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Abstracts of Papers in This Issue

An Investigation of Faculty and Student Experiences and the Move to Online Learning Following Hurricane Katrina, Sandra Hartman and Mary Jo DeMatteis

In this paper, we provide a discussion of the experiences of faculty and students from the University of New Orleans during and following hurricanes Katrina and Rita to consider the implications for online teaching and learning. In addition to anecdotal discussion of faculty experiences, we examine representative postings from approximately 300 business students at the graduate and undergraduate levels. We consider what lessons can be learned about the role of the university in a disaster situation, the Katrina disaster, in this case. Our emphasis is on the role of online instruction in such situations. We provide a number of general findings about the student experiences and illustrate what occurred with excerpts from their online postings.

Keywords: online learning, disaster recovery, online teaching, student support, universities and disaster

Powerful E-Learning: A Preliminary Study of Learner Experiences, Barbara Rivera and Gordon Rowland

This study continues a program of research into the nature of powerful learning experiences, with a focus this time on e-learning contexts. It was conducted using structured phone interviews with adult learners pursuing undergraduate degrees through e-learning coursework. Among other things, data suggest that meaningful social interaction and emotions may be important components in powerful learning experiences. In addition, the data suggest that powerful learning can indeed occur in e-learning environments. Results of this study combine with those from three previous studies to point toward practices of instructional designers and educators that may contribute to powerful learning in e-learning environments. Further examination of powerful learning in such environments holds promise.

Keywords: meaningful learning, powerful learning, e-learning, adult learning, instructional design

Computer Literacy in a Traditional Nursing Program: A 7-Year Study to Identify Computer-Based Skills Needed for Success, Mona Ternus and George F. Shuster

Computer literacy is critical to student success in higher education today. Assessment of student knowledge related to computers is generally for either hardware capabilities or overall ability, without an assessment of specific computer competencies. The focus of this study was to identify the literacy level of nursing students over a 7-year period to assess which computer competencies need the most support and development and to determine how literacy levels varied in successive years. A convenience sample (N = 401) of undergraduate nursing students admitted from 1999 to 2005 were given an assessment of computer literacy at the beginning of the upper-division nursing program. Results indicated that the literacy of students increased with each successive group of students. Literacy varied across technological functions, with students having the lowest literacy levels in the data inquiry skill set, and students who owned computers were more computer literate than those who did not. An assessment of general computer literacy can provide an overall appraisal of computer competency, but it is important to examine the separate dimensions of specific skills within general knowledge, as these are the points on which faculty will need to focus.

Keywords: computer skills, online learning, student assessment

Persistence in Online Classes: A Study of Perceptions among Stakeholders, Denise Stanford-Bowers

Because online learning presents unique challenges for not only learners but faculty and administrators as well, those involved in these cyber-environments must think beyond the boundaries of the traditional classroom. This study examined the perceptions of online persistence factors, those characteristics which influence student retention, as seen by the three major stakeholders in community college distance education programs: administrators, faculty, and students. The purpose of the study was to determine which factors are most important among the three groups and where those perceptions converge since lack of convergence could be a factor resulting in high attrition rates of some online courses. While the results of this study indicated that the perceptions of administrators and faculty are more closely aligned than either is with the students' perceptions, they also show a recognition among all groups of stakeholders of online learning as an evolving phenomenon which requires attention to even the most minute details which are sometimes overlooked, not emphasized, or taken for granted. This recognition indicates a necessary paradigm shift, which will lead to improvements in online learning policy, design, and pedagogy, is in the making.

Keywords: online learning, retention, attrition, online learning communities, adult learners

Development of an Advanced Classroom Technology Laboratory: An "incubator" for next generation learning, Jacqueline Gilbert

This article explains the history of an Advanced Computer Technology (ACT) laboratory at Middle Tennessee State University Honors College. The ACT laboratory serves as an incubator classroom, and as a testing and experimental learning environment for faculty and students. Interviews with four administrators involved with the planning and procurement of the room (along with five faculty who had actual experience in teaching with the new equipment) are provided. This article details the history of the room's inception, along with a list of advantages and suggestions for improvement from faculty who have taught classes in this space. An actual schematic of the current room is provided to help readers envision its capabilities.

Keywords: ACT laboratory, Community Collaboration, Leaderful practice, Flexibility, Communication

Achievement and Satisfaction in an Online versus a Traditional Health and Wellness Course, Anna Block, Brian Udermann, Manny Felix, David Reineke, and Steven R. Murray

Online education has become a rapidly developing educational alternative. Many universities deliver online courses across a variety of disciplines. However, few studies have evaluated the efficiency of online health and wellness courses. The purpose of this study was to examine achievement and satisfaction in students who participated in an online or a traditional lecture based health and wellness class. Eighteen subjects in an online health and wellness class and nineteen subjects in a traditional lecture-based class participated in this study. Outcomes included performance on a 50-point written exam (pre- and posttest) and three regular course exams. All participants completed a satisfaction survey. The online participants completed a perception survey. No significant differences were found between online and traditional courses in the 50-point written exam or in the three regular course exams. Significant differences were found in age, employment status, year in school, and the degree to which participants felt that they were encouraged to participate in class discussions. Overall, perceptions of the online course were positive. Data suggests that an online health and wellness class was an acceptable alternative to a traditional lecture-based class, when achievement on exams was the primary outcome measure.

Key Words: distance education, physical education, lecture-based, knowledge acquisition, no significant difference, perceptions, employment status, age, class standing

Introducing Social Software to K-12 Teachers in a Research Setting, Jacqueline Waggoner and James B. Carroll

Twelve K-12 teachers who were enrolled in a graduate qualitative research course were introduced to collaborative software to use as part of work on group research projects. Data were gathered from one-on-one interviews, technology use surveys, and instructor reflections. Three themes appeared: a) the importance of developing learning communities when using these tools; b)

overcoming inertia needed to gets students to learn new software; and c) the conflict of technology use with instructional approaches.

Keywords: collaborative software, technology, graduate teaching, on-campus courses, teacher education

An investigation into the perceptions of first time online undergraduate learners on orientation events, Melanie Wilson

Orientation programs have been used for years in face-to-face universities and colleges to help prepare new students adjust to their new college community by providing key information about school resources and providing an opportunity socially interact with other students. These orientation efforts have been a vital component in increasing a students' likelihood of persisting in their program of study (i.e. not dropping out). Distance Education institutions (often with online course offerings) tend to have significantly higher drop out rates than their face-to-face counterparts, and thus orienting new online students to their new online learning environment is a logical progression. However, orientation events need to be customized to the population if they are to have a significant impact on persistence. This study explores the perceptions that a group of online undergraduate students had of three different types of orientation events. These events included a traditional face-to-face orientation session, a pre-recorded course orientation video, and a live webinar. These perceptions were revealed in responses to an online survey and comments within and after the webinar. The study concludes with suggestions for further research and presents possible alternatives to the traditional methods of student orientation.

Keywords: orientation; induction; attrition; drop out; persistence; higher education; student perception; webinars

Integrated, Multidisciplinary and Technology-Enhanced Science Education: The Next Frontier, Ivo Dinov

Contemporary science education at all levels presents several critical pedagogical and social challenges to educators and learners alike. Among these challenges are the widening *Intergenerational Information Technology* (IIT) divide and the need for a comprehensive and balanced multidisciplinary training. In the past few years, it has become clear that one significant hurdle impedes the efforts to integrate information technology in the classroom – the Intergenerational IT divide. The IIT gap reflects a different growing misalignment between providers and recipients of the science and technology educational content in terms of the expected vs. supplied, needed vs. perceived and contextual vs. abstract specialized learning. The common K-12 teacher or college instructor is much less familiar with, and slower to adapt to, the new ether of communication and novel IT resources. The transfer and blending of data, research challenges and methodologies between diverse areas of science is also critical in motivating wider spectra of students, demonstrating cross-disciplinary methodological concepts and synergies, as well as for engaging students in research projects. This article discusses the problems faced by

modern science educators and suggests some methods and vision for coping with the increasing IIT divide and the social need to train “complete” and broadly educated citizens.

Keywords: science education, multidisciplinary, Internet, technology, blended instruction, online resources, intergenerational IT divide, information technology, policy

Culturally Targeted Online Course Redesigns for English Composition and Research Writing: A Case Study, Shalin Hai-Jew

The Enduring Legacies Reservation-Based Project, now in its third year, supports Native American college students of a number of Pacific Northwest tribes. This paper addresses the pedagogical and e-learning strategies applied to the culturally sensitive curricular redesigns for English Composition 1 and 2 (which involve essay writing and research respectively). These are foundational and required courses for a number of degree programs and certificates. The curricular redesigns for both courses address issues of cultural sensitivity, learner focus, and strategy, and apply concepts of universal design for more effective learning for a wide range of learners. With the redesigns now in place for a year for the EC1 course and one quarter for EC2, some early findings have emerged as well.

Keywords: Online course redesign, cultural sensitivity, The Enduring Legacies Reservation-Based Project, The Evergreen State College (TESC), WashingtonOnline (WAOL), Tribal Based Program, Grays Harbor College (GHC)

Collaborative online learning: A constructivist example, Donna Ashcraft, Thomas Treadwell, and V. Krishna Kumar

While many other disciplines have implemented constructivist pedagogical changes, psychology has been slower to implement similar educational reform. In this article we describe a constructivist method to teach group processes. Pretest/Posttest data indicate this type of learning experience results in significant increases in students’ content knowledge in four targeted areas (American Psychological Association writing style, group processes, social psychology, and research methodology) from the beginning to the end of the semester. Student perception data indicate students learned “content" as well as "process" information in the online collaborative course.

Keywords: On-Line Collaborative Learning, Electronic Group Development , Social Constructiveness, Video-Conferencing, Webboard, Chat Rooms, File Manager, Course Content Evaluation, Student Perceptions, Project Guides (peer mentors), CORAL Pedagogy, Social Psychological.

Pedagogical Strategies for Building Community in Distance Education Courses, Eileen McElrath and Kate McDowell

Community building in online distance education is important to a successful learning experience because it alleviates feelings of isolation for both students and faculty members. Ruth E. Brown describes the process by which students become part of an online distance education community, identifying three stages: "making friends," "community conferment," and the development of "camaraderie" (Brown, 2001). The purpose of this article is to present concrete, specific, and practical pedagogical strategies to implement Ruth E. Brown' 3-stage theory of community building in online distance learning courses. These strategies are based on the authors' combined 14 years of teaching distance courses in graduate level Library and Information Science (LIS) programs.

Keywords: Building community; virtual community; Ruth E. Brown's 3-stage model; online courses; student stories in theoretical frameworks; distance education

BIO 151: Applied Biology – Developing Creative Learning Partnerships with Blackboard VISTA™, Michael Shelmet, Christopher Shields, and Jane Huggins

Teaching large, undergraduate, non-major biology courses represents an enormous hurdle for any instructor. Effectiveness in this endeavor requires innovative techniques addressing multiple activities including active student engagement, automated quiz and exam mechanisms, and accurate record keeping. In this particular case study, students were asked to "partner" with the instructor and produce multimedia presentations of important course concepts. Learning management software (Blackboard VISTA™) was utilized to automate delivery, grading, and recording of quizzes and exams. A class of 167 students majoring in business was divided into groups of 5-6 individuals per group. Over the course of the ten-week term, 34 multimedia presentations were given by these groups. Two major exams and multiple lab activities including quizzes were delivered, graded, and recorded using Blackboard VISTA™. Overall, this large course was effectively taught by encouraging student engagement through active participation in the development of multimedia presentations. Effective management of the course was realized through reliable technological support of administrative functions using Blackboard VISTA™ learning management software.

Keywords: instructional design, student engagement, multimedia, record keeping, large class, undergraduate, non-majors science

An Investigation of Faculty and Student Experiences and the Move to Online Learning Following Hurricane Katrina

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Abstract

In this paper, we provide a discussion of the experiences of faculty and students from the University of New Orleans during and following hurricanes Katrina and Rita to consider the implications for online teaching and learning. In addition to anecdotal discussion of faculty experiences, we examine representative postings from approximately 300 business students at the graduate and undergraduate levels. We consider what lessons can be learned about the role of the university in a disaster situation, the Katrina disaster, in this case. Our emphasis is on the role of online instruction in such situations. We provide a number of general findings about the student experiences and illustrate what occurred with excerpts from their online postings.

Keywords: online learning, disaster recovery, online teaching, student support, universities and disaster

Introduction

This paper is intended to provide a discussion of the experiences of faculty and approximately 300 business students from the University of New Orleans during and after the Katrina disaster. The students were at the graduate and undergraduate levels. We report their experiences to consider what can be learned about issues centering upon the role of the university in a disaster situation. Our emphasis is upon the role of online instruction in such situations. We provide a number of general findings about faculty and student experiences and illustrate with excerpts from student online postings.

The Setting

The University of New Orleans (UNO) is located on the lakefront of Lake Pontchartrain near one of the key areas where the levees breached during Hurricane Katrina. Prior to the storm, approximately 17,000 students were enrolled in graduate and undergraduate programs, with the business school the largest college on campus. The UNO student body has been primarily non-traditional, with an average age of over 27. Most work full or part time and many have families. Because of the attractiveness of New Orleans as an "international" city, many foreign students have traditionally been enrolled. Importantly for this study, most students and faculty preferred to live on the lakefront to be near to the University, and, as a result, when the flooding occurred, a large percentage of both students and faculty sustained heavy losses. Most were evacuated. Moreover, while much of the University itself, which is situated on a raised area which was the former site of an airfield, did not flood, 20% of the campus, including all of the University's Information Technology (IT) capabilities, were flooded and destroyed.

In the weeks immediately following the disaster, a skeleton crew of University officials gathered in Baton Rouge, 80 miles northwest of the city, where they were provided temporary office space, and began planning how the University should respond to the disaster. The result was a decision to open as an

online university on October 10, 2005, just over a month after the storm. The plan was risky – the University had offered almost no online courses in the past, faculty and students were scattered and few had computers with them, and almost none of them was trained in teaching or taking online instruction. Moreover, with no IT facilities, the decision was made to work through Blackboard ™, a popular online teaching "platform" headquartered on the east coast. Blackboard™ agreed to provide the platform through its headquarters location, rather than attempting to set up at the University.

Note that the emphasis during this initial period was upon responding in a prompt and flexible manner to the events. What was in evidence was and ability to react quickly to the environment in ways which paralleled the ideas of classical contingency theory (e.g., Duncan, 1979; Morse & Lorsch, 1970; Ashkensas, Ulrich, Jick & Kerr, 1998). What was not in evidence were notions such as *contingency planning* or *active readiness,* from the crisis literature, emphasizing preparation for disaster *before* it occurs (see especially Connell & Drennan, 2006). Recently, and drawing upon recent crises including Hurricane Katrina, Mitroff, Diamond and Alpaslan (2006) have examined planning for crises in the college and university setting and have recommended that crisis management teams be formed *prior* to disaster situations and that they develop plans and establish contingencies prior to the disaster situation. Very little of this kind of thinking was in place in the New Orleans setting, a situation consistent with much of the Mitroff et al. findings.

One Instructor's Experiences

At this point, we shift the discussion to the experiences of the lead author of this research. While they cannot be described as typical – and perhaps there is no one typical faculty experience – they can be used to illustrate the challenges and rewards of what ensued. I was fortunate in that I had a summer home in the North Carolina Mountains where I was able to evacuate with family members, friends, and pets. However, because I expected to be gone only a few days, I had almost no clothing and no computer. Moreover, as the days passed, more and more faculty "joined" me, in a pattern which we will see re-occur in the findings of this research, as people first evacuated to emergency settings and then moved again, often repeatedly, to more secure spots. At a high point, some 17 people were with me and literally every bed, couch, blow-up mattress, and spot on the floor was taken. But we had no computers and none of us knew how to use the Blackboard™ or how to teach online. At this point, we were *extremely* fortunate that a former colleague was now teaching at a nearby university and had experience teaching online, although with a different platform from Blackboard™. Moreover, the nearby community college offered computers in its GED classroom which were not used by day, as well as help from a Blackboard™ instructor, who knew how to set up the Blackboard™ sites, but who was less familiar with teaching online. In effect, we had to locate textbooks and teaching materials, find ways to get them to students, and set up Blackboard™ courses, a situation generally analogous to setting up a website for the course and "discussion boards," which were similar to chat rooms for course topics. We also learned how to test online, how to correspond with students via the Blackboard™'s e-mail capabilities and similar activities. It was an enormous task to be completed in a very short time.

It is interesting to note that my experiences echoed much of what other faculty reported in their informal discussions with me in the months after the storm. As was the case with me, most expected to be gone only a short while, brought very little with them, and were dismayed to discover that they would not be returning for a substantial period. Virtually everyone I talked to reported that they turned to the local colleges in the towns where they found themselves and that they were given a great deal of help and support.

Students and faculty alike learned that courses would be offered online through the University's website, through the key New Orleans website, NOLA.com, which is affiliated with the newspaper, the *Times Picayune,* through the newspaper itself (which, remarkably, was up and running literally days after the storm) and through public service announcements in key evacuation cities, such as Houston and Dallas. In reasonably short order, the University's e-mail platform was rebuilt and it proved a key communication tool it a situation where telephone service, both land lines and cell, were not working in the city and where most people had no way of knowing how to contact other evacuees. As students began to enroll, we, as faculty, next had to consider how to set up our online courses – a first-time experience for most of us, and as noted, doing this was made possible primarily because of support from colleges throughout the nation. Another consideration was text materials. The bookstore was destroyed and would not have been accessible to most faculty and students, even had it been intact. For these issues, the book

manufacturers were invaluable, and they typically made arrangements to ship to students directly or to bookstores in key evacuation cities. Many offered online texts.

Doing all of this was extremely time consuming, and my colleagues and I who were at my summer home in North Carolina became concerned that we would not be ready for the October 10 start-up. To gain us a little more badly-needed time, our mentor from the local university suggested that we set up an initial discussion board in each of our courses entitled "Getting to Know You" (GTKY), post our Katrina stories, and ask students for theirs. I followed his suggestion and was overwhelmed by the results. Nearly 100 stories, all raw, some courageous, others filled with humor or pathos, flowed in. It quickly became apparent that GTKY was serving an important purpose in giving students a vehicle for talking about and making sense of their experiences. I have continued to use GTKY every semester since the fall of 2005, as we are still operating online to a large extent. Students are often still evacuated and life in the city for those who have returned remains very difficult. As a result, I am still finding GTKY an extremely important tool for helping students "process" what has happened to them. The following excerpts from student postings may give an indication of what I have been seeing and why the online situation is important:

> From Nicole, in my initial class, "Online courses give me a chance to regain normalcy."
>
> Danielle: "Online course gave me the opportunity to grow stronger each day."
>
> Ashley: "Grateful to have an online course and not have to wait a semester."
>
> Sherrie (immediately after the storm): "I apologize for being so long winded, it's a hard story to condense, *particularly given this is my first time to tell it.* I'm really excited about classes starting to help keep my mind occupied. And, I'm anxious to see how the rebuilding process for our wonderful city pans out."
>
> Bing, from China, was living in campus housing and lost everything when the apartment was flooded and looted. "I am in a wheelchair with no computer at home or at work. But I search for one so I can take these online courses."
>
> Several, including Doyle, commented about how: "UNO online courses allow me to finish the degree I started at LSU." Doyle is a father with four children who has returned to complete his degree.
>
> "I'm psyched about this class; let's do it," said Jason, in summary.

As is probably apparent, the fall, 2005 semester proved to be a challenging but very rewarding experience both for me and – judging from their comments – for the students as well. I still feel that way. Perhaps the strangest part of the experience is that I feel in most ways I know the students far better than I do those in the traditional classroom setting, especially because of GTKY – but I have no visual cues and no idea what they look like.

The final "piece" which led to this paper was a visit to Washington, DC, where I was able to catch up with a friend in private industry whose background and greatest interest is training. She was immediately intrigued by all of the stories, and when I confessed to being overwhelmed by the sheer amount of material I had, she offered to analyze it and set it up in a format which we have used for analysis. My co-author is the unsung hero of this research!

The Students: General Findings and Illustrative Narratives

The full sample, at this point, consists of GTKY narratives from 311 students from graduate and undergraduate online business classes over the period fall, 2005 through spring 2007. Of these, 19 provided incomplete narratives to the point that we did not use them in our analyses, bringing the final sample to 292.

Interestingly, only 15, or less than 1%, were international students, a low number in terms of the University's traditionally high foreign student enrollment. We suspect that the number is low because many international students evacuated to their home countries after the storm and did not return to school. For those who *did* stay in the US and who returned to New Orleans, the experience was a

difficult one. Minh and Takura provide the following reports:

Minh:

Sunday 8/28/05, I stayed back on the Westbank as my family evacuated to Houston. It was a deadly silence and breezy Sunday afternoon to be sitting in front of my house watching the neighborhood…all Hi to everybody. I'm a senior in computer science and now also majoring in MIS and BA w/CSCI. I was about to finish up CSCI on Fall 05 but then Katrina happened. My hurricane experience is similar to what everybody has been through, but different from my own eyes. As Katrina was approaching LA, the houses were boarded up and nobody was on the streets….."What's all that noise, and why can't I see a thing" I said to myself as I was awakened by Katrina around 4am Monday morning. I can't fall back to sleep with the hollowing wind and rain outside. The house shifted and shook with every gust…if I go to sleep, I might wake up SOMEWHERE else! It was a horrible morning with Katrina at her peak. The rain fell sideways, and the wind carried trees and debris, as it traveled over the neighborhood. I sat behind a re-enforced door with small windows to watch Katrina's wrath…there went my street sign and my neighbor fence; pieces of roofing material were flying down the street. The only radio station on was Ch4; people called in from everywhere around town—they screamed and begged to be rescued but there was not much anybody could do in such intense conditions… those were the LUCKY ones. Unheard voices from people who were trapped and clinging on to dear life were also carried by the raging storm. Callers from Lakeview were claiming that the water was rising too rapidly—everybody assumed that the worst has happened, the levees were breached!!! I could only hear distress stories over the radio and watched the weather radar to pass the time. AMAZING that Katrina turned a few degrees toward the East as it was coming ashore. By late afternoon, the rain has stopped, and the sun was peaking out over the horizon. My brother and I ventured outside to look at the damages all over the Westbank. Everywhere houses were damaged, trees were down blocking streets, and pools of standing water engulfed cars in their tracks. The sunset seemed more beautiful with this second lease on life, but the night had an ominous calm. There wasn't any light around beside the stars in the new-moon sky…absolute darkness everywhere, over all over the horizon. By daybreak, EMS vehicles heading toward New Orleans were the only cars on the highways as helicopters crisscrossed the sky all day long. Ch4 broadcasted the first few images of the devastation…so much destruction and so many lives were lost in just ONE hurricane. My brother and I got enough supplies to last us a few weeks, but what is the point of staying in this desolated city. It was time to GET OUT for us as conditions were getting worst on the New Orleans side. All the cell phone communication networks were out but luckily the land lines still worked. We relayed our status to our family in Houston and packed our "livelihood" into the car and shut down the house for it could be months until things will be back to normal. Such memories inscribed into some of us different than some others. With my hectic school schedule, I have learned to appreciate the little time I do have for myself to sit back and watch the world turn.

Takura:

Hi everyone! I'm Takuro from Osaka, Japan and am living on Houma Blvd in Metairie now.

I studied international government and economic issues at Kinki University in Japan from 1997 to 2001. In order to develop the global awareness required to be successful in international business,

Prior to my arrival in the United States, I worked for Nidec Corporation in Japan from 2001 to 2004, a company that develops and sells small precision motors for computers. For 3-1/2 years, I was employed in the Sales Division of Nidec Corporation. Today, my goal is to earn an MBA and market EM (Effective Microorganisms) technology, an alternative to chemical fertilizers.

The following is my experience during Hurricane Katrina.

Aug. 27, 2005 - I heard the news on TV, that the greatest hurricane in American history, Katrina, might be coming to directly to New Orleans. My roommate from Taiwan, Nathan, suggested we

leave New Orleans and drive to Alabama in his car. But I refused because people in Japan always stay in their houses when our city is struck by a typhoon. I thought it would not be terrible. Nathan left for Alabama in the night and Ryohei, another IELP student from Japan, came to my house in the uptown district of New Orleans because he was kicked out of Bienville Hall by a janitor.

Aug. 29, 2005 - In the early morning, New Orleans was hit by Hurricane Katrina. My house was shaking so badly I couldn't sleep. When I looked out of the window it was unearthly and I thought what a hell!!! The electricity was already cut off, the roof of my house was destroyed by the strong wind, and trees near my house were blown down by the gale.

New Orleans was within Hurricane Katrina until noon. Early in the evening, at around 4:00 p.m., I went outside and walked along St. Charles Avenue. It was too hard for people to walk because many trees lay on the street along with a lot of broken glass. At night, I couldn't see anything because the lights had already gone out.

Aug. 30, 2005 - There were a lot of ordinary people, homeless people, and gangsters on the street who attacked the grocery stores to get food, water, and things they needed. At that time I had no food so I decided to join the people who attacked the store and get some food and water. I had no choice. I just had to choose whether I would die or attack. Suddenly a police officer who was driving a patrol car appeared and stopped us from taking things. At this moment I thought that police were an enemy to us. People said that somebody shot a police officer with a gun; I think that's why he didn't try to arrest us.

Aug. 31, 2005 -I got up in the morning because of a bad smell. I saw the shadow of water on the ceiling. Why? I looked out the window. I saw a flood on the street in front of my house. According to the radio, Lake Pontchartrain was damaged. That's why it flooded. I was worried about the damage from the flood. As expected, New Orleans stopped the supply of water. I just listened to the radio that day.

Sept. 1, 2005 - In the dead of night, at 3:00 or 4:00 a.m., I was awakened by the sound of a low voice from my backyard. I timidly went to the window, and just then I saw two guys talking in my backyard. They seemed like gangsters attacking my house. But, at the same time, an old person who lived next to my room coughed, so I think that they heard that sound and gave up their plan to attack my house. I guessed that maybe there wasn't enough food at the store and they had no more food or water. That's why they broke into my backyard. I made up my mind to go to the Superdome in the morning.

I went to the Superdome, walking in water for several hours. When I got near the Superdome, the U.S. Army stopped me and others. Why? I listened to the radio and they said, please come to the Superdome as soon as possible. If you do that, you can be safe. But what they were saying on the radio was quite different from the facts. There was a great difference between what I had heard and what I actually saw. Once there, I learned that people had been kept waiting for 3 days! What a hell!

There were a lot of people around the Superdome; the crowds stretched as far as the eyes could see. To my surprise, I couldn't distinguish the ordinary people from the homeless. Of course I also looked like a homeless person. It was like the Third World. When I tried to enter the Superdome, I couldn't. I couldn't see anything because there was no electricity. Everyone relieved themselves everywhere in the Superdome. It was so stinky that I couldn't stand it any more. I left.

I went to the bus station, trying to get on a bus going to Houston. There was a crowd of people. I waited a long time but was never able to get on. It was terrifically hot and humid. People started fighting with each other. There was booing, crude heckling, and countless swear words. I was dizzy and gave up trying to get to Houston that day.

I hit upon a good idea after I took a rest. I went to talk with the U.S. Army. I told them a lie. While I was showing my passport, I explained my situation like this. I said, "I'm from Japan. I

> have to return to Japan as soon as possible because I have a serious visa matter. How can I return to Japan immediately?" The soldier said, Ok, we'll transport you by helicopter. But sick people go first. After that we will call you. I told them I understood and thanked them very much.
>
> I slept outside of the Superdome after I ate a box dinner from the U.S. Army. When I looked up at the night sky, it was star-studded. Because we didn't have electricity, I could enjoy the sight of shooting stars.
>
> *Sept. 2, 2005* - I got up early in the morning. I felt it gradually became hotter and more humid. I continued to wait for my turn on the helicopter with a crowd of people while I was listening on the radio. At 4:00 or 5:00 p.m., the U.S. Army finally came for me. They led the way to the heliport. I shook hands with a captain of the U.S. Army. I was really excited because I saw a military helicopter without doors! As soon as I got on the helicopter, the helicopter took off into the air. When I looked down from the air, I could see some houses suffering from fire and enveloped in smoke. Almost all of New Orleans was flooded. The helicopter flew over Lake Pontchartrain and the bayou. I was so impressed by the scenery from the air. About one hour later I arrived at the Baton Rouge heliport.
>
> After that my long trip to Los Angeles by way of Houston, El Paso, and Phoenix started.

What did the US citizens – many of them New Orleans natives - experience? A total of 217, or 78.1%, reported that they evacuated. Jonathan was one who rode out the storm and evacuated later. He reports:

> I am 27 years old and live in Metairie, La. in a house I purchased last year. Luckily I didn't have any major damage to my house from Katrina. In fact the little damage I had inspired me to finish the remodeling of my home. I am working with a commercial contractor dealing with several local businesses that have relocated their offices outside of New Orleans. It has been a very rewarding experience being a part of the rebuilding process here at home. It feels good to see people and local businesses putting their lives back on track.
>
> I got to experience Hurricane Katrina right on the riverfront in downtown New Orleans. My family and I decided to "hunker down" at the riverfront Hilton. Boy, that was an experience I will never forget. Long story short, we stayed... the storm came in... they evacuated everyone to the 2nd and 3rd floors due to the possibility of windows blowing out (did I mention the water was swishing around in the bathtub from the building swaying)... the storm ended... we left for Houston where we stayed for a month. At least there was a happy ending because everyone was safe.
>
> I am happy to be enrolled in school right now. I am eager to share my experiences with other people. I think these events have changed all of our lives in some way. Good Luck to everyone!!!

Other thoughts on the horrific period immediately after the breaches:

> From Olivia: My fiancé is in the National Guard and worked in the Superdome. He helped many people and watched many people die. He will never be the same."
>
> Steele was "…with my parents; we busted out of the roof and swam to a 2-story house and waited there until we were picked up by a boat."

Of those who evacuated, only 8 reported a return to the city within one week. Mary Claire reports her experiences on an early return:

> Hi, my name is Mary Claire. I am 24 and currently live in Metairie. I am originally from Alexandria, LA; I was lucky enough to grow up on a farm. I graduated from LSU (geaux tigers!) with a degree in electrical engineering. Pre-Katrina I lived uptown. I was very lucky, the house that my roommates and I were renting was built off of the ground and we had no flood damage. Unfortunately for the majority of my neighbors, their houses were built on slabs and flooded. My roommates and I decided to move to Metairie in November. The weekend before the storm hit, I went home to Alexandria to celebrate my birthday with my family. I knew that there was hurricane in the Caribbean headed for the gulf. I thought it was headed to Florida—boy was I wrong. My

> boss called me on Saturday and asked me were I was. He told me to stay put, and that the storm was supposed to hit the metro area on Monday. He also told me to get back to the Westbank once the storm had passed the area. I work as an engineer for Entergy; my work area consists of Algiers, West Jefferson, and Plaquemines Parish. So Tuesday the 30th, I left Alexandria around 3:30am and headed south. After going through several police and military checkpoints, I was able to get to my office on the Westbank. Needless to say those first days after the storm were scary. I had worked in hurricane damage before, but they were in Florida, not here, not my home.
>
> We had guys from work missing who lived in Chalmette and the East that had stayed for the hurricane. No one could find them; thankfully two of our guys were picked up off their roofs by rescuers in boats. There were rumors and reports about people getting attacked at hospitals, the Superdome and the Convention Center. Then the Oakwood Mall caught on fire. Unfortunately this is all that the national news media reported on. My parents couldn't get in touch with me for about two weeks due to my lack of power and telephone. After watching the news, they were picturing the worst case scenario. I didn't work in New Orleans so I can't comment on anything that happened there, but I did work in the Algiers area the first month after the storm. I saw the people there helping not only their neighbors and friends, but complete strangers. Now I am working down in the Port Sulphur/Buras/Venice area. I am amazed at the resiliency of the people that live down there. They are determined to make a comeback. One man told me that his family had lived in Buras since the early 1900's and that he has to rebuild, it is in his blood. Katrina did make me take a step back and really evaluate what I hold important in my life. We all saw a bad side of human nature in the aftermath of the storm, but I know that I also saw a great deal of good. I know that it will take years before things get somewhat back to "normal", but I believe in the saying "that which does not kill us only makes us stronger".

Other experiences of early returnees:

> Jimmy, a policeman (NOPD), worked in the Superdome. Jonathan was on a search and rescue boat and saved five lives, but had to leave others who didn't want to leave their homes. Ava and her husband (also NOPD), lived on a Carnival Cruise ship. David, an electrical engineer, "flew over NO in a helicopter to identify main leaks and valves." Christina returned with her Mom, a nurse, and "…lived without electricity, helping others." Rebecca returned to her job as a Traffic Assistant for NO Clear Channel Radio. Jill commented, "one week after Katrina, I snuck back into Lakeview; the police caught me and sent me to the Arena to be decontaminated. It was humiliating."

What about those who remained evacuated? While many initially found their way to relatively comfortable conditions, 71, or nearly 33% of those who evacuated experienced extreme difficulties, generally with multiple moves, extremely crowded and sometimes dangerous conditions, with many people crowded into extremely cramped quarters or in shelters lacking the most basic services, like water, electricity, toilets and phone service. The pattern which appeared to emerge was of multiple moves, as this group attempted to find more secure living conditions. Here are Georgiana's experiences:

> Hi, my name is Georgiana and this is my story. I am a paralegal and a part-time student at UNO pursuing a BA degree with a minor in Management, Computer Informational Systems. Until the Friday before the storm, I didn't know there was a storm! You see, for three weeks I had been out-of-town attending a trial. My family never mentioned the storm; they thought it would hit Florida! That Sunday we evacuated to Mississippi then to Houston. Hats off to Texas, they were wonderful. I took all my essentials [my swimsuit and beach towel]. I was ready for a vacation and looking forward to returning shortly. I prepared the house for 3-4 feet of water, not the 10-1/2 feet of standing water that I got for 3+ weeks. Evacuating was the wisest decision I could have made, we would have died in my home. I lived in St. Bernard [formerly known as "da Parish"]. My Chalmette home was 2 blocks from the 40 arpent canal and near MRGO (note that "Mr Go" is a New Orleans acronym for the Mississippi River Gulf Outlet Canal, which sustained a storm surge which was a major contributor to the levee breaches). The canal levee breached near my home as did MRGO. According to a parish engineer the wave crested at 25 feet and the tidal surge was 22-1/2 feet. The force of the water was so strong that my front door ended

> up in the den. Between the flood water [18 inches on the second floor] and the roof damage, nothing could be saved.
>
> The only living things that survived in my home were the snakes, frogs and other marsh creatures that came in with the 12 inches of mud. I do feel lucky though, I got the small stuff and my neighbor got the cow! It's amazing how much you learn about the marsh ecosystem; 4 months after the storm things were still hatching! I am happy to report that the house is now clean and I have a FEMA trailer sitting in my driveway. I can't live in it [no utilities], but one day the government will surprise me and connect my electricity. Until then, I and my family [party of 5] are staying in Destrehan with my oldest daughter and her family. This storm has affected all of us. I have lost my home and way of life, I will be forever changed, but it is not all bad. It is amazing to see how many positive changes have taken place in my personal/professional life and in the lives of my family/friends. I am looking forwarding to the future.

Of those who stayed, most reported that they stayed because their jobs kept them in the city. Several key groups were hospital workers, those maintaining IT services, those in areas such as National Guard or police, and other healthcare workers. Another group was comprised of individuals who decided to stay and then went on to assist with the relief effort. Here is how Abner reports his relief work:

> My name is Abner. I am a first semester grad student and graduated in the Spring of 05 from Southern University. I was in New Orleans for 6 days. Three of those days were spent helping rescue women and children from American Can apartments located on Orleans Avenue where I was staying with my cousin. With the help of 5 others and 3 NOPD officers, we rescued over 80 people and brought them to choppers via boat. I then spent 3 days on the Causeway in the heat, watching the elderly and children suffer daily. I stayed until the last day helping people get water and food. I could not move the last day due to an infection that started to grow on my feet from being in the polluted water. I am separated from family and friends and hope that everyone affected can find peace of the mind and soul. My heart goes out to all. I'm currently in Houston and hoping to come back to the city in the Spring. It's true you never truly miss something until it is gone. I wish the best to all of the returning students and hope this semester runs smoothly

Barbra stayed because her husband worked at Charity Hospital. She gives the following report:

> My name is Barbra and I am a senior and I am looking forward to finishing up. The closer I get to graduating, the more nervous and anxious I become. I am a General Studies major with an ILP in Early Childhood Education. I now reside in Harvey where I was residing before the storm. Our hurricane Katrina damage was really minimal compared to some people.
>
> The whole Katrina experience was terrible though. I had to evacuate to my husband's job (Charity Hospital) which is where I worked as well pre-Katrina, except he was on duty. We had our 2 oldest granddaughters with us there for 5 days; no lights, water, or food for at least 3 of those days. The girls were crying to get out of there and so was I. It took the rescue team 5 whole days to evacuate everyone. Then we boarded school buses and they didn't know where to take us. Finally, someone says to take us to Baton Rouge, so there we were on our way to Baton Rouge with no clue as to where we would be staying. Anyway after arriving I called my brother to pick us up, he already had 20 people living at his house and we added 4 more people. Well, the next day, I started making calls and found us a one bedroom apartment in Gonzales, where we remained until we were able to return home in October.
>
> Post Katrina, things are looking a little better for my family and me. I still some siblings who have not been able to return home because their homes were totaled, but overall things are progressing.
>
> So I want to say hello to everyone.

What did the evacuees find when they returned home? For 71, or 32.7% of the evacuees, the report was that they had "major losses" to "lost everything." From Tricia, in one of the hardest-hit areas:

> My home is in the Lower 9th Ward. Twice flooded, horribly damaged. My husband and I went to see it about a week ago. The only thing I brought back was 3 buckets. They must have floated on the water. I had a lot of software in those buckets and family pictures. The rest is history. I received my undergraduate degree in 2004 with a minor in management and a paralegal certificate a few years earlier (all from UNO). I like UNO. I'm just frustrated. I recently left the legal field to open a small business bookkeeping service. Most of my clientele were in the 9th Ward, so that strategy is squashed. Talk about restructuring... My husband is an electrician and has recently left Riverdale, Ga. for New Orleans. His previous employer called him back. According to him, things are moving really slow. He's living in his mother's apartment on the Westbank, thankfully. We'll just have to play it by ear. I don't feel comfortable uprooting our daughters again (4 & 7 years old). They like their schools. On the other hand, I've put a lot of planning and resources into this venture. I can see giving up that easily. I'm still thinking...
>
> Anyhow, I'm looking forward to class. Sandy, you *are* funny. (As a note, this was a student who was in a ”physical” class with me for one week before the storm!) I happened to bring my book with me for the ride to Georgia so I'm ready when you are. God bless everyone with a speedy recovery. Tricia

For Sabrina, it was a house and business:

> Hello All! I’m looking forward to another semester of internet classes, haha. After being a Floridian for 3 weeks post-Katrina, my family and I are back in our hometown of Lafitte, La. We made it through Hurricane Katrina virtually unscathed, only to have Rita bring 5 feet of water into our house and business. My sister and I owned and operated the only tanning salon in the city, and we were open only 1 month before the hurricane. It was fun while it lasted, and now we get to start over from scratch. Right now, I have one of the most interesting jobs out there, I work for Allstate Insurance. I am a licensed support staff in the Lisa Matherne Agency located in Gretna, La. I have been there only 2 years, but the experiences I have had in the last 6 months compare to no other job I have ever had. Before working for Allstate Insurance I taught Kindergarten for 4 months, which reaffirmed to me that I do not belong in a classroom. Before that I obtained my bachelor's degree in Political Science from LSU, and worked for the family business, Cajun Consulting and Inspection, Inc., a company specializing in Oilfield construction and site clearance, which has now branched out into equipment rentals and sales, as well as owning one of only 3 water weight rental companies in the world. It's been an interesting ride so far, and obviously, my family experiences have molded my choices in school.
>
> My notable Katrina story is the fact that 3 days before the hurricane, my grandfather was operated on and had parts of his lung removed due to cancer. He stayed in West Jefferson Hospital for 3 days after the storm, and doctors would not let him leave. On the third day, doctors told his girlfriend to get him out if she could but her car was destroyed and she could not go. My father and uncle bribed their way onto the Westbank with trucks full of food and water in order to get into the city just to get them out. The day they were gone to retrieve my grandfather and his girlfriend was one of the most worrisome days of my life. Knowing that all of our earthly possessions could have been lost, those were just things, the prospect of losing family members was a feeling I never want to experience again.
>
> Later that day we got a call that they had moved my grandfather from Marrero to Lafayette, and from that day on we became Acadians and left Florida. He is fine now, and we are all in the process of rebuilding our homes and lives. I'm looking forward to this semester hoping it brings back the sense of normalcy that we have all been missing. Thanks!!

Anna reports:

> Well, my 8 year old daughter and I evacuated late Sunday before the storm. My boyfriend stayed home in Chalmette. He refused to leave. I cried and cried and I begged and begged. I never stay during a storm, if they encourage us to leave. I have a child to care for and I can’t fight for her life and my life if it came down to it. After about 5 days, I figured out he was alive. That part was hard!! It’s a long story and in his words...his house filled up with water in approximately 20 minutes.

> He and I (only!) gutted the house in Chalmette. It took freaking forever! I have good photos and good video. Most of my things were still in storage on the Westbank, so I really didn't lose all those things you hear people talk about. I mean, my greatest loss, was his precious, precious baby picture. That hurts the same today! We're not back in the house, but eventually.....

Several additional overall findings about student experiences are notable when the postings are examined. One of these is that those who reported that they had minimal losses also stepped in to aid the relief efforts, often with activities such as gutting houses. For some, months and often years, passed by and they were unable to return. Typically, issues such as work in a new location, care of elderly relatives, or schooling of their own children prevented return. The tone of many of these postings is one of deep sadness as they report knowing "what it means to miss New Orleans."

Here is how Anna described her feelings and her boyfriend's experiences in a subsequent posting:

> Well ya'll there it sits...It isn't in my name, but it is in my heart. I didn't lose my valuable childhood photos, I hadn't moved in quite that much....But when it was lost - it took all of his stuff. Everything. It almost took him. He fought a hard battle [note: Anna said that he reported that the house filled with water in 20 minutes and he barely made it to safety].
>
> But - where do we both long to be?
>
> *Ventura Street…*
>
> in Chalmette. It was just a regular house on the outside, but...a place of solitude and peace on the inside.
>
> It has been 1year, 6months, and 20 days since the chaos began. The house is gutted (that took about 3months – no help, just he and I), the house in compliance so that we are not charged $100/day and we even have the electricity box in place. No lights but...we are ready to go...
>
> Yet we are still waiting...
>
> The problems that seem to be in the way of getting back are our solid choices to do just that. Some of those choices that may lead us <u>nowhere.</u> Some of the choices that may lead us to have to start over again!
>
> Part of me wishes we would listen to nothing. Stories like the cost of insurance for living in the area or rumors like Murphy ['Murphy' refers to the oil company which is based in Chalmette and whose seepages produced further environmental problems post-storm] is going to buy the whole area. Wondering if we'll get enough money from the Road Home Program. Even if we can survive all of that…will we have neighbors? Will it be safe to live there? If you ride down Ventura – there are only a handful of FEMA trailers, not a lot of signs of a busy future.
>
> I'm lost, I don't feel the objectives are clear. The only clear objective in my path is where I want to be. The problems are scattered everywhere – some are clear and some are not. Seems the people with loss can agree on what is needed and those making the decisions see things a different way. The only alternative there seems to be is live elsewhere – *but I don't want to*! The consequences that lie ahead are not known. The decision makers have rational ideas – but nothing is acted upon. I admire those who already have rebuilt in the areas that are uncertain. That is what I think we are going to do. Choices mean taking chances!
>
> I wanna go home! I wanna know that I work hard everyday and I wanna go home because it's my choice to do so.

Finally, there are many reports that the students are grateful to be able to take classes online. These thoughts appear as early as GTKY and continue throughout subsequent discussion boards. For some, the report is that they remain evacuated and the availability of online classes means that they can complete their coursework and obtain their degrees. For others, taking class, even online, provides the only semblance of normalcy in lives which have been radically disrupted. Evidently, my reputation had preceded me, but here is what Ashley has to say:

> Hello, Dr.Hartman and my new class; my name is Ashley and I am currently living in Houston, TX. I am 22 years old and I had just started work at UNO as a research graduate assistant along with getting my MBA. I was also working for an oil company downtown called Dominion. The company has been amazing and relocated 300 employees to Houston where they are taking care of us. I am so glad to hear that so many people are doing well. I am also grateful that we are still receiving this opportunity and not having to wait a semester. I look forward to this class and hearing all of Dr. Hartman's crazy stories.

For a final group, sharing experiences, especially at GTKY, provides a virtual "support group" to help them make sense of their situations. Remarkably, many are able to muster a great deal of resilience, humor, and a willingness to see positives as they support one another. Here is how Connie puts it:

> Hello everyone. My name is Connie. Like many, the end result is that we had 12 inches of water in our house and 18 inches in our sunroom. My husband and I spent all Saturday afternoon boarding up our house but kept saying to ourselves things like, "We'll get high winds, but we'll ride it out. We don't want to leave. We haven't before, why would we now." By 10pm, my sister convinced us to leave as she had secured a room for us in West Houston. At midnight, we began moving cars to higher ground. We tried the parking lots of the Galleria, Lakeside Hospital and the Lakeway buildings, but to no avail. We ended up parking at the airport. By 2 AM Sunday, we heard Nagin on TV saying that he "wished" he could say he was authorizing a mandatory evacuation, but he "couldn't" as the City Charter wouldn't allow him to do so. We left by 5:30 am. Unfortunately, we couldn't convince my 84 year old father to go with us (and our four Pomeranians). I'm sure you've heard the story plenty of times: "I survived Betsy; I can survive this." He's since re-evaluated his position.
>
> We arrived in Houston 14 hours later. Monday, the 29th of August, seemed like just any other day. Houston weather was beautiful. We drove around sightseeing. Then we started watching the devastation unfold on the TV. I couldn't get in touch with my father; phone lines were down. I tried for days. I was beside myself with grief, like so many others were (and still are, I'm sorry to say). But eventually I was able to get through. Thankfully, he was safe, but without a lot of basic necessities. He relayed to us the stories that unfolded over the WWL radio waves, for example, 18 people being stuck in an attic with a baby - no food - just looking to be rescued. Here we were in Houston, three days after Katrina, and finding ourselves in the position of having to find semi-permanent housing. It seemed unreal. Yet still, we were trying to get my father out without having him get on one of those buses. I have to say, however, that my father is very resourceful. He hitchhiked out to Jackson, MS four days after the storm hit to the safety of my sister's house. By the time we were able to come back to the city, I cried from the moment we entered St. Charles Parish all the way to our house. The loss of trees, the downed power lines, twisted metal, blown out windows, debris-blocked roads---everywhere the eye could see. The devastation was immense and overwhelming to say the least. We watched bugs crawling in our couch cushions and I couldn't help but cry over the loss of our contents. But, after getting over the initial shock of it all, I am a very lucky person. I still have my father, husband, and four Pomeranians. I lived in Houston for two months (and waited out Rita there, as well, safely). And now that we're back home, we're a family among thousands who have had to gut their house and are now awaiting electricians, plumbers, inspectors, etc., and who are also awaiting checks to be issued by the good graces of our insurance company. When we're not home, we're at Lowe's (Note – a home improvement store and currently the biggest business in the city). Perhaps I've even passed some of you in the aisles trying to find this or that. Who knows how long it will take to recover from all of this. I'd like to end my story by saying that I recognize my losses are not as great as numerous others, but my heart goes out to everyone, especially us students, just trying to hang on. The mere fact that we are trying to go to UNO during this reconstruction phase of our lives says a lot about our fortitude, our strength, and our goals. To continue on is quite a fete. My wish for everyone is that as each day passes, I hope one more goal is accomplished in your lives, no matter how big or how small. An accomplishment is just that: an accomplishment. Thanks for taking the time to read my story.

Bonnie comments:

> My name is Bonnie. It was nice reading all of your stories just now. Some of the stories are amazing! In the midst of the whole Katrina disaster, rays of light still managed to shine through - someone got married to the love of his life and another had a baby boy while away from New Orleans. It is refreshing to hear such stories of miracle because it reminds us all that no matter how bad things get, things will always get better and fix itself over time. Even now, our town is slowly coming back to life. With the onset of each new day, more signs of hope are showing.
>
> I know it has been a trying time for all of us. Believe me I know, my house still has no floors, no kitchen, and one functioning bathroom from the flood. But even so, we just have to see it as a new experience. I mean, before Katrina, if someone told me that I would currently know how to tear out, hang, and float sheetrock, I would have told them that they were crazy! Now, I can honestly tell you that I know the mechanics behind the art of sheetrock. I am proud to say that the sheetrock is done. I even dared to make a design and tile my own bathroom shower walls. It was definitely a new experience! I never knew so much prep work went into putting up tile. You have to prepare cement blackboard to the walls before putting on the tile. Then you have to measure and learn how to cut tile in certain shapes. It's definitely hard work, but I can proudly say that "I did it myself," which is a great feeling. Although, along the great feelings, I have discovered muscles in my body that I never knew existed (but that's another story; and it's nothing a good tube of Ben Gay® cannot fix.)
>
> Anyway, before I start sounding like one of those "do-it-yourself" info-mercials, I will move on to telling you a little bit more about myself. As you have gathered, I am a moonlighting "contractor-in-training," but my real job is as a graduate assistant for the University of New Orleans. I am currently finishing my last semester of school for my M.S. in Tax. I am taking five classes, studying for the CPA certification exam, and working on my house on my free time in between school. So, as you may guess, I am already getting a healthy dose of physical and mental exercise each day. Upon graduation, I will do what all students dread -- that is, start working full-time and make the final transition into adulthood. Then I can start replaying the movie Office Space and noting correlations between me and Peter Gibbons (main character) in making "TPS reports." Just joking! I just love that movie too much for my own good. I really am excited to be finishing up my masters and to begin working full-time. It would be nice to put the skills I acquired in college to good use and start developing my analytical skills farther. Of course, the paycheck is an added bonus!
>
> Life is definitely starting to look "normal" again. It seems like eons ago that my family and I became nomads and lived on the road. I was initially in Houston, TX, then I was in Baton Rouge, then I was Hammond, and finally back home. It is definitely nice being home. It's nice to be able to give out a physical address again. For awhile, my "permanent home address" was my car's license plate number (and I was not being sarcastic). In any case, I look forward to getting to know everyone better during the course of this semester. You all are my new "on-line buddies." (It's the newest rage to have on-line chat sessions apparently.) Here's to a great semester: "Cheers!"

Additional comments:

> Kristy says, “Internet courses are an excellent way to increase my knowledge because I work at my own pace within the timed schedule, whenever it is convenient.”
>
> Robyn offers, “I’m excited to see UNO is offering courses online. I look forward to completing my program, mostly online.”
>
> Bessie says: “I am happy I can continue my studies thanks to UNO’s online courses.”
>
> Richard points out he is “grateful UNO went to great lengths to get the school up and running with online courses.

Summary and Conclusions

In this paper, we have examined instructor experiences and postings from 292 students describing their experiences during and after Hurricane Katrina. From an instructor perspective, the process was extremely difficult and time consuming and was made possible only through the generosity and support of colleges and faculty throughout the nation as well as text manufacturers. In the disaster situation, creative use of information dissemination tactics by university administrators and the city was invaluable and online teaching proved to be the needed vehicle for reaching students and restoring a sense of normalcy and purpose. For both faculty and students, the pattern which emerged is of lives severely disrupted and of great need to establish some form of stability and to "get on with their lives." In this situation, online teaching provided an important vehicle for establishing stability, a support system, and a means for students and faculty alike to make sense of what had happened to them. Blackboard™ is, of course, an instructional tool, but in the disaster situation, it appeared to have value far beyond instruction.

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owerful E Learning: A reliminary Study of Learner Experiences

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Abstract

This study continues a program of research into the nature of powerful learning experiences, with a focus this time on e-learning contexts. It was conducted using structured phone interviews with adult learners pursuing undergraduate degrees through e-learning coursework. Among other things, data suggest that meaningful social interaction and emotions may be important components in powerful learning experiences. In addition, the data suggest that powerful learning can indeed occur in e-learning environments. Results of this study combine with those from three previous studies to point toward practices of instructional designers and educators that may contribute to powerful learning in e-learning environments. Further examination of powerful learning in such environments holds promise.

Keywords: meaningful learning, powerful learning, e-learning, adult learning, instructional design

Introduction

What makes a learning experience powerful? For instance, what makes one experience especially memorable while another is easily forgotten? If we knew, could we take specific actions that might make learning experiences more powerful? The present study is the fourth in a series, and the first in the series to extend from traditional learning environments to the area of e-learning. E-learning is defined here as encompassing "a wide set of applications and processes such as Web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, CD-ROM, and more" (Kaplan-Lieserson, n.d.).

ac ground

This series of studies evolved out of the concern that traditional approaches to instructional design tended to focus on the attainment of only low-level learning goals (e.g., several authors in Seels, 1995). Through these studies, the authors endeavor to add to work that addresses more meaningful, higher-level goals such as "understanding" (e.g., Kember, 1991; Wilson et al., 1995; Gardner, 1999; Perkins & Unger, 1999; Reigeluth & Squire, 1998) and to serve educators, researchers, and policymakers who are looking for updated learning and schooling models that can better address the increasing use of e-learning technologies (McCombs & Vakili, 2005).

While the term "powerful" can be applied to the process of learning, for instance, to a learning experience that has special qualities that make it especially effective and/or efficient (Brandt, 1998; McPhee, 1996), it often refers to the outcomes of learning. For instance, learning that is powerful results in new knowledge and skills that change how one thinks and acts in some substantial way and often

transfers to a wide range of circumstances. In the present study, *powerful learning experience* was defined as one that stands out in memory because of its high quality, its impact on one's thoughts and actions over time, and its application in a wide range of circumstances.

The specific aim of the series of studies is to learn more about the nature of powerful learning experiences and the conditions or factors that might be involved in making them special. This descriptive work is intended to eventually lead to insights that designers and educators might consider as they develop courses. The approach for this study was similar to the approaches used by Visser and Visser (2000) and Perry (2002), who asked people to reflect on particularly meaningful learning experiences in their pasts.

As in the previous three studies (Rowland & DiVasto, 2001; Rowland, Hetherington, & Raasch, , 2002; Rowland, Lederhouse, & Satterfield, 2004), two assumptions impacted the approach. First, learners were assumed capable of recognizing when an experience was powerful. Secondly, although some of the factors might be internal (i.e., characteristics of the learner) and may not be readily exposed by the learner himself or herself, the learner was assumed capable of communicating at least some of the factors involved in his or her experience.

The three previous studies of powerful learning by adult learners provided a foundation for this fourth study. In the first study (2001), Rowland and DiVasto conducted extensive multi-stage interviews and surveys (see Appendix for similar survey) and made comparisons between a small, highly diverse group of learners and a group of instructional design experts regarding what each group believed were factors and key elements of powerful learning experiences. Factors that emerged included active engagement in authentic settings (i.e., in settings that either represent or approximate environments where knowledge and skill is typically applied), personal interaction with mentor/expert teacher (i.e. with someone who serves as a mentor and who is also an expert teacher), and opportunity for reflection in and on action. Much uniqueness was noted among individual participants' responses, and it was hypothesized that powerful learning may be an individual experience that designers can do little to affect.

In the second study (2002), Rowland, Hetherington, and Raasch sought to determine if clearer themes would emerge from more similar groups. Adult professionals with considerable work experience in four fields were surveyed. Themes that emerged as factors in their powerful learning experiences included active learning, personal growth/development, relationship between instructor and learner, relevance to one's work and/or life, and personalization (i.e., adaptation of instruction for the individual learner). However, no single factor was identified by more than one third of the participants, so just as in the first study, most support was given to the conclusion that powerful learning experiences are unique to the individual.

The third study (Rowland, Lederhouse, & Satterfield, 2004) involved surveys of undergraduate students in three professional fields and explored the question of whether an even greater coherence in participant groups would lead to identifiable themes relating to powerful learning. Across the responses, several themes emerged including hands-on activity; practical application in real or authentic environments; and supportive interactions with others. However, no themes represented the responses of a majority of participants. Therefore, the evidence continued to suggest that learning experiences and the factors that make them powerful are unique to individuals and/or specific circumstances.

Participants in all three previous studies rarely viewed 'instructional technology' as a contributing factor to powerful learning. Yet, e-learning opportunities continue to grow. For example, in their most recent report regarding the status of online higher education, the Sloan Consortium stated that "higher education institutions taught nearly 3.2 million online students during the fall term of 2005, an increase of about 850,000 students and a growth rate of 35 percent" since their previous 2005 report (Allen & Seaman, 2006, p. 5). Therefore, in response to the increasing use of e-learning technologies, the present study began to explore powerful learning in e-learning contexts.

Method

The names and e-mail addresses of approximately 180 potential student participants were supplied to us by a New York State college in early 2006. A target of twelve participants was set, and participants were recruited through an e-mail invitation. Those who responded were sent an electronic consent form

to complete. Interview appointments were set up with the nine students who completed consent forms. Prior to their interviews, participants were e-mailed topics to reflect upon, including their memorable learning experiences, their past e-learning experiences, and any circumstances that might enhance their learning. Structured phone interviews were then conducted with nine adult students who were seeking bachelor's degrees primarily through e-learning classes.

Interview questions were tested with four Ithaca College graduate students who would not be part of the study. Based on the flow of those interviews and the students' feedback, the questions were refined (see Appendix). Interviews began with several questions about participants' professional backgrounds and their use of computers. Participants were also asked to identify their ages in terms of ranges that were offered by the interviewer. The gender of each participant was inferred by the interviewer. The interviewer then defined a powerful learning experience and asked participants to describe a learning experience that had been very powerful for them. In order to uncover significant factors in their experiences, participants were asked to expand upon their descriptions by naming components or aspects of the experiences that might have contributed to those experiences being powerful for them. Similar questions then examined e-learning experiences. Participants were then asked to compare their two types of experiences and describe any similarities or differences between their powerful e-learning experiences and other types of learning experiences.

The next questions involved future possibilities for powerful learning with the intention of constructing theoretical and/or practical paths from current approaches toward ideal states. Participants were asked to imagine and describe what could be a powerful learning experience in an ideal world and, then, in an ideal *e-learning* context. These descriptions led naturally to a comparison and a question of barriers or constraints that currently prevent e-learning experiences from being more powerful. Lastly, participants were asked for recommendations to e-learning instructors or designers that might improve e-learning experiences, then for any additional comments or insights about e-learning and/or powerful learning. After responses were accumulated, identifying information was removed.

Beyond the simple tabulation of demographic data, data were analyzed in an inductive manner, moving from data in individual responses, to categories and cross-case comparisons, essentially following steps proposed by Tesch (1990). The authors started with an independent examination of each participant's response to each question, then compared interpretations and allowed categories to begin to emerge. Next, again working independently, the authors coded all responses by category, allowing the coding to further refine the category. Codings were compared, and the few differences that were found were easily resolved (i.e., discussion revealed either a miscoding by one author or one alternative coding that both authors agreed was more reasonable). The authors then created a large question X participant table with coded responses in the cells. Some detail beyond the codes was maintained in the cells in order to stay closer to the data. Once again working independently, the authors searched for meaningful relationships across responses and participants, for example, the emergence of subgroups. As before, few inconsistencies were found between interpretations, and these were easily resolved. Finally, results were compared with those from the previous three studies following the same analytic process (i.e., first by each author individually, then comparing interpretations).

Results

Demographics

Participants included seven females and two males. One person was 18–25 years old, one person was 26–35, and all others were over 36. Two participants described themselves as being in the accounting field, one was a school bus driver, one worked in education, and one worked in the high-tech field. Years of experience in their fields covered a range from less than five years to over twenty years. Four participants did not currently perceive themselves to be members of a professional field and thus chose to self-identify as students.

Computer Experience

All participants described themselves as being comfortable using a computer, two being moderately comfortable, five very comfortable, and two extremely comfortable. When asked how often they use a computer each day, one person said 1–2 hours, four said 3–6 hours, and four said 7–12 hours.

E- earning Experience

When asked about their experience with e-learning, two participants said that they had a little experience, four said a good amount of experience, and three said an extensive amount of experience. (Participants were all enrolled in programs that are delivered primarily via e-learning, but they were not asked how far along they were in those programs.)

Powerful earning Experiences

Participants shared a wide range of what they considered to be powerful learning experiences—from a high school field trip to the loss of a family member. The authors found no patterns among these experiences, for example, with regard to context, type of activity, or specific outcome. As far as conditions or factors that contributed to these experiences being powerful, a few patterns did emerge. All nine participants described experiences that involved active engagement in authentic (real or realistic) settings, settings such as community meetings, family environments, and business conferences. All nine participants also described experiences that included meaningful interactions with other people. These other people were not described as simply being bystanders to experiences; instead, certain people—often teachers, community members, peers, professional colleagues, and family members—seemed to play integral roles in participants' processes of personal meaning making.

Five participants indicated that a high emotional state or emotional bond was involved. Four participants said that their personal response to pain, fear, and/or loss was a contributing factor. Two participants stated that their experiences were powerful because the experiences were new or out of the norm.

Only six of the nine participants said that they could recall any e-learning experiences that were "good" and were thus able to provide answers to questions in this area. Three participants indicated that flexibility contributed positively to their experiences—flexibility in time and course interactions, in sources of learning materials, and in learning activities.

Three participants said the instructor and/or delivery method was important. Two participants described the use of resources beyond the text as having contributed to their positive experiences. Four participants expressed that their e-learning experiences were beyond "good" and could be described as "powerful." No patterns were found across responses when participants compared their powerful learning experiences and e-learning experiences.

Powerful earning in an Ideal orld

Descriptions of powerful learning in an ideal world produced several patterns. Participants cited the desirability of hands-on/experiential aspects (three participants), flexibility and/or control (three), virtual classroom experiences (two), a combination of e-learning and classroom learning (two), and real-time interaction with others (two).

When considering an ideal world, and comparing similarities and differences between imagined powerful learning and imagined powerful e-learning, two participants felt that both types of experiences could be similar because they both involved interaction with others. Two participants saw similarities in the component of real-time interaction. Two participants expressed that the two types of ideal experiences would be different because e-learning is not experiential for them.

Barriers to E- earning Experiences

When asked about what barriers prevent e-learning from being more powerful, three participants described computer and/or technology difficulties. Three participants described inadequate contact/involvement by professors. Two participants felt that mistrust of students on the part of some professors (i.e., treating responsible adult students as irresponsible children) created a barrier. Two participants cited other students' poor commitment as being a barrier.

Recommendations to Designers

Three participants suggested that more professor interaction might make e-learning experiences more powerful. Three participants suggested more real-time, synchronous interaction. Two participants suggested more assistance in using the computer. Two participants suggested providing course content

that was more than just text.

Other Topics

Two topics of interest emerged from a comparison of responses across interview questions. First, several participants brought up the topic of online discussions. One offered a positive view, another offered a negative view, and five others described both positive and negative aspects. Second, the role of the professor in online courses surfaced across participant responses to several different questions. Two participants made positive comments about their professors' impact on their learning while five participants shared stories about difficulties they experienced as a result of the practices of their professors. Two participants did not mention professors' impacts on their learning.

Summary

Two themes emerged from responses by all participants. All nine described powerful learning experiences that demonstrated active engagement in authentic settings, and all of the powerful learning experiences cited involved meaningful interactions with other people.

For learning experiences in general, and for a majority of participants, emotion surfaced as an aspect of powerful learning. Several participants stated having a preference for hands-on or experiential learning. Also, the uniqueness of a learning experience contributed to its being powerful for several participants.

In the area of e-learning, participants identified flexibility as a feature of positive learning experiences, and they expressed a desire for more real-time interaction, more contact with their professors, and more computer assistance. Finally, participants expressed mixed views about online discussions and they noted the significance—both positive and negative—of their interactions with professors in e-learning courses.

Discussion and Implications

The intent of the study was to begin to focus exploration of the phenomenon of powerful learning on the context of e-learning. The authors conducted interviews with a small number of college students pursuing undergraduate degrees through e-learning coursework. From this small set of interviews it would not be appropriate to make broad generalizations. However, some notable patterns of interest could be seen across the responses, particularly when considered in combination with results from the previous three studies.

Before discussing those patterns, however, several other limitations should be acknowledged. First, interviews were fairly structured and lasted only about 20 minutes for each participant. Second, interviews were conducted over the telephone and, therefore, missed nuances that might come from face-to-face interaction. And third, interviews were all conducted by one female researcher (first author). Her manner of questioning and the fact that she was female may have had an influence on participant responses.

In terms of interpreting results, several participant examples of powerful learning experiences surprised the authors, and this revealed an initial bias. A powerful learning experience was defined as being one that stands out in memory because of its high quality, its impact on one's thoughts and actions over time, and its application in a wide range of circumstances. How could a simple Web conference or a high school field trip be *powerful* in this sense? It became clear that what participants considered to be powerful learning was highly personal and complex, and that the authors were unconsciously imposing an inappropriate external standard. This did not affect data gathering in any way the authors are aware of, nor did it affect interpretation once it was exposed.

Similarly, the authors came to realize that they had begun the study with a bit of skepticism regarding the ability of e-learning environments to support powerful learning. In contrast, four participants described online classes as having been powerful learning experiences for them. For instance, one participant said that an online class had "opened up many new avenues" for her. Another said her learning was powerful because of the many "expressions of personal experience" that took place during the class. Another said that her e-learning course provided her with "deeper insights into how people think." In fact, some participants perceived the mere existence of e-learning and its associated

opportunities as having made their learning powerful. As one participant expressed, “had it not been for e-learning, I would not be finishing my degree.” Results reveal that, at least for some people, powerful learning can occur in e-learning environments.

In terms of patterns that emerged, active engagement in authentic settings was an important aspect of powerful learning described in this study as well as in the previous three studies. For example, participants in this study shared stories such as speaking to a group at an Alcoholics Anonymous meeting, connecting with peers at a symposium, and interacting with children at home. Additionally, in descriptions of ideal learning situations, participants expressed things such as “virtual reality,” a “live participatory component,” and learning “in real life” situations as being preferable components of their ideal learning experiences. Authenticity of setting was defined in terms of realism or fidelity, that is, how realistic the environment in which the learning occurred was perceived to be in comparison to the context where tasks would normally occur or in which knowledge and/or skills would typically be applied. This did not necessarily imply physical fidelity, but rather, it referred to learners’ perceptions.

Authenticity of setting appears possible in e-learning, but due to the different challenges involved in the e-learning context, this definition may need to be broadened. For example, Barab, Squire, and Dueber (2000) propose that authenticity occurs “not in the learner, the task, or the environment, but in the dynamic interactions among these various components…authenticity is manifest in the flow itself, and is not an objective feature of any one component in isolation” (p. 38). Data from the present study suggest that authenticity in this sense may be important in powerful learning experiences, including those involving e-learning.

Another pattern that emerged was that all nine participants described powerful learning experiences where another person or other people played active roles in their individual meaning-making processes. These included people such as teachers, children, group members, and peers, in contexts such as meetings, classes, and parent-child interactions. For example, one participant described an e-learning class that she felt was powerful because, “the instructor made it fun.” Another participant talked about his powerful learning including “input from other peers in your field that have had similar experiences.” And another participant who does home schooling said her learning was powerful because it included “learning with my children.” Even when describing good or powerful e-learning situations, information about active, meaningful interactions with teachers or peers was included in all participant accounts of their experiences.

This finding was consistent with a large majority of the 271 experiences described by 82 participants in the three previous studies. In those studies interaction with others, such as relationships with instructors and collaborations with peers, was frequently cited as a factor in descriptions of powerful learning experiences. Analyses from all four studies do not reveal *how* interaction with other people affects powerful learning experiences, but the fact that it does seems likely. That is, it seems that some form of meaningful social interaction may be a significant ingredient in powerful learning experiences.

In e-learning environments particularly, emphasizing the presence of others, through discussions, communication with instructors, and other social interactions may be especially significant. When that social interaction was lacking or poorly facilitated by instructors, participants in this study expressed dissatisfaction. For example, one participant shared that she had “no real interaction with professors” and “felt like I was talking to myself.” Another participant expressed the need for more “professor interaction to keep things on track.” And another said that at times “teachers seemed to disappear” and this was a barrier to making her learning experience a powerful one. Further research should be conducted into other peoples’ role(s) in individuals’ powerful learning experiences.

Dirkx (2001) suggests that “personally significant and meaningful learning is fundamentally grounded in and is derived from the adult’s emotional, imaginative connection with the self and with the broader social world” (p. 64). Five participants in the present study described a high emotional state or emotional bond. For example, one participant talked about the emotion of seeing her community’s negative reaction to a mixed-race couple. As a result she developed life-long empathy for those who are persecuted. Another participant described her emotional bond with her daughter as being an important component in the powerful learning she has recently experienced as a new mother. It is interesting that the seven study participants who were women included emotional aspects of their powerful learning experiences in their descriptions. The two male participants gave accounts of

experiences that did not include descriptions of emotions at all. This may suggest that women find emotion to be an important factor in powerful learning. On the other hand, it may also be the result of the female participants feeling more comfortable describing emotions to a female interviewer or simply the inclination of the two males not to provide emotional descriptions. Nonetheless, future research into connections between emotion and powerful learning seem warranted.

Also in the realm of emotion, four participants said that their personal response to pain, fear, and/or loss was a contributing factor to their power learning experiences. One participant "learned how much we can overcome" through the experience of losing her son. Another participant described a powerful experience involving a poorly-skilled teacher. She talked about her painful loss of confidence and her wish that she could change teachers halfway through a course. "I say that—but I learned how to deal. How can you say eliminating the bad stuff is good? Maybe it's the best." These responses suggested that powerful learning can occur in contexts that are both pleasant and unpleasant, another finding consistent with previous studies.

Descriptions of contexts of active, experiential learning came up in all participant stories about powerful learning. Previous studies (Rowland & DiVasto, 2001; Rowland, Hetherington, & Raasch, 2002; Rowland, Lederhouse, & Satterfield, 2004), also support this theme. One participant described how she would like to interview and interact directly with an expert in her field. Another spoke about the desirability of experiences where she could "actually see why you're learning what you're learning… and how it can be applied in real life."

Flexibility and control were themes that emerged in three responses to questions about good e-learning experiences and in three responses about powerful learning in an ideal world. For example, one participant offered a Web conference as an example of a good e-learning experience. He indicated that he liked the flexibility of Web-based conferences. He explained that they are easy to schedule and that there is no need to make travel plans. Because of this flexibility, he said that more people can attend Web-based conferences, and he felt that there tends to be better input from diverse backgrounds than the input from one group meeting in a room somewhere. Another participant said that because she has health issues, the flexibility to do class work only on her "good days" makes online courses ideal for her. One participant spoke in terms of control, saying that being able to make changes "if things weren't going well" would enhance her learning in an ideal world. Another participant described flexibility relating to the instructor's manner or delivery method and said she appreciated an instructor who created assignments that "allowed her to do her own thing." As Garrison and Anderson (2003) suggest, "control in content and process is a catalyst for spontaneous and creative learning experiences and outcomes" (p. 18). Results from this study support this notion.

Technological aspects of e-learning were mentioned as factors impacting e-learning experiences. Two participants said that real-time interaction was a component of good e-learning experiences, and three others cited this as a recommendation to e-learning designers. One participant stated that "today's environment lacks real-time power." Another said that the lack of real-time interaction made her feel as if she were talking to herself at times. Several participants mentioned the importance of a well-functioning computer system and/or of lessons for which navigation functions have been thoroughly tested. For example, when asked about recommendations for instructional designers that might make e-learning experiences more powerful, one participant blurted out, "make sure the links work!" These responses suggested that the technologies used in e-learning settings influence learning experiences, at least for some people.

Participants provided mixed views about e-learning experiences involving asynchronous online discussions. Six participants mentioned enjoying them or finding them helpful. However, five of those participants also expressed that they found online discussions problematic due to factors such as other students' poor communication skills and attitudes, poor discussion facilitation by professors, and difficulty communicating due to lack of real-time, synchronous options. For example, two participants suggested that because people can be somewhat anonymous in online discussions, fellow students do not always give enough thought to what they are writing and to who might be in the discussion. As one participant put it, "language can be dangerous…it's not a chat room." Increased involvement of professors in guiding asynchronous discussions was suggested by four participants as a way to improve discussions in e-learning situations.

Additionally, several participants mentioned the role of professors in e-learning experiences. They expressed a desire for their professors to be more available and, as one participant put it, "more involved and on top of things." Others felt that professors need to make personal connections with students. The importance of the instructor-learner relationship was a factor in previous studies (Rowland & DiVasto, 2001; Rowland, Hetherington, & Raasch, 2002; Rowland, Lederhouse, & Satterfield, 2004) and, when combined with this study, suggests that instructors do play a role in determining the quality of learning experiences in formal settings.

Only four participants felt they could describe their e-learning experiences as being *powerful*. However, it seemed that what made learning powerful for these participants was the content and/or activity, not the e-learning medium *per se*. For instance, a participant spoke about an online history course that she "didn't want to take in the first place," explaining that it turned out to be extremely powerful for her because the content opened up new ideas and broadened her interests. Still, the results support the notion that powerful learning is possible in e-learning environments for at least some people.

The study's overall results appear to reflect two theoretical perspectives. First, results were consistent in several ways with the perspective of *constructivism*, which suggests that knowledge is actively constructed and reconstructed by individuals through reflection upon past and present experiences (Piaget, 1957; Bruner, 1960). All descriptions of powerful learning experiences involved active engagement in events by the participants, not just in terms of doing things but actively making meaning through the doing. And participants frequently cited that, through reflection during and after their experiences, they achieved deeper and highly personal understandings, not just, for example, reinforcement via rehearsal.

More specifically, results seem to point toward a *collaborative constructivist* perspective of learning, which has its roots in the works of Lev Vygotsky and John Dewey. This perspective stresses the "inseparable relationship between personal meaning making and the social influence in shaping the educational transaction" (Garrison & Anderson, 2003, p. 12). For instance, all participant descriptions of powerful learning involved meaningful interactions with other people, not just in terms of an exchange of information but in what appeared to be a negotiation of meaning as both parties came to new and personal understandings. No study participant described a powerful learning experience where he or she simply observed an event in solitary and reacted to it, in other words, vicarious learning which may have been accounted for by an objectivist learning theory.

A second perspective that was especially interesting, and which is just beginning to be applied in the areas of human learning and performance, was complex systems theory (see Rowland, 2007). Results from the four studies suggest that powerful learning may be an emergent phenomenon—a unique result of non-linear interactions among components (e.g., Gleick, 1987). A non-linear interaction is one in which effects are not proportional to causes and, therefore, one whose effects cannot be predicted by the examination of simple causal relationship among separate parts. Specifically, three related results include: (1) power has not been described as the result of single causal factors or any consistent group of factors, (2) the effect obtained appears significant beyond what one might expect from a simple causal (i.e., linear) interaction of factors, and (3) there appears to be little consistency across experiences in the factors cited and how they interact. These approximate the characteristics of emergent phenomenon described by Morowitz (2002) and others. If powerful learning is emergent, then it is largely unpredictable and, therefore, a search for typical prescriptive design principles (i.e., if learning goal X, then apply method Y) would be futile (e.g., Brown, 2002; McDaniel, 2007). Rather, the designer seeking to facilitate powerful learning would likely find it more effective to focus on creating conditions in which powerful learning would be more probable.

Conclusion

The descriptions provided by the participants of this study appear to reinforce findings from previous studies that powerful learning experiences are likely to be individual and to result from many factors coming together in a unique way. Consequently, it would appear difficult if not impossible to engineer them through applying simple prescriptive principles. On the other hand, results indicate a strong tendency for social interactions and active engagement in authentic settings to play a role.

Results also suggest that powerful learning experiences are possible in e-learning environments. While

instructional designers and educators may not be able to control or prescribe individual experiences of powerful learning, the inclusion of meaningful social interaction and active engagement in authentic settings in courses may increase the likelihood that individuals will find their learning experiences to be more powerful.

These results are preliminary. Larger numbers of participants and more in-depth methods should reveal how far results from previous studies extend to e-learning, and provide greater insight into powerful learning in e-learning contexts.

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Computer Literacy in a Traditional Nursing rogram: A ear Study to Identify Computer ased S ills Needed for Success

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Abstract

Computer literacy is critical to student success in higher education today. Assessment of student knowledge related to computers is generally for either hardware capabilities or overall ability, without an assessment of specific computer competencies. The focus of this study was to identify the literacy level of nursing students over a 7-year period to assess which computer competencies need the most support and development and to determine how literacy levels varied in successive years. A convenience sample (N 401) of undergraduate nursing students admitted from 1999 to 2005 were given an assessment of computer literacy at the beginning of the upper-division nursing program. Results indicated that the literacy of students increased with each successive group of students. Literacy varied across technological functions, with students having the lowest literacy levels in the data inquiry skill set and students who owned computers were more computer literate than those who did not. An assessment of general computer literacy can provide an overall appraisal of computer competency, but it is important to examine the separate dimensions of specific skills within general knowledge, as these are the points on which faculty will need to focus.

Keywords: computer skills, online learning, student assessment

Introduction

Computer literacy is a critical competency for the success of undergraduate students. Many programs either enhance courses with online learning platforms or deliver courses completely online. With the diverse populations attending the traditional 4-year Bachelor of Science in Nursing (BSN) program at our institution, a varied level of skill and competency was evident in classes of incoming students. The focus of this study was to identify the literacy level of nursing students over a 7-year period to assess which computer competencies needed the most support and development and to determine how literacy levels varied in successive years. Computer literacy is defined for this study as technical skills and level of competency in four areas: general computer knowledge, documents and documentation, data inquiry (databases and search engines), and communications and surfing.

Literature Survey

se of Online earning Platforms in Higher Education

Universities are reporting that online learning is critical to delivering and maximizing programs for students. More than 96% of universities with over 15,000 enrollments offer online courses, and an estimated 3.2 million students were taking at least one online course in Fall 2005, marking a substantial increase over 2.3 million students the previous year (Allen & Seaman, 2006). Palloff and Pratt (2001) reported that almost 90% of institutions with enrollments of 10,000 or more are offering some form of Internet-based learning. Allen and Seaman (2006) reported that 62% of academic leaders believe the learning outcomes in online education are superior to or the same as those in a face-to-face classroom.

Hosie and Schibeci (2005) noted that learning through online platforms is a mega trend. Predictions regarding the virtual university of the world without any national boundaries have been prevalent in the literature (Moe & Blodget, 2000; Taylor, 2001), with a slow but steady shift in this direction. There have been many proponents of the use of Internet technology as a tool for delivering health science education (Cobb & Baird, 1999; Franck & Langenkamp, 2000; Thurmond, Wambach, Connors, & Frey, 2002), as well as those who address the challenges of this delivery method (Frase-Blunt, 2000; Monke, 2005/2006; Reynard, 2007; Schmitt, Titler, Herr, & Ardery, 2004; Sit, Chung, Chow, & Wong, 2004). Among academic leaders, 73% believe that online education reaches students not served by the face-to-face programs, and 58% rate online learning as critical to the long-term strategy of the institution (Allen & Seaman, 2006). There is no doubt that online learning is vital to all disciplines involved in education today.

Computer iteracy

The most critical barrier noted by 64% of academic leaders is the need for more discipline on the part of online students (Allen & Seaman, 2006). Reynard (2007) observed that in online education, there is increased learner autonomy where students are central to their own learning process and need to maximize self-direction, organization, and interactions. Computer skills and competencies are one of the factors cited as essential for student success with online programs. The ability to leverage the Internet and the chosen online learning platform for information, research, communication, and interaction are critical to student motivation, persistence, and success (Bernard, Brauer, Abrami, & Sturkes, 2003; Tyler-Smith, 2006). Technical problems and a low level of student technical skills are two of the top eight factors considered as posing the most significant barriers to online learning (Muilenburg & Berge, 2005).

Measures of Computer iteracy

Many measures exist for assessment of program management and outcomes, faculty teaching, and structural organization of online courses (Billings, 2000; Jairath & Stair, 2004; Keinath & Blicker, 2003; Phipps & Merisotis, 2000; Richard, Mercer, & Bray, 2005; Williams, 2003; Wolf, & Stevens, 2007), but there are far fewer measures for assessing the technical skills associated with student competencies needed for success (Kirkwood, 2006; Osika & Sharp, 2002; Yu, Kim, & Roh, 2001). Kirkwood (2006) specifically explored the potential for mismatches between faculty assumptions and student competencies by surveying 1,017 students, and more than half of the students surveyed identified the following specific areas as those needing the most skill development: creating and manipulating images (61%), finding and using information effectively (60%), using electronic resources (e.g., libraries; 60%), understanding more about information computer technology generally (59%), building a website (53%), and using a computer for studying (52%). This same population was most experienced with word processing (73%), communicating with other people using e-mail (61%), and getting information from the Internet (54%). A survey of 257 students by Yu et al. (2001) concluded that skills and knowledge of computer technology and use of the Web should be provided formally or informally to facilitate online learning. This provision of formal or informal help to facilitate online learning is important because Osika and Sharp (2002) found that many students did not possess the technical skills required for success in online courses.

earning Styles and evel of iteracy

There are multiple studies of learning styles, online learning satisfaction, and ability (Beyth-Marom, Saporta, & Caspi, 2005; Butler & Pinto-Zipp, 2006; Du, 2004; Graf, Viola, & Leo, 2007; Heiman, 2006; Lu, Yu, & Liu, 2003; Neuhauser, 2002; Richardson, 2007; Speth, Lee, & Hain, 2006). Lu et al. (2003) found that students were able to learn equally well in online courses despite differences in learning styles. Neuhauser (2002) compared learning styles and outcomes of students in two sections of the same course; one section was online, and the other was in the traditional classroom. She found that there were no significant differences between learning styles/preferences and the effectiveness of learning activities in either group. Butler & Pinto-Zipp (2006) explored learning styles in relationship to student preferences for online methodologies (N 96) and found that students preferred asynchronous methods (99%) along with a high degree of interaction. They also found that students enrolled in the online course predominantly displayed a dual learning style (56%). Beyth-Marom et al. (2005) specifically looked at synchronous versus asynchronous materials and student learning preferences, and found that those students who preferred synchronous materials had stronger inclinations toward the positive aspects of interaction and scored lower on the need for autonomy and access to learning materials. In 2004, Du found a significant relationship between student satisfaction with online learning for those students with an accommodating learning style and computer literacy/competency.

Overall, the literature reveals that computer literacy is a key component for success with online education. A gap in the literature exists related to specific student skills assessment and evaluation.

urpose of This Study

The purpose of this study was to measure and evaluate the literacy level of three groups of undergraduate nursing students entering an upper-division university BSN program, categorized according to their year of entrance into the college. The nursing students were admitted to the program in their junior year following completion of university core courses and required prerequisites. The authors hypothesized that the literacy levels would increase for each successive group among three groups of basic undergraduate students admitted to the program over the 7-year period of the study. Another hypothesis was that computer literacy varied across technological functions, with students having the lowest literacy levels in the data inquiry skill set. The final hypothesis was that students who owned computers would be more computer literate than those who did not.

Methods

Sample

The College of Nursing has three different groups of students that enroll in the baccalaureate program: second-degree students, who already have a baccalaureate degree and are returning for a nursing baccalaureate degree; associate-degree-to-baccalaureate students; and basic students who have completed 2 years of university courses, including all of the nursing prerequisite courses, and are entering their junior year after being accepted into the upper-division nursing program. The students in this convenience sample (N 401) included seven incoming year-groups of basic students who completed a computer literacy survey at the start of their nursing program over a period of 7 years, from 1999 to 2005, as shown in Table 1 (all tables appear at the end of the narrative). Undergraduate enrollment data indicated that 42% of the students were minorities (29% Hispanic, 10% American Indian, and 3% Asian/Black). Women made up 94% of the total sample.

Measures

The Computer Literacy Survey was originally developed at the University of Oregon as a student self-assessment questionnaire. It was used with permission and modified for use in this study to help determine if students needed additional training or practice to meet the computer-related requirements of the nursing degree program. This computer literacy survey consists of 40 Likert-type questions measuring four specific dimensions of computer literacy (10 questions in each subscale): General Computer Knowledge (software and hardware), Documents and Documentation (word processing), Data Inquiry (data bases and search engines), and Communication and Surfing (e-mail, computer conferencing, and the Web). Each dimension is scored separately, with higher scores indicating a higher

level of computer literacy. Internal consistency for this sample, as measured by Cronbach's alpha, ranged between 0.89 and 0.64.

Completion of the survey takes 10 to 15 minutes. Potential scores range from 0 to 80 for the overall survey and from 0 to 20 for each of the four subscales. To determine their level of literacy, students answered each question using a 3-point Likert scale: 2 points for "yes," 1 point for "not sure, but likely," and 0 points for "no or unlikely." Students were also told that if they scored 16 points or more for any of the four specific dimensions of computer literacy, they probably had the skill level needed in that specific dimension for this BSN program; but if they scored between 10 and 15, although they had a significant amount of familiarity, they were given the suggestion that it would be beneficial to develop additional computer literacy skills in that specific dimension. If students scored below 10, they were advised to obtain additional training or practice in order to be successful applying those skills in the online education environment.

Procedure

Following approval from the Institutional Review Board, a survey design was used to collect data over a period of 7 years, as each cohort of basic undergraduate students enrolled at the start of their upper-division program in a required course. This computer literacy survey was given at the beginning of that course.

Data Analysis

SPSS 15.0 was used for data analyses. Students were divided into three groups based on the year they were admitted to the nursing program. The first, or early, group was admitted in 1999 and 2000 (n 64); the second, or middle, group was admitted in 2001 and 2002 (n 110); and the third, or most recent, group was admitted from 2003 to 2005 (n 227). These three groups paralleled the progressive integration of Web-enhanced and fully online Web courses during the 7-year period of the study into the program curriculum. In the beginning (early group), only a few courses were Web-enhanced, and no courses were completely online. From 2001 to 2002, more courses were Web-enhanced, and by 2003, when the most recent group was admitted, the faculty had made significant efforts to Web-enhance almost all courses, and basic students had the option to take some courses completely online.

Descriptive statistics were calculated for all demographic and study variables. As a preliminary step, data were first analyzed for normality, skew, and kurtosis as well as assumptions for parametric and nonparametric statistical analysis. Although the distributions of the dependent variable data were similar, the results indicated a negative skew for both the total computer literacy scale and some of the subscales. Results from Kolmogorov–Smironov tests for deviation from normality were small but significant (Pett, 1997). Consequently, the first hypothesis was tested by nonparametric statistics using the Kruskal–Wallace tests and, when appropriate, with post-hoc analysis using Mann–Whitney U tests. Assumptions for using both the Kruskal–Wallace test and Mann–Whitney U tests were met for all the tested hypotheses (Pett, 1997). The last hypothesis was tested using a Mann–Whitney U test. Each of the hypotheses was tested in turn.

Results

The first hypothesis stated that computer literacy levels would increase for each successive group among the three groups of basic undergraduate students admitted to the program over the 7-year period. Results of the Kruskal–Wallace tests and appropriate post-hoc Mann–Whitney U tests supported this hypothesis with significant differences for the Computer Literacy Survey overall ($X^2_{K\text{-}W\ (2,\ N\ 401)}$ 10.00, p .007) and for two of the four computer literacy subscales. The results of the Kruskal–Wallace test for the Communications and Surfing Subscale were $X^2_{K\text{-}W\ (2,\ N\ 401)}$ 13.70 (p .001) and $X^2_{K\text{-}W\ (2,\ N\ 401)}$ 8.42 (p .015) for the Data Inquiry Subscale. Mann–Whitney U post-hoc analyses for these three Kruskal–Wallace results are presented in Table 2.

The second hypothesis stated that computer literacy would vary among all three groups of basic undergraduate students across technological functions, with students having the lowest literacy levels in the data inquiry skill set. Results by group for the overall Computer Literacy Survey, the four subscales, and the individual items that made up each of the four subscales are presented in Tables 3 through 6, which appear at the end of the paper. The third hypothesis stated that the basic undergraduate students who owned computers would be more computer literate than those who did not. This hypothesis was tested by nonparametric statistics using a Mann–Whitney U test. Only 9% of students (33 of 371) who answered this question did not own a computer. Students who did not own a computer received a significantly lower score on the total computer literacy survey than those who did own one (z -4.34, *p* .001).

Discussion

The results indicated that the literacy of students did increase with each successive group of the three basic student groups admitted over the 7-year period, although the difference between groups 2 and 3 was not statistically significant. For the overall computer literacy, Data Inquiry, and Communications and Surfing Subscales, this hypothesis was partially supported with statistically significant post-hoc tests between the early year's group and the middle and most recent year's groups. The only statistically significant difference between the middle and most recent year's groups was for the Data Inquiry Subscale, with the most recent year's group scoring higher.

There were no significant differences between groups on the other two subscales of General Computer Knowledge and Documents and Documentation. Student knowledge was consistent with some areas over time in regard to general computer knowledge and word processing, but the greatest difference in data inquiry may be related to an increase in the number of bibliographic and other databases available and expectations of faculty for students to be able to access and utilize this data. It is not surprising that each successive year-group was more computer literate, as there are more expectations to be familiar with computers in primary and secondary education, and some high schools are requiring an online class for every student, as well as the application of technology within working and home environments. More resources are also available and computer use is prevalent in today's society.

Among all three groups of basic undergraduate students, computer literacy varied across technological functions, with students having the lowest literacy levels in the data inquiry skill set. This hypothesis was supported as students across all year-groups had the lowest scores in the data inquiry skill set and the highest scores in documents and documentation. Across all groups within the subscales, there were eight individual items in which students scored lower than 1.25. For the General Computer Knowledge subscale, the only item was "Do you know what a pathway is and can you find a file with a pathway?" For the Documents and Documentation subscale, the only item was "Do you know how to tell your word processor to paginate?" For the Data Inquiry subscale, there were four items: "Can you explain how the following fit together: file, records, and fields?"; "Have you ever used an electronic clinical information system?"; "Have you ever sorted a database to put the records in a particular order?"; and "Do you know what MESH stands for and how to use them?" For the Communications and Surfing subscale, there were two items: "Have you ever participated in asynchronous computer conferencing?" and "Do you know what SHOUTING is in an email message?" These items are important to emphasize as technical and process/interaction skills, particularly the MESH technique, which had the lowest scores. If students are not aware there is a common classification of subject headings, they will not be able to appropriately retrieve all resources and then sort them accordingly from a bibliographic database. Faculty cannot assume that students have these skills and need to ensure that either students already have these skills or these skills are taught at the outset of their course. Faculty may not realize the difficulties some individual students are experiencing, particularly in online courses because they do not have face-to-face interaction with students.

The third hypothesis that basic undergraduate students who owned computers would be more computer literate than those who did not own computers was supported by statistical analysis; however, there was only a small group of students who did not own a computer. Also, the effect size related to the impact of not owning a computer was relatively small. One reason that the impact was relatively small could be because students have access to computer laboratories at the university, at the public library, through friends and family, or at work. Because university students are required to submit projects and papers using computer software, most of them own their own computers.

Implications

How do you remediate computer skills if you are teaching an online program and you have students who are deficient in computer skills enrolled either on campus or at a distance? Can this be done with or without a computer from campus or at a distance? Do you use the computer itself to teach computer skills? With the advent of computer instant messaging, chats, and video chats, can you teach computer skills online, or should university programs consider providing modular instruction DVDs or Web-based tutorials for teaching computer skills? One finding of this study suggests that you cannot assume that students have all skills or that if they are proficient in some skills, they are proficient in all. There needs to be some assessment of the minimum computer literacy skill level necessary for success in individual courses or the program of study. If your assessment reveals problems, what are the resources that can be provided to remediate these computer skill deficits?

Most university programs assess the computer capabilities of students based solely on computer hardware requirements for taking Web-based courses. Consideration must also be given to the skills related to software, communication in an online Web-based course environment, and to the use of databases, particularly bibliographic databases, which are necessary for success at the university level. An Internet etiquette portion of instruction should also be included with all online courses so that students become familiar with the best ways to communicate online. For example, when all capitalized letters are used in a word, it may come across as if the writer is shouting, when in fact he or she may be just trying to emphasize a point.

In general, outcomes for both face-to-face and online methods of delivery are validated and have parity; however, there is little research on particular skills and identified competencies for students. This research clearly points to the need for further development of skills in data management and data inquiry, especially as the amount of information increases exponentially every year. As noted in the literature review, two of the most significant barriers are technical problems and a low level of technical skills (Muilenber & Berge, 2005). The purpose of technology is to enable distance education, not to create a barrier to it. For this to be the case barriers need to be identified and students need these fundamental skills to be successful.

An assessment of general computer literacy can provide an overall appraisal of computer competency, but it is important to examine the separate dimensions of specific skills within general knowledge, as these are the points on which faculty will need to focus. Certain skills, such as e-mail skills or knowledge of fonts, are consistently high and do not need further attention. Our study supported Kirkwood's (2006) findings about students' mastery of word processing skills. Some platforms for online learning guide the student and are easy and intuitive to use. Students will often be able to perform well within these environments until they need to supplement their learning with a search in a database, which is not as intuitive. Students then need support to access various ways of searching for credible, relevant, and timely sources, whether they be journal articles, data, or other resources. This finding also supports Kirkwood's study, which indicated that almost two thirds of the surveyed students needed better online database search skills.

Very few educators question the importance of computer literacy for success in today's educational system, but results from this and other studies suggest that faculty and administrators cannot assume that their students are computer literate across all of the areas required for academic success. The assessment of skills needs to be systematic and methodical, and it should occur at the beginning of an educational program to best facilitate student success. As computer literacy is related to student satisfaction (Du, 2004), assessment of skills will allow students to know that they have the skills necessary to navigate either on campus or within distance education program expectations. When assessment of computer skills indicates a deficit, academic programs need to provide options for remediation so the use of technology becomes an enabler for education and not a barrier to learning.

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Table 1. Number of BSN Students by Year and Percentage of Sample

ear Group	N
1999	35 (8.6)
2000	29 (7.1)
2001	48 (11.8)
2002	62 (15.2)
2003	31 (7.6)
2004	153 (37.6)
2005	43 (10.6)

The numbers for 2004 are higher because of increased enrollment and students from both semesters participated. All other cohorts only had students from one semester participate during the year.

Table 2. Comparison of Year-Groups for Overall Computer Literacy and Two Subscales

Group	Comparison	Mann–Whitney z statistic	Test of significance
Overall Computer Literacy			
1 vs. 2	Early vs. middle	-1.85	.05
1 vs. 3	Early vs. most recent	-3.02	.002
2 vs. 3	Middle vs. most recent	-14.75	ns
Communication and Surfing Subscale			
1 vs. 2	Early vs. middle	-2.951	.003
1 vs. 3	Early vs. most recent	-3.66	.000
2 vs. 3	Middle vs. most recent	-.45	ns
Data In uiry Subscale			
1 vs. 2	Early vs. middle	-2.67	.008
1 vs. 3	Early vs. most recent	-2.72	.007
2 vs. 3	Middle vs. most recent	-1.9	.05

ote: Group 1 indicates the 1999-2000 group (early years; n 63), Group 2 indicates the 2001-2002 group (middle years; n 108), and Group 3 indicates the 2003-2005 group (most recent years; n 225); ns not significant.

Table 3. Results by Group for the uestions in the General Computer Knowledge Subscale

	Group 1999-2000 Mean (SD)	**Group** 2001-2002 Mean (SD)	**Group** 2003-2005 Mean (SD)
Can you name one input device and one output device?	1.28 (.73) n 61	1.36 (.74) n 108	1.41 (.73) n 225
Do you know what RAM stands for and how much RAM your computer has?	1.32 (.68) n 60	1.20 (.74) n 107	1.14 (.80) n 224
Do you know what an “icon” is and what to do with it?	1.93 (.31) n 60	1.98 (.14) n 107	2.0 (.07) n 224
Do you know how to use a mouse to “drag” an item?	1.93 (.35) n 61	1.88 (.32) n 108	1.97 (.16) n 225
Do you know the acceptable form for a filename?	1.42 (.74) n 60	1.44 (.68) n 107	1.49 (.70) n 224
Do you know what a pathway is and can you find a file with a pathway?	1.12 (.80) n 60	1.06 (.79) n 107	1.21 (.81) n 224
Do you know what a modem is used for?	1.78 (.52) n 60	1.86 (.38) n 107	1.83 (.44) n 224
Do you know how to reboot your computer?	1.49 (.84) n 61	1.67 (.61) n 108	1.81 (.50) n 225
Can you find the command line on a Windows program screen?	1.52 (.65) n 61	1.54 (.62) n 108	1.49 (.69) n 225
Do you know how to open up more than one program at a time in Windows and move quickly between them?	1.46 (.71) n 61	1.84 (.48) n 108	1.81 (.49) n 225
Total Scale Score for General Computer Knowledge	15.76 (3.42) *n* 62	16.25 (2.31) *n* 110	16.27 (2.91) *n* 227

Table 4. Results by Group for the uestions in the Documents and Documentation Subscale

	Group 1999-2000 Mean (SD)	**Group** 2001-2002 Mean (SD)	**Group** 2003-2005 Mean (SD)
Do you know what font or typeface is?	1.98 (.13) n 60		1.99 (.15) n 224
Do you how to right and left justify a document?	1.59 (.77) n 61	1.77 (.57) n 108	1.56 (.73) n 225
Do you know how to cut and paste a block of text?	1.56 (.78) n 61	1.77 (.61) n 108	1.77 (.55) n 225
Do you know how to use a mouse to “drag” a block of text?	1.68 (.57) n 61	1.60 (.69) n 108	1.69 (.62) n 225
Do you know how to reset margins in your word processor?	1.46 (.74) n 61	1.67 (.64) n 108	1.50 (.73) n 225
Do you know the difference between “Insert” and “Typeover”?	1.77 (.62) n 60	1.76 (.55) n 107	1.73 (.59) n 224
Do you know what the clipboard does?	1.27 (.82) n 60	1.42 (.75) n 107	1.49 (.71) n 224
Do you know how to tell your word processor to paginate?	.78 (.91) n 61	.98 (.91) n 108	.71 (.81) n 225
Can you use a spell checker?	1.97 (.26) n 61	1.98 (.14) n 108	2.0 (.07) n 225
Do you know how to create a page break?	1.0 (.89) n 61	1.12 (.96) n 108	1.33 (.84) n 225
Total Scale Score for Documents and Documentation Skills	16.94 (3.10) *n* 64	17.22 (2.28) *n* 110	17.41 (2.42) *n* 227

Table 5. Results by Group for the uestions in the Data Inquiry (Databases and Search Engines) Subscale

	Group 1999-2000 Mean (SD)	**Group** 2001-2002 Mean (SD)	**Group** 2003-2005 Mean (SD)
In a database do you know what a record is?	1.32 (.85) n 60	1.24 (.73) n 107	1.33 (.73) n 224
Can you explain how the following fit together: file, records, and fields?	1.10 (.83) n 61	.94 (.76) n 109	.97 (.75) n 226
Have your ever searched an electronic library catalog?	1.52 (.78) n 62	1.73 (.65) n 107	1.83 (.55) n 224
Have you ever used an electronic clinical information system?	.63 (.84) n 60	.84 (.87) n 107	.80 (.90) n 224
Have you ever used a personal database such as a computerized address list?	1.29 (.88) n 62	1.44 (.86) n 107	1.54 (.79) n 224
Have you ever searched a database for a particular item?	1.63 (.68) n 62	1.85 (.47) n 107	1.89 (.39) n 224
Have you ever sorted a database to put the records in a particular order?	1.03 (.91) n 62	.96 (.89) n 107	1.25 (.87) n 224
Do you know what difference “AND” or “OR” would make in combining the results of two searches?	1.50 (.77) n 60	1.73 (.58) n 107	1.79 (.55) n 224
Have you ever used a “search engine” (i.e., Yahoo, Infoseek, Medline, CINAHL)?	1.87 (.46) n 62	1.96 (.27) n 107	2.0 (.07) n 224
Do you know what MESH stands for and how to use them?	.18 (.47) n 60	.20 (.40) n 107	.16 (.41) n 224
Total Scale Score for Data Inquiry (Databases and Search Engines) Skills	11.98 (4.22) *n* 63	12.85 (3.52) *n* 109	13.58 (3.16) *n* 226

Table 6. Results by Group for the uestions in the Communications and Surfing Subscale

	Group 1999-2000 Mean (SD)	**Group** 2001-2002 Mean (SD)	**Group** 2003-2005 Mean (SD)
Do you have an e-mail address?	1.93 (.31) n 61	1.95 (.30) n 108	1.98 (.19) n 225
Do you have an Internet provider for your home or office computer?	1.54 (.81) n 61	1.81 (.59) n 108	1.89 (.43) n 225
Have you ever subscribed to a listserv?	1.15 (.96) n 62	1.77 (.59) n 107	1.63 (.75) n 224
Have you ever used a browser like Netscape or Internet Explorer to visit the World Wide Web?	1.97 (.25) n 62		1.94 (.35) n 224
Have you ever participated in asynchronous computer conferencing?	.37 (.68) n 62	.51 (.82) n 107	.51 (.82) n 224
Do you use e-mail regularly?	1.68 (.70) n 62	1.95 (.25) n 107	1.93 (.35) n 224
Do you know what SHOUTING is in an e-mail message?	.75 (.93) n 60	.92 (.93) n 107	1.11 (.92) n 224
Can you locate three major search engines on the Web?	1.59 (.76) n 61	1.93 (.30) n 108	1.86 (.46) n 225
Do you know what an electronic “bookmark” is and how to create one?	1.40 (.85) n 60	1.56 (.76) n 107	1.63 (.70) n 224
Have you ever participated in an online chat session?	1.47 (.86) n 62	1.42 (.87) n 107	1.57 (.78) n 224
Total Scale Score for Communications and Surfing Skills	13.71 (4.42) *n* 63	15.91 (2.53) *n* 108	16.04 (2.49) *n* 225

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ersistence in Online Classes: A Study of erceptions among Community College Sta eholders

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Abstract

Because online learning presents unique challenges for not only learners but faculty and administrators as well, those involved in these cyber-environments must think beyond the boundaries of the traditional classroom. This study examined the perceptions of online persistence factors, those characteristics which influence student retention, as seen by the three major stakeholders in community college distance education programs: administrators, faculty, and students. The purpose of the study was to determine which factors are most important among the three groups and where those perceptions converge since lack of convergence could be a factor resulting in high attrition rates of some online courses. While the results of this study indicated that the perceptions of administrators and faculty are more closely aligned than either is with the students' perceptions, they also show a recognition among all groups of stakeholders of online learning as an evolving phenomenon which requires attention to even the most minute details which are sometimes overlooked, not emphasized, or taken for granted. This recognition indicates a necessary paradigm shift, which will lead to improvements in online learning policy, design, and pedagogy, is in the making.

Keywords: online learning, retention, attrition, online learning communities, adult learners

Introduction

Online learning is an option which allows students greater flexibility in building a course schedule that caters to their lifestyles. This is especially beneficial to those adult community college students trying to successfully integrate educational pursuits into lives already busy with work and family responsibilities. Although online learning can provide an attractive option for these adult learners hoping to pursue higher education, it is not necessarily a panacea for every challenge confronting these learners. Despite astronomical growth in the past decade, distance education programs see many casualties when large numbers of students register for online courses with no concept of what the experience will entail (Bathe, 2001; Hill & Raven, 2000; Moore, Bartkovich, Fetzner, & Ison, 2002; O'Brien & Renner, 2002, Stover, 2005). Various studies which examined student retention in distance education programs (Dahl, 2004; Nesler, 1999; Valasek, 2001) agree that student attrition is a huge issue in online learning, and each study offers proactive measures from learning communities to technology awareness as methods to increase retention in online courses.

Online learning can resemble a virtual "field of dreams" where officials believe that "if you build, it they will come." Institutions take an aggressive stance toward building online programs by making available a large number of online courses to attract students into the college. Of the large numbers of students who register for online courses, many end up withdrawing from the course formally, or informally through lack of participation, or they may continue and receive less than desired results. As such, a huge investment is made in technology, but little in comparison is made in the human stock when lack of attention to traditional course management issues such as learning styles, individual differences of students,

selection of appropriate course activities and materials, and proper training for online faculty and students (Bass & Ritting, n. d.; Bates & Poole, 2003; Conrad & Donaldson, 2004; Franklin, 2001; O'Brien & Renner, 2002) fails to consider online pedagogy and the students who are to benefit. Retention rates, however, directly relate to how well the courses and facilitators meet the needs of the learners enrolled in these courses. Palloff and Pratt (2003) contend that online programs which are designed around the learner tend to offer more quality which, in turn, increases learner satisfaction. If learners are satisfied with the results of their online experience, they are more likely to stay in the course.

Online learning presents unique challenges for not only the learners but the faculty and administrators as well. Those responsible for making decisions regarding, designing, facilitating, and even learning in these cyber-environments must stretch themselves to think beyond the limitations of the traditional classroom. The purpose of this study was to determine what factors community college administrators, faculty, and students perceive as important in influencing student persistence in community college online learning programs. The study was a descriptive one which compared the perceptions through these different lenses to reveal which perceptions are held in common among the stakeholder groups and where those perceptions diverge.

Review of the Literature

Persistence in a college or an individual course requires commitment on the part of the student; the student's level of commitment is directly influenced by a person-environment fit. Tinto's (1993) Student Integration Model describes student attrition as a result of the lack of social and academic integration into the college or university community. This idea reasonably suggests that when students feel comfortable within the social and academic milieus of the college, they are more likely to stay. Community colleges fall victim to overall student attrition at a higher rate than 4-year institutions (Tinto, 1993), and distance education courses see a larger number of students who fail to persist than traditional courses (Bathe, 2001; Moore et al., 2002; Stover, 2005). Online dropout rates have traditionally ranged from 30 to 50 percent (Hill & Raven, 2000; Moore et al., 2002; O'Brien & Renner, 2002). Reasons for this attrition coincide with those of traditional students who cite "personal problems, financial problems, changes in work schedule, and teacher-related concerns" (Moore et al., 2002, p. 6). Studies also indicate that a lack of personal interaction and support are major reasons for online student attrition (Moore & Kearsley, 1996; Moore et al., 2002). In addition, many students enroll in online courses with the misconception that these courses are less challenging than traditional courses or with other mistaken expectations such as the idea that working at one's own pace means due dates and deadlines are nonexistent (Burnett, 2001; Moore et al., 2002; Tait, 2004). The realities of virtual learning often overwhelm many of these students who ultimately become attrition statistics.

Online Learning Communities

Building community online is a crucial characteristic for influencing presistence. Palloff and Pratt (1999) characterize an online community as one which contains active interaction involving content and personal communication between students and the instructor. Students and faculty share ideas, information, and resources while at the same time they offer support and encouragement along with constructive critical evaluations of each other's work. Online learning communities can also provide a student-centered learning environment, develop critical thinking skills, and provide expanded connections to specialists, faculty, and students around the world, thus extending phenomenally the boundaries of the traditional classroom (Alexander, 1999; Milheim, 2001). Likewise, in the absence of a physical connection to an institution, virtual learning communities allow students an opportunity to make connections with the institution, other learners, and course content in a supportive environment. Persistence rates are higher for students who are involved in learning communities than for those who are not a part of such an environment (Santovec, 2004).

Access to an electronic learning environment, however, does not guarantee community. A learning community develops when the participants recognize their shared goals and responsibilities and commit to working toward realization of those goals (Palloff & Pratt, 1999). Facilitators in online courses (just as in the traditional face-to-face course) must use a variety of methods and techniques to foster this sense of shared community in an environment in which the primary mode of communication is text-based. Lock (2003) asserts that establishing online learning communities encompasses more than the selection

and use of technology:

> Attention ought to be directed to ways in which online learning environments accommodate the social and psychological needs of people who come together virtually to learn. Nurturing the creation of a learning community is not only about changing practices and routines; it is about changing how we empower learners within an online community. (p.1)

Therefore, educators need to re-examine learning styles theories and methods of assessments which will move the focus from teaching to the facilitation of learning (Hart, 2001). A shift in focus from the "technical to [the] social aspect" (Chen, 2004, Introduction) of online learning is also necessary as interaction is touted as a mainstay of meaningful learning.

A ew Paradigm

A most important issue in online teaching and learning is shifting the paradigm from the traditional teacher-centered approaches which have dominated instructional practices of the past. Although the instructor is still the content expert in a virtual environment, students in an online community must assume responsibility for managing their own learning experiences (Bathe, 2001; Conrad & Donaldson, 2004). Many faculty, however, are reluctant to give up their control in the courses they teach, and many learners are reluctant to take a more independent role in their learning.

Role of the instructor.

For maximum effectiveness, the one-size-fits all approach should not reflect the online learning experience. Thus, online facilitators are faced with challenges unique to the online learning environment. Like the face-to-face instructors, they must establish relationships with their students, determine their needs, and develop a teaching style which fits those needs; however, they must do so without any face-to-face contact (Bass & Ritting, n. d.). In addition, online facilitators must be aware that their students are adult learners who bring with them a number of other issues requiring their time and attention. Recognition of and attention to these factors contributes to increased student satisfaction which, in turn, yields higher persistence rates.

Designing a course and implementing a program of study conducive to the online environment while providing meaningful learning experiences is a special challenge for the online instructor. Technical considerations, including skills of the instructor and the learner, availability and accessibility of technology, and the level of technical support available are issues which combine with content presentation, classroom interaction, and the time required to develop and facilitate such a course are all aspects which require attention. Conrad and Donaldson (2004) posit that designing an online course is much like designing a face-to-face one in that the main objective is to fulfill the learning outcome: "an activity that does not contribute to a learning outcome only adds confusion to the course and risks learner dissatisfaction at having to do an unnecessary activity" (p. 17). Posting of extensive lecture notes which mirror the textbook presentations, PowerPoint outlines used for classroom presentations, and "busy work" are all ill-advised techniques for retaining students in an online learning environment (O'Brien & Renner, 2002). Faculty in an online learning program must learn how to be effective instructors in this medium, and administrators must make available the necessary provisions to help these faculty (Inman, Kerwin, & Mayes, 1999).

Role of the learner.

Engaged learning is a prerequisite for an effective learning community. Engaged learning includes students establishing their own learning goals, working together in groups, and exploring appropriate resources to answer meaningful questions; tasks that are multidisciplinary and authentic, with connections to the real world; assessment that is ongoing and performance-based; and products that are shared with an audience beyond the classroom (Jones, Valdez, Nowakowski, & Rasmussen, 1994). Students are also expected to share in decision making and assessment and evaluation of themselves, the instructor, and the course. "When a student is engaged on an individual level and his/her ideas are validated before the group, the student is made to feel like a part of a community where his/her opinion is sought or valued" (Franklin, 2001, Designing Successful Communities section, para. 5). This method of engaged learning equips students to achieve a level of comfort in the online environment and ultimately to step out of their traditional passive roles and become active co-learners with fellow students and the

facilitator.

Social Constructivism
Many instructors adopt a learning-centered pedagogy using a social constructivist approach in which students learn new knowledge by assimilating information, relating it to existing knowledge, and reflecting on it. For constructivists, reflection and discussion are key activities through which knowledge is gained. The asynchronous nature of online classes allows for and encourages such reflection. The inherent anonymity and safety of the online learning platform combined with the ability to take time to ponder ideas and reflect before posting enables many online learners to contribute more readily than in the traditional learning environment (Chen, 2004; Howard, 2003).

Critical Reflection and Transformative earning
Critical reflection can be defined as a process by which an individual carefully and objectively examines his or her behaviors in a given situation. Palloff and Pratt (1999) point out that the very nature of online learning presents disorienting dilemmas and psychic distortions which cause the participants to examine their pre-existing beliefs and behaviors. Although unaware of their transformation, they are approaching learning through a new medium which is very different from the traditional venue of classroom instruction. Becoming accustomed to new technology as a dominant means of communication and instruction presents another nontraditional aspect of their learning environment. Perhaps the most transforming component of their experience is the reliance upon self and other learners as opposed to the traditional view of the instructor as the authority or expert. Learners who are unable to reconcile themselves to this new medium become casualties of virtual learning environments; in contrast, those who are able to find an appropriate fit with their educational objectives and abilities persist.

Climate of the Online Learning Community

Learners are better able to form online communities when they feel comfortable within the learning environment. This comfort can result from a number of activities and sources including comfort with the technology, clear expectations established from the beginning, and an opportunity to share ideas in a non-threatening environment where every voice is important.

> Students must feel free to take risks and challenge assumptions. Without this level of comfort . . . they will be reticent to dispute ideas and stretch their thinking. They will also find the learning experience very isolating and many will retreat to the comforts of a classroom setting or be lost to continuing education entirely. (O'Brien & Renner, 2002, para. 2)

Faculty who are sensitive to their online students can detect cues, such as “decreased activity level, diminished quality, and delayed responses” (O’Brien & Renner, 2002, Course Design section), which may indicate frustrations with the learning environment and other issues related to this type of learning. At this point, faculty should communicate with the student to determine a reason for the change in behavior and try to arrive at a resolution which may involve a behavior modification on the part of the student, the instructor, or both.

Students who become overwhelmed because of mounting issues which are unresolved tend to drop out of their online courses (Gaide, 2004). This is frequently the result of students entering the online learning environment without an accurate assessment of what the venture entails. Online students need clear expectations about course objectives, requirements, and policies communicated from the start (Gaide, 2004; Lorenzetti, 2005a; Lorenzetti, 2005b). Therefore, feedback from the instructor is an important retention factor by helping to develop a connection between the faculty and the student. Such feedback is automatically delayed in an asynchronous environment, but the instructor should make every effort to respond in a timely manner and in a tone which demonstrates warmth and caring (O’Brien & Renner, 2002). Effective online learning communities can be characterized by four critical components: interaction, communication, participation, and collaboration.

Interaction
Isolation or lack of connectedness has been cited (Bathe, 2001; Stark & Warren, 1999) as a major threat to student persistence in online courses. Students report feelings of not being a part of an institution or an attitude of “out-of-sight out-of-mind” which leads them to direct their attentions to more immediate and tangible concerns (Stark & Warren, 1999). The online instructor can even fall victim to the latter when

attentions are constantly divided among a variety of responsibilities: "a name without a face is easier to *not* get involved with" (Stark & Warren, 1999, p. 395). However, an ideal online learning environment is highly interactive with all participants consistently involved with content, the facilitator, and each other. Online facilitators who consider the students' need for the human touch and the importance of an interactive course create learning environments which promote connectedness and meaningful learning thereby leading to higher student persistence rates.

Communication
Effective online communication is that in which faculty and students recognize that they are each a vital part of a learning community in which interaction is not only appropriate but necessary for the attainment of individual and shared goals. "Communication is the brick and mortar of virtual communities, and communities only exist as long as communication is available to participants" (Schweir, 2000, Whither Virtual section, para. 6). Effective communication includes thoughtful discussion and feedback among learners and the instructor/facilitator.

Participation
In order to promote interactivity and participation, it is important that the instructor is clear about how much time the course will require of both students and faculty in order to eliminate potential misunderstandings about course demands. The instructor also needs to teach students about online learning, be a good model of good participation by logging on often and contributing to the discussion and community formation, be willing to step in and set limits if participation wanes or if the conversation is headed in the wrong direction, and remember that there are people attached to the words on the screen (Palloff & Pratt, 2003). Palloff and Pratt further assert that facilitators should establish minimum posting requirements and monitor those for compliance, grade on participation, post grading rubrics that establish guidelines for acceptable participation and posting, and use collaborative assignments and evaluate them collaboratively.

Collaboration
Collaboration in an online course involves anything from threaded discussions, chat sessions, and paired activities to small group activities. Collaboration allows students to become more involved in the learning process, and this involvement leads to greater subject matter comprehension. Not only does this type of environment and activity mimic the type of group processes which will be found in the workplace, it also promotes desirable interpersonal skills and allows students to connect with each other (Burnett, 2001).

arriers to ersistence

Many factors ranging from academic aptitude, pedagogy, and curriculum to financial factors, grade-point average, and family backgrounds influence student persistence in online courses (Stover, 2005). Clearly, students who opt to take online courses have issues beyond the actual learning environment which need attention. These include access to student support services such as advising, registration, counseling, financial aid, and bookstore and library services (Bathe, 2001; Dahl, 2004; Milheim, 2001). All these and other factors can be categorized into one of four major barriers to student persistence:

1. Situational barriers are those which occur as the result of changes in the social, economic, or personal life of the student. They include such issues as transportation, age, time constraints, family support, or family responsibilities over which the institution has no control (Cross, 1981; Lorenzetti, 2004).

2. Conversely, institutional barriers result from difficulties with college programs, policies, and procedures; these include issues with admissions, registration, class schedules, financial aid, and other support services over which the institution does have some control (Cross, 1981; Lorenzetti, 2004). Institutional barriers emphasize the need for an institutional support system that can be accessed online (Dahl, 2004).

3. Dispositional barriers result from an individual's personal background, and which include issues such as attitude, motivation, learning styles, and self-confidence (Cross, 1981; Lorenzetti, 2004).

4. Epistemological barriers result from problems with academic or institutional matters such as course content, prerequisite knowledge, and expectations (Lorenzetti, 2004; Moore, et al, 2002).

Many of these barriers can be overcome by training for all persons involved. Faculty and administrators should be trained in effective design and implementation of online courses, and students should be trained in the concepts and ideology underlying online learning (Lorenzetti, 2004).

Student Motivation

Motivation is an extremely important characteristic for any student but particularly the online learner. These students must utilize a different level of initiative and self-discipline that students in traditional classes may not possess. Without this, many of them would be destined for failure because the impetus to log into the course, read, and submit assignments may not be forthcoming without that little nudge from the "authority" figure.

Since many community college learners are working adults who have families and who may not have attended college for many years, they may present with what Brookfield (1995) calls "imposter syndrome." They feel inadequate to do what is required of them, and they think that everyone else (but them) knows what they are supposed to be doing. These students want to avoid failure, and they need reassurance that they still can learn. "Adults are much less open to trial-and-error approaches than children are. Many adult learners will resist trying something new if it involves the risk of making an error and feeling foolish as a result" (Stilborne & Williams, 1996, Dispositional Barrier section). In an online environment, the syllabus and course outline should be supplemented with a detailed description of every task that must be completed. It is also important to make first assignments such that every student can be successful. Timely feedback on first assignment submissions is an essential retention tool. Such feedback gives students a glimpse of what to expect in future assessments and an opportunity to decide whether to persist or not (Tait, 2004).

This study examined the perceptions of online persistence factors as seen by the three major stakeholders in community college distance education programs. The purpose of the study was to determine which factors are most important among the three groups and where those perceptions converge since lack of convergence could be a factor resulting in high attrition rates of some online courses. Consensus of these indicators calls attention to those areas which should be emphasized in online teaching and learning. Likewise, a lack of convergence on major issues related to online learning reveals possible reasons for high attrition rates in distance education courses and provides significant insight into improving the quality of online learning and increasing retention rates among online learners.

Methodology

The research methodology was a modification of the Delphi technique, which is a consensus-reaching process designed for non-interacting expert groups whose geographical locations, status differences, or opposing viewpoints of the members make it difficult for the members to physically assemble (Andranovich, 1995). The modified Delphi used three separate groups of participants who represented the various levels of stakeholders in online learning to compose the panel. Although participants could respond to information originating within their respective groups, all participants remained anonymous to each other.

Potential panelists who met the criteria for participation volunteered for the study by completing an online questionnaire. Thirty-nine volunteers from 10 community colleges in Alabama met eligibility requirements to participate as a member of the administrator, faculty, or student Delphi group. All of the faculty and student panelists had completed at least one semester of instruction or learning, respectively, in an online course, and administrator panelists had at least one semester's experience of oversight in some aspect of online learning as self-reported on the Preliminary uestionnaire.

Design of the Study

The study was conducted over a 6-8 week period from July 2006 through September 2006 through a series of questionnaires communicated via an online survey website. The study included three rounds of data collection and a resolution round in which panelists were provided the results of the Round 3 responses. Panelists were notified by e-mail of the availability of each round's questionnaire. Each questionnaire was available for 10 days during which panelists had an opportunity to reflect, to evaluate their ideas and those of fellow panelists, formulate any new ideas, and share their views.

Results

The initial question was an open-ended one in which panelists were asked to list factors which they perceived to support student persistence in a community college online course. They were not asked to rank those items during Round 1. At the end of the 10-day period, the researcher compiled a comprehensive list for each group of all factors submitted by the panelists in that group.

Round 1 Results
Administrators generated 49 factors and statements pertaining to online student retention. Those 49 statements were reviewed, coded, and summarized into 20 themes. Faculty panelists generated 72 factors and statements which were summarized into 25 themes, and student panelists generated 44 factors and statements which were summarized into 16 themes. All themes generated during Round 1 are shown in Table 1. In order to establish consistency, when possible, themes from each group were matched as closely as possible to emerging themes developed from the administrators' responses. This was done only if no risk of compromising the integrity of the responses existed. These themes were then used to develop the Round 2 survey instrument. Although Table 1 shows the frequency with which each factor was mentioned during the Round 1 data collection, factors were presented in random order in Round 2.

Round 2 Results
During the second round, panelists were asked to rate those factors that they perceived most important in supporting persistence in a community college online course by using a five-point Likert-type scale: *1 ot Important, 2 Somewhat Important, 3 Important, Very Important, 5 eutral*. Those factors were identified by calculating the frequency with which each panelist rated a factor as *Very Important, Important,* and *Somewhat Important*. Administrators identified 11 of the 20 factors produced during Round 1 as important; faculty identified 10 of their 25, and students identified 10 of their 16 factors (see Table 2).

Round 3 Results
The third round questionnaire presented the lists of top 10 indicators and asked panelists to indicate their rank preferences. The factor receiving the highest rating in the Round 2 survey was placed in the number 1 position, and the factor receiving the lowest rating was placed in the number 10 position as shown in Table 2. Panelists were asked to rank each item from 1 to 10 to indicate the level of importance of each of the factors in contributing to student retention in online courses. The most important factor received a ranking of 1, and the least important factor was ranked 10.

In order to determine the rank order of factors in the Round 3 survey, the researcher tabulated only the top 5 totals for each factor. The frequency with which each factor received a particular ranking between 1 and 5 was tallied to determine how many panelists indicated that that factor should be listed among the top 5 of the 10 factors listed. Table 3 shows the rankings of each of the top ten factors as indicated by each group.

In the administrators' group, Time Management, Instructors, and Convenience/Flexibility received high rankings from those who ranked these factors as important at any level from 1 to 10; however, not all panelists ranked these factors as important at any level. Eight of the nine panelists ranked Time Management; 7 of the 9 panelists ranked Instructors as important, and 7 of the 9 panelists ranked Convenience/Flexibility as important using the 1 to 10 scale. Therefore, these factors were not ranked as high as those receiving a ranking from 100 percent of the panelists. User-Friendly Format received the lowest ranking and was dropped from the list.

Summary

Sixteen variant factors emerged from the responses of the three groups. Of those 16 factors, three appeared in all of the groups' top 10 lists. Six factors appeared in two of the groups' top 10 lists, and the remaining seven factors appeared in one group's top 10 list (see Table 4). Table 4 also indicates the ranking of each factor by group of stakeholders.

Table 1. *Themes Emerging from Round 1 uestionnaire*

Administrators	Faculty	Students
Convenience/Flexibility (8)	Student-teacher interaction/ Prompt feedback (15)	Convenience/Flexibility (12)
Responsiveness of Instructor/ Prompt Feedback (7)	User-friendly format (7)	Independent learning/ Responsibility (5)
Self-motivation (5)	Clearly-stated requirements (6)	Course design (4)
User-friendly format (4)	Discussion (6)	Discussion/Interaction (3)
Course design (3)	Self-motivation (4)	Time management (3)
Collaboration (3)	Course design (4)	Personal contact (3)
Time management (3)	Computer access (4)	User-friendly format (2)
Computer access (2)	Computer skills (3)	Clearly-stated requirements (2)
Self-discipline (2)	Discipline (3)	Technical support (2)
Instructors (2)	Subject-matter knowledge (2)	Personal issues (2)
Availability of courses (1)	Instructor (2)	Less class interaction (1)
Dedication (1)	Lack of personal contact (1)	Computer skills (1)
Basic computer skills (1)	Cheat-ability (1)	Accessibility (1)
Organization (1)	Textbook (1)	Less difficult coursework (1)
Clearly-stated requirements (1)	I (1)	Efficiency (1)
Value (1)	Perception of course difficulty level (1)	
Communication/ Writing skills (1)	Flexibility (1)	
Computer support tools (1)	Alternative means of contact (1)	
Difficulty level (1)	Reliable server and support network (1)	
	Outside assistance (1)	
	Control (1)	
	Value (1)	
	Time (1)	

Table 2. *Round 2 Most Important Retention actors*

Administrators	Faculty	Students
Responsiveness of Instructor	Motivation	Convenience/Flexibility
Self-discipline	Student-teacher interaction/ Prompt feedback	Clearly-stated requirements
Time management	Clearly-stated requirements	Technical support
Clearly-stated requirements	User-friendly	Course design
Convenience/ Flexibility	Outside assistance	Independent learning/Responsibility
Self-motivation	Time	User-friendly format
Basic computer skills	Discipline	Accessibility
Reading ability	Reliable server & support network	Personal contact
User-friendly format	Computer skills	Discussion/Interaction

Table 3. *Round 3 Top 10 Retention actors*

Ran	Administrators	Faculty	Students
1	Self-discipline	Self-motivation	Convenience/Flexibility
2	Responsiveness of instructor/Prompt feedback	Clearly-stated requirements	Time management
3	Self-motivation	Student-teacher interaction	Clearly-stated requirements
4	Computer access	Computer access	Independent learning/ Responsibility
5	Basic computer skills	User-friendly format	Technical support
6	Clearly-stated requirements	Discipline	Course design
7	Reading ability	Computer skills	Accessibility
8	Time management (-1)	Outside assistance	Personal contact
9	Instructors (-2)	Reliable server	Discussion/Interaction
10	Convenience/Flexibility	Time	User-friendly format

Table 4. *Comparison of Stakeholders Top 10 actors*

Factors	Administrators	Faculty	Students
Computer access/ Accessibility	X (4)	X (4)	X (7)
Clearly-stated requirements	X (6)	X (2)	X (3)
Time management	X (8)	X(10)	X (2)
Self-discipline	X (1)	X(6)	
Responsiveness of Instructor/ Prompt feedback/ Student-teacher interaction	X (2)	X (3)	
Self-motivation	X (3)	X (1)	
Basic computer skills	X (5)	X (7)	
Convenience/Flexibility	X(10)		X (1)
User-friendly format	X (5)	X (10)	
Reading ability	X (7)		
Instructors	X (8)		
Outside assistance		X (8)	
Reliable server		X (9)	
Independent learning/ Responsibility			X(4)
Technical support			X (5)
Course design			X (6)
Personal contact			X (8)

Discussion

This study focused on three questions concerning persistence factors for students in online courses.

uestion 1: hat indicators influence student persistence in a community college online course according to internal stakeholders, and what importance do the stakeholders place on each of the indicators

The administrators' ranking of Self-Discipline as the most important factor along with Self-Motivation, Computer Access, and Basic Computer Skills as subsequent important factors suggests that administrators value highly the learner's role and responsibility in completing an online course. The top five factors for faculty suggest combined responsibility on the parts of the learner and the instructor for creating and maintaining a positive online learning experience. It is not surprising that Convenience/Flexibility and Time Management would be the most important factors in a learner's decision to enroll in and complete an online course. These factors represent foundational issues of the online learning phenomenon to make education more accessible for students who previously may not

have had such an opportunity and to expand those opportunities beyond the boundaries of the traditional classroom (Burnett, 2001; Milheim, 2001).

uestion 2: hat are the areas of consensus among the perceptions of the three stakeholder groups by role administrators, faculty, and students in identifying indicators that support student persistence

Computer Access/Accessibility, Clearly-Stated Requirements, and Time Management are the factors which all three groups of stakeholders indicated important in supporting student persistence in online courses. These are all practical considerations which address the students' ability to access the course and fulfill the requirements necessary for successful course completion. Therefore, the absence of these factors can create situational and epistemological barriers (Cross, 1981; Lorenzetti, 2004; Moore, et al., 2002) to student persistence.

uestion 3: hat are the areas of difference among the perceptions of the three stakeholder groups by role administrators, faculty, and students in identifying indicators that support student persistence

Eight factors appeared in only one group's Round 3 list of top ten factors. The ability of the students to read and comprehend adequately in a text-based medium and the need for instructors who are knowledgeable in their content and proficient with the technology were areas of concern for only the administrators. Likewise, only faculty expressed a need for students to have access to people outside of the class who can serve as resources for them. In addition, faculty emphasized the need for the institution to commit the financial, technological, and personnel resources to maintain a reliable network. This is different from the students' concern that adequate technical support be available to assist with technology questions and problems which arise. This is a natural concern for students who may feel alone and frustrated in cyberspace during non-business hours. It is surprising that faculty did not indicate this issue as a concern since they as course instructors are the primary recipients of technical questions and complaints. While a Reliable Server and Technical Support are not synonymous factors, they do reflect a valid concern for technological issues which directly impact students' ability to successfully participate in an online course. Where such difficulties exist, students are less likely to persist. Only the student group indicated Course Design as a factor influencing student persistence. This included primarily a concern for the number and types of activities and assignments included in the online courses. Also, only the students indicated a possible need for some type of personal contact (i.e., personal conference or telephone conference) with the instructor in an otherwise totally online environment.

Conclusion

Based on the results of this study, the administrators' and faculty's ideas about factors which influence student persistence in online courses are closely aligned while the students' factors present a different perspective. These are not surprising results since the ideas of the administrators and faculty develop from an institutional/instructional perspective, and those of the students emerge from a more personal perspective of convenience and practicality. Since students take online courses mainly for the sake of convenience instead of the academic experience alone, when situational barriers arise which affect their ability to successfully integrate educational pursuits with personal obligations, their priorities tend toward the personal.

From an instructional standpoint, each course offers a unique learning experience in which students are expected to participate at maximum level to derive maximum benefits. This means that self-discipline, self-motivation, adequate time, appropriate technology, and adequate technological skills are all required commitments to the learning process. Therefore, when a student enrolls in an online course, there is the presumption that such a commitment has been made. To the students, however, each course represents an advance toward an overall goal whether it be a degree, a career advancement, or other form of self-fulfillment. The online course is merely a vehicle of convenience which best fits with the students' lifestyles. While some students may strive to excel in their courses, other life challenges equal that of or take priority over academic coursework. When these differences in perspectives collide, persistence issues can result. Community colleges offer online courses with the understanding that convenience and flexibility are attractive drawing points. The level of flexibility, however, varies with each course, and rarely is a course designed around the convenience/flexibility factor. Students, on the other hand, enroll in online courses primarily because of the convenience/flexibility factor. When course activities and

requirements conflict with convenience and flexibility, students tend to neglect or leave the courses.

The same is true of other areas where the students' expectations or goals for the course conflict with those of the institution/faculty. Students who matriculate in online courses are less likely to inquire and follow up about institutional processes and technological concerns if they feel they will have to expend a great deal of time and effort to resolve issues. That process could be troublesome to the online student for a number of reasons. For one, the sense of immediacy may not be as prevalent with the online student as with the student who frequents the campus to initiate actions to resolve problems. Thus, prolonged procrastination ultimately leads to inevitable separation from the course or institution as the issues remain unresolved. Secondly, the anonymity which is so advantageous in the online course becomes a detriment as these students may feel isolated as faceless entities to college personnel who deal with them on an impersonal level. They may feel ignored or less important than the traditional students whose mere presence on campus commands attention. They may feel the only way to satisfactorily solve their problems is to visit the campus, which may be time and cost prohibitive. Thus, attrition becomes the solution.

Recommendations

The information collected from this study can be used by individual community college administrators, faculty, and staff as they develop new and strengthen existing online retention initiatives. Specific aspects of these initiatives could range from the allocation of funds for technology upgrades and technology support personnel to professional development programs for new and veteran online faculty. Training for college personnel should include attention to principles of adult learning and best practices for online learning. These would include course development strategies which emphasize the need for less rigid, more flexible scheduling options within the courses and careful selection of course activities to eliminate those events which constitute busy work and do not directly impact student learning. Institutions could also use this information as the impetus to ascertain that online students have the same access to resources and student services (i.e., library services, bookstores, financial aid, counseling, etc.) that on-campus students have and that these students are served efficiently.

Consideration could also be given to the establishment of student support strategies which offer face-to-face or online orientation programs for new online students. These programs could emphasize not only the technological concerns which confront students but also those strategies for learner success which are germane to online learning. Components might include a list of services available to the student, points of contact for issues which may arise, and guidelines for addressing or resolving issues expeditiously. Assessments for online learning readiness and aptitude could also be made available to prospective students prior to enrollment in an online course. If students know what to expect before they enroll in a course, attrition rates will likely fall, a result that can only benefit students, faculty, and institutions.

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Development of an Advanced Classroom Technology Laboratory: An Incubator for Next Generation Learning

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Abstract

This article explains the history of an Advanced Computer Technology (ACT) laboratory at Middle Tennessee State University Honors College. The ACT laboratory serves as an incubator classroom, and as a testing and experimental learning environment for faculty and students. Interviews with four administrators involved with the planning and procurement of the room (along with five faculty who had actual experience in teaching with the new equipment) are provided. This article details the history of the room's inception, along with a list of advantages and suggestions for improvement from faculty who have taught classes in this space. An actual schematic of the current room is provided to help readers envision its capabilities.

Keywords: ACT laboratory, Community Collaboration, Leaderful practice, Flexibility, Communication

Introduction

Organic, de-structured, flattened, and de-layered are all euphemisms associated with a rapidly changing organizational environment. In the era of advanced computing and electronic information however, organic is also associated with a free flowing stream of communication that is generated among individuals within organizations. Not only may institutions as a result be more fluid, but they may also be more productive. A Gallup survey reported by LaBarre (2001) for example found that the most "engaged" workplaces had substantially lower turnover, higher than average customer loyalty and productivity, and higher profitability. A decentralized structure also has implications for diminished bureaucracy, enhanced management capabilities, and over the long term, a participative mode of self-governance (Nakamura, 1996).

In *Creating ew Spaces for earning* (2007) the authors assert that learning spaces, especially within institutions of higher education, should mirror these new organizational environments so that they are able to enhance students' preparation for employment. They argue that space should be designed for "socially catalytic" interaction, in which projects can emerge through brainstorming, informal chat, and civil dialogue. This "cyber infrastructure" is characterized as more of a "studio" than a classroom, which should be (1) multidirectional; (2) connected to other spaces; (3) student-centered; (4) with varied and multiple activities; and (5) with more faculty student interaction. The authors further explain that the building blocks for this new type of community are technology, physical space, and curriculum. In this welcoming "studio" space, opportunities for learning permeate the entire campus (Bickford, Wright, & Dittoe, 2007).

Raelin (2003) reiterates managing in a way that promotes the unfettered contribution of all members - in what he terms a "leaderful" community, where everyone regardless of rank may serve as a leader depending upon the circumstances. He describes leadership as concurrent (e.g., multiple people serving in a leadership role at one time, where leading is considered the potential domain of all members), collaborative (in which everyone's opinion is considered important and is frequently solicited), compassionate (in that it respects the dignity of others) and collective, in that it is based on a community model. He argues that these new skills will be required in organizations that "…are becoming more fluid,

experimenting with virtual and network structures that have begun to even challenge our conventional notion of 'internal' and 'external'" (Raelin, 2003, p. 17). In such fluid environments individuals must be able to readily step up to the plate to serve in whatever role is required of them. "Leaderful" practice is then mutual, multidirectional, and reciprocal. In line with this assertion Pollard argues in *The Soul of the irm* that "…the mission of the firm is understood to include the personal development and growth of every worker" (1996, p. 21).

At Middle Tennessee State University (MTSU) this philosophy has been implemented in the form of a newly renovated learning space in the Paul W. Martin Honors College. The purpose of this article is to describe the experiences of faculty who have taught in an Advanced Computer Technology (ACT) laboratory learning environment at Middle Tennessee State University (MTSU), and, to explain the room's development from the MTSU administrators involved in the classroom design. Results of interviews with four administrators and five instructors who have actual experience in teaching in this laboratory are provided, along with future directions for technology-enhanced classrooms and instructional applications.

History of the ACT Laboratory

The Honors College classroom renovation project began over two years ago, when it was determined that student computers in the Honors College laboratory were not being used in the manner for which they were intended. Students for the most part liked to work in informal, small groups, rather than in small individualized carrel spaces as the room had been originally configured. The increased emphasis on collaboration within the MTSU Learning Community provided an incentive for a redesign of the physical space within the room itself, and, an exploration of electronic learning and teaching tools premised on a community model. One administrator remarked that it is important to look at ways of redesigning classroom delivery, as students today are more intuitive as a result of growing up with a variety of technology. Consequently, building community will result when faculty learn how technology can further their instructional goals.

University administrators and classroom technology staff from the Information Technology Division, along with a consultant (The Sextant Group), who specializes in audio, visual, and technology design, met for a period of several months to identify how the emergent technology could be configured for an Advanced Computer Technology classroom that would best serve student needs.

Goals for the ACT lab included:

- providing opportunities for new pedagogical approaches
- accommodating variable student learning styles
- encouraging student-to-student collaboration
- serving as a way to record classroom discussions and preserve course material
- increasing the marketable skills of students ("Honors College," Fall 2006, p. 2)
- testing equipment to see if it was appropriate for campus wide usage

The technology in the room includes a mobile instructor station (a Polyvision "Walk-and-Talk™ cordless lectern") with a tablet computer and annotation screen, ("Honors College," 2006), a VCR, DVD player/recorder, a visual presenter, a ceiling mounted projector, eighteen tablet personal computers, and four wall mounted plasma screens with laptop connections that can be displayed through the ceiling mounted projector and the Polyvision Thunder™ Virtual Flipchart™ System. In addition, the equipment, along with lighting and window shades, can be controlled through a Crestron control panel. The room also showcases furniture that was specifically designed for flexibility with ease of movement, as well as student comfort. The chairs can be placed in various configurations, including grouped around one of four plasma computer screens that are each stationed in a different quadrant of the room, strategically positioned to facilitate student group collaboration and activities.

Unique to this room is the Polyvision Thunder™ Virtual Flipchart™ System, an electronic flipchart that can simultaneously display up to six electronic views at a single time. It was initially designed for corporations, but was more recently introduced into the higher education environment. Middle Tennessee State University was one of the first institutions to create a classroom featuring the integration of all of these advanced technologies. One administrator remarked, "We need to look at our students as they come through with intuitive capabilities, and how it affects students minds' and the way they learn."

The Thunder™ system can be connected to other Thunder™ systems in remote locations, creating a "virtual meeting room" in which team members do not need to be present in order to participate. Pages can be saved in PDF format and displayed as Web pages, or sent via e-mail ("New Classroom," 2007). Text on the Thunder™ whiteboard is dynamic in that it can be seamlessly reordered, easily moved into another part of the electronic page, or "thrown in the trash" (a process which is graphically displayed on the screen). Notes made on the Thunder™ system may also be saved and retrieved at a later time, as well as sent to a USB storage device. Moreover, images can be imported from an attached scanner and displayed on an electronic page, along with video from the VCR or DVD players. Content from multiple classroom tablet PC's or an external computer (when provided with the appropriate IP address) can also be shown, and control of the Thunder™ easel can be shared among participants. Any pictured item may be annotated with a special marking pen and included in the archived file.

To officially open the laboratory, a demonstration of its capabilities was held for representatives from MTSU and the local business community. The demonstration included a simulated class with the use of collaborative exercises, and role playing with the use of an online game ("Virtual U") in which participants worked with one another to simulate managing a higher education institution. Further demonstrations were also conducted to showcase the use of this cutting edge technology for departmental and committee meetings (note: a schematic of the ACT Laboratory is provided in Figure 1 at the end of the paper). Classes commenced in the ACT laboratory one semester after the demonstration.

Method

Five faculty and four administrators at MTSU agreed to participate in interviews regarding their experiences within the ACT laboratory and their role in the planning process, respectively. The questions that were posed of faculty appear below:

- How did you find your experiences within this classroom?
- What type of applications did this technology facilitate? What was possible in this space that would have been impossible or difficult in a traditional classroom, or in a traditional master classroom?
- Describe some of the student projects and instructor applications that you performed in this room.
- Describe some of the challenges that you encountered with this technology.

uestions posed of individuals involved with the procurement and maintenance of classroom equipment included:

- How did you decide on this particular technology? What is the history of this technology, and what did the procurement process entail?
- Are there any other applications of this technology in the world?
- Is there anything that you would have done differently with regard to installation and vendor dialogue?

Participants were encouraged to add their own observations and commentary, in addition to the pre-scripted questions that were posed. Open-ended questions allowed for participants to elaborate on concepts they found of particular interest, and to contribute their own observations and ideas. Data was collected by written notes and later transcribed to a word processing format. Interviews were conducted between September and November of 2007, with each individual session lasting between twenty and thirty minutes.

Interview Results

When interviewed, faculty identified advantages to using the laboratory, and they also shared what they liked about their experiences. Common themes that emerged included a collaborative environment, less paperwork, more peer interaction, and enhanced technological capabilities. These responses are summarized below:

- The format facilitated applications in both undergraduate and graduate science and behavioral courses. Faculty who taught in these disciplines liked the informal environment, which they felt enhanced connectivity inside the classroom.

- Because students worked in groups where the results from plasma screens could be broadcast to the front of the room, less paperwork had to be generated, and faculty did not have to do as much preparation ahead of schedule.
- Students were more comfortable presenting their in-class research projects on tablet personal computers. In addition, they received practice in gathering information.
- The room facilitated participation, small group problem solving, role play, and simulation.
- Thunder™ was used to capture "talking points," which could be saved and later e-mailed to students.
- Web-quests could be performed during class time.
- The room provided the capability to capture a presentation on DVD, which could then be given to another student group for evaluation and "interactive feedback."
- Students' confidence level was boosted when they saw that they could present "on the fly" and provide a fresh perspective to their peers; one faculty remarked that "…students can collaboratively develop a power-point for impromptu presentations."
- The technology was especially useful when it is important to show students "something in the background," along with an actual application, such as the database that is underlying a geographic information system map and the map itself.
- One instructor remarked that there should be training provided by the professor to make students aware of the benefits of the ACT laboratory as compared to a traditional classroom. One such benefit might include "Projection from multiple sources that enables students to more easily see the source of the change caused by an intervention."

As the intent of an incubator classroom is to test and experiment new pedagogical and technology techniques, faculty were also asked to comment on what noted improvements they would like to see in future ACT laboratories on campus, along with changes they would like to see in the current room. These comments appear below.

- Use of AMEX technology instead of Crestron would have enabled the in-house IT staff to both repair and maintain the equipment, because AMEX is the controller standard at MTSU.
- Chairs should not be as heavy, and they should have multidirectional wheels.
- A dedicated IT staff member who can help faculty when they reach a difficulty, and/or who can help train them on equipment is essential.
- Have a backup whiteboard.
- Include flipcharts at each of the plasma groupings. According to one faculty interviewed, "PowerPoint was not viewed as a malleable draft;" when in actuality, the traditional flipchart was more suited to brainstorming.
- The tablet computers were very slow, and were often shelved in the storage unit without being linked into the charger system.
- A closet with a set of wall hooks for coats and backpacks would have removed clutter from the floor.
- The building closed around 4:30 p.m., which created reliability and technical support issues.
- The "pointing stick/track ball" on the notebook computers was cumbersome to use; a "touch pad" would have been more efficient and easier for students.

Faculty concerns were shared with university administrators and information technology staff. As a consequence, considerations for new classrooms/laboratories planned on the MTSU campus will include:

- Increased capacity for up to 20 students
- A traditional instructor station.
- Thunder™ projection and the traditional projection on different walls so that seven displays can be viewed at once
- Shelving for the notebook computers so that students can open them inside the closet
- A mobile lectern with a laptop instead of a "walk and talk" lectern
- Chairs with bi-directional wheels
- Hardwood flooring.

Although faculty and administration did not collaborate prior to the design of this particular space, there is ongoing consultation with faculty, academic affairs officers, and classroom technology support personnel prior to determining classroom technology configurations.

Discussion

Tinzmann et al. (1990) describe collaborative learning as a collective event, driven by learners who are self-determined and knowledgeable, and who are led by teachers who behave as mediators. Optimally, they suggest that this type of connection occurs in an environment where there is "shared authority among teachers and students," (9) which allows for [use of] "diverse media for communicating ideas" (18) in which students are active participants. In this type of learning enclave there is an emphasis on content as well as process, and an attempt to incorporate dialogue, or a dual-party participation and examination of speech within the classroom. In conjunction with this assertion, Bruner (1987) describes the process of "scaffolding," in which individuals become responsible for their own learning. Because MTSU recognizes that the role and desires of incoming students are changing, (as Tinzmann et al. articulate), its goal was to create a cutting edge learning space that would provide more freedom and creative license for faculty, along with enhanced opportunities for students to synergistically learn from their peers through observation, open critique, feedback, and learner driven outcomes. At MTSU the design process, implementation, and the democratic response to faculty feedback (with regard to the incubator classroom) all demonstrate a desire to collectively evolve traditional instruction so that it is more responsive to changing student needs. Because students have so many shared electronic, or "Web 2.0" resources at their disposal, their expectations in terms of learning environments are radically different from even a few years ago. Individuals who regularly use blogs, wikis, and social networking tools may naturally respond better to a classroom in which chairs are not rigidly placed in preset patterns, and in which there is a free-flow of give and take between themselves and the instructor. In this space the "sage on the stage" is transformed to the "guide on the side" in an attempt to proactively stimulate interaction that is seen as both natural and beneficial for students.

Future incarnations of the incubator classroom will incorporate the iterative feedback process to enhance student learning, and to facilitate faculties' ability to effectively reach their constituencies. Learning in this case then becomes a transformative event and an instructive process, which evolves with time in response to a student driven mandate. The incubator classroom is partly an answer to Palmer (1998), who exhorts academics to mimic the democracy and leadership experiences that students experience daily in their electronic social lives.

Conclusion

The MTSU ACT laboratory (one of the first of its kind in the country), integrated a confluence of cutting edge technologies to provide a classroom community model which facilitated two-way communication. Although this room was on "the bleeding edge of technology," (as one MTSU administrator stated), the first incarnation netted a positive benefit to both students and instructors, while at the same time providing essential feedback on how to reconfigure future classroom and laboratory designs.

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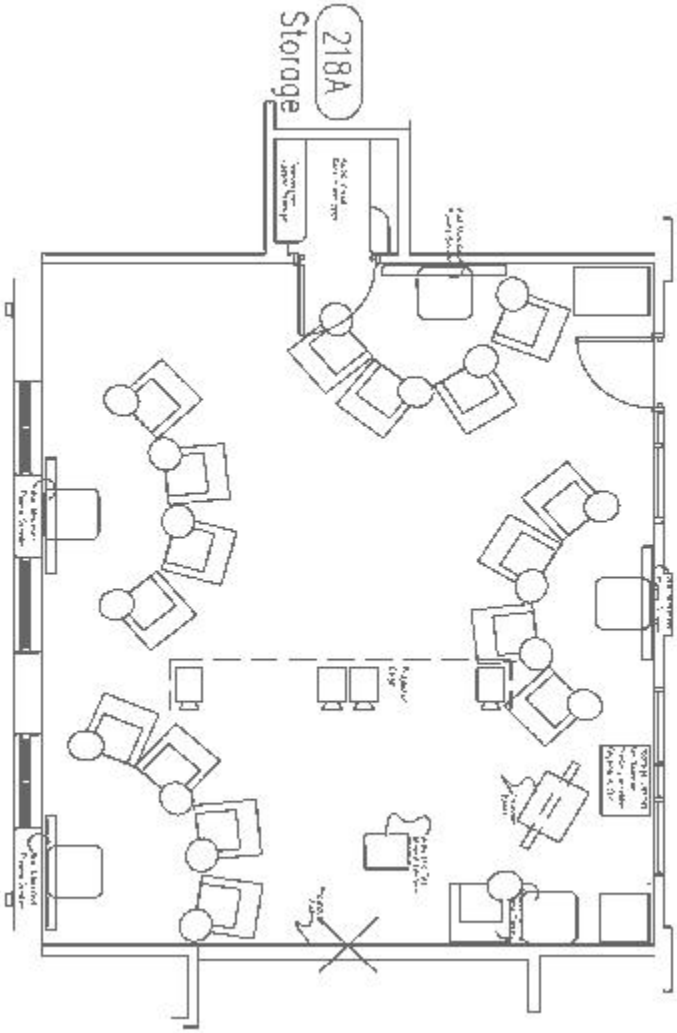

Figure 1. Current ACT Laboratory Configuration

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Achievement and Satisfaction in an Online versus a Traditional Health and ellness Course

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Abstract

Online education has become a rapidly developing educational alternative. Many universities deliver online courses across a variety of disciplines. However, few studies have evaluated the efficiency of online health and wellness courses. The purpose of this study was to examine achievement and satisfaction in students who participated in an online or a traditional lecture-based health and wellness class. Eighteen subjects in an online health and wellness class and nineteen subjects in a traditional lecture-based class participated in this study. Outcomes included performance on a 50-point written exam (pre- and posttest) and three regular course exams. All participants completed a satisfaction survey. The online participants completed a perception survey. No significant differences were found between online and traditional courses in the 50-point written exam or in the three regular course exams. Significant differences were found in age, employment status, year in school, and the degree to which participants felt that they were encouraged to participate in class discussions. Overall, perceptions of the online course were positive. Data suggests that an online health and wellness class was an acceptable alternative to a traditional lecture-based class, when achievement on exams was the primary outcome measure.

Key ords: distance education, physical education, lecture-based, knowledge acquisition, no significant difference, perceptions, employment status, age, class standing.

Introduction

Alternatives to traditional lecture-style delivery of education have been offered for many years (Huang, 1996-1997). These alternatives, called distance education, became available with the development of a reliable mail delivery system during the late nineteenth century (Ascough, 2002; Rumble, 2001). Though

much has been written pertaining to online learning, the majority of articles are opinion pieces, “how-to” articles, or second-hand reports that do not include original subject-based research (Merisotis & Phipps, 1999). Minimal original research examining online instruction in physical education and health and wellness courses is available (Bennett &Green, 2001). Thus, the purpose of this study was to explore whether any differences exist between the achievement and satisfaction levels of students taking a traditional lecture-based health and wellness course and students taking a comparable online course.

Literature Survey

Distance learning has been defined as any approach to education delivery that replaces the same-time, same-place, face-to-face environment of a traditional classroom (Volery & Lord, 2000). According to this definition, distance education can take many forms such as mail correspondence, open- and closed-circuit audio and video presentations, telephone communications, and the increasingly popular Internet. With these alternatives, however, students are able to attain an education even if they live a great distance from an educational institution or when their respective campus does not offer desired courses (McLester, 2002). Moreover, student athletes and non-traditional students have been able to complete courses that otherwise would have been impossible because of their inability to attend regularly scheduled classes.

Advances in computer technology, particularly the development of the Internet, have improved the delivery of distance education. Many universities are developing and offering a multitude of courses designed to be taught using Internet services. With broadening horizons and the expanding utility of Internet resources available to universities and consumers, the potential for this form of education and life-long learning has become more accessible. In fact, from 2003 to 2004, online learners in the United States increased from 1.98 million to 2.35 million (Allen & Seamen, 2005).

Distance education is appealing for many reasons. Foremost, online courses do not require regular attendance at scheduled lectures. Thus, those working full-time or who have other responsibilities are drawn to online courses, as is the case with many non-traditional students. Another convenience of online education is the ability for students to learn materials at their own pace. Many online courses are presented in an asynchronous manner—where materials are time- and place-independent —allowing students to access course materials at any time (Newlin & Wang, 2002). In these instances, instructors can be contacted with a simple email, and students can receive feedback quickly. Online courses usually still have project due dates and examinations, but these courses generally provide students with flexible course options.

Although the advantages of online education are appealing, there are also disadvantages. For those who have never taken an online course or who have little computer experience, an online course may be frightening. For example, Wang, Newlin, and Tucker (2001) found that many Web-based students expressed feelings of intense anxiety about the technology. There are also disadvantages in online courses for individuals who need a great deal of structure. Online courses are frequently self-paced and those lacking self-discipline may struggle. However, these advantages and disadvantages are highly individual and should be considered by each individual learner.

Methods

Participants

Participants included students enrolled in sections of either a traditional health and wellness lecture course (n 447) or an online health and wellness course (n 19). The online participants included all 18 students who completed the study materials; 19 students from the traditional lecture-based health and wellness course were randomly selected—because of sample size difference between the two courses—from the participants (n 372) who completed all portions of the testing.

The procedures for this study were reviewed and approved by the sponsoring university’s Institutional Review Board for the protection of human subjects. Written informed consent was obtained prior to data collection and all participants were given the opportunity to complete all testing materials.

Procedures

The traditional course format included two lectures per week via PowerPoint and a lab portion once per week in the institution's field house. To begin each lecture, a 10-question review was completed from the information presented during the previous lecture. The lab portion included various physical activities; students completed six activity-related lab assignments. Three written, in-class examinations were given throughout the course.

The online course format included the same two PowerPoint presentations each week plus an additional document of narrative information for each presentation. Materials were presented using the Desire2Learn course management system (Desire2Learn Inc., Ontario, Canada). Weekly quizzes were given online using the same questions from the daily reviews in the traditional course. Students participated in weekly discussions using an online forum. Instead of weekly labs, students submitted weekly physical activity logs and were required to participate in three days of cardiovascular activity and one day of resistance exercise. The traditional course lab assignments were slightly modified for online presentation. The same three written examinations were given and online students were required to come to campus for examinations.

Demographic information was collected to obtain descriptive characteristics for the students in the two groups. A pretest examination was given to assess the participants' knowledge of course content prior to presentation of any course materials. The pretest examination contained 50 randomly selected multiple-choice questions from the three written examinations given during the previous semester of the traditional lecture-based health and wellness course. A posttest examination, composed of the same 50 questions as the pretest, was given at the completion of the course. Additional measurements of course achievement were collected including individual participant's scores from the three in-class written exams and the overall letter grade received for the course.

All participants completed a Satisfaction survey, which consisted of a modified Students' Evaluation of Educational uality (SEE) survey (Centra, 1993). The SEE uses a 5-point Likert scale and the following variables: strongly agree (SA) 5, agree (A) 4, neutral (N) 3, disagree (D) 2, and strongly disagree (SD) 1. The participants completed this portion of the study upon termination of the course, after completing the posttest examination. A final survey, given only to the online participants, asked questions to determine their perceptions toward the online course. These questions used the same 5-point Likert scale as the Satisfaction survey. This measurement was completed at the termination of the course after both the posttest examination and the Satisfaction survey had been completed.

Statistical Analyses

All data were analyzed using the statistical software package SPSS (version 12.0). The mean distance from campus and the mean year in school for students in the online course were compared to the corresponding means in the traditional course using independent samples *t*-test. Because of the non-normality of age, a Mann-Whitney test was performed to determine if a difference in age existed between traditional and online students. Distributions for sex, employment status, and living arrangements across treatment groups were compared using a chi-square test for independence. Cross tabulations and chi-square tests were obtained to provide the distribution and comparison of responses to each question for the online and traditional students. The mean overall satisfaction of the online students was compared to that of the traditional students using a pooled *t*-test for independent samples at a level of significance of 0.05. Average scores of the twenty-five individual measures of the Satisfaction survey were compared for online vs. traditional courses using *t*-tests, each using a Bonferroni-corrected level of significance of 0.002, yielding an overall level of significance of 0.05. Frequency tables of the Perception measure of the online course also were constructed.

Results

In the traditional lecture-based health and wellness course, 372 (83.2%) students completed all requested study measures and 19 of these were randomly chosen for participation, while 18 of the 19 (94.74%) students in the online course completed all requested measures.

Significant differences (*P* 0.0005) were noted between the ages of the students in the two courses, where the online course mean age (SD) was 21.94 7.62, and the traditional course mean age was 18.47 0.61. A significant difference (*P* 0.0005) existed between the groups in class standing (year in school), as the online students (2.35 0.862) were further along in their education than the traditional students (1.16 0.501). The scale used for this measure was as follows: 1 freshman, 2 sophomore, 3 junior, and 4 senior. A significant difference (*P* 0.034) was found in employment status, where 72.2% of the students in the online course were employed part-time compared to only 36.8% of the traditional students. Also, only 22.2% of the online students were not employed, compared to 63.2% of the traditional students. One student (5.6%) in the online course was employed full-time, while none of the traditional students were employed full-time. No significant differences were found in sex (*P* 0.80) or living arrangements (*P* 0.057) between the online and traditional courses. Table 1 presents the demographic information.

Table 1. Demographic Information of Online and Traditional Students

	Online	Traditional
Age (years)	21.94 7.62	18.47 .61
Sex	Male 5, Female 13	Male 6, Female 13
Year in School	2.35 .86	1.16 .50
On-Campus Housing	55.6%	84.2%
Employment Status	Part Time: 72.2% Not Employed: 22.2% Full Time: 5.6%	Part Time: 36.8% Not Employed: 63.2% Full Time: 0%

Reached 0.05 level of significance Scale: 1 freshman, 2 sophomore, 3 junior, 4 senior

No significant differences were noted in pretest score (*P* 0.348), posttest score (*P* 0.461), the pretest-posttest score difference (*P* 0.975), or any of the three written examinations (*P* 0.381, *P* 0.840, and *P* 0.670 for exams 1, 2, and 3, respectively); see Table 2.

Table 2. Course Performance of Online and Traditional Students

	Online (mean SD)	Traditional (mean SD)
Pretest Score	23.56 (4.29)	22.37 (3.27)
Posttest Score	33.61 (4.10)	32.47 (5.09)
Pretest Posttest Difference	10.06 (2.90)	10.10 (6.13)
Written Exam 1	40.22 (5.00)	41.63 (3.34)
Written Exam 2	41.11 (5.58)	40.79 (3.95)
Written Exam 3	42.11 (5.70)	41.42 (3.95)
Final Course Percentage	87.13 (11.03)	90.86 (4.31)

Presented for informative purposes only - grading system differed and thus results cannot be directly compared

Mean course satisfaction scores between the online (3.73 0.857) and traditional (3.62 0.937) courses (*P* 0.515) were not significantly different. However, within the individual satisfaction questions, with a Bonferroni-corrected level of significance of 0.002, a significant difference (*P* 0.001) was found between the online and traditional courses when the participant was asked whether "students were encouraged to participate in class discussions." The online students indicated that they felt more encouraged to participate in class discussions than the traditional students. Though all other

variables did not reach the corrected level of significance, many showed a trend toward significance. These trends, where the *P* value indicates higher satisfaction, can be found in Table 3, and all satisfaction information is presented in Table 4.

A survey assessing student perceptions was completed by the online students; see Table 5. Generally, students had positive perceptions of the online course. When asked if they had learned something that encouraged them to modify their lifestyles, 94.1% of students answered A or SA. The majority of students chose the online course for various personal reasons; it fit with the individual's class schedule (88.9% A or SA), the class fit around the individual's work schedule (72.2% A or SA), it was convenient and flexible (88.9% A or SA), and the individual wanted to try taking an online class (82.4% A or SA). Students also thought that their indirect cost of learning (e.g., gas, travel time) was reduced by taking the course online (72.2% A or SA). Also, most students (83.3% A or SA) felt that both the online and traditional sections of the health and wellness course should be offered. When asked if they would take another course online, 66.6% of students reported that they would.

Table 3. Satisfaction uestions nearing Significance

	Online (*P*)	Traditional (*P*)
"I have learned and understood the subject materials in the class"	0.011	
"Students felt welcome in seeking help or advice"	0.009	
"Instructor(s) were adequately accessible to students during office hours or by appointment"	0.037	
"Students were invited to share their ideas and knowledge"	0.009	
"Students were encouraged to express their own ideas and/or question the instructors"	0.021	
"Material explanation was clear"		0.027
"Course content prepared me for the exams.		0.013
"Methods of evaluating student work were fair and appropriate"		0.029
"Examinations/grades materials tested class content as emphasized"		0.034

P- value indicates higher satisfaction level for the particular participant group

Discussion

The present findings indicated that both the online and traditional course formats effectively presented materials and enhanced knowledge levels of students enrolled in a health and wellness course. No significant differences were found in either achievement or satisfaction between the online and traditional groups. Moreover, no significant differences were found with sex or any other achievement measures. Age, year in school, and employment status, however, were found to significantly differ between the two groups.

No significant differences were noted between achievement scores in the pretest, posttest, pretest-posttest difference, or mean written exam scores between the online and traditional courses. Thus, it can be suggested that both the online and the traditional courses provided the same degree of knowledge acquisition. This finding has been somewhat controversial in the literature, as some studies have found that there is no difference while others have found that either online or traditional courses perform better than the other. It may be that certain courses cannot effectively present materials in an online format (Allen et al., 2004). For instance, a course in social work history (Faux & Black Hughes, 2000) found that there was a significant difference between the traditional and online groups, where the traditional group scored significantly higher than the online group on posttest.

In a meta-analysis, Allen et al. (2004) examined the effectiveness of distance education versus traditional classes. The results indicated a small overall improvement in performance for the distance education courses.

The majority of the literature has found no significant difference in student knowledge gains between online and traditional courses (Dellana, Collins & West, 2000; Ashkeboussi, 2001; Navarro & Shoemaker, 2000; Lockyer, Patterson & Harper, 1999; Davies & Mendenhall, 1998). Yet, Merisotis and Phipps (1999) have indicated that a few researchers have been quick to critique the no significant difference finding. At this point, though, it appears that online courses provide a means for comparable learning potential on outcome measures.

Table 4. Satisfaction Information of Online and Traditional Courses

	Online (mean	SD)	Traditional (mean	SD)	*P*-value
Satisfaction Mean	3.73	.58	3.62	.40	.515
The class was intellectually challenging and stimulating	3.83	.86	3.11	.94	.143
I learned something which I consider valuable	4.06	.64	3.95	.62	.354
I intend to use the information learned in this class in my daily life	4.11	.76	4.00	.67	.841
My interest in the subject has increased as a consequence of this class	3.67	.90	3.79	.92	.117
I have learned and understood the subject materials in the class^{+}	4.00	.97	3.89	.32	.011
Material explanation was clear^{+}	3.06	1.11	4.05	.40	.027
Course materials were well prepared and carefully explained	3.00	1.14	3.84	.60	.081
Course content prepared me for the exams^{+}	3.28	1.32	3.84	.37	.013
Proposed objectives agreed with those actually taught, so I knew where the class was going	3.94	.80	3.89	.46	.287
Students felt welcome in seeking help or advice^{+}	4.28	.96	3.53	.84	.009
Instructor(s) were adequately accessible to students during office hours or by appointment^{+}	4.33	.77	3.53	.77	.037
Examinations/graded materials tested class content as emphasized^{+}	3.50	.99	3.89	.32	.034
Feedback on examinations/graded material was valuable	3.33	.77	3.63	.68	.498
Methods of evaluating student work were fair and appropriate+	3.56	.98	3.79	.42	.029
Required reading/texts were valuable	3.28	1.18	3.21	.92	.579
Readings, homework, etc. contributed to appreciation and understanding of the subject	3.83	.86	3.32	.89	.054
Students were encouraged to participate in class discussions	4.53	.51	3.59	.62	.001
Students were invited to share their ideas and knowledge^{+}	4.47	.51	3.59	.80	.009
Students were encouraged to ask questions and were given meaningful answers	4.12	.60	3.65	.61	.127
Students were encouraged to express their own ideas and/or question the instructors^{+}	4.29	.59	3.59	.62	.021
This class compared favorably with other classes at this institution	3.35	1.22	3.65	.93	0.62
The lecture performance compared favorably with other lectures at this institution	3.06	1.03	3.88	.78	.167
Subject difficulty compares to that of my other subjects	3.00	1.27	3.00	1.06	.884
Subject workload compares to that of my other subjects	3.24	1.03	2.59	1.00	.425
Subject pace was typical for my classes	3.59	1.06	3.53	0.72	.446

Scale: 1 Strongly Disagree, 2 Disagree, 3 Neutral, 4 Agree, 5 Strongly Agree
Significant at the 0.002 level, $^{+}$ Denotes trend at the 0.05 level

A consideration when providing educational alternatives is whether students enjoy the alternative forms. The current study found that mean satisfaction scores were not significantly different between sections. The only significant difference that resulted was the degree to which students believed that they were

encouraged to participate. This was similar to a finding in a meta-analysis (Allen, Bourhis, Burrel, & Mabry, 2002) that reported an overall slightly higher, non-significant level of satisfaction with traditional courses, but concluded that students found distance learning to be as satisfactory as traditional formats. The way in which the students in the present study participated varied slightly. The manner of participation in the traditional course was to ask questions and discuss in a very large lecture setting, while the online students participated in online discussions. Several studies (Newlin & Wang, 2002; Althaus, 1997; Huang, 1996-1997) have found online discussions to have positive effects on satisfaction and achievement. These sorts of online discussions provide a level of anonymity for students who may be intimidated in large lectures while also providing all students a platform to take as much time as they need when thinking about and discussing topics. This can lead to greater comprehension of materials and access into areas that in-class discussions many not provide time for. For these reasons, it may be beneficial for instructors to incorporate online discussions into a variety of different courses, not strictly those online. Althaus (1997) found that 67% of students felt that online discussions should be incorporated into other courses. Student satisfaction has also been evaluated through rating instructors. Wang and Newlin (2000) found that, in an instructor evaluation, the online and traditional courses were nearly identical, indicating that students were equally satisfied with how the courses were taught.

Table 5. Perceptions of Online Students

	Class Response
I learn better in an online class than in a traditional (lecture-based) class	27.8%
I learn the same in both environments	27.8%
I learn better when the pace is self managed	55.6%
I learn better when the class is structured by a teacher	38.9%
I feel like my indirect costs of learning were reduced with an online class	72.2%
I took this class because it fits with my class schedule	88.9%
I took this class because it fits around my work schedule	72.2%
I took this class because it was convenient and flexible	88.9%
I took this class because I wanted to try an online class	77.8%
I think that students should be required to take an online class	22.2%
I think that both class formats should be offered for HPR 105	83.3%
I think that online classes are a waste of time	77.8%
I learned something in this class that has encouraged me to modify my lifestyle	94.1%
If I have the opportunity I will take another class online	66.6%

Percentages reported for the responses Agree and Strongly Agree, except for , where the percentage is reported for Disagree and Strongly Disagree

Similar to current findings on age, Cooper (2001) found the average age of traditional students to be 23 and the average age of online students to be 27. Several authors (Karber, 2002; Eastman & Owens Swift, 2001; Volery & Lord, 2000) have noted that participants in online courses tend to be more mature students who elect to further their education. For example, Anstine and Skidmore (2005) indicated that their online M.B.A. course was reaching students who might not otherwise be in a graduate program, speculating that many of the students had children at home. Other studies, however, do not show this age trend (Sweeney & Ingram, 2001; Perez-Prado & Thirunarayanan, 2002). These studies found the majority of students to be in their early to mid-twenties. At the investigating institution, students register according to number of credits completed, and it is possible that the course was filled before younger students were able to register. Additional considerations for these differences include the possibility that different courses attract different age populations. Another possibility is that younger students were not comfortable with or interested in taking the course in an alternative manner. Older students may feel more prepared or may be more willing to take on the challenges of an online course as was shown

(Elvers, Polzella & Graetz, 2003) when 19 of 21 students reported that they disliked an online class because it was easy to get behind.

Similar to the findings of Cooper (2001), this study did not show any significant differences in sex between the online and traditional students. Yet, other researchers have found sex differences (Perez-Prado & Thirunarayann, 2002; Tu & McIssac, 2002). Again, as with age, different types of courses may be more appealing to one sex or may be needed for a course that is required for a major in which one sex typically dominates. The significant difference in sex could also be due to some other factor such as a skewed sex distribution at the university.

This study found a difference in employment status between online and traditional students. Employment status of students taking online courses has not been extensively evaluated in the literature; however, Cooper (2001) found similar results, and again this may be related to the age and maturity level of students who choose online courses.

The perceptions of the participating online students were positive. Previous results have indicated (Daugherty & Funke, 1998) that students appeared to be genuinely impressed by the variety and quality of learning materials offered in an online course. The authors believed that this led to an increased motivation to learn and that critical thinking was enhanced because of access to meaningful online resources. E-mail access was shown to have a positive influence as students thought that they received more individualized attention that helped offset the physical separation of student and instructor (Karber, 2002). The majority of students in each course format (Ashkeboussi, 2001) believed that each of the course formats allowed for effective interaction between students and instructors. Cooper (2001) found that 38% of students thought that they learned equally well in online and traditional environments and, similar to present results, when asked if they would take another online course, 81% indicated that they would. As in the current study, convenience and flexibility have been repeatedly cited (Cooper, 2001; Navarro & Shoemaker, 2000; Lockyer, Patterson, & Harper 1999) as reasons that students decide to take courses online.

Though the results of this study revealed no significant differences in nearly all variables explored, there are still many areas for further investigation. Larger samples of students should be recruited and samples should be randomized by group. Also, the courses should try to be kept exactly the same except for presentation method. However, this may be disadvantageous as a number of authors (Volery & Lord, 2000; Newlin & Wang, 2002; Bennett & Green, 2001) have indicated the need to structure online courses to meet their own unique needs and not simply duplicate traditional courses. These studies suggest that every effort should be made to ensure that course content be modified to be presented in the online format without compromising the substance and integrity of the course. Another area of interest includes that of individual learning styles (Diaz & Cartnal, 1999; Sabry & Baldwin, 2003; Elvers, Polzella, & Graetz, 2003). Additionally, online courses need to be examined for an extended time to be sure that results are not due to the novelty of online courses (Bennett & Green, 2001).

Conclusions

The results of the present study indicate that academic achievement and student satisfaction were similar in both online and traditional lecture-based health and wellness courses. In addition, student perceptions regarding the online format were generally positive in nature.

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Introducing Social Software to K Teachers in a Research Setting

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Abstract

Twelve K-12 teachers who were enrolled in a graduate qualitative research course were introduced to collaborative software to use as part of work on group research projects. Data were gathered from one-on-one interviews, technology use surveys, and instructor reflections. Three themes appeared: a) the importance of developing learning communities when using these tools; b) overcoming inertia needed to gets students to learn new software; and c) the conflict of technology use with instructional approaches.

Keywords: collaborative software, technology, graduate teaching, on-campus courses, teacher education

Introduction

An increasing number of services are becoming available online that allow those working on the World Wide Web to gather resources and links to those resources in ways that are personal, convenient, and add meaning to the collected information (http://socialsoftware.weblogsinc.com/2005/02/14/home-of-the-social-networking-services-meta-list/). These resources include services as diverse as comprehensive bookmarking facilities (i.e. http://del.icio.us) to negotiated knowledge sites like Wikipedia (http://www.wikipedia.org). Beyond having these services available, most also include the ability to communicate a collection of information to others or to allow others to access an individual's collection of resources and information. Many of the sites provide opportunities for participants to work in virtual communities with others of like interest (Vallino, 2006). Broadly, these services are referred to as social software (Anderson, 2005).

The infusion of these tools into education has been mostly part of online learning courses (Anderson, 2005; Curtis & Lawson, 2001). On most college campuses, though, course management software has been made available to instructors of courses that meet face-to-face in addition to those courses that meet virtually. Part of typical course management systems is the ability for students to access course material asynchronously and for them to be able to communicate and collaborate with other students online via the software embedded in these systems. The ubiquitous use of course management software is promoting an environment where students are used to taking advantage of online learning opportunities.

Although the numbers are unclear as to what percentage of our newer students are coming to college already having used social software in one form or another, most indications are that it is a fairly high percentage. The familiarity of our students with both course management systems and social software suggests that faculty may be able to integrate appropriate uses of social software successfully in courses that meet either online or in physical classrooms. The purpose of this study is to examine the effect of the

uses of social software in an educational research course that meets in a traditional classroom setting.

Baird and Fisher (2005) are representative of an optimistic view toward the infusion of technology in teaching and learning, generally; and the use of social software more specifically, that suggests that students born after 1982 represent an always on generation who are comfortable with a wide variety of online communication and collaboration tools. Our job, as teachers in this environment, is to design curricular activities that take advantage of the predispositions of the students toward uses of technology in learning. Particularly, online learning communities can provide the opportunity for a high level of Vygotskyan social integration. Course designs need to focus on elements of "social networking technologies [that] facilitate learning situated in a social context" (p. 9).

Collaborative online activities are likely to have more effect if they are oriented toward going beyond finding and using information to a level of knowledge construction (Warschauer, 1997). This would imply that the infusion of social software in a research course would be an ideal fit. A major difficulty in integrating technology into courses that meet face to face and have a tradition of being teacher centered is that use of technology is constrained by institutional and social expectations (Cuban, 1986). Building independent learning communities may work online for students with common interests, but it may be antithetical to their expectations of how traditional classroom collaborative relationships are to function.

In order to increase the likelihood that students can become engaged in online knowledge generation, it is important that attention is paid to issues that may inhibit the development of learning communities (Crampton, 2001). If students cannot figure out how to develop and sustain working relationships through electronic media, the quality of the outcomes of their learning activities will suffer. Crampton presents a complex model for understanding online collaboration by focusing on the need for groups to develop *mutual knowledge* among their members. She describes five types of information problems:

- failure to communicate and retain contextual knowledge
- unevenly distributed information
- differences in salience of information among members of a dispersed collaboration
- relative differences in speed of access to information
- interpretation of the meaning of silence. (p. 360)

These studies would suggest that successful infusion of social software into a traditional course structure will require careful course design to take advantage of students' pre-existing online social networking skills, helping students understand why the use of these tools is more appropriate than traditional instructional approaches, and advising students in how to develop productive online learning communities by insuring that project knowledge is shared efficiently and equitably.

Methods

In this study, 12 masters of education students, eleven of whom were classroom teachers, were enrolled in a semester long qualitative research course. Six of the students were newly licensed, three were regular classroom teachers (two with more than 15 years of experience), two were special education resource teachers, and one of the students was working in higher education in student services.

On the first day of class students were told that the course would include group completion of a research paper on a topic of their choice. They were given standards for evaluation of the project. Subsequently, the students discussed a variety of topics of interest. They reduced a substantial list of topics to three of highest interest and then assigned themselves to the topics based on which they thought were most interesting. Three groups of four students appeared.

During each class meeting for the first half of the course the instructor made presentations on content related to qualitative research. In addition to traditional research course topics, the students were instructed in the use of electronic tools that might assist in their collaborative work. These tools included:

1. Online library databases and journals—the university in which the students were enrolled subscribed to approximately 122 electronic reference databases and over 23,000 online serials. All of these materials were available to the students both on and off campus;

2. Google Scholar—through Google, researchers searched the WorldCat database and accessed a variety of refereed journal articles, other scholarly resources, and information about authors;
3. Del.icio.us—online sharable user-defined bookmarks;
4. Wikis—multi-user editable Web pages;
5. SubEthaEdit—online collaborative writing tools;
6. Track Changes/Insert Comments commands in Microsoft Word;
7. E-mail—using attachments to facilitate collaborative work on writing projects and developing mailing list to facilitate discussion.

Students were encouraged, although not required, to include the instructor in collaborative communications. The above uses of social software were selected, because they afforded cumulative records of progress on projects which other members of each research team could evaluate asynchronously.

To monitor the effect of the infusion of these collaborative tools, data were gathered from a pre and post iteration of a survey of student technology use. The survey asked students to assess their general level of skill with technology, specifically about the their use of the software introduced in the class, plus more general open-ended questions about their perceptions of positive and negative effects of working online with others.

Additionally, students were interviewed individually using a question protocol that included questions about successes and struggles related to working together online, perceptions of effectiveness, their sense of how community had developed, and a short series of questions related to Crampton's (2001) assessment of mutual knowledge problems of students collaborating online.

Finally, the instructor of the course wrote periodic reflections on how successful course activities had been and how instruction might be changed in the future.

The student interviews, instructor reflections, and open-ended survey responses were analyzed using a constant comparative qualitative assessment of dominant themes. The quantitative items on the student survey were reviewed for significant differences between pre and post responses.

Results

Data gathered from one-on-one student interviews, surveys of student technology use, and instructor reflections revealed three consistent themes. These were: a) the importance of community in the process; b) overcoming inertia; and c) the conflict of technology use with instructional approaches.

The importance of community in the process. Few of the students knew each other when they first came to class. In order to accomplish the course objectives, it was important to form research groups on the first evening. A number of concerns related to community building and how that affected the use of technology surfaced over the course. These included problems related to technology skill and how ages of group members affected prior technology knowledge, obtaining and sustaining agreement on the direction of the group, how low technology skill group members were enabled by the more skilled users, trust among group members, and the degree to which the groups tried to supplant the need to work online with face-to-face work sessions.

The most prevalent recurrent theme that emerged in the participant interviews was the discrepancy between the technology skills among group members. When mentioned, the lower skill level was associated with the older age of the group members. Participants indicated that the skill/age discrepancy affected collaboration, communication, and community building in the individual groups. In fact, one participant responded to the survey prompt, "Write a bit about what you see as the positives of working online with other people" with "Those who you don't like, you don't have to see them and can make comments without them hearing." Also, in one of the three groups, a "splinter group" formed of two of the most technology-skilled participants (the only two males in the course, ages 21 and 22). One participant reported there was community with "like ages" and referred to the "young, arrogant" group members. There was a 38-year range between the youngest participant (21 years) and the oldest participant (59 years). The

mean age was 31, the mode was 22, and the median age was 22, indicating a positively skewed age distribution of the participants. Interestingly, age and participants' initial and concluding self reports of their technology skill level was not statistically significantly correlated (r -0.436, *p* 0.05). It appeared that some generational trust issues and individual perceptions may have been interfering in community building versus an actual relationship between technology skill and age of the group member. Some participants who were younger also had low technology skill levels.

This difference in technology skill level was evident in how the K-12 teachers rated their technology skill level on a five-point, ordinal scale at the beginning and end of the semester. The response categories were: a) Non-user; b) Minimally Skilled; c) Moderately Skilled; d) Accomplished; and e) Expert. From the beginning to the end of the semester the mode increased to 4 (Accomplished) from an initial mode of 2 (Minimally Skilled). Using a chi square, results indicated there was a statistically significant increase (*p* 0.01, *df*) in how participants rated their skill level.

It was evident from the participant interview responses to "In what ways has a sense of community developed in this class" that the sense of community was chiefly within each research group rather than with the class as a whole. Several students variously referred to being "close in our own group." Groups were encouraged to "cross-pollinate" for information and solutions but chose to work solely among themselves.

When asked "How has the *use of technology* affected your sense of community in class," students referred to their use of the wiki where they could communicate among themselves and hear what other class members had to say, even if they did not frequently post to it. Several students mentioned the wiki was useful to communicate with the professor and appreciated his constant involvement and quick responses to questions via the wiki. The sense of community was also aided by technology through the use of e-mail and with the ability to write and revise work as a group online. Though technology assisted a sense of class community, there was still inertia to overcome regarding its use.

Overcoming inertia. As graduate students, these teachers initially had difficulty seeing how applications of technology could make their work more effective or efficient. This manifested itself in a number of ways, including selecting only those technologies that group members already knew how to use, convincing students that the technology could increase the efficiency and effectiveness of group work, and students resisting learning new technologies for which they did not see an immediate use.

Participants were asked "How has the technology helped you be successful in completing the work for this course." E-mail, editing, and attachments were cited most frequently in the participant interviews as being useful in completion of the group research project. Other frequently mentioned resources were chats/IM, Google Scholar, and online searches of sources for the literature review. When asked how they struggled with technology in the course, there was a split in responses between those who embraced using technology and those who had less experience using technology. It became evident during classes and during the interviews that when a group member struggled with technology, the other members created a "work around," like putting the full text within an E-mail versus sending the text as an attachment and bringing hard copies of articles to give to the individual at the next class meeting. These strategies were expedient, but they essentially enabled those less skilled with technology to remain so.

In examining whether there was a broader use of technology by the participants from the beginning of the semester to the end, a wider variety of technology use was evident. However, much of the greater use had to do with professor-led explorations of such tools as De.licio.us, wikis, Google Scholar, and online databases. There was a tendency of students to give up easily if something (De.licio.us) was tried, and there was not immediate success. It was not uncommon to hear in the interviews from the students with lower technology skill that they liked a particular use of technology when it was presented by the professor, but that they did not use it on their own afterwards in the completion of the group research project.

The conflict of technology use with instructional approaches. The open-ended use of technology tools and resources in teaching and learning is effective when learning activities are project based. This course was designed with this in mind. The attempt was to provide as pure a project-based environment as was possible and to allow for the integration of social software and other technology tools. Although the course may have been designed that way, students did not approach the work in this manner. The professor noted students wanted detailed instruction on how to use software and wanted this instruction repeated at the

exact point they might be using the software. Groups ignored the opportunity to explore uses of newly-presented software in their collaborative work. Students resisted completing assignments designed to practice using new software. Students had trouble imagining a transfer of newly-learned strategies into their own classrooms citing concerns related to student safety on the Internet.

Some of the participants could see how their newly-learned strategies could be implemented in their teaching environment. The most frequently cited use of technology in the classroom was to have a classroom Web page to which the teacher could post information for students and parents regarding homework, class units, a calendar, and special class events. With an electronic calendar, due dates and copies of assignments could be linked. The participants also could see using wikis in their classrooms, even with children in first and second grade. One teacher saw how a wiki could be used by kindergartners. Online journals and class journals appeared popular, and students and teachers using PowerPoint was not uncommon, especially in schools that had funds for technology purchase and maintenance of the equipment. Interestingly, three teachers mentioned implementing student mini-research projects with an approach similar to what was used in this study.

It was evident from the interviews that some teachers wanted to continue to be cautious in implementing the use of social software and technology in their classrooms. There was concern with students using technology to bully others and post inappropriate items. There was also an issue that in lower socio-economic areas and with students who live in migrant camps that accessibility at home to technology could be problematic. Those teaching children who were English Language Learners mentioned the scarcity of materials available in other languages.

Although this research course was designed to encourage the use of technology and social software in completing a group research project, there were efforts to supplant the use of technology with face-to-face interactions. Participants expressed in their interviews and on their surveys that face-to-face interactions were better when brainstorming, coming to an agreement on the research topic, sustaining a common direction in the research, and with some aspects of the communication process. In particular, participants commented on not seeing facial expressions or body language, or knowing the emotional inflection in a comment. They also commented on the instantaneous response available with face-to-face encounters versus having to wait for an e-mail response. The operational definition of a “quick” online response varied from “within hours” to “within the week before the next class.” Thus, meetings were set outside of the scheduled class to work in person. In spite of this, participants reported there were not difficulties related to Crampton’s (2001) other issues around the development of *mutual knowledge*: unevenly distributed information, difficulty communicating, or understanding the importance of specific information. The online use of technology did not interfere with any of those processes associated with mutual knowledge, even for those students with low technology skills.

Conclusions

Overall, the inclusion of the use of social software in a traditional educational research course *did no harm,* but it is not clear that, at least in this iteration, it provided a substantial advantage to student learning. Specifically, the ability for groups to develop a community in which they could accomplish collaborative goals was more important than whether they were effective users of technology. Although the students showed some greater confidence with these uses of technology as the course progressed; in general, those students who were comfortable users of technology before the course were more likely to try to incorporate social software into their work than those who were initially less competent. Baird and Fisher’s (2005) optimism that we are teaching an *always on* generation of students did not match the reality of students trying to find ways to work together in this traditionally-delivered higher education course.

It appeared that it is not sufficient to teach students how to use social software and to provide an environment that supports the software’s use. Teachers who incorporate these tools in teaching and learning need to consider carefully what instructional strategies best match student technology use, the way that these tools are introduced in the curriculum, and most importantly, how to build learning communities in which learners encourage each other to incorporate collaborative electronic tools in the learning process effectively and efficiently.

We expected to see Crampton’s (2001) problems related to mutual knowledge development appear among the students. Generally they did not. Students were able to circumvent problems related to the distribution

of information about the projects some times by returning to face-to-face interactions but most often by using technologies with which most of the students were familiar (i.e., attachments in E-mail). When problems did appear, they were more often related to personality conflicts than to issues generated from trying to distribute information in order to accomplish the group tasks.

This is a small study, and the idiosyncrasies of this set of students may not be particularly representative of the students that will be moving into our programs in the near future. Also, this was the initial use of a number of these electronic tools in a course by the instructor. It is uncommon that innovations in instruction work well the first time even for seasoned faculty. Problems in the infusion of technology in this course may also be related to the fact that these students were in a graduate program in which uses of technology only appeared in a few courses and even then mostly related to library research. This course was atypical of their other experiences within the program. Regardless, it was clear that when given the choice, this group of students would consistently choose face-to-face interactions over electronic tools even when presented with evidence that electronic tools had a *value added* component to them.

We have no doubt that as the electronic tools available to students become more powerful, and as the ease of use of social software increases, that some of these tools will become necessary components of higher education teaching and learning regardless of the instructional setting. Some already have. What cannot be assumed is that students will be able to use these tools effectively without being comfortable participating in and developing learning communities. The strength of social software is that it improves collaboration when students are working together online. It does not teach users to collaborate but rather has the potential to improve collaboration that already exists. Not surprisingly, collaborative learning with technology is unlikely to be effective if collaborative learning without technology is difficult.

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An Investigation into the erceptions of First time Online ndergraduate Learners on Orientation Events

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Abstract

Orientation programs have been used for years in face-to-face universities and colleges to help prepare new students adjust to their new college community by providing key information about school resources and providing an opportunity socially interact with other students. These orientation efforts have been a vital component in increasing a students' likelihood of persisting in their program of study (i.e. not dropping out). Distance Education institutions (often with online course offerings) tend to have significantly higher drop out rates than their face-to-face counterparts, and thus orienting new online students to their new online learning environment is a logical progression. However, orientation events need to be customized to the population if they are to have a significant impact on persistence. This study explores the perceptions that a group of online undergraduate students had of three different types of orientation events. These events included a traditional face-to-face orientation session, a pre-recorded course orientation video, and a live webinar. These perceptions were revealed in responses to an online survey and comments within and after the webinar. The study concludes with suggestions for further research and presents possible alternatives to the traditional methods of student orientation.

Keywords: orientation; induction; attrition; drop out; persistence; higher education; student perception; webinars.

Introduction

Successful completion of a course or program has been a grave concern for distance educators (Tyler-Smith, 2006; Rovai, 2003; Carr, 2000; Taylor et al., 1993; Bullen, 1996; Galusha, 1996) because distance education (DE) students have significantly higher rates of attrition (drop out) than their face-to-face counterparts (Bernard et al., 2004; Kember, 1996). DE students are at least 10 to 20 percent more likely to drop out than face-to-face students, with reasons ranging from a lack of communication and interaction with faculty (Carr, 2000), long turnaround time for faculty feedback (Taylor et al., 1993), course content not well suited for distance delivery (Bullen, 1996), and poorly designed course materials (Galusha,1996). Persisting in one's course or program is a vital aspect of learner success (Cookson, 1990), and thus developing strategies to combat the high levels of attrition in DE is imperative for the field. Traditional face-to-face undergraduate institutions have long determined that properly orientating new students from high school, for example, to their new college or university learning environment, has an overall positive effect on the persistence of these students (Tinto, 1985; 1998). With the advent of new technologies, the traditional delivery of orientation events (e.g. 'welcome sessions', 'frosh' week) can now be contrasted with new, internet-facilitated methods. This paper reports on a study of the perceptions of first-time, online, undergraduate students' on orientation events geared at preparing them for their new online learning experience. In this paper the author presents the findings of a study conducted at an online division of a large, urban, Canadian university, in which the reasons for engaging (as well as not engaging) in three separate orientation events for online DE were investigated. These three events were as follows: a traditional, face-to-face, synchronous, real-time event (an orientation session); an online

asynchronous, delayed-time event (a pre-recorded course orientation video); and an online synchronous, real-time event (a webinar titled "Getting Ready for Online Learning).

Literature Survey

Persistence and Orientation

Tinto's (1975) model of student integration has provided a framework to understanding persistence and attrition in traditional undergraduate courses and programs. The model notes that students must be integrated both academically and socially to increase the likelihood of their persistence. Tinto (1975) stated that the importance of interactions with peers and faculty, and the need for students to feel as part of the learning community (and not at odds with it) is integral for persistence. Additionally, Tinto (1998) noted that this academic and social involvement is most important for students during the first year of college, when the "transition to college is not yet complete and personal affiliations are not yet cemented." (p. 169), and consequently when drop out is highest.

As a result of Tinto's work, many face-to-face colleges and universities presently offer various orientation events to help new students join into the college or university community. The type of orientation event can range from formal orientation sessions or workshops to informal 'meet and greets'. These interventions are typically 'face-to-face', and thus may not be optimal for online DE students. Differences between the two populations (face-to-face and online DE) in aspects, such as goal and institutional commitments, can make social integration very different for students in DE (Rovai, 2003). To address persistence, DE institutions need to:

(1) ensure students' social and academic integration (Kember, Lai, Murphy, Siaw, and Yuen, 1994);
(2) do so within the first year of instruction (Tyler-Smith, 2006); and
(3) do so taking into account the specific attributes of the online undergraduate DE student population.

Social Integration in DE

To promote intimacy by building a feeling of community students synchronous discussions have been found to be helpful (Maples, Groenke and Dunlap, 2005; Motteram, 2001; Im & Lee, 2003). Synchronous communication is defined as communication that occurs at the same time and [virtual] place (Bernard, Abrami, Lou, and Borokhovski, 2004). This communication can be mediated through video-conferencing, audio-conferencing (e.g. VoIP), computer-conferencing, and/or a combination of these tools. In online DE, synchronous discussions are facilitated by synchronous communication tools. Examples of these tools include readily available (and free) applications such as MSN Messenger™ (which allows participants to converse either in text or by voice), as well as integrated components in Course Management Systems (CMS) such as FirstClass ™, WebCT Vista™ and BlackBoard™, which typically permit text-based chats. Virtual classroom software, such as Elluminate™ and Adobe Connect™, are intended to create an online environment that mimics many of the characteristics of a classroom, using text, voice, and video communication. Some virtual classroom software also allows users to perform tasks such as collaboratively updating files, sending and receiving files, sharing the presenter's desktop image, and conducting polls.

Contrasting with synchronous communication is asynchronous communication, in which neither the instructor nor student communicate at the same time. Online asynchronous communication can occur through e-mail, discussion boards, posted course materials (such as a published PowerPoint™ presentation from an instructor), and websites, blogs and wikis, where participants can read and contribute material at their convenience (Carliner, 2002). Asynchronous DE has been found to outperform their synchronous counterparts on levels of achievement; however, not surprisingly, incidences of drop out are substantially higher in asynchronous DE than in synchronous DE (Bernard, Abrami, Lou, and Borokhovski, 2004). Synchronous components have been found to help students as they cross over from a face-to-face learning environment to an online learning environment (Garrison et al., 2003), which implies that orientation sessions geared towards facilitating social integration should involve synchronous components, and when content needs to be learned asynchronous components should be involved.

Orientation for online students

Since most DE programs now leverage online technologies, DE students typically are online students. Studies have suggested that what is needed to properly orient an online learner is systematically teaching skills needed to be successful learners in their online environment (Salmon, 1998). Online students require a different set of learning skills than those required for face-to-face learning, orientation events designed for this group need to be geared towards this different skill set. Motteram and Forrester's (2005) qualitative investigation of online student experiences of orientation events, suggests that orientation should take place online, but some students may need face-to-face interaction to quickly resolve issues. A new technology that may help to address this need to develop online orientation events is webinar technology.

Webinars (web-based seminars), are online synchronous events that use multimedia technology to host online seminars. Webinars run on a participant's computer, after they download the multimedia application and connect to a secure server. Webinar software typically includes the following features: a list of participants in the webinar (viewable by all participants); a forum for text chats; a two-way audio and video feed; and a presentation area which is typically used to show slides (e.g. from a PowerPoint™ presentation). This presentation area also facilitates showing the moderator's desktop to the participants, who often have the ability to share files and to conduct polls where participants can answer questions in the form of multiple choice and yes/no responses. Examples of web conferencing software used for webinars include Elluminate™, Adobe Connect™ (formerly Breeze), and Microsoft Live Meeting™.

The challenge for institutions that offer online courses is to design an orientation event that can positively impact online student persistence. This paper presents the perceptions of such events by a group of online undergraduate students. The research questions to address these perceptions were:

1. What did students perceive as their biggest fear to online learning when they registered for their first online course?
2. What were the reasons that students gave for engaging or not engaging in orientation events and how did this relate to their perception of their usefulness.

Methods

This study was conducted at the distance education division of a large, urban university in Canada, during the winter term of the 2006-2007 academic year. This university offers approximately 20 online undergraduate credit courses per semester, aimed at traditional undergraduate students enrolled at the university (typically ages 19 through 24) and returning adults who are continuing their education (ages 25 and over, and often working part-or full-time; many also have families). Course topics range from political science to philosophy and from chemistry to economics. Most of the courses support existing face-to-face degree programs in a given academic year.

One of the reasons that this online division of the university was chosen as the research site was that it had two of the three modes of induction (orientation) implemented prior to the study. Specifically, they had already implemented a face-to-face orientation sessions for new students that is delivered at the beginning of the academic school year (in September) and an asynchronous pre-recorded course orientation video made by the instructor of each course. Additionally, the division had conducted research on attrition the previous year, and so the instrument (an online survey) could be modified and re-administered to examine a new kind of orientation - a webinar.

Participants

Two sets of participants were recruited. The first set of participants voluntarily enrolled in a webinar entitled "Getting Ready for Online Learning", that the author developed and administered. These participants were invited (by mass e-mail to the online student community 4500 students) to participate in a webinar for new students that would address issues of how to succeed in an online course and provide an opportunity to communicate and interact with other students.

In total, there were 22 participants in the webinar. The second set of participants responded to an online survey sent to the online student community (n 4500) a week before the deadline to drop courses without penalty. This survey, which was modified to include questions related to the perceptions of the orientation interventions, was responded to by 533 students, of which 207 were identified as first time online learners.

The ebinar

The 60-minute webinar was conducted at the onset of the term, and was delivered using the virtual classroom software vClass from Elluminate Live! The objectives of the session were to ensure that, at the end of the session participants would be able to:

- Prepare an ergonomically sound work area
- Create an online-learning file system on their desktop
- Create a learning schedule to plan and manage their semester.
- Communicate effectively in their online course.
- Access the university's online research tools
- Access and utilize online division's guide to online learning

The Survey

The survey consisted of 50 Likert scale questions and five open ended questions. The Likert scale questions used an assessment key with the values: 0-have no opinion; 1-strongly disagree; 2-disagree; 3-agree; 4-strongly agree. The data retrieved for this study came from the open questions on the survey, which were as follows:

1) List the main reason(s) that would cause you to drop this course. (examples: poor performance on midterm, fell behind in the course, procrastinated too much, commitments at home...):
2) I attended the orientation session at the beginning of the semester. If yes, please state what you liked/disliked about it. If not, please state why you did not attend.
3) I watched the orientation video for my course. If yes, please state what you liked/disliked about it. If not, please state why you did not watch it.

These open questions were specifically geared to ascertain the perceptions that students had about the two orientation events, the face-to-face orientation session and the pre-recorded orientation video. The face-to-face orientation session was held in-person at the beginning of the school year. The session provided an overview of a number of practical issues associated with taking online courses, such as how students register and what to expect from an online course. The pre-recorded orientation video was a recording of the course instructor, who provided a background of the course topics and an overview of what was expected in the course. Students viewed these online course videos asynchronously online. These one-way video feeds were made available to students in the “Getting Started” section of their online course.

Results

The data analysis was conducted separately on the two sets of participants: the webinar participants and the year-0 or year-1 survey respondents.

Results from the ebinar

Some demographic information about the group was retrieved during the webinar using the polling feature in the application. This revealed that 37% indicated that they were in their first year of online learning, 16% were in their second year and 21% were in their third year (26% did not respond). 36% of webinar participants indicated that they were under 24 years, and 36% indicated they were older that 24 years (26% did not respond). To determine the perceptions about the webinar, the transcript of the session was reviewed, and specific responses to particular questions were grouped and for similar responses. Additionally, unsolicited comments about the webinar that were received by email were also reviewed.To ascertain what perceptions participating students had about online learning, open responses (n 14) retrieved during the webinar were grouped based recurring themes in the statements. The groups of responses reflected that interaction (n 5), scheduling issues e.g., effective time management (n 5), and technology-related issues (n 3) were the most common fear that the students

reported they had when embarked on their first online course. Administrative (n 1) and academic issues e.g. understanding of content (n 1) were also concerns.

At the end of the session, the group was asked what they would 'take away' from the session, addressing the perceived usefulness of the webinar. All the comments received were positive, however, participants may have felt uncomfortable posting negative comments given that there was only a relative amount of anonymity because some real names (not aliases) were attached to the comments. The usefulness of addressing issues such as time management and using the discussion tools were reported. Some of these comments are presented in Figure 1.

About the Discussion oards:

"I will be far more active in the discussion boards"

"I'll be using discussion boards more as well, and coordinate elearning with my work schedule"

"…has given me more confidence in future to participate in these sessions"

About Time Management:

"thank you, it was good to know how to begin to organize"

"take time to do weekly planning and monthly planning and semester planning!"

About further uses of webinars:

"very useful overview of the resources available to students. I'd suggest that each course hold a webinar at the start of term"

"yes, it would be good to have something like this again"

"we should do a part II"

Figure 1: Categorized Webinar Responses

Results from the eneral Survey

The responses to the open questions on the online survey were grouped and coded for apparent emergent themes. To ensure reliability, a co-rater reviewed randomly selected responses and grouped them according to the themes that had been extracted by the primary researcher. There was a 95% reliability rating achieved. Descriptive statistics about the group was also attained via the Likert scale responses; however, there was no specific information regarding the perceptions of the orientation events solicited in the questions on this survey, and thus were not included in the final analysis.

In response to the question that asked for potential reasons why a student may withdraw (drop out) from an online course, several themes emerged in the responses:

- 31% of respondents (n 65) mentioned procrastination as a main reason. One participant responded "[If I] Fell so behind in the course that I couldn't catch up at all".
- 24% (n 49) mentioned evaluation components such as poor marks on midterm.
- One participant stated "A poor grade on any assignment or quiz would prompt me to drop the course."
- 13% (n 26) could not specify a reason, but stated they would not be dropping the course. One participant stated "I don't believe in dropping courses - period!!!!".

- 12% (n 25) mentioned course content being a main reason. One participant stated "The main reason I would drop an online course would be because it does not interest me and the material is too hard to understand".
- 8% (n 17) cited other commitments such as work as being a main reason for dropping. One participant stated "The reason I would drop the course would be if I had too many other commitments…".
- 7% (n 14) gave no answer at all.
- 1% (n 3) mentioned poor instruction as a reason.
- One participant mentioned that technical problems as a main reason.

Table 1 summarizes these results.

Emergent Theme	Number of responses n 207
Evaluation – poor results on midterm or assignments	65 (31%)
Time Management - procrastination, falling behind etc.	49 (24%)
No reason...not dropping course	26 (13%)
Content – too much, too hard etc.	25 (12%)
Other commitments – both personal and professional	17 (8%)
Interaction - too little/no interaction	8 (4%)
Instruction - poor or no instruction/resources	3 (1%)
Technical problems	1 (0%)
No answer	14 (7%)

Table 1: Summary of potential reasons for dropping an online course

To the question, "I attended the [face-to-face] orientation session at the beginning of the semester. If yes, please state what you liked/disliked about it. If not, please state why you did not attend":

- 86% of first time students stated that they did not attend (n 179). Of these students, the reasons given as to why they did not attend fell into seven categories.
- 26% (n 55), belonged to the theme "Did not attend because of other commitments". One participant stated "I did not attend it because I had other obligations (work)."
- 20.2% (n 42) did not attend but did not provide a reason why.
- 15% (n 31) did not attend because they were late in registering, or they had heard about the orientation too late. One participant responded "I didn't attend because I registered after the orientation date."
- 13% (n 27) did not attend because their expectations about the orientation session were low. One participant stated "I didn't attend the orientation session because all the information was already available online and because I took an online course specifically to avoid having to go to school."

- 5.3% (n 11) did not know that there was an orientation session.
- 4.3% (n 9) did not attend the session because of location. For example one student remarked, I did not attend because I live too far away to come into the city just for an orientation session".

Of the 14% (n 29) of respondents who did attend the session, an almost equal amount of students found it useful (5.8%, n 12), as not useful (6.3%, n 13). A small number of respondents attended but did not provide any feedback about it (1.9%, n 4). Table 2 summarizes these results.

Emergent Theme	Number of responses n
Did not attend because of other commitments	55 (26.4%)
Did not attend (no reason)	42 (20.2%)
Did not attend because registered (or heard about it) late	31 (14.9%)
Did not attend because they had low expectations	27 (13%)
Did not attend because they did not know about it	11 (5.8%)
Did not attend because of –location	9 (4.3%)
Did not attend – various reasons	4 (1.9%)
Did attend – found session useful	12 (5.8%)
Did attend – was disappointed	13 (6.3%)
Did attend but did not provide feedback	4 (1.9%)

Table 2: Summary of Reasons for Not Attending the Face-to-Face Orientation Session

In response to the question, "I watched the orientation video for my course. If yes, please state what you liked or disliked about it. If not, please state why you did not watch it", 80.7% (n 167) first time online learners stated that they watched the video. Their responses were categorized by three emergent themes.

- Most (50.2% of all respondents, n 104) had a positive experience with the video. One participant remarked "I did see it, and thought it was helpful. It gave me an insight about the program", another participant stated that "I liked that we got to see the instructor. I think that's who he was. It made it a bit more personal."
- A smaller number (13.5%, n 28) of respondents had either mixed or neutral feelings about the video, for example one participant stated "I did watch the orientation video, but to be honest there was nothing that I liked or disliked about it".
- A comparable group (13%, n 27) watched the video but had a negative response to it. For example one participant stated, "I watched the video and found that the professor seems too mechanized. I think that there should be more life put into the videos and an effort should be made so that the professors do not make it obvious that they are reading off a screen."
- Eight (8) students (3.9%) watched the video but did not elaborate on their experience.

Reasons that students did not watch the video fell into three emergent themes:

- 5.8% (n 12) had low expectations of the video and did not watch as a result. For example one student mentioned "I watched about 30 seconds of it. It was too slow and monotone for me. I believe that although this is an online course, the instructor's orientation should at least be interesting and enthusiastic which would promote the class."
- Five students (2.4%) had difficulties viewing the video.
- Four students (1.9%) did not watch because of time commitments, for example one participant stated "I did not watch it because I never got around to it."

The remainder of the students (8.7%, n 18) did not watch the video, but did not elaborate as to why. Table 3 summarizes the results.

Emergent Theme	Number of responses n
Viewed the video – positive experience	104 (50.2%)
Viewed the video – neutral/mixed feelings	28 (13.5%)
Viewed the video - negative experience	27 (13%)
Viewed the video – no reason	8 (3.9%)
Did not view the video - no reason	18 (8.7%)
Did not view the video - low expectations	12 (5.8%)
Did not view the video - technology	5 (2.4%)
Did not view the video - time commitments	4 (1.9%)
Did not view the video – late	1 (0.5%)

Table 3: Summary of Responses to the uestion about the Course Orientation Video

Discussion

Student perceptions of the webinar

Although 60 students had initially signed up to participate in the webinar, only 22 participated. When non-attendees were asked why they did not attend, students cited technical difficulties and unforeseen circumstances, in which something unexpected came up—essentially the same primary reason for not attending the face-to-face orientation session (discussed later in this section). This suggests that the "anywhere, anytime" model of distance education applies not only to the courses, but possibly also to orientation events. Social integration that during the webinar was difficult to quantify given the small number of participants and the 'one-time' aspect of the event; however, the sharing of fears and concerns about online learning, the shared experience of the webinar, and the group reflection of 'take aways' at the end of the webinar did exhibit signs that social integration had occurred within the group. These signs included the results from the 'take aways' prompted in the webinar as well as unprompted 'thank you' e-mails from participants after the webinar to the author.

Student perceptions of the face-to-face orientation session

Results revealed that most first-time online learners that participated in this study did not attend face-to-

face orientation sessions (81% of those asked did not attend). The primary reason given for not attending was 'Other Commitments'. This is not surprising given that it has been well documented in the literature that many individuals choose distance education because of the convenience of the "anywhere, anytime" model. Other themes that emerged in descending order were as follows: the students' registering late (and therefore, after the session was held); low expectations; and location. Of those respondents who did attend, an almost equal number of students found the session useful as not useful.

Student perceptions of the online course orientation video

Results revealed that most (81%) students viewed the videos in their entirety, and of these 169 students, only 27 (16%) did not like the video. The rest enjoyed the video, did not comment, or were indifferent. One student remarked, "I thought the orientation video was a nice introduction to begin the semester, just like teachers do in a classroom environment.". What is evident from these results is that students primarily respond positively to having an introduction to what is ahead, much like what they would expect in a face-to-face class. Additionally, having the video within the course area is an orientation activity in which most first-time learners voluntarily engage. When investigating the reasons for viewing the video, students cite the convenience, availability, and usefulness of the information provided.

Limitations of the Study

Several potential limitations affect this study. One is that while some inferences could be made with regard to the perceptions of the attendees of the webinar, the small number of participants makes these perceptions non-transferable to a larger population.

Also, the webinar was the first of its kind at this institution, and thus aptly, there were lessons learned during this experience. One important lesson was the need to have an orientation webinar as a component of each course, embedded within the online course area. It would seem that students did not perceive the value-added from webinar participation, hence the low registration rate, so by expressing its potential value within the context of the course, may have had increased participation results. Another limitation of this study was incurred by costs. Webinar hosting can be an expensive endeavor for an institution, and in this case only one webinar was granted by the host to conduct this study. A full year, unrestricted license would be needed to develop administrative expertise in facilitating orientation webinars. Additionally, such a license would be needed to gain a full composite picture of the effects of the webinars on, for example, the persistence of new students. Last, the lack of co-rater reliability obtained from the webinar response groupings also compromises the validity of the results.

Conclusion

This study investigated the perceptions new online students at the undergraduate level had of orientation events. These orientation events were all geared to help ease the transition of these students from a traditional face-to-face learning environment to an online learning environment. The need to address comes from the higher levels of drop out experienced by these students. It is widely accepted that orientation events, as suggested by Tinto (1975) and others, do help combat attrition (drop out). By providing new students with the information they need to successfully embark on their academic journey, and also by helping create a sense of community for students, these orientation events provide the support that students often need in order to persist.

This study showed that while webinars have great potential to increase social integration of students, the low registration and participation imply that the perceived benefits are low for first-time online learners. Additionally, as the term progresses, this need for online students to socially integrate may likely increase, but being at the onset of the semester, and not course related, this social integration would likely have a marginal effect on students. Additionally, because the webinar was not attached to the courses that students were registered for, students likely did not perceive the webinar as an integral aspect of their learning. Perhaps if these webinars were offered periodically throughout a program, where students could become part of a learning cohort, sharing their learning experiences as they progress through a course or program, webinars could effectively increase social integration of these

online learning groups. This can only happen with full upper-level administrative support, providing not only the resources to conduct these webinars in a timely manner and strategically placing them within the online course area, but also allow time for personnel to develop expertise in conducting these webinars. A “build it and they will come” attitude is not enough to ensure success, and it can also end up being a costly error for those involved (Bates, 2000). Fortunately, webinar technology can and has been used to facilitate synchronous communication within online teaching, and so leveraging this technology in as many ways that one can is advantageous to administrators as well as online students and teachers.

This study also showed that while face-to-face orientation sessions can be also be useful for online students, like the webinar, their usefulness was not highly perceived by this student population (81% did not attend).

In contrast, the asynchronous course orientation videos were perceived by students as useful and important, as demonstrated by the significantly higher proportions of students that watched the videos (over 80% of new students). The fact that the course video was embedded in the course area is a likely contributor to this statistic, however another possible contributor is that they provide students an opportunity to “see” who their teachers are, thus providing a sense of ‘knowing’ who their teacher is and belonging to an actual 'class'. Third, the current zeitgeist of online videos and websites such as YouTube™, which is easily accessible and also engaging for students, likely was factor in its popularity as well. Regardless, this method of delivery had the most effective uptake and must be considered.

To fully understand the implications and potential of online orientation events such as webinars, further research is needed. Research is required to determine what content would be most valued and useful for new online students. Since online students have different perceptions about the usefulness or importance of different types of orientation events, it is important that we continue to investigate ways to optimally design and delivering these events to effectively engage students. This study has found that having an orientation event that is online and connected to the online course area is important if students are to perceive the event as useful to their learning. An orientation webinar provides an innovative way to provide social interaction to students, as well as a forum to discuss the challenges that online learning may present; however, new students need to be made aware of their potential value to their entire learning experience if we expect them to engage.

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Integrated Multidisciplinary and Technology Enhanced Science Education: The Next Frontier

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Abstract

Contemporary science education at all levels presents several critical pedagogical and social challenges to educators and learners alike. Among these challenges are the widening *Intergenerational Information Technology* (IIT) divide and the need for a comprehensive and balanced multidisciplinary training. In the past few years, it has become clear that one significant hurdle impedes the efforts to integrate information technology in the classroom – the Intergenerational IT divide. The IIT gap reflects a different growing misalignment between providers and recipients of the science and technology educational content in terms of the expected vs. supplied, needed vs. perceived and contextual vs. abstract specialized learning. The common K-12 teacher or college instructor is much less familiar with, and slower to adapt to, the new ether of communication and novel IT resources. The transfer and blending of data, research challenges and methodologies between diverse areas of science is also critical in motivating wider spectra of students, demonstrating cross-disciplinary methodological concepts and synergies, as well as for engaging students in research projects. This article discusses the problems faced by modern science educators and suggests some methods and vision for coping with the increasing IIT divide and the social need to train "complete" and broadly educated citizens.

Keywords: science education, multidisciplinary, Internet, technology, blended instruction, online resources, intergenerational IT divide, information technology, policy.

Introduction

There are many geographic, social, economic and technological challenges that K-College science educators and students regularly face (Burns, 1995). Two of the most pressing ones are the continuing expansion of the *Intergenerational Information Technology IIT* divide and the social demand for broad, comprehensive and balanced multidisciplinary education.

Since 2000, we have witnessed the explosion of the Internet, various web-applications and information technologies for content generation and delivery. Certain groups of the population help develop and embrace these new ITs, others just try to keep abreast with them and still others are barely hanging in, if not completely giving up on the new IT developments (Inoue, 2006). There are extremely strong age effects in how the population perceives and responds to these technological demands, changes and implications (Finegold, Mohrman, & Spreitzer, 2002). Typically, students and learners are more inclined to be engaged in development, testing and adoption of new ITs (Maag, 2006; Ya ar, Little, Tuzun, Rajasethupathy, Maliekal, & Tahar, 2006). Despite their frequent early exposure to new IT and blended educational developments, teachers and instructors seem to be much more conservative, less willing to explore, validate and/or adopt new IT instruments in their curricula (Koukel, 2006; Vannatta & Fordham, 2004), e.g., www.genyes.com, www.eschoolnews.com. This leads to an undesired gap – the *Intergenerational IT divide* – between the providers (instructors) and consumers (learners) of educational and training curricula. This effect is secondary to the normative gap representing the natural gradient in

the knowledge of the two parties engaged in science education. The knowledge-gap is an important underlying cause for our educational endeavors – to bring up the next generation of citizens, well prepared to deal with future scientific, health, political, environmental or social challenges. The IIT divide is a byproduct of the fast-paced evolution of technology, which will likely widen and have detrimental effects on the ways we teach, the efficacy and apprehension of our educational endeavors.

The second considerable challenge in modern science education is the training of *complete* and *broadly* educated workforce. On the short-term, it may be economical, resourceful or appealing to train students extremely well in one narrow scientific discipline or subject. We may accomplish much specific progress, with measurable outcomes, by allocating significant resources in development of an individual-field expertise. However, the long-term results of such approach may be quite the opposite of expectations. Now-a-days, most graduate and professional schools, as well as much of the job opportunities, seek to recruit individuals that have widespread interests, training and capabilities. For example, application review panels at top medical schools currently give preferences to applicants that have a round background and affinity to social, geo-political, scientific and cultural facts and affairs; more so than to applicants that may be exceptionally strong in only one discipline or have narrowly defined curiosity. For example,

> UCSD School of Medicine admission guidelines state *A broad base of knowledge is advantageous in preparing to be a physician*;
>
> *Harvard Medical School is looking for people with broad interests and talents*;
>
> University of Pennsylvania School of Medicine advises applicants *to consider and think broadly of their prior academic and extra-curricular experiences*

This comes from the realization that a modern clinician, scientist, engineer, economist or politician needs to be able to reason, integrate knowledge and make decisions in *out-of-the-box* situations, where no single discipline or methodology is likely to solve a problem completely. In addition, abilities to effectively navigate and bridge the gaps between different science disciplines, social orders and behavioral psychologies will likely improve the prospects for our future workforce, leaders and scientists (Munshi, 2006). Lastly, the transfer and blending of data, research challenges and techniques between diverse areas of science is critical in motivating majority of students, demonstrating cross-disciplinary methodological concepts and synergies as well as for engaging students in research projects.

If technology enhanced multidisciplinary education improves student motivation and learning retention, what are some specific instances of IT instruments that may be employed by instructors? Modern information technology-driven educational tools are much more than simply collections of static lecture notes and homework assignments posted on one course-specific Internet site. Over the past five years, a number of technologies have emerged that provide dynamic, linked and interactive learning content with heterogeneous points-of-access to educational materials (Dinov, Sanchez, & Christou, 2008) These new IT resources include common web-places for course materials (e.g., Blackboard, Moodle), complete online courses (e.g., http://www.uclaextension.edu/), Wikis (e.g., http://wiki.stat.ucla.edu/socr), interactive video streams (e.g., http://duber.com/LetsTalk, http://blog.click.tv/, www.ivtweb.com/), audio-visual classrooms, real-time educational blogs (e.g., http://www.pbs.org/teachersource/learning.now), (Brescia & Miller, 2006), web-based resources for blended instruction (e.g., http://en.wikibooks.org/wiki/Blended_Learning_in_K-12), virtual office hours with instructors (e.g., http://voh.chem.ucla.edu/), collaborative learning environments (e.g., http://sakaiproject.org/), test-banks and exam-building tools (e.g., http://sourceforge.net/projects/tcexam/) and resources for monitoring and assessment of learning (e.g., http://www.opensymphony.com/webwork).

Challenges and Actions

No one can accurately predict the technological advancements or the prospective pedagogical challenges that educators will have to deal with in the next 10-30 years. This is because of the expected exponential increase in computational power and significant geopolitical, social and environmental challenges we are likely to face in this period. Yet, it is reasonable to assume that the technological progress we are likely to see will exceed an order of magnitude the advances witnessed in the past 20 years (Adomavicius, Bockstedt, Gupta, & Kauffman, 2006; Munakata, 2007; Pareek, 2006; Roberts,

2000). Such rapid increases in knowledge build up, data collection, communication and information infrastructure, for a relatively short time-span, will strain the delicate but functional balance we had reached in the 20th century in educating a broadly intelligent and skillful workforce. Two specific high-impact science educational challenges are likely to exacerbate over the next couple of decades – the *Intergenerational IT divide* between students and educators; and the dilemma of training *broadly* educated citizens at higher cost vs. the alternative of lower-cost *discipline-specific* education.

Intergenerational IT Divide

The accelerated development and utilization of the Internet, web-applications and new information technologies in all areas of social life has also impacted the field of science education. There is an interesting interplay between technology developers (visionaries and engineers) and the general public. New technologies may be designed by developers to solve general problems or may be introduced to solve some specific user needs. In either situation, age effects may sometimes have desirable taming implications or unintended forestalling repercussions (Daveri & Maliranta, 2007; Willis & Tranter, 2006). Younger learners are more willing to get involved in design, testing and broad distribution of new ITs (Bongalos, Bulaon, Celedonio, de Guzman, & Ogarte, 2006). There is evidence suggesting a correlation between the use of IT in the classroom and the level of student involvement (Cutrim, Rudge, Kits, Mitchell, & Nogueira, 2006). On the other hand, instructors appear to be more attracted to the established/accepted pedagogical techniques than to explore newly introduced IT instruments (Cartelli, 2006; Guillot & Pryor, 2007; Moore, 2006). Certainly the majority of new technologies may eventually be discarded, proven to be inefficient or be quickly replaced by even newer advancements. However, some, like the collaborative Wiki environments, are bound to make an impact on how we train the next generation of scientists and engineers. This IIT gap between the educators and students is the result of differences in perceptions of the goals of scientific training, socio-economic factors, as well as quick turn around of technological breakthroughs (Conole, 2008). Left unchecked, the IIT gap will likely expand and impact on the immediate efficacy and long-term apprehension of our current educational activities.

There are several possible strategies to slow and perhaps reverse the IIT divide and ensure that our educational efforts are balanced and effective. Some of these are discussed below.

Continuing Instructional Technology Training

One of the most powerful ways to impact the progression of the IIT divide is to involve science educators in continuing technology education training. This may be done under discipline-specific or general societal/organizational umbrellas. Most instructors and teachers already participate in various semiannual or quarterly continuing education events within their discipline. Few are deeply involved in regular technology-based refresher courses. For example, fewer that 25% of the UCLA statistics faculty attend a continuing education course each year. The experience of this author, as a recipient and deliverer of science and technology education to teachers and educators, confirms that many instructors are not familiar with the basic modern means of Internet communication (including, blogging, collaborative wiki environments, database and applet interfaces, web-services, data resources, etc.) A sustained effort is needed on the part of educators, science administrators, policy makers and the general public to facilitate and enable continuing science and technology education for instructors at all levels.

Engagement of Instructors in Science and Technology Research Pro ects

Instructors from elementary school to college should be involved in science and technology research projects pertinent to their level and curricula. By judging at variety of state and local science fairs, this author has been very impressed by the motivation, elaborate thinking and complexity of projects developed by K-College students who were supervised by instructors engaged in multi-disciplinary science and technology research. For instance, the annual California Science Fair serves as a forum for showcasing student research projects directed by K-12 teachers and college instructors, a venue for exchange of ideas and as an informal student project evaluation mechanism. The amazing variety and work quality of student projects presented there are evidence of the effects of engaging instructors in research projects (e.g., http://www.usc.edu/CSSF/History/2006/Alpha.html). There are various ways to learn and contribute to new or ongoing research projects conducted by higher education institutions, professional organizations, private and federally funded initiatives (e.g., www.usc.edu/CSSF, NationalGeographic.com/genographic, ed.fnal.gov/trc_new/projects/web_resources.shtml, etc.)

Institutional Commitment in IT and Blended Instruction
The interest, available infrastructure and resources provided by home institutions are essential for the engagement of teachers and instructors in contemporary science and technology education. Many institutions (e.g., schools, colleges, universities, institutes and centers) provide computational resources, audio-visual and Internet-digital infrastructure, seed grants, human resources and other forms of support to entice their instructors in technology learning and creative utilization of IT in the classroom (e.g., www.oid.UCLA.edu/AVS). Institutional commitment could be a significant barrier or a considerable asset in developing an IT blended curriculum.

unding Agency Engagement in IT and Blended Education
There are a multitude of agencies that provide funding support for a wide spectrum of innovative educational endeavors (e.g., www.ED.gov, www.GrantsAlert.com, www.NSF.gov, www.spencer.org, www.kidsinneed.net, etc.) Federal, state and private funding initiatives aim at stimulating creative thinking and exploration of novel strategies for IT and blended education. Even though these are merit based and in some instances very competitive, few good proposals are turned down. For example, in 2006-2007, the National Science Foundation received 44,000 grants, 11,000 of which were funded (of course, not all were education related). When submitting a grant proposal, the critical components are to find a specific call for application that jibes well with the proposed idea, format the proposal according to the specific call and grant writing guidelines, and ensure that the proposal addresses a real (educational) challenge that is not already solved. Such extramural funding does enable instructors to buy out time for attending continuing education events, develop blended curricula, establish new collaborations, collect data and design research projects. All of these will have a positive effect on reducing the IIT gap.

Integration of Available Digital Resources in the Classroom
In the past several years, a large number of digital resource libraries have been cataloging, curating, evaluating and integrating most of the valuable IT resources for enhancing science education using interactive aids, electronic media and instructional materials. A list of some of these resource libraries is available online at http://SOCR.ucla.edu/htmls/SOCR_Recognitions.html. These resources provide datasets, methodological and conceptual learning materials, tools for data analysis and exploration, hands-on activities, demonstrations, tutorials and refreshers for all disciplines, topics and levels. Instructors should dedicate the time to find, test, compare and select appropriate resources for their curricula. With respect to web utilization, students are much ahead of most instructors and they can easily discover Internet resources on their own (Maag, 2006; Ya ar et al., 2006). The problem with the latter is that students may use inappropriately such resources (intentionally or unintentionally) without instructors even realizing it. For example, many instructors (including this author) are sometimes unaware that on the Internet, problem solutions, virtual tutors and blogs contain solutions to many homework assignments, which diminishes the intended value of personally completing such assignments. The reduction of the IIT gap will taper these possibilities and increase the value of personal learning efforts.

road vs. Narrow Spectrum Educational Training

There is a good agreement that all learners need to be generally trained first (Hernon & Schwartz, 2006; Posch & Steiner, 2006). Science oriented learners eventually should branch out and specialize in a specific discipline that they further explore and advance in. The main question is: when should the regression into a specific scientific area occur in the learner's course of training? In the past, this break point was probably in the first decade of life. More recently, the point of specialization occurred first in high-school (1960's), then in college (1980-1990's). Now-a-days, science students frequently carry multi-disciplinary research and training in graduate and post-graduate school. This ever increasing demand for multidisciplinary training reflects the steady increase in human life-span, the accumulation of general knowledge, technological advancements and the escalation of the complexity of problems addressed by researchers, clinicians and policy-makers.

The debate over the discipline bound vs. cross-discipline training is especially crucial in undergraduate and graduate college education (Holt, 2007; Mitrany & Stokols, 2005). Frequently, the two extremes are pure mathematics students (very discipline-oriented, high-level of competency, low cost training) and various humanitarian majors (broad discipline learning requirements, including many watered-down quantitative courses, somewhat higher training costs, low-level knowledge spanning many subjects). The

multi-disciplinary and area-specific educational trainings are complementary, not overlapping or antagonistic. For example, brain mapping and computational neuroscience challenges may serve as driving biological projects for developing novel methods for statistical analysis (Dinov, 2005). And conversely, the introduction of new mathematical models of shape may lead to unexpected biomedical applications (Srivastava, 2005). An over commitment to any one of the two educational directives will ultimately have drastically negative effect on the entire educational system. The reason is that multi-disciplinary sciences are completely contingent upon having robust and computationally tractable theoretical properties and results needed to establish the spokes of modern scientific understanding of the physical world we live in. Multidisciplinary research efforts allow us to build bridges and establish affinities between such (sometimes independent) spokes of scientific endeavors. On the other hand, no single scientific area can model, represent and explain the complexities in any physical, biological, social, political, medical or psychological system. Solutions to all real-world problems demand multi-disciplinary thinking and cross-scientific approaches.

Some of the directions below may help us promote interdisciplinary science and protect the homeostasis between discipline-oriented and cross-discipline thrusts in science education.

Develop ew and Diverse Multidisciplinary Educational Curricula

There is a real need to design new plans for multidisciplinary instruction involving two or more disciplines. The lack of available educational materials that cross between different disciplines and enable sharing of data, techniques and tools is due to scarcity of expertise to develop such instruments (Borgman, 2006). Few educators are well versed in multiple scientific fields (Bender, 2005; Freeman, 2005). Thus, collaborations and interactions between different areas are sometimes impeded by insurmountable linguistic, methodological and physiological barriers (e.g., terminology, specifications of data and methodological protocols, *a priori* assumptions). The community of science educators should strive to improve communication and overhaul the efforts to develop educational materials and transferable knowledge across multiple disciplines. Examples of such efforts involving mathematicians, engineers, biologists, statisticians and physicists are developed by the National Internet-based Science Educational Resource.

Institutional Commitment to Multidisciplinary Education

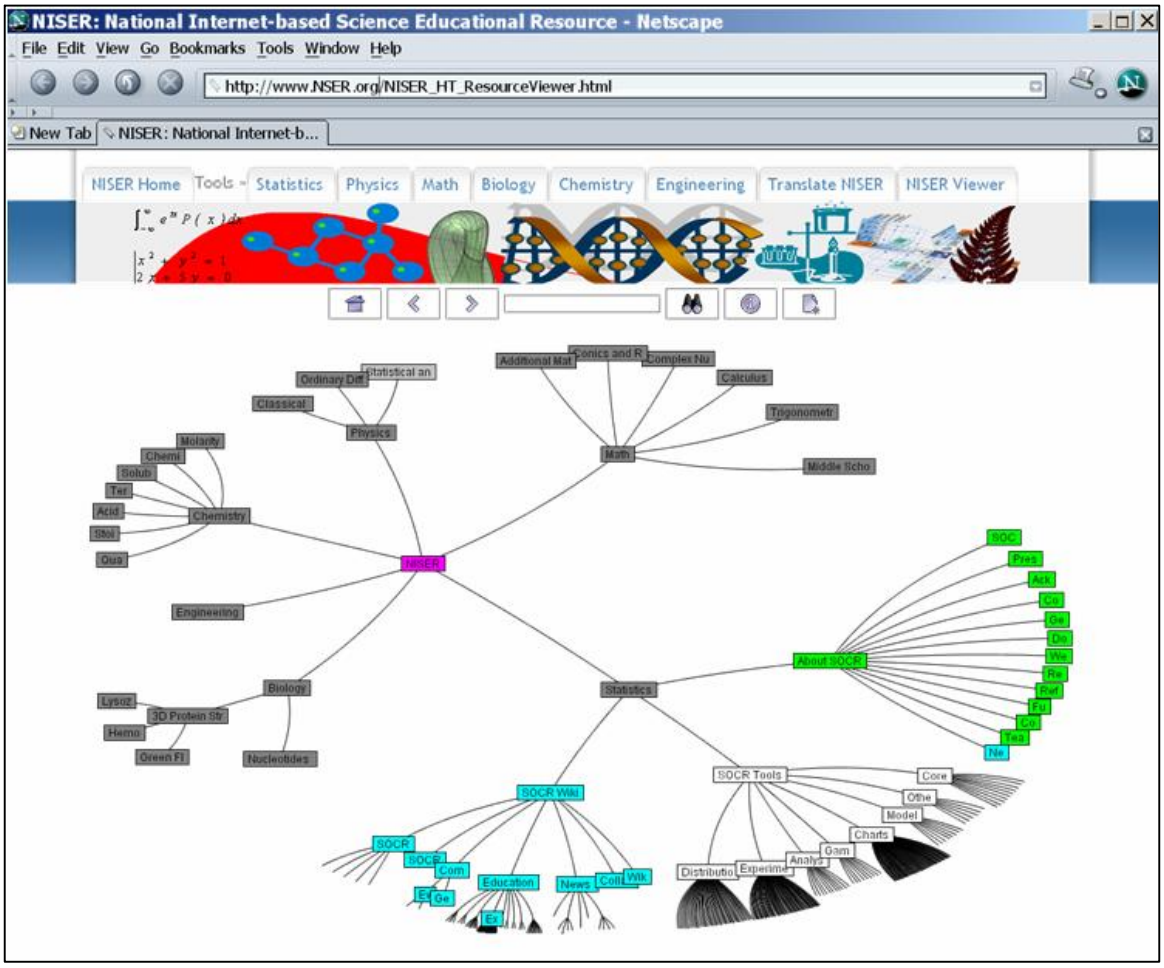
Little progress in designing, validating and disseminating multidisciplinary educational materials is practically possible before ensuring firm institutional commitments and support to these efforts. In addition to demanding scientific expertise from varieties of fields, multidisciplinary resource developments also require logistical, financial, administrative and human resource commitments that are only conceivable and implementable by larger institutional, organizational and legislative initiatives. A 2004 National Academy of Sciences report entitled *acilitating Interdisciplinary Research* (NAS, 2004) identified barriers to interdisciplinary efforts including limited resources, the academic reward system, differences in disciplinary cultures, the pursuit of national rankings (based on traditional disciplinary categorizations), differences in policies and procedures across departments, and decentralized budget strategies that give advantages to departments over interdisciplinary programs.

The University of California, Los Angles (UCLA) is one example of an organization embracing crosscutting educational programs that serve undergraduates and graduates. UCLA includes 32 interdepartmental program majors, nearly 500 courses are offered as cross-listed in two or more departments, faculty members participate in several departments through split appointments (5.4%) or joint appointments (24.5%), and there are over 80 campus-based multidisciplinary research centers, characterized by long-term institutional commitment and robust funding.

Introduce Efficient Multidisciplinary Resource Interfaces

Even if we are successful in developing, testing and distributing a large number of interdisciplinary educational resources, a possible imperative to their utilization by instructors as classroom aids may be the efficient means of resource traversal, querying and comparisons. Such interfaces to multidisciplinary digital libraries should facilitate the community involvement in updating, ranking and management of the resource collectives. NSDL, MathDL, and NISER provide examples of such interfaces. This figure below illustrates an example of the interactive and dynamic exploration of the NISER resources. The issues of classification, organization, traversal and management of interdisciplinary materials and educational resources will become pressing with the expansion of the volume, complexities and affinities of these resources. Efficient, robust and extensible infrastructures for management, visualization and (human and

machine) interaction with these resources will be vital for the success of the future interdisciplinary educational efforts.



The NISER interactive graphical user interface enabling traversal, discovery and dynamic exploration of available multidiscioplinary educational resources and learning materials. (http://www.nser.org/NISER_HT_ResourceViewer.html)

Expectations of Student Participation in Multidisciplinary Programs

There are several direct implications of engaging students in multidisciplinary learning activities. Interdisciplinary training exposes students to the practical interactions of concepts and properties they have learnt in other field-specific curricula. This reinforces the meaning and applications of these concepts to study natural processes or develop models about our world. Multidisciplinary research projects also tend to rapidly and sustainably attract students' attention and serve as a powerful learning motivational tool (Joan, 2007). Learners exposed to well-designed and interactive hands-on multidisciplinary training acquire unique perspectives in understanding and dealing with complex problems (Shekar, 2007). Such training provides the glue that will hold together and perhaps stimulate the future scientific endeavors. At the same time, imminent advancement in scientific research and applications is contingent upon the availability of sufficient high-level knowledge expertise within each scientific field as well as the abilities of researchers and scientists to look across many areas, draw resources and make inference about general multi-disciplinary challenges.

Mechanisms for Assessment of Instructional effectiveness of Interdisciplinary Education

uantitative evaluations of many educational interventions, including the efficacy of multidisciplinary training, are difficult because treatment effects may be observed as dependent or categorical measurements, they may be significantly delayed in time, be extremely non-parametric/non-linear or

may be indirectly manifested (Dinov et al., 2008). Therefore, a mixture of quantitative and qualitative evidence should be used to assess the effects of interdisciplinary training, as well as the social and economic impacts of the balance between high-competency area-bound and cross-disciplinary education. The table below summarizes some of the important measures for assessment of the efficacy, perception and promise of interdisciplinary education to improve human life, health and general knowledge.

ASSESSMENT OF THE LONGITUDINAL IMPACT OF INTERDISCIPLINARY EDUCATIONAL EFFORTS

MEASURES	TYPE	ANALYSIS METHODS	SUMMARY
Volume of Multidisciplinary Materials & Resources	quantitative	Time-series analysis, parametric inference	Overall measure of interest and motivation behind interdisciplinary educational endeavors
User Demographics	Mixed quantitative and qualitative	Qualitative data analysis	Geographic, socioeconomic, age and level of the consumers of multidisciplinary training
Translational and Transitional Scientific Discoveries	qualitative	Domain analysis	What types of problems have been solved using techniques, data and tools developed by broad multidisciplinary teams and consortia?
Multidisciplinary Publications	Mixed quantitative and qualitative	Quasi-Statistics & Domain analysis	Scientific perception of multidisciplinary activities by peers and the general public
Training Curricula Overhauls	quantitative	Regression, correlation & parametric inference	What are the grass root changes in formal and informal training curricula reflecting the progress and perception of modern multidisciplinary education?
Economic demand for interdisciplinary trained workers	quantitative	Time-series analysis, parametric inference	The economic impact of interdisciplinary training will be realized only if there is a clear trend to increase the quantity and quality of workers with integrated and broad knowledge of variety of scientific areas

Multidisciplinary science education – an impact evaluation matrix.

Discussion

There will be some educational challenges in the next decade that we can foresee now and many that will only become apparent in the future. For instance, it is expected that computers and Internet usage will vary by family socioeconomic status, race and parent educational level (Norris, 2001). There are several studies that have consistently established this notion of the digital divide (DeBell, 2003). A summary of these social and geo-political effects is included in the *Computer and Internet se by Students in 2003* report, published by the National Center for Education Statistics in September 2006, (DeBell, 2006). This report surveyed about 56,000 households and obtained information on close to 30,000 students from nursery school to 12th grade. The results indicate that students' technology usage

is divided along low (87%) and high (95%) income families; Whites (93%), Asian (91%), Latinos (85%) and Blacks (86%); public (91%) or private (86%) school enrollment; high-school (89%) and college (93%) educated parents. All of these differences are statistically significant at 0.05.

In anticipation of the less obvious future challenges of education, and particularly the role of IT-enhanced and multi-disciplinary curricula, we need to debate and outline clear policies and directions for smooth transitions and timely resolutions of such unexpected conundrums. The ideas proposed in this manuscript provide a starting point for this debate on how to address prospectively two of the most pressing needs of science and technology education – the student-instructor *Intergenerational IT divide* and the dilemma of effectively training advanced discipline-bound and multidisciplinary scientists.

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Culturally Targeted Online Course Redesigns for English Composition and Research riting: A Case Study

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Abstract

The Enduring Legacies Reservation-Based Project, now in its third year, supports Native American college students of a number of Pacific Northwest tribes. This paper addresses the pedagogical and e-learning strategies applied to the culturally sensitive curricular redesigns for English Composition 1 and 2 (which involve essay writing and research writing respectively). These are foundational and required courses for a number of degree programs and certificates. The curricular redesigns for both courses address issues of cultural sensitivity, learner focus, and strategy, and apply concepts of universal design for more effective learning for a wide range of learners. With the redesigns now in place for a year for the EC1 course and one quarter for EC2, some early findings have emerged as well.

Keywords: Online course redesign, cultural sensitivity, The Enduring Legacies Reservation-Based Project, The Evergreen State College (TESC), WashingtonOnline (WAOL), Tribal Based Program, Grays Harbor College (GHC), Native American learners, English composition, and research writing

Introduction

The Enduring Legacies Reservation-Based Project (funded by the Lumina Foundation for Education, College Spark Washington, and others), now in its third year, supports Native American college students of a number of Pacific Northwest tribes. Educational technologies and e-learning play a central role in the program. This project involves three main endeavors.

1 Associate of Arts. The first involves the creation of a three-year associate of arts degree that is fully transferable to any university in the US. This program combines e-learning courses offered through WashingtonOnline (WAOL), a consortium of 34 community colleges of Washington State, with some credits of face-to-face courses that focus on humanities credits and topics such as public speech, writing and literature, e-portfolios, and battlegrounds (original Native American teaching case studies learning) in order to promote the learner cohort and community. Also, the students meet with a study leader from their own tribes one day a week to focus on their studies. Tribal-based study leaders serve as "whipmen" and work with learners "for tutoring and mentoring". The study leader relates to the learners culturally, and, as a member of the respective tribe, connects to the social support and familial structure surrounding each learner. Historically, Native American societies unite around caring for their young and students "were not allowed to fail" (Demmert, Dec. 2001, "Improving…" p. 1).

The selected courses from the curricular offerings of WAOL were initially revised in the first year of the project for more Native American cultural infusion in the curriculum, and the online faculty underwent culturally-sensitive instructor training and intercultural competence at The Evergreen State College (TESC) campus, with considerable peer learning from other faculty, tribal members, and tribal learners. The online instructors were handpicked for their high engagement with learners and academic rigor. Events at The Evergreen State College's Longhouse Education and Cultural Center were designed to help learners meet and greet instructors - over traditional and friendly forms of the breaking of bread: fall

orientation events like clam bakes and salmon roasts. This curriculum related to the Reservation-Based/Community Determined Bridge Program's basic tenets of promoting student's personal authority, honoring of indigenous knowledge, and the use of academics to "complement personal authority and community knowledge." Annual themes of the 2006 – 2009 academic program include "Contemporary Indian Communities in a Global Society," "Traditional Knowledge: The Foundation for Sustainable Tribal Nations," and "Integrating Change in a Communal Society."

One-credit humanities courses are taught four Saturday afternoons per quarter at the TESC Longhouse. These provide opportunities for peer mentoring and socialization with Grays Harbor College students in their freshman and sophomore years mingling with juniors and seniors from The Evergreen State College. The design of this degree allows for easier transfer of freshman and sophomore credits to the university. The pacing - a two year degree offered over three years - acknowledges the many outside-of-academia commitments of the Native American learners and makes the work load more realistic.

2 High-tech, high-touch hybrid approach. A second feature employs a "high-tech high-touch" hybrid approach. The high-tech involves the Blackboard™ learning management system (LMS), campus-based student-owned e-portfolios (with a learning framework), The Evergreen State College (TESC) website, and digital learning artifacts. The use of e-learning technologies allows a much deeper reach into the geographically dispersed and somewhat isolated reservation-based tribes of the Pacific Northwest for "place-bound" learners. The benefits of the LMS are manifold. The courses used and developed are digitally archived and may be transferable to others. Any revisions to the courses may benefit more than the targeted Native American because of copyright releases built into all system-owned courses in WashingtonOnline. The use of accessible builds - through authoring tools and an accessible LMS - make the curriculum applicable to a wider audience.

The use of the World Wide Web (WWW) to collect and deploy various learning resources in e-portfolios and case studies magnifies the influence of this program beyond the boundaries of the various educational institutions. The ability to publish broadly affords the Native American students (and studies) voice, reach and often, respect.

The use of these technologies also involves some cultural border crossing in the sense that many Native American communities have been "have-nots" in the "digital divide." This program gives software-loaded laptop computers to the learners as part of the learning, and it includes face-to-face training on the use of BlackBoard™, the laptop, and Web resources. Native American teaching case studies may be deployed online for a wider reach for the curriculum, and many of these cases involve full-sensory digital wraps (sight, sound, and hearing). The benefits of the Web for rich research also strengthen the learning with the definition of web quests and other online assignments.

3 ative American case studies. The third strand involves the development of original Native American teaching case studies involving primary and secondary research by college instructors at WAOL, TESC, and experts in the Native American communities. Teaching case studies support the value of indigenous knowledge and the learners' personal observations of the world and their connections to vibrant communities. These cases engage issues of relevance to Native American learners and capitalize on tribal knowledge and often less-publicly-accessible primary resources. These may counter the observed Native American invisibility in both the academic research and the college teaching (Demmert, Dec. 1001, "Improving…A Review of the Research Literature," pp. 3 – 4). These teaching cases are available on the WWW and are shared with Creative Commonsk-type global publication.

Participants. The Evergreen State College (TESC) serves as the lead institution in this collaborative endeavor. Grays Harbor College (GHC) is the supporting college, and WashingtonOnline (WAOL) serves as the main online course provider. The Enduring Legacies Reservation-Based Project started in Sept. 2005 with an initial half-dozen First Nations tribes: the Makah, Muckleshoot, Nisqually, the Port Gamble S'Klallams, uinault and Skokomish. By the second year, a number of others had joined: Squaxin, Lower Elwha Klallam, uileute, and Shoalwater Bay. By Jan. 2007, the Chehalis Tribe had joined.

This paper addresses one aspect of this project: the pedagogical and e-learning strategies applied to the culturally sensitive curricular redesigns for English Composition 1 and 2 (which involve essay writing and research respectively). These are foundational and required courses for a number of degree programs

and certificates, and the subtle curricular redesigns for both courses address issues of cultural sensitivity and learner focus.

aper Organi ation

The paper will begin with a brief pedagogical rationale for the cultural sensitivities approach, with a focus on Native American learners' cultural needs. Then, some course redesign strategies used by the WAOL instructors will be summarized. The paper then focuses on the culturally targeted online course redesign work cycle before addressing the specifics of the two English courses in the redesign.

rief edagogical Rationale

Culture in learning has been discussed in the research literature in different ways - as different expectations, worldviews, assumptions, emotions and comfort zones. It is part of the social landscape that people are habituated to and often becomes invisible until it conflicts with others' expectations. Culture may be learned and unlearned. Adaptive and variable, culture evolves (Nee and Wong, 1985, p. 287, as cited by Aldrich and Waldinger, 1990, p. 125).

Culturally sensitive approaches to learning came into focus in the late 1980s and early 1990s as a response to the growing diversity in US classrooms and "concern over the lack of success of many ethnic/racial minority students despite years of education reform" (Pewewardy and Hammer, Dec. 2003). Here, a culturally relevant instructor may mitigate some of the "social-historical-political realities beyond the school" that may constrain learning (Osbourne, Sept. 1996, p. 291).

Ladson-Billings' theory of culturally relevant pedagogy suggests dynamic "culturally responsive" actions by instructors, regardless of their own cultural backgrounds. There must be a focus on three realms: conceptions of self and others, social relations, and conceptions of knowledge (Autumn 1995, pp. 478 – 481). Ladson-Billings, in a prescient work, suggests that culturally attuned instructors must see themselves as part of the community and believe that the students are capable of academic success; they must see their pedagogy as "art—unpredictable, always in the process of becoming" (Autumn 1995, pp. 478 – 479). They must maintain fluid student-teacher relationships; demonstrate a connectedness with all of the students, and develop a community of learners, among which students learn collaboratively and responsibly (Autumn 1995, p. 480). Culturally responsive instructors also need to view knowledge as "shared, recycled, and constructed," and they must build bridges or scaffolding to facilitate learning; they must use a range of multi-faceted assessments for multiple forms of excellence (Autumn, 1995, p. 481).

Adhering just to mainstream norms in education may be exclusivist and socially myopic. Pewewardy and Hammer observe: "Ultimately, the attitudes, beliefs, and actions of the school must model respect for cultural diversity, celebrate the contributions of diverse groups, and foster understanding and acceptance of racial and ethnic plurality" (Dec. 2003).

The grounds for a culturally sensitive course redesign lie in a deep knowledge of and empathy with the Native American learners and their respective cultures. Instructor sensitivity to the unique needs and personalities of each learner will be critical and possibly even more relevant than generalizations about their cultures. In this case, cultural subject matter experts (SMEs) with ties to TESC were brought in to advise and to critique the course redesign plans and actual course rebuilds.

Online means have been used to teach issues of intercultural competence, respect for others' ways of life, changing perspectives, and the promotion of knowledge about one's own and others' cultures (Liaw, Sept. 2006, pp. 49 – 64). Online learning technologies have been used for adaptive cultural heritage learning (Casalino, D'Atri, Garro, Rullo, Sacca, and Ursino, n.d., p. 224-). Culture may affect learning preferences and styles. Culture may affect perceptions of "time, gender, dress, source of authority, individualism, risk-taking, life goals, relationship of education to community goals, and previous classroom experience" on learning styles (Boiarsky, 2005, p. 48). A Native American journalist sees the Internet as "raising the volume" as a "continuing legacy of storytelling" and a sign of genetic memory for storytelling (Merina, Fall 2005, pp. 32 - 33).

As many peoples, Native American comprise less than 1.5% of the US population. Half live in urban

areas, and fewer than 33% on reservations. Some 550 tribes are federally recognized. As a group, only 15% of Native American students who went on to college achieved a four year degree, with an overall average college graduation rate of 3%, compared to 16% for the general population (Tierney, 1991; Fries, 1987). Kroc, et al. (1995, p.2) found underrepresented Native American learners with graduation rates at 17 percentage points lower than for the white student rate. Of the American Indian students entering university in the mid-1990s, only 24% had completed a pre-college curriculum compared with 56% of all college-bound graduates" (Pavel et al, 1998, as cited by Kirkness and Barnhardt, 2001, p. 3). The U.S. Secretary of Education's Indian Nations at Risk Task Force (1990 and 1991) found that "schools that respect and support a student's language and culture are significantly more successful in educating those students" (Reyhner, 2002 / 2004).

Washington State has one of the main regional concentrations of Native Americans. Two-thirds of Native Americans are found in ten states, including Washington (Shumway and Jackson, Apr. 1995, p. 191). This state's higher education statistics echo the national crisis in Native education. There are 158,940 American Indians and Alaska Natives living in Washington State, according to the U.S. Census. In this state, the large majority of Indian children are failing in all subjects at all grade levels on Washington Assessments of Student Learning tests. At least 32% of Washington Native American students do not complete high school (Office of Superintendent of Public Instruction, Washington State). Thirty-six percent of Indian students receive a B.A. within six years of entering a four-year college program. Fifteen percent of degree-seeking Indian students in Washington receive a community college degree within 3 years—and the large majority of Indian students attend community colleges (National Center for Ed Statistics; Washington Higher Education Coordinating Board). Nationally, only 29% of the Indian population is a high school graduate, compared to 79% of whites. Solutions to the challenge of educating a larger number of Native American learners require partnerships, especially in Washington where half the students begin college in a two-year institution, and the transfer and baccalaureate completion rates are low ("Proposal to the Lumina Foundation for Education", Aug. 18, 2006, p. 3).

In using G. Hofstede's cultural dimensions model, Native American cultures—while diverse—may be described through the issues of power distance, individualism, masculinity, uncertainty avoidance and long-term orientation quite differently than mainstream American culture ("Geert Hofstede™ Cultural Dimensions", 2008). "Power distance refers to the unequal distribution of power, prestige and wealth in a culture. Individualism looks at the degree of cultural emphasis on the individual vs. the collective. Masculinity examines the cultural focus on traditionally masculine vs. feminine traits. Uncertainty avoidance looks at the value placed on risk and ambiguity. Long-term orientation examines the focus on short-term vs. long-term forward-thinking values in a particular culture" (Hai-Jew, 2007, p. 8). Native cultures tend to be less tolerant of high power difference differentials; they tend to focus on the collective instead of the individual; they focus on more traditionally feminine values; they are comfortable with ambiguity, and they tend to maintain more of a long-term orientation.

Another way of viewing the cultural divide may be between Western and Non-Western worldviews. Some Native Americans may subscribe more to the Non-Western model, which emphasizes group cooperation and group achievement, "value harmony with nature, time is relative, accept affective expression, (value) extended family, (practice) holistic thinking, (see) religion permeating culture, accept world views of other cultures, (and) (be) socially oriented" (Sanchez and Gunawardena, 1998, p. 51). A subjective and relativist approach to reality may be more common: "Objectivist research has contributed a dimension of insight, but it has substantial limitations in the multidimensional, holistic, and relational reality of the education of Indian people. It is the affective elements - the subjective experience and observations, the communal relationships, the artistic and mythical dimensions, the ritual and ceremony, the sacred ecology, the psychological and spiritual orientations - that have characterized and formed Indigenous education since time immemorial" (Cajete, 1994, p. 20).

Academic competition between learners is discouraged, contrary to many of the confrontational student-competitive approaches. Culturally, Native Americans revere Native art and share a mythical storytelling. Native American students may mask their competence so as not to stand out from others in their communities (Swisher, 1991). Those who do earn their higher education degrees may have a reverse acculturation challenge in reintegrating with their communities.

E.T. Hall's high- and low-context cultures analysis could be understood as also applying to this cross-cultural situation. High context cultures understand information to be an inherent part of a person, so a minimal amount of verbal interchange is needed in human relationships. Because they have experienced stable traditions and history, "age, education, family background and such things that confer status do not change rapidly. In dealing across cultures, high-context cultures become impatient and irritated when low-context people insist on giving them information they do not need. They perceive low-context people as being less credible because silence sends a better message. High-context cultures tend to handle conflict in a more discrete and subtle manner and are predisposed to require learning for the sake of learning. For example, high-context cultures include … Native-American(s)" (Sabin and Ahern, 2002, p. S1C-11).

The concept of an "Indian theory of education" was offered by E. Hampton, a Chickasaw academic from Oklahoma. He listed the twelve 'standards' on which to judge any such effort for creating education for Native Americans: spirituality, service, diversity, culture, tradition, respect, history, relentlessness, vitality, conflict, place, and transformation (1998, p. 19, as cited by Kirkness and Barnhardt, 2001, p. 8).

However, there are detractors to the idea of cultural learning dispositions (Brown, 1979; Chrisjohn & Peters, 1989; Harris, 1985; Shepard, 1982; Stellern, Collins, Gutierrez, & Patterson, 1986; Bland, 1975; Kleinfeld and Nelson, 1991; Stellern, Collins, Gutierrez and Patterson, 1986). Several warned of taking uncritical approaches to the idea of Native American cultural dispositions towards learning (Chrisjohn and Peters, 1989, as cited by Pewewardy, 2002, pp. 22 – 56; McCarty, et al., Mar. 1991, pp. 42 – 59).

Culturally Targeted Online Course Redesigns

Combined with the unique needs of many in Native American communities, the instructors applied concepts of a kind of universal design. The concept is to create barrier-free learning ("Universal Design," Nov. 12, 2007), without cultural hindrances. In the same way that accessibility may be designed into structures, such broad-spectrum solutions help everyone, not just those from a special group. This approach was needed because these courses for the Native learners would be taught to mainstream learners simultaneously. Too much of the cultural tuning may conversely make the curriculum too difficult for non-Native learners.

Augmented curriculum for cultural awareness. One political science course on American government involved a deeper integration of tribal organizations, treaty rights and intergovernmental relations to include the Native American view. One objective was to ensure that students "more effectively understand the unique relationship between federal and state authorities and Native American tribal government." Textbook readings were integrated with Web links and video clips for more rich learning. A Native case study was included in the learning. A group project was designed to address Native American cultural property rights. "Redesigned assignments emphasize relationships between First Peoples and local and national governments" (Enduring Legacies Course Redesign Report, 2007). Here, the instructor strove to create more cultural relevance for Native learners.

S*caffolding for disadvantaged learners.* Other courses humanized the technology for students unaccustomed to computer technologies by offering extra credit assignments to encourage familiarity and facility with the LMS and virtual learning environment. Developmental learning add-ons to mitigate the preparedness of some of the less prepared learners was designed, such as through the building of a glossary of terms, incremental assignments to help students build their larger projects step-by-step, simplified languages and terminology were used. One math teacher worked out a number of solutions for the learners to study, learn from and master. A biology instructor designed at-home "web labs" that would allow learners to buy the materials at local grocery stores and to pair up with other learners to actuate these experiments, for lowered cost barriers.

Promoting ative American scholarship. An anthropology professor used readings from Native American writer-scholars. She included more work that took place within the learners' individual tribes. Her assignments targeted issues within the tribal communities (Enduring Legacies Course Redesign Report, 2007).

Communal learning. An art instructor integrated more Washington State Native American art into her course and emphasized experiential and communal learning by using forums for student-to-student discussions. She built studio critiques or "visual evaluations of the student's and peer's work(s)". She strove to make the course "more culturally sensitive and relevant to all the multicultural aspects of contemporary society". She encouraged research topics along the lines of which indigenous people's works affected the works of modern artists, to emphasize the "fusion of materials, formal elements, and contextual themes that artist deal with on a daily basis." She avoided artificial "subjective hierarchies" sometimes used in the definition of art. Likewise, a music instructor redesigned his music course to reflect more Non-Western culture. He adapted his adopted textbook to Native American resources and Nonwestern music sites (Enduring Legacies Course Redesign Report, 2007).

Researching and learning. The course instructors all researched more about Native American studies and history. One music instructor wrote: "Also, I have been actively exploring, reading, researching American Indian music…examining its influence on Western Art music" (Enduring Legacies Course Redesign Report, 2007).

Defined virtual spaces. A math instructor defined the e-learning paths in her course more clearly and offered a richer range of assignments ("Search the internet (sic) for information about any mathematical topic of your choice such as how math was used in an early culture such as a Native American tribe or any other culture of your choice" (Enduring Legacies Course Redesign Report, 2007).

istening to learners. The instructors also solicited student feedback ("Student Feedback: What They Say about their Courses," 2006). Many designed integrated feedback loops in their online courses to capture learner experiences in order to make the courses more culturally sensitive.

The Courses in the Redesign

English Composition I and II went through this cultural sensitivity rebuild process. While a redesign could suggest a thorough change, the limitations to this project prohibited that. The Native American cohorts taking these courses would be only a few students, or a total of maybe less than a dozen each quarter. That number would be too small to "carry" an entire course section. This means that non-Native American learners would be in the section, and their academic needs should also be considered. The shared course model of WAOL meant that these team-created courses would have to meet the academic requirements of 34 community colleges.

Whatever curricular changes are made should broaden and promote learning across a wider swath of the learning public. The changes cannot be so culture-specific or explicit that it becomes exclusivist. The "universal design" tenets and practices would have to be followed. Course redesigns could not fundamentally affect the textbook selection, main curricular build, quarter-length scheduling, main assignments, and grading structure. In other words, these course redesigns would have to function implicitly on the margins—even though they had not been revised systematically for a number of years.

The course revision build would occur in a master classroom, isolated from learner access. Once the build was complete, it would go through an alpha testing phase with the critique of cultural subject matter experts (SMEs). Then, after revision, it would go straight into "beta testing" with student feedback and insights. Another round of revisions would follow the first quarter of testing with live learners.

The work progressed in general in the following way:

1. Cultural Immersion and Formal / Informal Intercultural Learning
2. Initial Development of Culturally Sensitive Course Redesign Plan
3. Syllabus Revision, Grade book Revision
4. Creation of Digital Learning Objects
5. Course Configuration
6. Uploading of Materials / Annotations (to the LMS)
7. Subject Matter Expert (SME) Critique and Feedback
8. Further Revision (alpha testing)

9. Final Report to Supervisors on the Project
10. Going Live with Learners
11. LMS (Learning Management System) Data mining
12. Further Revision (beta testing)
13. Learner Performance Results and Learner Feedback (Hai-Jew, Culturally Targeted Online Course Redesign Work Cycle, 2007)

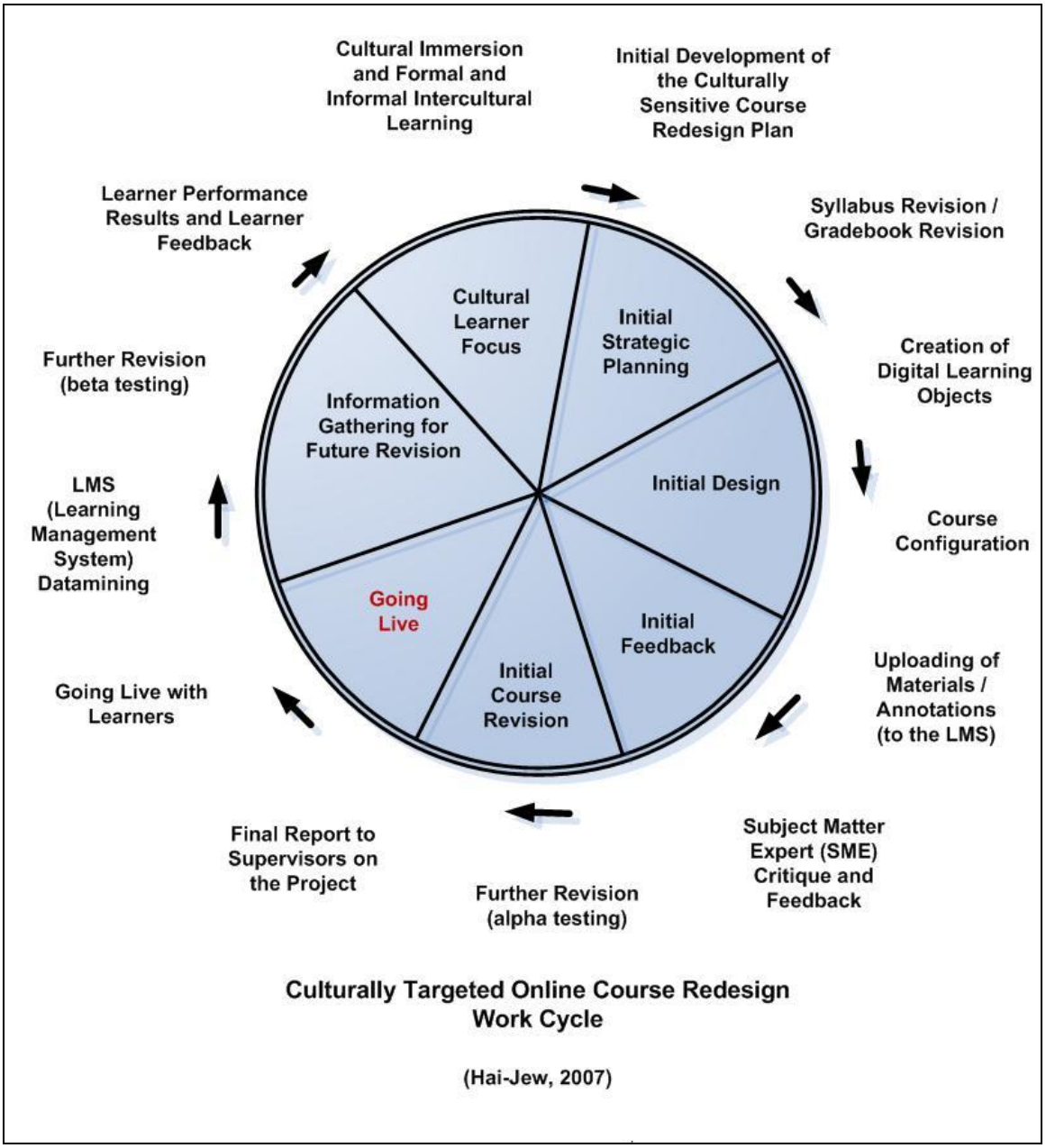

Figure 1: The culturally sensitive course redesigns followed a general work progression.

Defining a Course Revamping

The redesign approaches then are applied to a course revamping or retrofitting. In broad terms, this relates to an updating of the pedagogical approaches. This may involve the application of new e-learning technologies. New approaches regarding the design and delivery may add value to the learning and make it more applicable to learners. Learning objects may be integrated more tightly with the defined e-learning paths. A greater range of ways to move through the curricular materials may be created.

Scaffolding for both amateurs and experts in the course domain would enhance the accessibility of the course for a wider range of potential learners. (Some of these learning experiences will be mandatory, and others will be opt-in.) Course resources may be annotated for the other instructors who may be inheriting the course.

Course revamping should optimally also be informed by learner feedback about their needs and what would enhance their achievements. The inclusion of former learners' works (with their legal copyright releases) would help norm quality based on the reality of what learners are actually producing instead of a defined normative ideal.

Accessibility retrofitting may involve the inclusion of verbatim transcriptions for sound files and video files. Files may be versioned from Word and slideshow files into portable document files for easier accessibility. The technological strand is a part of online learning and should be considered an integral part of the course revamping.

Some possible re-branding of a course may be helpful. This would enhance the ecology of the online learning environment and to make the space more coherent about the learning and the professional values of the field.

Some Cultural Assumptions in Relation to English and riting

Place-bound learners. One of the assumptions is that the reservation-based learners are place-bound. Many not only were single heads of household with children but also had full-time jobs (often within their tribes), in addition to their college studies. This suggests a requirement for distance access to courses and on-reservation activities for face-to-face (F2F) endeavors.

Accessibility. Another angle related to the place-bound learners is that most learners have dial-up access because of the lack of broadband wiring on many reservations. An occasional winter storm often knocks out electricity access for days given some of the tenuous infrastructure on some reservations. Any online course redesigns would have to take into consideration accessibility and digital file size and design strategies regarding video delivery.

Remediation. For various basic academic skills, many Native American students need remediation because of the poor quality of teaching and learning (and often low-resource conditions) that they received prior to enrolling in college. This need applies both to urban and rural learners, non-reservation based as well as reservation-based. Academic preparedness, of course, applies to a majority of conventional university students as well. A curricular build needs to scaffold for learner preparedness and academic success as well as to support an internal locus of control / sense of self-efficacy.

Cultural considerations. The cultural considerations for these course redesigns involved a complex mix of understandings of Native American learners' living situations, worldviews, academic needs, understood values systems, rituals, and motivating topics of interest (for writing and research). Their communal orientation came into play in terms of assignment designs that emphasized cooperative work and support for community-based writing and research topics.

Technological accessibility. Many reservation-based learners lack access to computers in their homes. Many of those who do have computers have only dial-up Internet access from their homes. This suggests that the accessibility design must take into consideration this aspect. Digital learning objects will need to be updated to avoid the "slow fires" of disintegration based on updated software programs (many of which may not be able to read versions from a few software cycles back).

owering unnecessary costs. The statistics about Native American learners' economic lives show many living below poverty. The costs of college tuition, books and supplies may be highly prohibitive. Part of these redesigns involved using electronic book resources and essays (many from published textbook anthologies) archived online to save on costs.

Acculturation into academia. The course rebuilds also involved awareness of the cross-cultural issues between academia, mainstream Native American cultures, and online learning assumptions (Web 2.0,

open-source). The awareness of such challenges led to cross-cultural and cross-values sharing moderated by the course annotations, learning activities, and informed instruction. Surfacing the various cultural understandings may enhance learner comfort and offer a language and openness to talk about their own perceptions and concerns. Defining ontologies in particular fields may help new learners more quickly grasp relationships and understandings.

Building for instructor transferability. Any course that is a shared one (inheritable by other instructors) needs to be adaptable. Given that there is little courseware space for instructor guidebooks, the learning itself must be common in the stated field, up-to-date, flexible and pedagogically transparent. If the value in the learning is not clear from the beginning, then the course adoption may be more difficult. Assignments must be able to be "versioned" for different learning contexts. The design must be neutral and generally non-political in order not to be off-putting for various instructors and their respective learners.

The Teaching Facilitation of the Online Learning for Native American Learners

The course redesign did not only refer to the "static" curricular build elements of the courses but also in how the courses would be taught.

Connecting people. The way the redesigned courses would be taught should align with the cultural sensitivity concepts. Among some Native American learners, they talk about "checking heart." This refers to their understanding of the motives of others towards them, in particular those of their instructors. If benevolence is not found while checking heart, learners will not take the risks necessary to learn because they may not feel sufficiently free from potential harm. This suggests that the instructor's telepresence -his or her digital embodiment, voice and video and still photo depictions, and interactions in the online classroom - should align with his or her person. This also would suggest that learners should be encouraged to bring their full selves into this online space in terms of their telepresences as well. They should be welcomed and supported in a sense of belonging. E-mails sent out at important junctures to learners (beginning, midterm and the end-of-term) may encourage stronger course retention and more participation.

Building community. Building a sense of community requires the development of a shared sense of trust and open communications. Culturally, Native American learners tend to be drawn to cooperation more than competition, so shared small group tasks may be more conducive to some types of learning. Some Native American learners also feel awkward having attention directed to them, so instructors should not create such "calling on" situations synchronously or asynchronously. The mainstream American focus on individualism for topic selection, and the focus on the first-person point-of-view in essay writing may be awkward for some Native American learners, so there should be sensitivity and flexibility about these issues.

Facilitating group work online requires a range of skills given the difficulty in coordination, assignments, guidance, learning support, and assessment. However, The Enduring Legacies Reservation-Based Project educators (and administrators) who work with Native American students have found that this may be efficacious to promote their learning online.

A more relativistic sense of time. The sense of time that many Native American students share may be less driven or deadline-centered. Instructors may offer more of a flexible deadline schema. Instead of daily deadlines, maybe the closing of forums at week's end would be helpful. Extending deadlines based on the unique family, health and other challenges of the learners may be more flexible and pro-learning. However, there also need to be limits to deadline extensions—as these may be abused to the point where a learner may not reasonably catch up with his / her peers.

Protection of learner interests. "Learner interests" may be interpreted in a variety of ways in freshman composition writing and research writing courses. Of course, their quality of learning is important, so they may have transferable knowledge and skills into their future courses, careers and lives. Their ability to discover and use their own voices would be important, which would suggest their ability to choose writing topics that are socially, communally (tribally) and personally relevant (and have learning value). Their

empowerment of speaking out in the larger world also is critical. Another aspect of learner interests would be their protection in terms of copyright and publishing.

Range of assessments. People with a range of different learning styles may assess differently based on the assessment instrument. Being open to different learner interpretations of the work would be helpful. As mentioned before, giving learners a wide sampler of prior student work (with the proper copyright releases) would be helpful, too. There may be more connections between learners' expressed ideas and formal projects than the occasionally dry writing in academic texts.

Encouragement of help-seeking behaviors. Learners' help-seeking behaviors should be encouraged for enhancement of their learning. Research has found that those who have fewer academic skills tend not to use the resources provided to them. Building motivations to access and use such resources are an important part of curricular rebuilds. "As described earlier, when students in these studies were provided with helpful resources (informational and strategic) and given the freedom to use them, many elected to utilize little or nothing. As this suggests, learners may have access to relevant information or strategies but may not choose to employ them. Because strategies as we have operationally defined them, are characterized by carefully planned and intentional use, their susceptibility to motivational effects may be rather considerable" (Alexander and Judy, Winter 1988, p. 396). Lifelong and discovery learning suggest that learner help-seeking behaviors would be a critical aspect to that.

Another assessment approach could be to offer incremental assignments that coalesce to create the larger multi-week or term projects. For example, smaller fine-focused assignments may be designed for the writing, essay organization, resource evaluation and citations for the term research paper. This allows more feedback to learners and support for their larger projects in incremental ways. This helps learners focus on the building of specific skills. This also may allow more customized and unique feedback for each learner and more constructive interactions with the instructor.

Redesigned rewards structure. With the additional assignments and opt-in resources, the grading rewards structure was also redesigned to more fully represent the value in learner interactivity (higher points) and support of each other. Extra credit was added to provide incentives for some of the optional value-added learning. Learners who published their works in their respective student or community newspapers earned extra credit points. This new rewards structure encouraged deeper learning and also moving beyond the virtual classroom into the wider world of publishing and sharing.

A irtual Community of Online Course Redevelopers

The faculty from various fields working on these course redesigns did not work in a social vacuum even though they were separated by distance. WAOL established an "open house" of courses for mutual sharing, including the creation of open guest accounts. A conference was hosted by TESC in the early summer of 2006 and another in Summer 2007 to train faculty in the writing of Native American case studies.

One of the goals of the collaboration was clearly to support each other's work. Another was to collaborate around the goals of interconnectedness between the learning and transference. For example, the research and library course was linked to the various academic projects from the areas of anthropology, history, and political science. The premise is that connectivity between the courses would create a sense of alignment in the course studies and better transference of reinforced skills.

The pedagogical theories applied to the course redesigns should lead to a sense of alignment and coherence between the learning objects. A clear learner experience and e-learning path should exist from the pre-week through the entire term and into any opt-in post-week learning. The focus should be both specific at the learning object level and broad at the course level.

The Selected Courses

Understanding the original intentions of the initial lead instructors of both courses and analyzing their digital artifacts and structural builds may form a stronger basis for the redesigns. The idea is to align with the thinking in the respective fields but also to offer some alternate narratives and options. Both of these

courses were built by lead instructors with the advisement of colleagues under course development grants in the late 1990s.

EC1 focuses on a number of learning objectives, mostly around the introduction of various rhetorical modes of nonfiction essay writing, paragraphing, organizational strategies, and the development of author voice. There is an early introduction of analytical reading and the concepts of objective and factual summaries vs. analytical evaluations of various writings.

EC2 was built around contemporary global literature. It adds academic research, which involves research strategies, various schools of literary criticism, Modern Language Association (MLA) citation methods, strategies for writing long papers, and other elements. The learning outcomes from both courses are fairly well defined for the respective colleges for transfer, and the skill sets expected from both have clear definitions in various master course outlines. These learning objectives must be left intact in any redesign, but new learning may be added to enhance the courses. A cultural redesign also strives to make the existing learning more accessible for a wider range of learners. The original course was built around the use of contemporary international literature as a basis for the research writing.

Redesign Strategies: English Composition I

English Composition I involves a reading and a writing strand. The readings expose readers to a range of ideas and topics. The learners explore a variety of individual and public voices. They learn various ways to summarize and analyze college-level readings. They acquire new vocabulary. Students form a sense of open-mindedness to others' ideas. The writing strand emphasizes self-expression and the discovery of a personal voice. Learners practice pre-writing, outlining and organization, thesis-writing, various literary techniques, point-of-vied, proper essay writing semantics, and empowerment in building a public voice.

Online collection of contemporary essays. For English Composition I, an online reader of a variety of contemporary non-fiction essays was created with live URL links. Learners were assigned to choose a total of 12 essays throughout the quarter to summarize and analyze—to enhance reading analysis skills and the differentiation between objectivity and subjectivity. The URLs were broken up by rhetorical mode and sequenced into the existing curriculum. This was to enhance reading comprehension and analytical abilities. This was also added to address an oversight in the earlier curricular build, which left the course without a reader and only a few brief essay readings. The assignments highlighted socio-cultural and historical assumptions underlying the various literary works and therefore raised the ability of learners to see others' cultural ideas, and more directly, their own. There were efforts to avoid inaccurate, commercial, or fly-by-night sites. Rather, the focus was on quality sites which offered just the essays without excessive or unnecessary add-ons.

Skills development. Different assignments were created for the students to focus on lead-ins and conclusions. More time was spent on rhetorical modes and outlines. Writing strategies were emphasized not only in the curricular materials but also in the feedback of learner works. The emphasis on extensive revision was brought to the fore, in part to counter amateur tendencies to go with just the first draft.

Clearly defined policies on civility, plagiarism, and other relevant guidelines were created, particularly given the academic nuances of these issues. A slideshow on how to annotate readings for helpful recollection and later analytical writing was designed and written. A clearer explanation of the course's pedagogical theory - to enhance the metacognition of learners - was created, with an emphasis on study strategies and approaches. A scaffolding piece on how to learn online was included in the pre-week, to help learners who are new to this mode of e-learning.

Some other resources defined terms with greater clarity, such as defining non-fiction vs. fiction writing. Differentiating between facts and opinions was addressed in one slideshow lecture. More elaboration on the different genres of writing was included. The use of rhetorical mode forms to create a piece of organized writing was built onto the course; learners were introduced to both writing samples and strategies based around narration, comparison and contrast, description, definition, analogy or extended comparison, collage, division and classification, causal analysis, and other modes. Using more effective thesis statements was included.

Audience analysis as a starting off point for writing a paper was introduced as a strategy. One lecture strove to show how the different stages of the writing process fit together. And at the conclusion an e-portfolio analysis was included at the end, to provide a way for learners to analyze their own work and thoughtfully approach their development.

ider topic ranges. While memoir writing was accepted, the learners could also go to the other objective extreme and choose less individual-focused writing topics. Instructors would benefit from further readings into Native American history, literature, politics, culture, health, and other elements—in order to be conversant on some of these issues.

Promoting learner interactions. The interactive curricular build encouraged learners to read and critique each other's works and to respond to each other in every forum. The idea here was to broaden their sense of possibilities in work and to learn from each other's writing strategies.

Research transition for English Composition II. A folder focused on research as the transition piece into the next course, English Composition II. This involved a segment on research strategies, the citation of primary sources, how to use online databases, and also how to use libraries. Some resources on Modern Language Association (MLA) citation methods were created.

Other learner works. Additional annotation was added to the student essay sampler, with insights on style and writing strategies. These annotations also enhanced the accessibility of their works, and reminders were included in the Announcements about this resource. Current students were encouraged to write quality works, with a perk as possible inclusion of their works in this small in-class repository (with their copyright release).

The essay assignments will connect more clearly to community (two of the current four assignments already relate to community), especially the evaluative first essay and the research final essay.

Redesign Strategies: English Composition II

The premises of the English Composition II course redesign were to strengthen learners' understanding of information, the different valuations of researched and discovered information, its use in research, professional research citation, and research writing. The ownership of information and their de facto ownership of their own writing was also an important element. The goal was to empower learners as authors and researchers.

EC2's focus on literature may be off-putting to learners of different cultural backgrounds because so much of literature is based out of cultural world views and time periods. So one adjustment was that learners were allowed a wider range of author selection for their term projects. Learners need a sense of comfort regarding their reading milieu especially given the relative rarity of reading in today's society. More "scaffolding" would make visible the cultural assumptions behind the literary works, the authors' lives and times, the values of the times, and potential embedded worldviews.

Pre-week transition materials and tasks. An opt-in pre-week folder was set up in the Assignments area. This included transitional lectures on issues of ethics in research, research strategies, ways to write longer research papers, and schools of literary critique.

pdated learning resources. Some elements were revised for better quality learning and up-to-datedness. These included "Tips for Organizing Longer Research Papers," "Schools of Literary Critique" (with a new explanatory graphic), "Avoiding Logical Fallacies," and other related handouts / lectures in EC2. These resources were created for easy downloading and learner comprehension, with the hopes that learners would use these as resources into the future post-course.

Visual literacy. One fundamental change involved a visual literacy element. This lecture addressed the inclusion of graphics, drawings, maps, tables, charts, graphs, diagrams, timelines, photographs, and other elements, in a broad way. This encouraged the examination of visually delivered information. This covered the need to have captioning and labeling as well as clear citations in the Works Cited list. This addressed what visuals may convey in a paper in terms of learning and memory. Also, some principles of

including graphics in a research paper were included. The idea was to include more multi-sensory modes in learning and in the handling of information.

A fundamental change came with the addition of a visual literacy resource. Students occasionally will drop images into their papers, but these are often done willy-nilly and without a larger sensibility about how images may convey, summarize, highlight, or communicate information in rich ways. This touches on "other ways of knowing" promoted in multicultural learning.

Coherent research strategies. Learners often do not have a coherent research strategy, so they often end up with highly disparate works that may be unrelated to their original pursuit. A strategy lecture covered a more coherent applied way to approach research, both primary and secondary.

Another slideshow lecture addressed tools that may be used to organize and present longer works - précis, subheadings, transitions, and others. Given the difficulty of in-text citation (both in-sentence and parenthetical) for many learners, this was addressed. The relation between the in-text citations and the Works Cited list was also emphasized. Other common errors - such as how to cite one author with multiple works in a paper - were addressed. New authors also have difficult times differentiating their own writing from their cited writing, so a new resource was created about when to quote, when to paraphrase and when to summarize.

Opt-in group assignment choice. An opt-in group assignment for the third critical essay was created which would give learners a chance to communicate and interact with peers in the writing of one essay with a shared grade. This essay allows for use of personal first-hand reader-responses to a piece of literature.

Addressing common domain fallacies. The embedded schools of literary critique from the initial course design can be quite difficult to grasp. Many students assert that authors write a work to fit a particular literary critique tool and do not seem to realize that all literary critique tools can be applied to all literary works—with differing outcomes. Authors may write a work that may seem conducive to certain critique, but they do not generally write works to fit a certain school of critique. Others will reverse engineer a literary work and make assumptions about authors' lives, even without any factual support. Addressing logical fallacies and differentiating facts and opinions are crucial.

The author s hand in research writing. New research writers also need support in understanding the importance of the author hand—originality, worldview, clear values in selecting research—in the writing of research papers. Amateurs and those from other cultures seem to be comfortable letting a research paper merely be a listing of ideas from other resources, and they forget the importance of actual authorship.

A passive mitigation. A more passive mitigation involved setting up a learner lounge, a space just for learners without instructor presence or intervention. However, just the mere existence of this space often is insufficient to encourage learner participation, so designing and placing some resources in this lounge may be conducive to learner use and forum presence.

Early Results

The course redesigns have not themselves undergone rigorous testing for learning efficacy. Anecdotal support has been positive from the learners who've taken the courses. Part of The Enduring Legacies Reservation-Based Project involves regular and constant support and monitoring of the learners.

Conclusion

Planning for when to revise and update the curricular materials of both redesigned courses will be critical in maintaining the quality of the curriculum. This would suggest that having clear documentation of the decision-making for the current rebuild, a definition of the applied cultural principles, and documentation about the technological standards and software used, will be critical for later work.

The work of retrofitting courses for cultural sensitivities may be seen as a larger part of making the courses more accessible, albeit along cultural lines. Some strategies involve the following:

- surfacing cultural differences in a safe learning environment
- creating a range of assignment options for learners
- scaffolding the learning for accessibility, technologies, developmental learning, and costs
- affirming learners' abilities and experienced lives
- offering student work samplers for deeper peer learning
- creating opportunities for the development of learning communities, group work, dyadic work, and interactivity among learners
- considering learner budgets in the course design
- promoting the scholarship of the learners' works
- soliciting learner feedback for more learner-responsive cultural course redesigns
- (and) exhibiting instructional flexibility (to some degree) regarding time and student work.

The application of universal design aims to improve the cultural accessibility and intercultural understandings of all learners taking the e-learning courses. In this paper, the focus was on English Composition I and English Composition II, with a focus on Native American learners through The Enduring Legacies Reservation-Based Project. The learning and general principles from these course rebuilds may apply to other course retrofitting situations from a cultural angle.

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edagogical Strategies for uilding Community in Graduate Level Distance Education Courses

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Abstract

Community building in online distance education is important to a successful learning experience because it alleviates feelings of isolation for both students and faculty members. Ruth E. Brown describes the process by which students become part of an online distance education community, identifying three stages: "making friends," "community conferment," and the development of "camaraderie" (Brown, 2001). The purpose of this article is to present concrete, specific, and practical pedagogical strategies to implement Ruth E. Brown' 3-stage theory of community building in online distance learning courses. These strategies are based on the authors' combined 14 years of teaching distance courses in graduate level Library and Information Science (LIS) programs.

Keywords: Building community; virtual community; Ruth E. Brown's 3-stage model; online courses; student stories in theoretical frameworks; distance education

Introduction

According to the fourth annual report on the state of online learning in U.S. higher education published by the Sloan Consortium of the Alfred P. Sloan Foundation in 2006, "nearly 3.2 million students were taking at least one online course during the fall 2005 term, a substantial increase over the 2.3 million reported the previous year" (Allen, p. 1). The report represents responses from over 2,200 colleges and universities. Distance education is large and growing, and online instructors need practical ways to help their students participate in a learning community to enrich their educational experience and motivate them to complete their degrees.

The purpose of this article is to present concrete, specific, and practical pedagogical strategies to implement Ruth E. Brown' 3-stage theory of community building in distance learning classes (Brown, 2001). Brown's model was chosen in part because it was derived from an online doctoral program, which is similar to the online graduate programs in which the authors teach. The pedagogical strategies presented here have been developed in online courses by two faculty teaching graduate students in Schools of Library and Information Science/Studies (LIS), and represent over 14 years of combined teaching experience. The two authors have taught distance education courses in a range of subjects areas within the interdisciplinary field of LIS, including youth services librarianship, children's literature, young adult literature, storytelling, library and information center management, leadership in libraries and

information centers, reference, information professions, and information sources and services in the humanities.

Literature Review

Brown's research uses grounded theory based on interviews and archived class interactions to develop a general theory of how community is created in online classrooms. Briefly described, Brown's 3-stage process consists of stage one, "making friends online;" stage two, "community conferment" or acceptance which occurred when students participated in "long, thoughtful, threaded discussions on a subject of importance;" and stage three "camaraderie," which is achieved "after long-term or intense association with others involving personal communication" (Brown, 2001).

Although Brown does not focus extensively on pedagogical practices to create community, she does argue that "[m]odeling, encouragement, and participation by the instructor helped community form more readily for more students in computer-mediated classes" (p 31). The three stages in Brown's model are achieved in fifteen steps, some of which are dependent on students' own initiative. However, steps 1, 2, 4, 7, 8, and 9 are amenable to instructor control, as discussed below.

Table 1: Brown's 15-Step Process of Community-Building

Step	Description
1	Tools
2	Comfort level
3	Self-assessment and judgments
4	Similarities
5	Needs met
6	Time allotted
7	Supportive interaction
8	Substantive validation
9	Acquaintances/friends
10	Earning trust, respect
11	Engagement
12	Community conferment
13	Widen circle
14	Long term/personal communication
15	Camaraderie

Instructors can positively influence the community-building process by developing pedagogical strategies to facilitate each of these stages. In fact, one study found that students identified "instructor modeling" as the most important factor in building online community (Vesely, Bloom, and Sherlock, 2007).

Brown is one of many researchers concerned with the development of classroom community in online settings, where community (or lack thereof) takes on a heightened importance. (McMillan & Chavis, 1986; Hill, 1996; Wellman, 1999). Collins and Berge (1996) describe positive aspects of community building in distance education courses including "promoting human relationships, affirming and recognizing students' input; providing opportunities for students to develop a sense of group cohesiveness, maintaining the group as a unit, and in other ways helping members to work together in a mutual cause" (The online instruction section, para. 3). Research on issues basic to the importance and success of graduate online programs indicates that providing supportive community for students is a necessity (Mellon, Kester 2004).

Some argue that community is in fact central to the learning process. For example, Rena M. Palloff & Keith Pratt argue that, in online education, "attention needs to be paid to the developing sense of community within the group of participants in order for the learning process to be successful" (p. 29). Alfred P. Rovai developed the Classroom Community Scale, a self-report measure of perceived cognitive learning, to survey online students, and found a positive relationship between a sense of community and perceived cognitive learning (2001).

It is vital that instructors approach the issue of community early and with specific pedagogical strategies to prevent student isolation and disorientation. As researchers from the LEEP program at the University of Illinois, Urbana-Champaign found, "the distance experience can be trying, particularly at the beginning, as students cope with new technologies and new ways of interacting in a world no one understands including the students themselves in their early months of the program" (Haythornthwaite, Guziec, Robins, Shoemaker, 2000). A student's experience during the first few weeks and months of an online course contributes to their decisions to continue in the course and to whether they will enroll in other online courses (Haythornthwaite, 2005). Gayle E. Mullen & Mary K. Tallent-Runnels (2005) found that students perceive online and traditional classroom environments differently and the most significant difference was in the instructors' affective support such as listening, encouraging everyone to share ideas, using personal examples and providing humor. They emphasize the importance of the online instructors' understanding that teaching and learning in the online environment is quite different from teaching and learning in the traditional classroom setting.

In fact, the online student experience is so difficult that some researchers have labeled it "distress." Noriko Hara & Rob Kling (2000) define distress as "a general term to describe students' difficulties during the course such as frustration, a feeling of isolation, anxiety, confusion and panic." Their findings reveal that students' distress include: the absence of physical cues lead to some confusion and anxiety for students, lack of feedback from faculty causes some anxiety and ambiguousness in human communication is more difficult to resolve in written communication.

Other research has explored reasons why students dropped or failed their online courses, and found that instructors need to orient the students to the demands of online courses and provide them with methods for learning online (Nash, 2005). While the instructor can facilitate the building of community, some researchers assert that, ultimately, students must build their own community (Conrad, 2005). Nevertheless, the pedagogical strategies that an instructor uses can either allow isolation to go unchecked or set the tone for cohesiveness and classroom community.

We also draw upon Alfred P. Rovai's definition of traditional classroom community:

> a feeling that members have of belonging, a feeling that members matter to one another and to the group, that they have duties and obligations to each other and to the school, and that they possess shared expectations that members' educational needs will be met through their commitment to shared goals. Classroom community is a specific type of community based on the following characteristics: a. the setting is the world of education b. the primary purpose is learning c. the community is based on a fixed organizational tenure (2000, p. 33).

There are parallels between Rovai's description of community as an affective sense of belonging and Brown's references to "making friends," "acceptance," and "camaraderie." It may be challenging for instructors accustomed to the traditional classroom to develop pedagogical strategies to promote such emotional and psychological aspects of online community, but it is vital that they do so.

Brown's 3 stages of online community development provide a theoretical framework for understanding the process by which community develops. Brown indicates that instructors can contribute to this process by

foregrounding the concept of community in class activities and discussions (2001, p. 33). Below are examples of other specific pedagogical strategies that instructors may use to encourage students to develop community in their own online classrooms.

edagogical Strategy for Stage : Creating a Supportive Environment

Combating the distance and depersonalization of the online environment requires that the instructor model a personal and supportive approach. Brown lists supportive interaction as the eighth step in community-building (2001). Reminding the students that they are learning not only the course material and new concepts but also learning to maneuver in the online course management system as well as learning how to learn online is a way of foregrounding the commonalities of students in the class. Students need reminders to be kind to themselves during the course, as they deal with the challenge of learning in a new way. Stressing the difference from learning in a face-to-face classroom allows students to reflect on their own learning processes. This establishes a tone of friendliness, which in turn makes it more likely that students will engage in "making friends" (Brown, 2001).

Similarly, establishing a supportive tone and realistic expectations about technology helps students cope with "distress" (Hara and Kling, 2000) so that they can relax in times of technological trouble. Acknowledging the possibility that something may go wrong with the technology helps to reassure students, as does sharing information about what we will do when problems occur. As Brown's steps 1 (tools) and 2 (comfort level) suggest, becoming comfortable with the technological environment is the foundation that all students need in order to effectively participate in the classroom community. Reassuring students that technology failures are surmountable obstacles with concrete suggestions for file backup and understanding regarding glitches in electronic communication provides an effective way to reduce their fears.

Brown suggests directly addressing the topic of community-building with students. A related pedagogical strategy is to directly address the theme of learning to be an online learner. To this end, it is important that students gain some understanding of Constructivism, the theory that provides the framework for this instructor's online courses. The following definition of the theory is provided in each online course so students can begin thinking about learning online vs. face-to-face learning:

> Constructivism is basically a theory -- based on observation and scientific study -- about how people learn. It says that people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences. When we encounter something new, we have to reconcile it with our previous ideas and experience, maybe changing what we believe, or maybe discarding the new information as irrelevant. In any case, we are active creators of our own knowledge. To do this, we must ask questions, explore, and assess what we know. (thirteen ed. online, 2006).

Rovai's definition of community states that building community relies upon having shared learning goals. Students share the goal of understanding the constructivist theory of learning while also gaining new ways of understanding themselves. The dialog that results from exchanges around these aspects of course content supports students through step 3 of Brown's process, when they tend to become preoccupied with self-assessment and self-judgment (2001). The instructor can support students by encouraging them to develop an intellectual curiosity about their own constructivist process of learning to be an online learner.

edagogical Strategy for Stage : Course Chat

Instructors support students in building community when they model the expected participatory behavior. One effective means of modeling open discussion is to create a "Course Chat" discussion forum, where students can ask general questions about the course or the course instructions and receive public replies from the instructor. These are the types of questions that students in a traditional classroom would be asking each other during a break or asking the instructor individually at office hours. By using a Course Chat forum, students' questions are answered promptly and the instructor is saved the trouble of answering the same question multiple times over private email. This also supports the building of community by showing students that they are not alone in having questions and empowering them to discuss the answers with the instructor in a public forum. Finally, students can be encouraged to answer their classmates' questions if they know the answer, helping them to know and respect each other as

learners with shared goals.

edagogical Strategy for Stage : Interactive Introductions

Providing a forum for students to begin to get to know each other is important for building community and learning. Brown suggests that instructors should "[b]uild an opportunity for the students to learn more about each other to facilitate early discovery of commonalities" (2001, p. 33). In a face-to-face graduate classroom, the instructor would typically introduce herself/himself and ask the students to introduce themselves to one another. Introductions are even more critical in online courses. One basic online pedagogical strategy is to provide a mechanism for encouraging the students to introduce themselves, inviting them to share typical information such as name, city, and why they are taking the course. Using this strategy yielded approximately 75-80 posts in eighteen online courses taught by this instructor. However, in seven online courses in which this instructor used an interactive introductory exercise loosely based on a childhood game entitled, "Truth is Stranger than Fiction," the students' interactions increased. This interactive exercise calls for the above information but also requires students to actively engage with others' introductions.

Table 2: Interactive Introductory Exercise

Exercise: Introductions
First, please tell us your name and the city and state in which you live.
Next, let's play, *Truth is Stranger than iction*. Tell us in four sentences three lies and one truth about yourself. The rest of the class will guess your one "true statement." Please do not tell us the real truth until someone correctly identifies it-that's part of the fun. Post your information by Monday so everyone will have time to guess your truth.
Then, list three or four of your favorite websites (PG-rated only, of course, so everyone can enjoy them). Please include: 1. One site that features your favorite author or singer. 2. One site that provides information about your "dream vacation." 3. One or two favorite websites – be sure they are rated PG and suitable for your classmates' viewing ☺
After reading each classmate's post, choose three classmates and comment on one of their favorite websites. Tell us about the website: 1. your interest in the subject 2. ease of navigation in the website 3. how informative you found the website

Students were required to post four times instead of one time, and so it is to be expected that the number of introductory posts and responses to classmates' posts would increase. However, a simple quadrupling of the above numbers would suggest that 300-320 posts would be expected, while in fact the numbers increased to between 375 and 380 posts in each course. This increase shows that students became comfortable talking online with each other and sharing more information than they did in typical online introductions. Additionally, the students given the interactive introductory exercise chatted with each other about their daily lives and their plans for future careers. This exercise invites students to accept one another and be accepted into the online community, addressing stage two of Brown's model (2001).

edagogical Strategy for Stage : Illustrating Theoretical Framewor s with Student Stories

In addition to providing various kinds of support for students' online interactions, it is in instructors' best interest to assure that community-building activities are closely connected to the content of the course.

As Brown argues:

> Community-building should be emphasized not just for the sense of togetherness it provides students, but also to help keep the students in the class and in the program, to promote full engagement in the class, to facilitate effective collaborative learning, and to encourage continued communication after the course of program is complete for development and career services purposes (2001, p. 34).

Full engagement and collaborative learning can be promoted by asking students to contribute stories from their lives that serve as examples of core course concepts. This third pedagogical strategy, using student stories to illustrate theoretical frameworks, is a means of insuring that students build community through exchanges that are both personal and firmly rooted in the course material. These exercises provide a platform for the sort of "long-term or intense association with others involving personal communication" that facilitates the third stage of community development (Brown, 2001).

To implement this strategy, instructors elicit stories from the lives of the learners that serve as examples of the material to be learned. Generally, these stories will serve as examples of real-world instances of basic course concepts. The instructor approaches these stories as information to be organized into a text or audio presentation that reiterates course concepts and explicates how students' stories serve as instances of these concepts. Studies of excellent teaching confirm that the most effective way to introduce new concepts is to start "from the lives of the learners" (Curran, 1998). Using student stories to illustrate course concepts builds a "bridge" from their lives to the course material, and creates meaningful interactions, both socially and pedagogically, in the online environment

Eliciting student stories that are relevant to course concepts requires two steps: 1) identify concepts that students need to understand and 2) write questions to elicit stories of experiences that can serve as examples or instances of these concepts in action. Most instructors accomplish the first task when they design a syllabus. The second task is difficult to describe in the abstract, because it involves looking closely at the course concepts for instances where students' lived experiences would provide relevant instances of a theoretical concept. However, it is easy to understand when based on examples from multiple areas of the interdisciplinary field of LIS. Three specific examples follow, from the areas of reference, collection development, and youth services, showing questions asked and examples of how students' stories can be organized and presented back to the students as a group to illustrate course concepts. These are only a few examples; students' stories could be used to illustrate theoretical frameworks in a variety of academic disciplines beyond LIS. In each case, this pedagogical strategy supports steps 4 (similarities), 7 (supportive interaction), 8 (substantive validation), and 9 (acquaintances/friends) as discussed below.

Example : Teaching Reference

In a burgeoning world of information resources, it is impractical to think that one course could teach all of the sources that a reference librarian will use in the course of their careers. However, a course can teach students to understand how reference is meaningful in their own lives. An instructor could ask: "What do you refer to?" In his paper surveying the practices of 61 superior LIS teachers, Charles Curran gives this question as one example of excellent teaching because it starts from the lives of the learners (1998). In a traditional classroom, a discussion centered on this question helps build community because students notice patterns and similarities among their own experiences.

Because distance education students answer in a text-based medium, an extended version of the question is useful, such as: "What do you refer to on a daily basis? Can you describe instances of having information needs, seeking answers, and having them met that occur hour by hour or moment by moment in your daily lives? What are your personal reference tools for organizing the information you need to navigate your world?"

The instructor organizes students' responses, pointing out patterns and similarities among groups of students (likely patterns include referring to calendars, clocks, maps, lists of tasks) as well as unique or unusual stories. Responding to students' individual stories supports Brown's step 8, substantive validation, by demonstrating to students that their lived experiences are valuable to the class (Brown, 2001). A range of discussions may emerge by using these stories as a starting point, the instructor may ask students to define an "information need" and introduce traditional categories of reference materials for

meeting these needs. Through reading each others' replies to the query about basic information tasks accomplished every day, students are also introduced to one another through a snapshot of each of their home or work lives. Students learn about other students who have similar or different sorts of lives, which facilitates stages two and three of online community development by supporting step 4, as students discover background similarities such as common "interests, ideas, or shared circumstances" (Brown, 2001, p. 29).

Example : Teaching Information Organi ation

To demonstrate how information organization is relevant to students' lives, the instructor might ask questions about students' personal collections, such as: "What have you collected? Do you organize your collection(s), and if so how? Do you have a collection big enough that you can't remember every item in the collection? If so, how do you keep track of what you have? Examples might include books, music, hobby supplies and equipment, etc" (P. Lawton, personal communication, June 14, 2007). This question requires students to engage with both information organization and the experience of trying to access that information.

The instructor then presents these students' collections, organizational schemes, and access strategies as examples of how individuals accomplish basic tasks of organization and access. It is worth commenting to the students in this case that the instructor is organizing this collection of student stories about collection organization. This reinforces the point that even the information we see about information organization is organized in some way. Understanding systems of organization builds fluency in information access as well as the ability to think critically about the process of organizing and the need to adapt or design systems. Most students will have some sort of collections, and those who enjoy collecting books, music, memorabilia, or other things are typically eager to talk about their hobbies. Again, the instructor facilitates community as students discover similarities, respond supportively to one another's collections (step 7) while building acquaintance and friendship (step 9) (Brown, 2001). At the same time, students are expanding their understanding of information organization.

Example : Teaching Child Development and Library Services

There are also instances where the instructor is introducing a more complex theoretical model with multiple categories that require definition and differentiation. For instance, in youth library services courses, students must learn about child development, often introduced through Jean Piaget's four-stage model of developmental child psychology. Each stage is reached sequentially by growing children and marks a level of psychological growth that allows the child to understand the world at increasing levels of abstraction.

Table 3: Piaget's Developmental Stages

AGE	STAGE	CA A ILITIES
0-2 yrs	Sensorimotor	Explore relation between sensation and physical
2-7 yrs	Pre-operational	Use symbols, including language, to represent objects
7-11 yrs	Concrete operations	Use logic, rational thought
11+ yrs	Formal operations	Develop abstract, hypothetical reasoning

To elicit stories that will provide examples for this framework, the instructor asks students: "Can you remember a learning experience or moment from your own childhood? Please describe this experience and what you learned."

In this case, the instructor inserts synopses of students' stories in the appropriate place in the 4-part theoretical framework. This can be done in a synchronous audio lecture, in which the framework is described and students are named individually and acknowledged for what their memory posting

contributes to the framework. However, it can also be done in a text lecture, so long as students are named and acknowledged for their contribution. Organizing and acknowledging student stories provides substantive validation, step 8, for students (Brown, 2001). Below is an abbreviated example of such a lecture; it includes far fewer students than would typically be enrolled in such a class.

Table 4: Framework Illustrated by Student Stories

THEORETICAL CATEGORIES from iaget	**ST DENT STORIES**
Sensorimotor	--learning to tie shoes (student A) --haircuts, self-given and otherwise (student D)
Pre-operational	--reading, writing, drawing symbolically (student H) --playing with "codes" (student B)
Concrete operations	--making guesses, "what happens if I drop this down the stairs" (student M)
Formal Operations	--making arguments, justifying actions (student E) --self-observation, values and morality (student C)

Another presentation choice could be to insert longer text excerpts of posted stories in students' own words, using quotation marks. The important features are that the framework is presented, that students' stories are connected to this framework, and that students are acknowledged by name for their individual contributions. By seeing how their memories of childhood (or perhaps of their own children) connect with Piaget's model of child development, students also have a rich field of stories through which they may personally connect with one another. Typically, this interactive lecture is followed by a second burst of postings in the class forums as students compare their experiences and discuss their commonalities. These exchanges provide a rich basis for the development of stage three community, in which students develop camaraderie after long and in-depth conversations (Brown, 2001).

Illustrating Theoretical Framewor s with Student Stories: Challenges and ariations

In using this pedagogical strategy, there are occasions when a student presents a story that, while being a relevant answer to the question posed, genuinely does not fit within the intended parameters of the course concepts. In such a case, after the general presentation of the concepts or frameworks illustrated with student stories, the best approach is to, again, acknowledge the students who contributed these unusual stories and to talk explicitly about *why* these stories don't fit. In so doing, the instructor offers students an important model of critical thinking about course concepts as well as an opportunity for students' own critical reflection about the limits of course concepts or theoretical frameworks. In that way, a supportive interaction is maintained, and students are still offered substantive validation for what their stories contribute to the class.

Occasionally there may be one or more concepts or categories for which no student stories serve as illustration. This offers an opportunity to invite students to speculate as to why this particular concept or category did not emerge as a theme in their stories. Instead of presenting a concept without illustration, this offers the opportunity to present another example or to invite students to apply their growing analytic skills by coming up with a story that would serve to illustrate this concept or category.

To encourage the development of camaraderie, or stage three community, it can be useful to invite students to discuss their opinions about how their story was presented by the instructor. Students can be invited to explain whether and why they might place their experiences in a different category. In this way, the instructor knows how the students have understood the concepts presented and can provide further clarification as needed.

A more time-consuming variation on this pedagogical strategy is to have students categorize their own stories in light of a set of concepts presented by the instructor. This could be particularly effective later in a course, once students are familiar with the basic course concepts. Observing this process of students categorizing their own stories provides useful feedback to the instructor regarding how adept students are becoming with analyzing their own stories in terms of course concepts.

Using student stories in theoretical frameworks creates community while achieving the learning objectives of the course. The instructor demonstrates that students' experiences have theoretical relevance to the material. Students are respected as actors in the virtual classroom and invited to bring relevant instances from their own lives to the class discussion as they learn to analyze their experiences. This pedagogical strategy is an ideal way to provide students with substantive validation, demonstrating that "students' ideas and opinions were valued and respected" (Brown, 2001, p. 29), and ultimately providing a time-efficient way to teach core course concepts and encourage the development of camaraderie, stage 3 of community-building among students.

Conclusion

These pedagogical strategies provide some concrete ways of taking Brown's theory of online community development into the online classroom strategically and pragmatically, engaging students in community-building exchanges. From the increasing numbers of students who are taking distance education courses, it is clear that distance learning will be vital to our teaching and learning future. Distance education instructors, administrators, and students need strategies that build community in online courses, taking students through the stages of making friends, acceptance, and true camaraderie in order to create vibrant online learning experiences.

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IO : Applied iology Developing Creative Learning artnerships with lac board ISTA

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Abstract

Teaching large, undergraduate, non-major biology courses represents an enormous hurdle for any instructor. Effectiveness in this endeavor requires innovative techniques addressing multiple activities including active student engagement, automated quiz and exam mechanisms, and accurate record keeping. In this particular case study, students were asked to "partner" with the instructor and produce multimedia presentations of important course concepts. Learning management software (Blackboard VISTA™) was utilized to automate delivery, grading, and recording of quizzes and exams. A class of 167 students majoring in business was divided into groups of 5-6 individuals per group. Over the course of the ten-week term, 34 multimedia presentations were given by these groups. Two major exams and multiple lab activities including quizzes were delivered, graded, and recorded using Blackboard VISTA™. Overall, this large course was effectively taught by encouraging student engagement through active participation in the development of multimedia presentations. Effective management of the course was realized through reliable technological support of administrative functions using Blackboard VISTA™ learning management software.

Keywords: instructional design, student engagement, multimedia, record keeping, large class, undergraduate, non-majors science

Introduction

Large classes, in general, often suffer from lack of student engagement. Large science classes are no exception. Wood states,

> We are not doing a good job at teaching undergraduates, at least in our introductory and non-majors science courses. Students are still coming away with the view that science is primarily a collection of facts, and we are generally failing to help them progress from thinking as novices to thinking as experts. In these large courses, we do not engage our students actively; rather, we lecture to them. (Wood, 2004, para 2).

Weiman indicates that there is a large and growing body of research indicating that post-secondary science education is failing to reach the educational goal of having students, even non-science students, understand science and think about science more like a scientist. He suggests that,

> Although most of the research has examined students' learning of physics, there is a significant amount of data on the learning of chemistry and some for biology as well. All of these results show a consistent pattern. Most students are learning that the subject is a set of facts that are unrelated to the workings of the world and are simply to be memorized without understanding, and they learn to "solve" science problems by memorizing recipes that are of little use other than passing classroom exams. Furthermore, they are leaving their courses seeing the science as less interesting and relevant than they did when they started. The typical student is *not* learning to see the science like an expert, as a set of interconnected experimentally determined concepts that describe the world. They are also not learning the useful concept-based problem solving methods of experts that can be applied in many different contexts." (Weiman, 2007, p.2)

The University of Delaware's Institute for Transforming Undergraduate Education (ITUE) concurs with Wood and Weiman by indicating that,

> Traditionally, many science classes have been conducted in 50-minute content-driven lectures. Abstract concepts and principles are often presented first and only later illustrated with idealized examples that may be far removed from the students' personal experiences or interests. Memorization of facts and algorithmic problem solving are often stressed, rather than conceptual understanding … In short, the structure of traditional science courses erects numerous roadblocks to students becoming actively involved in their learning." (ITUE, 1996, Statement of the Problem section, para 1).

Science courses for non-majors ("service" courses) often also suffer from poor reputations. ITUE concludes that these courses are perceived by students as irrelevant and that the material is not placed in appropriate, broad context:

Novice learners have a much more fragmented view of knowledge than do their instructors; without explicit connections between the ideas in these courses and those in the major discipline, or with the student's prior knowledge and anticipated experiences, the motivation needed to benefit fully from such courses may be seriously lacking. (ITUE, 1996, Statement of the Problem section, para 2)

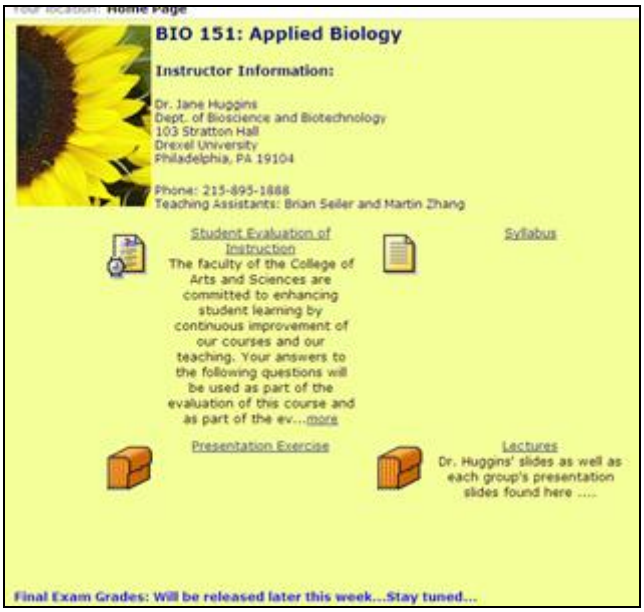
Moreover, administrative tasks for large science courses, whether for majors or non-majors may be inaccurately and inconsistently performed primarily because of the large numbers of students involved. These flaws become painfully obvious if the "number crunching" for grades is done manually and/or, as is often the case, poorly supervised, over-worked teaching assistants (TAs) are carrying the major responsibility for this aspect of the course.(J. Huggins, personal observation, September - December, 2005).

This paper presents an innovative design for a general biology course (lecture and laboratory) given to non-major business students. The overall goals of this design were as follows: 1) to engage students more fully with the subject matter and 2) to make record keeping more accurate and transparent to the students during the course of the term. To achieve these aims, students and instructor "partnered" for delivery of course materials resulting in greater opportunities for students to find/develop resources germane to course content and to participate creatively in presentation of these concepts. Exams and quizzes were automatically delivered to students using Blackboard VISTA™ software. Blackboard VISTA™ was also used to grade exams/quizzes and record those scores in the class grade book where students could access their scores promptly.

Methods

BIO 151: Applied Biology, is a non-majors, "service" course taught each of four quarters by the Department of Bioscience and Biotechnology at Drexel University. The course is designed to teach undergraduate business majors general concepts in the biological sciences with an emphasis upon application of these principles to current issues in ecology, medicine, and genetics. Enrollment ranges from approximately 50 to 250 students depending upon which term of the year the course is offered. Lectures are given twice weekly; students are expected to participate in one 2-hr supervised laboratory experience per week. One instructor and two to three laboratory assistants are generally assigned to teach/administer the lectures, exams and lab exercises. The textbook used for the course was that by Belk and Borden (2007).

This course could be termed a "web-enhanced" course as it was delivered with the aid of Blackboard VISTA (version 3) software which provided e-mail, lecture materials, and exams to students (Figure 1). Grades for the course were derived from a midterm (25%) and final exam (25%), a group presentation project (25%), and a lab score (25%).



igure 1. Homepage for BIO 151: Applied Biology

Exams

Exams contained 25 multiple-choice questions and were "open-book" format. Typically each exam was released electronically on Friday and due on Monday of the following week. The instructor contributed half the questions on each exam, the other half were contributed by the presentation groups based on the concepts in their presentation.

Presentation Pro ect

Presentation groups for each week of the term were developed using the "Group Manager" feature of Blackboard VISTA™. Five to six students were encouraged to voluntarily sign-up for each group (Figure 2).

BIO 151 Presentation Groups

Group Name	Maximum Members	Members
BIO151 01	5	(4) Ms Erica Alman , Mr Hasnain Chinwalla , Ms Tracey Fruh , Ms Aesha Mehta
BIO151 02	5	(6) Mr Paul Kumor , Mr Manuel Pesantes , Ms Maham Siddique , Ms Yu Sun , Ms Lauren Wetzel , Mr Christopher Young
BIO151 03	5	(5) Mr Mervin Choun , Mr Lucian Herciu , Miss Brenna Margol , Ms Anne Nguyen , Ms Kathleen Whyte
BIO151 04	5	(5) Mr Benjamin Campbell , Ms Bridget Kleinberg , Ms Alicia Luchetti , Ms Kelly Sawka , Mr Kurt Stine
BIO151 05	5	(4) Mr Paul Dorio , Miss Callan Fitz Patrick , Ms Stephanie Roche , Mr Tony Santos
BIO151 06	5	(5) Ms Elaine Chan , Mr Andrew Hallett , Ms Haejin Kwon , Mr Chris Mctyre , Ms Tea Nikic
BIO151 07	5	(5) Mr Christopher Alfano , Ms Lisa Ciechanowski , Ms Barbara Menico , Mr Stephen Nicolo , Ms Melanie Skloff
BIO151 08	5	(5) Mr Matthew Blakeslee , Mr Amar Brahmbhatt , Ms Mary Cate Cassidy , Ms Violetta Shubayeva , Ms Samantha Tom
BIO151 09	5	(5) Mr Raul Dazon , Ms Lisa Mehta , Mr Jed Singer , Mr Joby Varughese , Mr Manu Varughese
BIO151 10	5	(5) Mr Christopher Adams , Mr Michael Donaghy , Mr James Englehart , Mr Nicholas Illuminati , Mr Evan Wang
BIO151 11	5	(5) Ms Nina Buratti , Miss Jennifer Chruszcz , Ms Amanda Cunningham , Mr Christopher Paquette , Mr Jason Sweedler

igure 2. Signup Sheet

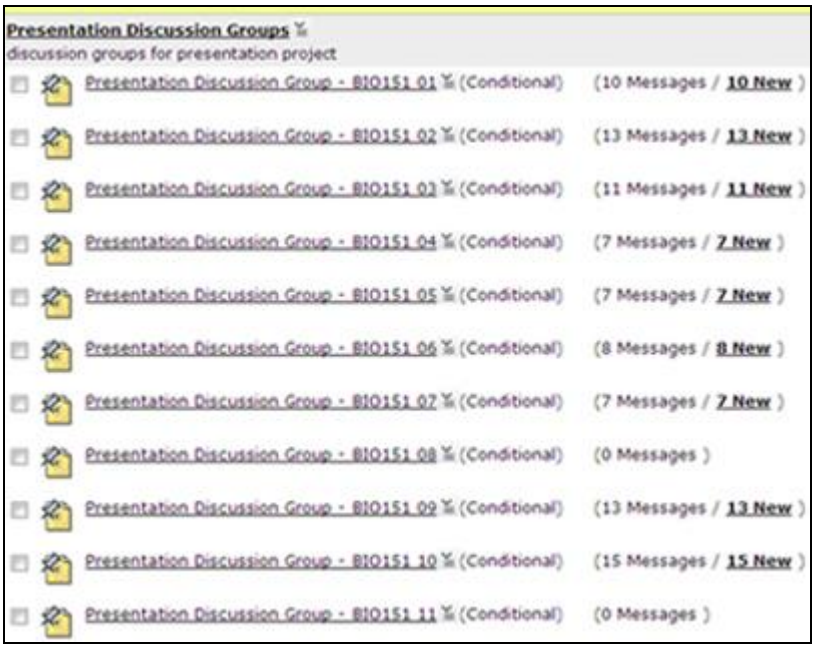
Discussion groups were also set up in Blackboard VISTA™ and linked to each presentation group. This linkage provided an electronic "meeting place" for each group to plan their presentation if needed (Figure 3).

Each presentation group was assigned the task of developing 10-15 PowerPoint slides about a concept germane to the lecture material for the week chosen for their presentation. Four groups presented per week in the ten week term. The instructor delivered a lecture during the first lecture period each week (Tues.) on the basic concepts presented in the assigned textbook chapter for that week. Student groups gave their presentations during the second lecture period each week (Thurs.) Group presentations were recorded using a video camera. PowerPoint™ slides from each presentation as well as the video clip were posted to the course website each week and were available to students during their exam periods (Figure 4).

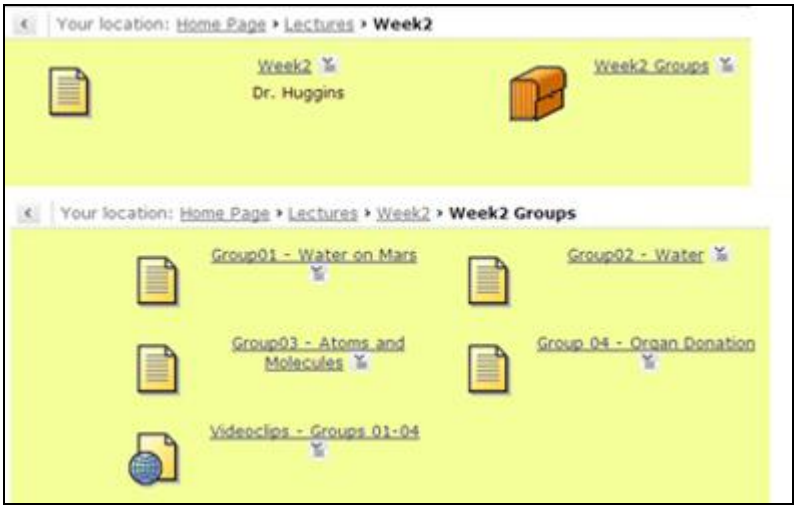
Twenty-five points were awarded for each presentation according to the following rubric: 1) 5 points for making the presentation; 2) 5 points for good organization of concepts (e.g. introduction to the issue, development of information, emphasis provided by multimedia, basic conclusions); 3) 5 points for incorporation of a germane multimedia feature; 4) 5 points for providing the instructor with an electronic copy of the presentation; and 5) 5 points for developing an exam question from the presentation. An extra five (5) points were added to scores for individuals in the first eight (8) groups giving a presentation. The extra points served as an incentive for student participation during the early weeks of the term.

aboratory

Typically, students were enrolled in 1 of 10 to12 individual lab sections of approximately 20 students each. The lab sections were "cross-listed" in the Blackboard VISTA™ course module to enhance efficiency with regard to uploading of laboratory instruction materials as well as administration/grading of weekly quizzes. "Cross-listing" is a term which is synonymous with compiling all the lab sections together on one site so that lab instructions and other materials only have to be uploaded to the site once. Each lab section was given a unique identifier so that the entire "cross-list" could be searched and sorted for results by lab section if needed (Figure 5).



igure 3. Discussion roups



igure . Instructor Student eekly ecture Slides and Videoclips

Cross-Listing Information Alphanumeric	Wk3: Att Numeric (out of 1)	Macromolecules Quiz (out of 5)
BIO-151-074 - SU05	1.00	5.00
BIO-151-074 - SU05	1.00	5.00
BIO-151-074 - SU05	1.00	5.00
BIO-151-074 - SU05	1.00	2.00
BIO-151-074 - SU05	1.00	4.00
BIO-151-073 - SU05	1.00	4.00
BIO-151-073 - SU05	1.00	5.00
BIO-151-073 - SU05	1.00	5.00
BIO-151-073 - SU05	1.00	5.00
BIO-151-073 - SU05	1.00	4.00
BIO-151-073 - SU05	1.00	5.00
BIO-151-073 - SU05	1.00	3.00
BIO-151-073 - SU05	1.00	5.00
BIO-151-073 - SU05	1.00	5.00
BIO-151-073 - SU05	1.00	5.00
BIO-151-073 - SU05	1.00	5.00
BIO-151-073 - SU05	1.00	5.00
BIO-151-070 - SU05	1.00	3.00
BIO-151-070 - SU05	0.00	--

igure 5. Cross- isting of ab Sections

Laboratory scores were based on weekly quizzes emphasizing the basic principles behind the laboratory exercise(s) and student attendance. Weekly quizzes were automatically and selectively released to each individual lab section of students with deadlines for completion specific to each section (Figure 6).

Criteria
Cross-Listing Information Equal to BIO-151-070
And July 10, 2006 1:00 PM Until July 17, 2006 1:00 PM
Or Cross-Listing Information Equal to BIO-151-061 1
And July 12, 2006 9:00 AM Until July 19, 2006 9:00 AM
Or Cross-Listing Information Equal to BIO-151-062 1
And July 12, 2006 11:00 AM Until July 19, 2006 11:00 AM
Or Cross-Listing Information Equal to BIO-151-063 1
And July 12, 2006 1:00 PM Until July 19, 2006 1:00 PM
Or Cross-Listing Information Equal to BIO-151-066 1
And July 13, 2006 9:00 AM Until July 20, 2006 9:00 AM
Or Cross-Listing Information Equal to BIO-151-073
And July 13, 2006 1:00 PM Until July 20, 2006 1:00 PM
Or Cross-Listing Information Equal to BIO-151-074
And July 13, 2006 3:00 PM Until July 20, 2006 3:00 PM

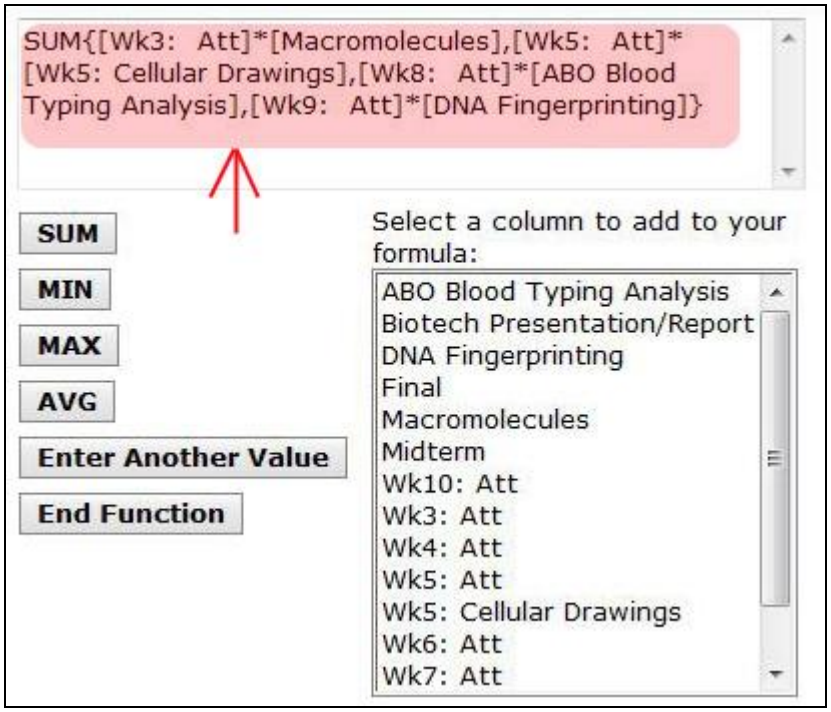
igure . Selective Release of ab uizzes to Multiple Sections

Scores for weekly quizzes were made immediately available to students upon completion of the quizzes. Correct answers for the quizzes were usually available one week following the quiz due date. Student lab attendance was manually entered (by TAs) into the grade book as a “1” for attendance or “0” for non-attendance. At the end of the term, this attendance column was multiplied by the weekly quiz score. Hence, students who may have taken the automated quiz, but did not actually attend the weekly lab, scored no points for the quiz (i.e. 0 (attendance) x 5 (quiz score) 0). In this manner, attendance was linked to quiz score (Figure 7).

Total Lab Points Calculated (out of 40)	Wk3: Att Numeric (out of 1)	Macromolecules Quiz (out of 5)	Wk5: Att Numeric (out of 1)	Wk5: Cellular Drawings Numeric (out of 5)
40.00	1.00	5.00	1.00	5.00
39.50	1.00	5.00	1.00	5.00
(25.00)	0.00	--	1.00	5.00
40.00	1.00	5.00	1.00	5.00
N/A	--	--	--	--
39.50	1.00	5.00	1.00	5.00
39.00	1.00	5.00	1.00	5.00
N/A	--	--	--	--
40.00	1.00	5.00	1.00	5.00
(34.50)	1.00	5.00	1.00	5.00
35.00	1.00	5.00	1.00	5.00
39.00	1.00	4.00	1.00	5.00
35.00	1.00	5.00	1.00	5.00
38.00	1.00	5.00	1.00	5.00
38.00	1.00	4.00	1.00	5.00
38.50	1.00	5.00	1.00	5.00
38.00	1.00	3.00	1.00	5.00

igure 7. radeBook, aboratory uiz Columns

The final score for the lab was tabulated by adding the number of points achieved on each lab quiz (multiplied by attendance). The tabulation was automatically calculated by Blackboard VISTA™ (Figure 8).



igure . aboratory Total Score Calculation

The calculated total lab score was subsequently integrated into the calculations determining the final grade for the course (midterm + final + presentation + lab total score) which was also automatically calculated by Blackboard VISTA™.

Results

Exams
The percentage of students in BIO 151 completing their exams by the due date was 93% and 92% for midterm and final exams, respectively. Very few, if any, technical problems were reported, due in part, perhaps, to an exam tutorial placed on the homepage. The tutorial included a short video clip explaining the exam procedure and a small, demonstration exam in Blackboard VISTA™. The average score on the midterm exam was 23.5/25 points (max: 25; min: 19). The average score on the final exam was 22.4/25 points (max: 25; min: 17).

Presentation Pro ect
Thirty-four (34) groups of 5-6 students gave presentations during the term on topics found in textbook chapters, two through ten (2-10). Title slides from 19 of these presentations can be viewed by following this link: BIO 151 Presentations

aboratory
The percentage of students in BIO 151 completing their laboratory activities was 93%. The average total score for laboratory activities was 21.1/25 (max: 25; min: 3).

inal rades
Approximately 25% of the students in this course made an A+; 50%, an A. Grades of B or lower were distributed as indicated below:

- A+ (97% and above) -- 27.8%
- A (90-96%) -- 52.7%
- B (80-89%) --13.3%
- C (70-79%) -- 2.4%
- D (60-69%) -- 0.6%
- F (less than 60%) -- 2.4%

Discussion

Historically, BIO 151: Applied Biology has been considered a difficult course to teach. For students, it has been an unwanted, but necessary course for which to register in order to graduate. Classes (and laboratories) have often been plagued by low attendance. Poor performance and steadfast lack of interest on the part of student and instructor were characteristic of this course. Unfortunately, a large communication gap was also in evidence primarily because neither party cared a great deal about what the other party had to say.

This case study attempted to remedy at least some of these ills by offering students a chance to engage more personally (fully) with the concepts being taught; to assume, as it were, the role of “lecturer for a day”. Moreover, accurate, efficient record keeping of scores was provided which enhanced the integrity of the course and elevated the level of student trust in the course, the instructors, and the teaching assistants.

Exams
The goal of the exams given in BIO 151 was to provide an opportunity for students to review the material presented (both by them and by the instructor) and to touch base, once again, with the basic concepts and issues addressed during the term. Needless to say, rote memorization of fact was not needed (or expected) in order to pass these exams. Rather, students could access exam materials easily through Blackboard VISTA™, review them, and select (hopefully) the best answer(s) for the questions posed. Moreover, Incorporation of questions from student presentation materials on exams broadened the exam experience for many in that not all the correct answers could be found in the textbook, but rather in the

slides, video clips, and URLs of student presentations. The high incidence of good scores on these exams indicates that students were successful in reviewing and understanding the basic concepts presented. Due to the fact that exams were in open-book format and available to students for a period of about 3 days over the exam weekend, there really was no method by which to monitor students during exam-taking. Hence, student collusion on the exams could have occurred. However, student collaboration was encouraged for exam-taking as a part of the emphasis on group interaction in this class. Moreover, it was felt that this type of encouragement tends to mitigate, to a certain extent, dishonest intention with regard to taking exams. The need to "cheat" is removed, essentially; collaborative interaction is supported, and many students benefit from a group experience in which potential answers to the exams are researched. So, while some collusion may have occurred; true collaboration did as well.

Presentation Pro ect

The presentation project allowed space for student creativity, not only with regard to selection of topic, but also in reference to graphic design and incorporation of multimedia resources. For example, although "You-Tube" video clips are not always considered of highest quality in terms of production conditions, their incorporation into some of these presentations required review and analysis of the clip by students and considerations with regard to appropriateness. Many of the clips presented (whether from You-Tube or other sources) reflected careful consideration by students as to how the clip could enhance the presentation. For example, the presentation about "Water on Mars" incorporated a video clip of NASA's Mars Rover and its search for water on Mars. The presentation about "Organ Donation" included a video clip from the movie, "John " which depicts a father's frantic search for an organ for his dying son. An excellent video clip about anorexia was included as part of the presentation about "Eating Disorders". Overall, this particular aspect of the course provided a good outlet for student creativity and engaged them very effectively with the subject matter.

aboratory

Many students from non-science backgrounds are daunted by a "hands-on" laboratory experience. In view of this reticence to embrace laboratory experiments wholeheartedly, the laboratory activities for these students included well-planned (and explained) experiments with historically, a very small chance of failure. An attempt was also made to balance their exposure to activities in which a reasonable level of technical expertise was required with activities which relied more fully on audio-visual materials. Moreover, incorporation of simple quizzes on the basic principles behind each laboratory activity served to reinforce those principles. In short, laboratory activities for non-major students do not have to be difficult to engage them. Rather, simple, straightforward expressions of basic concepts are probably more effective. As with the major exams given in this course, the percentage of high scores on lab quizzes/exercises indicates a good grasp by students of the principles presented in laboratory activities.

The decision to give lab quizzes on basic concepts versus requiring a formal laboratory report on each exercise was based on several factors. The first factor was the large enrollment for this course making individual grading of lab reports an arduous, time-consuming weekly process. Secondly, the subjectivity and lack of consistency exhibited by TAs (and instructors) with regard to manually grading lab reports is well-known and would be possibly compounded by the large numbers of reports in this instance. Finally, the instructor felt that very few if any non-major students would be required to write formal lab reports in their chosen jobs/careers upon graduation

Conclusions

One of the major conclusions from this case study is that student creativity should not be underestimated simply because the course is a non-majors course. Creativity may lie dormant in many non-major courses because it isn't tapped by the traditional teaching formats often used in these courses. (This could also be said of traditional teaching formats in major courses!). Giving creative voice to students, even in courses which are not in their major area, provides both students and instructor ample "play" space in which to explore any/all concepts under study. Incorporating multimedia elements into this "play" space also serves to enrich the learning/teaching experience.

While it is true that not all students (or instructors) will take advantage of this type of opportunity, encouraging student participation in the development of lectures/materials for the course establishes a

direct conduit to the concepts being taught. The student views presented are often refreshing and reflect their unique perspectives on the issues underlying the material. The particular requirement that students work in groups stimulates interaction between students which also enhances their appreciation of alternative viewpoints.

This case study also underscores the fact that effective, automated record keeping is its own reward in large courses in which student performance on a large number of different activities has to be recorded accurately. In this particular course, 167 students completed 2 major exams, a presentation project, and at least 5-8 laboratory activities. Each individual's laboratory attendance was also monitored for 10 weeks. Hence, a total of approximately 3000 data points were used to obtain final grades. Utilization of Blackboard VISTA™ to automate quiz/exam delivery/grading, and compile attendance as well as presentation project scores was extremely helpful and emphasizes the fact that large numbers of students are "doable" in terms of record keeping if you automate it. Moreover, the course motto of "everything in the grade book" encouraged students to check the grade book for their scores on all activities and to contact either instructor or TA if they felt something was amiss. This "transparency" gave them a sense of ownership and prompted stewardship with regard to their scores and, eventually, their final grade.

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