching in multicultural, generationally diverse classrooms and with regard to student-teacher interactions when diversity extends to faculty. Student and faculty diversity have enriched but also complicated the technology classroom. Because the course objective is students' incorporation of technological tools in teaching and learning, the students' diverse experiences provided more opportunities for the class to explore technology integration. On the other hand, the students' large variance in entering computer skills, learning styles, and English fluency created challenges for effective instruction. Instructional style, building supportive learning environments, and facilitating group collaboration were important factors in addressing these variances.

Dr. Wu balanced whole-class instruction with individualized learning. She reduced direct instruction and allowed individuals to self-pace their learning. She also paired students of different backgrounds during in-class activities. Students' reflection on their positive collaboration experiences is tangible evidence of success.

As Wlodkowski and Ginsberg (1995) noted, "people who feel unsafe, unconnected, and disrespected are unlikely to be motivated to learn" (p.2). Classrooms of diversity face such challenges if diversity is ignored and devalued. Dr. Wu was aware of the diversity and attempted to build a positive learning environment through that awareness. In this study, giving students sufficient latitude to form groups through choice and explore methods of collaboration provided a naturally formed "comfort zone." Student-student communications should be monitored and mediated by faculty. Instead of eliciting compromise as a solution to conflict, students should be encouraged to resolve the conflicts through negotiation and rational debate (Derry, Gance, Gance, & Schlager, 2000; Mercer, 1995).

Hall (1992) notes that individuals from different racial and ethnic backgrounds have subtle variations in the ways they communicate. Often, members of other cultures are unaware of these variations. Lack of recognition can lead to misunderstandings..Using examples, both culture- and nonculture-specific, to illustrate a point or an abstract idea is a common instructional strategy that has twofold application in a culturally and generationally diverse classroom.

Diverse Faculty Issues

Dr. Wu interacted with the Section 2 at a more complex social level because of a higher level of acquaintance. These students related to her that pivotal points to successful teaching were a) the instructor's attitudes and efforts and b) students' perceptions of faculty as knowledgeable, enthusiastic, supportive, and patient. Dr. Wu found that she incorporated student suggestions into classroom instruction.

Students from other countries, preparing to be teachers in the U.S., noted that they might "feel a cultural shock when meeting very challenging students." Dr. Wu responded that she had had similar feelings. Dr. Wu's experience implies that faculty born in foreign countries may find it necessary to adopt a more democratic and issue-oriented stance to encourage community-building in a culturally and generationally diverse college classroom.

Conclusion

From this experience, Dr. Wu drew three important conclusions. She observed that a) her own cultural expectations caused her to be offended by a student's critique of her teaching; b) students have expertise and expectations that can improve her teaching; and c) age and culture differences can build classroom community if facilitated positively. Likewise, as college classrooms become more diverse, it is important that our "teaching culture" recognizes and benefits from this diversity.

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