Editor's DeskTop

Statistics And More—Volume 12 of the *AURCO Journal* is not only the largest issue to date but also the most diverse in a number of ways. Of the nineteen refereed articles by twenty–eight authors, seven articles are by joint authorship (2 articles having three authors and 5 articles having two authors). Moreover, one article includes the contributions of three students, one article is from a colleague at a four–year college, and one article is jointly authored by a regional campus faculty and a four–year college colleague. Eleven regional campuses are represented: Bowling Green—Firelands (two authors); Kent State University—Stark (one faculty and three students) and Trumbull (one author); Ohio State University—Lima (four authors) and Newark (one author); Ohio University—Chillicothe (three authors), Eastern (one author), Southern (two authors), and Zanesville (eight authors); Wright State University—Lake (one author); Saint Xavier University (one author); University of Cincinnati McMicken College of Arts and Sciences (one author). Of the presentations, three regional campuses contributed: Kent State University—Stark (joint authorship, two authors) and Tuscarawas (one author); Wright State University—Lake (two authors). Student essays represent Kent State University—Stark (one author) and the University of Cincinnati—Clermont (two authors), with the students receiving a $300 scholarship for their wining essays.

Commitment

Mere numbers do no indicate the level of scholarship or the particular concerns of faculty. The nineteen refereed articles demonstrate the engagement of faculty across Ohio in maintaining their command of subject matter and their allegiance to the notion that contributing to the life of a university is more than just teaching classes. It is a commitment to the idea that faculty must be engaged in the ongoing scholarship and investigation of not only their respective subjects but also those factors which influence how the subject is taught and how the students are able or are unable to respond to the subject and the instruction. Today, more than ever before, technology plays a major

role in considering how students are instructed, how students are engaged in research, and finally how both faculty and students are both liberated and bound by the ever changing nature of the technology.

Refereed Subjects Under Discussion

Tim Blake, Sandy Jones, and Stacie Sweet of Ohio University—Zanesville in "Adult Learning: A Comparison Of Traditional Vs On–Line Methods Of Delivery" are concerned with the methods of delivering instruction to adult learners through the traditional lecture approach or the current technology of on–line access to instruction, each method exhibiting both advantages and disadvantages. It appears that the traditional lecture is as appropriate as on–line instruction, with the proviso that each method is used appropriately and receives timely reevaluation. Shannon M. Brogan, Camille Leadingham, and James R. McKean of Ohio University—Chillicothe in "An Interdisciplinary Service Learning Approach to Facilitate A Community Project" examine how a community project can be enhanced through the application of a service learning approach. Through engaging the students in a community project, the instructors move the classroom out from a building and into the community in such a way that students are fully engaged in the real world, with all its complexities and challenges. Since stress has been such a concern of not only faculty but the general population, which of course includes students who are under considerable stress, Kitty A. Consolo of Ohio University—Zanesville in "Implementing Physical Relaxation Techniques As A Class Or For Stress Reduction In Any Class" provides a variety of approaches for reducing the students' stress through relaxation techniques, with the added incentive to include a stress reduction class as part of the curriculum offerings. Kate Dailey and Jolene K. Buehrer of Bowling Green State University—Firelands in "Native Americans And The Holocaust: Introducing New Literature Courses To A Regional Campus" explain why and how new courses such as Native American literature and holocaust literature may be incorporated into the curriculum and into helping students become responsible citizens. Susan Emens of Kent State University—Trumbull in "When The Tail Wags The Dog: The Strategic Use Of Distance Learning Technology To Provide Access To

An Associate Degree" explains how distance learning technology can allow students to again access to a degree in business management and how such access can be used both as a strategic means of attracting and retaining students. Shahrokh Ghaffari of Ohio University—Zanesville in "Chemistry Or Mathematics?" shows how students taking chemistry for the first time in college may benefit from an integrated approach using mathematics. A. M. Hunt of the University Of Cincinnati—Clermont in "Educating The Next Generation: Community, K–12 Schools, And A Regional Campus Working Toward A Common Goal" explains how a model of volunteer community and school service may enrich and expand the horizons of teachers and K–12 students with regard to geology, geography, and environmental science. Keith S. Lloyd, with Dena Bartko, Crystal Berns, and Desiree Hoffman, of Kent State University—Stark in "Challenging Mostly White Classrooms To Actively Consider The Impact Of Race On Their Lives' explains the reasons for confronting issues of race in white classrooms and how students have responded to this issue. David M. Lucas of Ohio University—Southern in "Folknography: The Foundation And Rationale" explains the rationale for the establishment of the discipline of folknography and how such a program functions in introducing students to the real life histories of people who might otherwise not receive such attention. Sarah Mahan–Hays of Ohio University—Eastern in "Reflections On Reflections: Service Learning and Oral Histories" explains the outcomes of a service learning project in which students were partnered with senior citizens and recorded oral histories. Pradeep K. Mohanty of Ohio University—Southern in "Leveraging Distance Learning Technologies For Traditional Courses" explains how collaboration technologies used for distance learning may be applied to the traditional classroom. Jack Richardson of Ohio State University—Newark in "Three Sites/Three Voices: Intercultural Dialogue And The Artwork Of Pepón Osorio, Fred Wilson, And David Hammons" explores the use of the artwork of three painters in the application of dialogic learning. Ken Rosengarten of Wright State University—Lake in "Best Practice Teaching For College Classes" examines how to translate the concept of best teaching practices from the world of child–centered learning to that of college–centered learning. Teri Rysz of University Of Cincinnati—McMicken College of Arts and Sciences in "Metacognition In Learning: Elementary Probability And

Statistics" explains the phenomenon of metacogniton and how it affects the understanding of students learning elementary probability and statistics. Lynn Sametz and Dawn Wingate of Ohio State University—Lima in "Improving Education: Partnering With Our Communities" show how K–12 outreach programs and partnerships with both schools and communities are designed to improve the quality of education. Pamela S. Sealover and Deborah Henderson of Ohio University—Zanesville in "Designing An Educational Game For The Fun Of Learning literally *show* how the addition of game show techniques can be used to heighten the excitement of the learning experience. Sheida Shirvani of Ohio University—Zanesville and James R. Aman of Saint Xavier University in "Dick And Jane On–line: Implications Of Gender Differences For Distance Learning" examine whether or not gender accounts for differences in attitudes toward on–line courses. Bozena Barbara Widanski of the University of Cincinnati—Clermont in "Assessment For Learning: Giving Multi–Style Learners The Opportunity To Learn Organic Chemistry" indicates how through a self–designed questionnaire she has been able to apply different techniques to meet the needs of students who require various styles of learning to meet the demands of organic chemistry.

Presentations

E. Ted Bun of Wright State University—Lake in "Echoes: Why History Is Important" compares the issues surrounding the attack on Pearl Harbor with the attack on the World Trade Center of 9/11. Joseph Cavanaugh of Wright State University—Lake in "Engaging Students: Taking On–line Courses" investigates the development of on–line courses and the necessity for continuous revision, his conclusions stemming from a workshop which included eighteen participants. Chitra Rajagopal of Kent State University—Tuscarawas in "Teaching Embedded Systems Design In Regional Campuses" show how courses in special purposes computers can be incorporated into regional campus computer programs. Margaret Wick and Mary Griffin of Kent State University—Stark in "Diaries And Performance: Transforming Everyday Women's Voices Into Teachable Moments" explain how to make the diaries of nineteenth century women accessible to today's students through performance techniques.

Student Essays

Desiree Hoffman of Kent State University—Stark in "Machiavelli's Prince Or Nobody For President: Sources Of Political Discontent In America" applies the insights of a Renaissance political scientist to today's issues of discontent in the American public. Jun Yan and Andy Jackson of the University of Cincinnati—Clermont in "The Stabilization Of Garlic Compounds Via Refrigeration" conducted a laboratory experiment to test the possibility of stabilizing compounds found in natural garlic.

Parting Comments

The diversity of interests and the professionalism of the research exhibited by the content in the articles above indicates how well Ohio's twenty–three regional campuses are meeting the needs of students, communities, and the requirements of various disciplines. According to the Ohio Board of Regents 2004 *Performance Report of Ohio's Colleges and Universities*, across Ohio's state university regional campuses, 47,873 students are enrolled. Of these 46,434 are undergraduates; 63% are female and 37% male; 35% are 25 years of age or older. The figures for percentages are averaged and do not represent a full picture of the diverse populations served by regional campuses. For instance, one campus has a population of which 51% are 25 or older. One campus has a population of which 74% are female. Compare such figures to Ohio State University of which only 11% of the students are 25 or older and of which 48% are female. Clearly, the diversity of articles reflects in part the diversity of students pursuing their education at regional campuses, a total population which almost equals that of Ohio State University, the largest state university with a population of 51,677.

Since my association with AURCO and the *AURCO Journal* in 1993, it has been more than my pleasure to see the organization and the journal grow to become an established part of Ohio's educational system. The organization and the journal have supported the work of full–time and adjunct faculty as well as the work of students. Most recently colleagues from four–year institutions have seen their work published. Through the yearly Spring Conference and presentations of papers, faculty have

demonstrated in not only a professional manner but also often in very personal terms their commitment to their profession, their institution, their communities, and not lastly but most importantly their students. By any measure, the efforts exhibited here are a fitting commentary on the state of learning, technology, and research. As I now turn over the responsibility of the *AURCO Journal* to incoming editor Jeffrey C. Bauer of the University of Cincinnati—Clermont, I do so with the every confidence that the journal will continue to prosper and continue to be a clarion voice for faculty, students, and communities throughout Ohio's regional campuses.

Acknowledgments

A special thanks here goes to Associate Editor Robert Howell for his considerable assistance in making the journal possible. Since this is the last issue that Robert will be responsible for coordinating, I shall doubly miss my association with him and the journal.

Refereed Papers

Adult Learning: A Comparison Of Traditional Vs On–Line Methods Of Delivery

Tim Blake
Sandy Jones
Stacie Sweet
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Introduction

Teaching can be a challenging event for the instructor. Adult learners challenge their instructors to show them why they should learn the information being presented and why it is worthy of their time. They expect an atmosphere that will hold their attention without causing them to become bored. Complexity is added to the classroom when adult learners have preconceived ideas about the instructor and the learning process. The instructor must demonstrate that he or she is both knowledgeable about the subject and cares about the learners.

The traditional lecture approach has been utilized for centuries as far back as Roman Times (Bonwell, C., 1991; Bonwell, C., 1996). However, the traditional lecture is not the only effective means of increasing student understanding and retention of information. As we move into the 21st century, technology has clearly advanced the imparting of information and the acquisition of knowledge. Today's educational institutions are making a switch from the traditional method of delivery of information to the use of methods based on technology or a combination of both.

Adult Learning Styles

Malcolm Knowles, the pioneer of adult learning, has identified various characteristics of adult learning styles. In the 1950s, Knowles (1990) organized his ideas around the notion that adult learning takes place

best in informal, comfortable, flexible, and nonthreatening settings. By the 1960s he employed the term *andragogy*, which he thought was a better organizing concept of the art and science of helping adults learn. It is through this andragogical model that Knowles (1990) bases his assumptions of learning. Knowles (1990) believes that prior to undertaking the learning process adults must know why they need to know the information being taught and that they have a self–concept of being responsible for their own decisions and actions. Adults come to an educational activity with a greater volume and a different quality of experiences than those of youth. In order to cope effectively with their real–life situations, adults approach education with devoted energy, are ready to learn, and are life–centered in their learning. In addition, according to Knowles (1990) adults are the most potent motivators as a result of internal pressures such as the desire for increased job satisfaction, self–esteem, and quality of life. Thus, the andragogical model is a process model that is in contrast to the content models in which real life is not tied to learning but is employed by the most traditional educators. The andragogical or process model provides procedures and resources for helping learners acquire information and skills while the content model transmits information and skills (Knowles, 1990).

During the process of learning, adult learners will perform certain activities such as reading, listening, watching, or practicing. Once they have completed the learning activity, they will retain a certain amount of knowledge or skill. The knowledge or skill obtained will then be used to assist the adult learner when performing some task or action at a higher level than a previous knowledge level allowed (Knowles, 1990). Adult learning must be made optimal by providing variances in style, time, place, and the pace of learning (Knowles, 1990).

Well known nursing educators and authors Billings and Halstead (1998) agree with Knowles' principles of learning: the idea that adults learn best when treated as human beings and ultimately have a better attitude of seeing learning as a lifelong process. Adults are people with a self–concept of being self–directed and responsible for their own lives. This idea is consistent with and extends previous work initiated by Knowles (1990).

The advantages of self–directed learning are numerous for the adult learner. Self–directed learning is flexible and self–paced according to

the learners' needs. Thus self–directed learning has an advantage over the traditional combined lecture and discussion method of learning (Knowles, 1990). A major disadvantage of self–directed learning includes procrastination leading to slow completion or incompletion of study (Billings and Halstead, 1998).

As one who has taught adult learners for over thirty–five years, Teeters (2001) writes to include the adult learners' experience and knowledge in the learning process. Teeters (2001) writes of the unspoken demands of the busy adult learner when participating in learning activities:

> 1) Show me why I should learn the information that you have to teach.
> 2) Show me that you are knowledgeable of the information that you are teaching and worthy of my time and attention.
> 3) Show me that you can hold my interest while learning this information so I will not get bored.
> 4) Show me that you care enough about me to teach me what I want and need to learn to complete my goal.

Instructors are constantly challenged by the adult learner to make the instruction they are providing meet the real needs of the adult student and clearly demonstrate the benefits for the time they are committing to the learning process. Teeters (2001) goes on to state that adult learners present a formidable challenge to the instructor because they consciously or unconsciously evaluate the instructor and the learning process. Adult learners bring to the classroom expectations and anticipation of the learning experience that can affect how much they learn in obvious and subtle ways. Adults also bring human emotions and personal histories that may emerge sometimes in puzzling behaviors that may affect learning.

Lovejoy (2002) demonstrates his knowledge of education as a professionally recognized leader through facilitating professional development and advancement of adult learners. Lovejoy (2002) believes the adult learner, the instructor, and the environment play separate and distinct roles as the learning process takes place. The adult learner must share his or her thoughts, ideas, perceptions, and expectations with the instructor. Lovejoy (2002) believes the learner serves two purposes: first, the learner is both an individual and part of a group; second, the learner is a key component of the whole learning process by being involved in

the overall decision–making process. Lovejoy (2002) goes on to explain that the instructor facilitates the group discussion by asking open–ended questions, providing feedback, and recognizing and valuing opinions and expectations of not only individual students but the group as a whole. So the instructor must become the orchestrator of the overall decision–making process for the group. Lastly, the environment plays two main factors in the learning process: perception and communication (Lovejoy, 2002). These combined roles help to solidify the learning process and provide a legitimacy within the learning process as it relates to the adult learner.

The Traditional Lecture

The past several decades have given way to educational research which indicates that the traditional lecture is not necessarily the most effective means of increasing student understanding and retention of information (O'Shea, 2003). In fact, many advocate the use of active teaching approaches to encourage more effective learning (Bonwell, 1996). However, many instructors and students alike continue to gravitate towards the lecture format. Weber and Mitchell (1996, 28–29) discuss instructors' and students' perceptions of teachers through analysis of drawings depicting teachers:

> Even a cursory analysis of drawings done by children and teachers reveals the persistent and pervasive presence of traditional images of teaching as transmission of knowledge from the all knowing teacher into empty vessel students.

Weber and Mitchell felt their analysis was reminiscent of Goodlad's (1984) study in which the typical teacher portrayed in drawings by students and teacher alike was that of a white woman in front of a blackboard or desk. Many prospective teachers became aware of the influence of past experiences and stereotypes on them.

Advantages Of The Traditional Lecture

The lecture has both strengths and weaknesses. Cashin (1985) points out that the appropriateness of a lecture for a given course depends on the course objectives. The advantages of lecturing include familiarity,

closeness, and comfort for instructor and students (Zhang and Nunamaker, 2003). A lecture is often favored as a teaching and/or learning method by mature students with previous experience (Thompson and Scheckley, 1997). Lecturing allows for dissemination of unpublished material or material not readily available ("Advantages and Disadvantages," 2004). Through the lecture, the instructor determines goals, content, organization, pace, and direction ("Advantages and Disadvantages," 2004). The lecture can arouse interest in a subject and can clarify text material. In addition, the lecture allows for gradual development of complex concepts and permits the largest amount of content and/or material to be provided to a number of students in the least amount of time. Horrigan (2003) states the lecture can improve student retention and understanding of clinical information if the student prepares prior to lectures.

Disadvantages Of The Traditional Lecture

Lectures may necessitate travel and disruption of work for the student and may be impractical for the instructor, causing time and expense to be prohibitive (Zhang and Nunamaker, 2003). Although the lecture format can be an advantage due to the focus on the instructor in the dominant role, it can also be a disadvantage as the instructor controls content, discussion, and progress (Baloian, Pino, and Hoppe, 2000). The traditional lecture format goes against adult learning principles which include self–directed learning (O'Shea, 2003). Lectures encourage one way communication in which the instructor speaks and the learners listen ("Advantages and Disadvantages," 2004). Lectures require a large amount of time outside of the classroom to achieve an understanding and retention of the content ("Advantages and Disadvantages," 2004). Students have a limited ability to focus on lecture content for any length of time exceeding ten minutes (Borman, 2003). The student's retention can be negatively affected with too much information being provided at one time. Andrews (1989) states lectures may be poorly prepared or delivered and that the instructor may also ignore student feedback.

Improving The Lecture

Bonwell (1996) suggests more active teaching approaches be utilized in lectures to support more effective learning for the adult learner. Andrews (2001) recommends several techniques to improve the instructor's skill in lecturing. The instructor should be familiar with the teaching environment and be prepared for lecture in advance so that the presentation appears polished and seamless. Other teaching techniques combined with lecturing can provide a variety of teaching modalities to aid in student focus and retention. Andrews (2001) also suggests utilizing sound principles of speech to organize the lecture, thus assisting the instructor in delivering the lecture extemporaneously.

Bonwell (1996) advocates the use of the "pause" procedure to engage students and significantly increase learning. Bonwell defines such practice as a form of "enhanced" lecture in which short lectures are punctuated by a series of learning events designed to meet course objectives. Research originally done by Rowe (1980) and Ruhl et al. (1987) indicates that pausing for several minutes after 12–18 minutes of lecture fosters student attention and learning. Students were also given three minutes to write down everything they could remember about the lecture. After 12 days, the students received a 65 item multiple choice quiz and a comprehensive exam to measure long term retention. In two separate courses over two semesters, the experimental groups exposed to the pause procedure did significantly better on the quizzes and the comprehensive exam than the control groups. Differences between the groups were large enough to account for up to two letter grades. The results were obtained with only a per class loss of six minutes of lecture time.

Bonwell (1996) postulates that frequent breaks help students to deal with physiological and psychological responses that prevent them from listening effectively. Pause assignments can include reviewing notes, think–pair–share activities, short writing assignments, and formative (ungraded) quizzes.

Other authorities ("Teaching for Learning," 2001) offer guidelines as well. When planning the lecture, instructors must clarify what the lecture is trying to achieve. Is the student acquiring new information, improving comprehension, or applying information to a particular task? Likewise, the instructor must also consider the various learning styles

that students will bring to the classroom. Therefore, it makes sense to plan for multiple delivery methods (i.e., reading, audiovisuals, writing assignments, and discussion). Variety aids in restoring and maintaining attention and in improving comprehension. When delivering the lecture, the instructor should not tell the learner everything but emphasize areas in the reading that are important for the student to review and understand.

When delivering the lecture, the instructor must select an effective pace in order to allow enough time for each segment of information. Thus, the instructor doesn't have to rush through material. Delivering the lecture in an extemporaneous style also allows for directness and spontaneity (Andrews, 2001). Instructors who know the material well can deliver the lecture without the use of notes. In this context, eye contact with students tends to be improved and also helps the teacher adjust the lecture to the students' reactions.

Diekelman (2002) points out that effective instructors can pitch a lecture in a manner that includes timing and reading the faces of the students. Experienced instructors know when they are over the student's head or when they are off the mark. However, the practice of pitching a lecture and being able to evaluate the faces of one's students takes practice. Lecturing is embodied and learned by doing it and getting it wrong many times before getting it right (Benner, Hooper–Kyriakidis, and Stannard, 1999; Benner, Tanner, and Chesla, 1996).

Closing the lecture is just as important as the beginning and the content portion. If the instructor opens the class with a question, the answer to that question could be summarized at the end. One could opt to summarize the main points of the lecture and also preview what the students could expect for the next class ("Advantages and Disadvantages," 2004). Another method of closure is to restate what the students are expected to have gained from the lecture material ("Advantages and Disadvantages," 2004).

As the world moves into the 21st century, academic faculty continue to try to improve classroom techniques that enhance student's understanding and comprehension. The traditional lecture may not always be the most effective method of delivery for some self–directed adult learners, but it is still the preferred mode of delivery for many individuals. Although the traditional lecture can be counterproductive,

it can be an effective classroom tool if used in conjunction with strategies that incorporate active learning. Effective lecturing takes hard work and practice. Diekelman (2002) states that "teachers learning to lecture is perhaps the epitome of teaching."

On–Line Learning

Today's trend in higher educational institutions is to switch from the traditional method of delivery of information to the use of technologically based methods or a combination of both. On–line learning serves as a complementary mechanism to lifelong learning (Zhang and Nunamaker, 2003). These advances accommodate nontraditional students that have responsibilities such as families or jobs in addition to getting an education. Using computer technology also provides flexible self–directed learning, a desire of many adult learners.

What Is On–Line Learning?

On–line learning is a method of delivery that takes place in a computer–mediated environment and uses software to facilitate the teaching and learning process. On–line learning is an emerging revolution used as a complementary mechanism in the traditional classroom. This method of delivery provides a great deal of interaction between students and between students and the instructor. There are many course management systems available to provide students with the ability to communicate with peers or the instructor, obtain information, and complete assignments.

Advantages To On–Line Learning

Use of on–line learning provides students with the flexibility to complete assignments and to learn when it is convenient for them. It also eliminates the barrier of travel. Many adult college students travel considerable miles to get to class. In addition, on–line learning provides the opportunity to reach people who under traditional circumstances can not attend class. With the elimination of travel, the cost of education

can be reduced.

With on–line learning, the learner is encouraged to participate in and interact with the environment to construct individual meaningful learning. This self–directed learning also allows the student to be self–paced and to complete assignments when it is convenient, thus allowing students to spend more time on difficult concepts and to accelerate in areas that they feel competent.

On–line learning also provides the opportunity for students to interact with others, whereas in the traditional classroom there may be limited interaction as the lecture focuses on the instructor. According to Zhang and Nunamaker (2003), on–line learning encourages learners to ask questions they may not be able to in traditional classrooms, to offer their personal opinions without inhibition, and to share different ideas with each other more easily through on–line forums. In addition to having the opportunity to interact with others in the class, Zhang and Nunamaker (2003) say that on–line learning provides better access to the instructor.

A very valuable advantage includes the unlimited access to learning materials. Students can access materials 24 hours a day and as many times as desired. In addition to being able to obtain course materials anytime, they are also able to access their grades through the use of on–line grade books. This form of delivery also provides several different methods of learning in order to accommodate those with different learning styles.

Disadvantages Of On–Line Learning

Although there are several advantages to on–line learning, there are also some concerns. According to MacDonald, Stodel, Farres, Breithaupt, and Gabriel (2001), on–line learning is often poorly designed and fails to create an effective learning environment because of time constraints for planning, creating, and teaching on–line courses. Other factors include lack of the instructor's willingness to change methods, inappropriate use of materials and resources, and insufficient technical support (MacDonald et al., 2001).

Another disadvantage to the instructor is security of testing. It is possible for students to cheat while taking on–line tests or quizzes. They

may use notes, textbooks, or other sources of information without the instructor's knowledge (Jones and Harmon, 2002). There is also a possibility that another person may take the test or quiz for the student. In order to prevent this problem, some universities utilize computer labs on site which can be monitored by a proctor. However, this option does require the student to travel to the site for testing and negates many of the benefits of on–line learning.

Effectiveness

As with any course, evaluating the effectiveness is an ongoing task. Grades on assignments, final exam scores, and final course grades can be indicators of student success but may fail to identify components of the course that are successful and components that may need to be improved. According to Jones and Harmon (2002), evaluation of the course can be based not only on exam grades but also on student learning (Did they learn the material?), student perceptions (Did they perceive the course environment as good or bad?), and course functionality (Were there significant technical problems with the class?). Many on–line forums provide tracking of student involvement. This data can be used to perform analyses which can be used to improve subsequent offerings of the course (Jones and Harmon, 2002).

Some literature suggests that adult students in on–line courses were somewhat less satisfied with the course than those in the traditional class. Drop out rates for those taking on–line courses was found to be slightly higher than those taking courses taught by the traditional method. Analysis of data seems to indicate that there is no significant difference in both self–reported motivation and grades found between face–to–face classes and on–line classes (Zhang and Nunamaker, 2003). On–line course work was not only an effective means of delivery of material for students with prior on–line experience but also for adult students who had less experience. The literature suggests that students who were not very experienced with personal computers and the Internet actually benefited slightly more from on–line course work (Zhang and Nunamaker, 2003). Data also suggests that adult females benefited significantly more than adult males with on–line learning as a method of delivery (Zhang and Nunamaker, 2003).

Improving On–Line Learning

There are several measures that the instructor can take to improve on–line learning as a method of delivery. Some of those measures include engaging the learner, providing plenty of interaction between students and the instructor, using student centered techniques such as small group discussions and peer reviews for projects and papers, motivating students on–line, using technology appropriately, and ensuring preparation of the course (Real Education, 1998). Making students responsible for learning and providing opportunities for them to teach their peers may facilitate engagement and may also assist with interaction between peers and the instructor. The instructor should also provide immediate, rich feedback to support student involvement and motivation. In order to keep students motivated, instructors should provide them with credit for their involvement. According to MacDonald et al., (2001), there are also some other principles that may facilitate motivation of the adult learner to on–line learning. These include allowing the learner to make choices, building assignments on each other, and looking for ways to personalize the Web experience.

Conclusion

Adult learning must be made optimal by providing variances in style, time, place, and pace of learning while at the same time accommodating a variety of learning styles. The adult learner plays an important role in his or her learning experience and prefers a method that involves self–directed learning. Although there are several disadvantages to the traditional lecture as a method of delivery, there are also some valuable advantages that make the traditional lecture an acceptable format for learning. The Internet allows the self–directed learner to control his or her own environment for learning, an aspect which for some learners may be more convenient than attending class and providing opportunities that otherwise may not be available. Today, the traditional lecture and on–line delivery are being used as methods of delivery of education to the adult learner. Each has its own advantages and disadvantages but may be viewed as acceptable methods of delivery if they are used

appropriately and if on–going evaluation of the method allows for improvement of the course being taught.

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Biographies

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An Interdisciplinary Service Learning Approach To Facilitate A Community Project

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Abstract

This article examines service learning as an emerging pedagogy applied at a regional campus event. Faculty integrated a service learning approach during Chillicothe's annual Halloween–on–the–Hilltop community event. The event provided both students and faculty from various regional higher educational disciplines the opportunity to utilize and incorporate services offered from their areas of expertise. The theoretical foundation of the project intended to provide learning outside the classroom with hands–on application of student skills while gathering reflective conceptualizations of the experience. The interdisciplinary nature of this service learning helped the campus gain a sense of community. In addition, the institutional visibility was enhanced by bringing community members onto the campus for a weekend of Halloween fun while raising funds for a local nonprofit organization. The outcomes of this project provided each discipline the opportunity to bring forth its theory and apply it to a community project while continuing on and improving a new tradition at the Chillicothe campus.

Service And Learning

Ohio University is committed to providing service to the community and region. A growing number of colleges and universities in the United States have become actively engaged in encouraging their undergraduate students to participate in some form of service learning (Astin, Sax, and

Avalos, 1999; Cohen and Kinsey, 1994; Levine, 1994; Markus, Howard, and King, 1993). However, the process of developing and implementing service learning on many campuses has been gradual.

Service learning is an emerging pedagogy that engages both students and faculty in their communities. Service learning is defined as a

> course based credit–bearing educational experience in which students (a) participate in an organized service activity that meets identified community needs and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility. (Bringle and Hatcher, 1995)

Giles and Eyler (1998) found that service learning curriculums result in interesting professors, positive evaluations from students, better grades, more involvement from nontraditional and traditional students, positive involvement in the classroom, and increased attendance rates. Students (customers) feel they get their money's worth and learn more. In turn, colleges are able to keep up with today's ever–changing professional society (Giles and Eyler, 1998).

Project

During the 2003–2004 academic year, students in a meeting and event planning communication course wanted to increase a sense of community at Ohio University—Chillicothe. They intended to implement a collaborative event that met the service needs of students while benefiting the community. Since Ohio University—Chillicothe's community consists of traditional and nontraditional students, it was important to consider everyone's needs.

The planning committee selected the annual Halloween–on–the–Hilltop for their service learning project. The primary goal of the project was to increase the interaction between students and community while establishing a sense of tradition for the campus. The students contacted the administration to solicit initial funding support to begin the project. Next, they contacted specific local businesses to request in–kind contributions for the event. Companies provided employees willing to donate their time to serve refreshments. A local band provided live

entertainment during the evening. Since the university is surrounded by houses, the faculty advisor directed the students to canvass the neighborhood and invite families to participate. Faculty and student planners remained sensitive to noise concerns of neighboring residents. Approximately 100 community members of all ages attended the initial event.

The following year, the communication planning committee desired to broaden the participation of campus students, faculty, and community members in this traditional Halloween service learning event. Faculty solicited participation from other disciplines at the Chillicothe campus, such as nursing, law enforcement, and early childhood education as well as campus student organizations. The university also wanted greater participation from local businesses. Shannon Brogan sought greater participation from local businesses by sending letters seeking financial support or cosponsors. In response, the *Chillicothe Gazette*, Pepsi, and Classic Brands decided to help sponsor the event.

The communication students worked with the newspaper staff to develop the best means for advertising. For example, students created the event poster and then worked with newspaper staff to create tickets for the event. Students designed event plans to facilitate an efficient and effective setup for event activities such as the live music, haunted house, and children's activities. In order to emphasize community service, students collected donations of canned food at the entry point to the haunted house. These donations supported the Good Samaritan Network food pantry for use at Thanksgiving. Hence, communication was a key to making this event successful.

In addition to serving community needs, an ancillary benefit of this service learning project was the opportunity for students and faculty to interact outside the classroom in an interdisciplinary environment. Students and faculty from communication, nursing, and law enforcement met weekly to discuss the progress of the event. Students developed an agenda for each meeting and recorded meeting minutes. This activity helped students learn to manage an effective meeting.

Callister and Hobbins–Garbett (2000) found that service learning can have a positive impact on students' ability to apply

their knowledge. Most educational professionals believe that today's curriculum should be applied to real life experiences through programs such as service learning, internships, hands–on learning, community service projects, small group projects, and applied learning (Katula and Threnhauser, 1999). Faculty were able to supplement discipline–specific knowledge with service learning concepts in the classroom that the students were able to apply during the project.

Campus Benefits

The service learning approach not only provided students with active participation in the planning phase but also with an opportunity to apply their skills and knowledge to a real–life situation. The variety of student involvement included the following regional higher education tracks: organizational communication to oversee the event planning needs; nursing to assess and provide medical support at the first aid station; law enforcement to provide event security; facility operations to coordinate building needs and space utilization; and early childhood education to provide children's activities. Additionally, the student clubs constructed the haunted house, judged the costume contest, and created the artwork for the event posters. This service learning project was used as an experientially based pedagogy to bring a sense of community to faculty and students while benefiting the community with a weekend of Halloween celebration and tradition.

Participating campus faculty soon recognized the many benefits from the implementation of service learning. Service learning allows instructors to purposefully construct their classroom materials toward more applied end results (Rashotte, 2002). Law enforcement faculty provided classroom instruction on the proper use of mobile radios for participating students prior to their security patrols during the Halloween event. Additionally, service learning creates an environment in which the instructor can demonstrate to the student firsthand day–to–day challenges that might be otherwise overlooked in the traditional classroom setting. Nursing students staffing the first aid booth experienced the challenges of a variety of diverse patients in a real–world environment.

Student And Community Benefits

It is critical that one considers the area in which most students live and work. Students learn to connect with local businesses and serve on committees with potential employers. They also enhance many skills when working with the community, for instance utilizing persuasive tactics when asking businesses for donations and conducting effective meetings which they attend on a weekly basis. Time management skills are critical. Students must come to meetings prepared since the rest of the group is depending on their individual effectiveness for group success.

Volunteer service requires a substantial amount of student time and energy normally spent interacting with peers. Students who participate in volunteer service also discover an increased interaction with faculty and community members. Combining service tasks with structured opportunities links the tasks to self–reflection, self–discovery, and the acquisition of values, skills, and knowledge. Astin, Sax, and Avalos (1999) found that service participation positively affects students' commitment to their communities, to helping others in difficulty, to promoting racial understanding, and to influencing social values.

According to Friedland (2003), students involved in service learning have significant differences in affective outcomes, such as improved pro–social attitudes and skills and better moral awareness. The current historical context of our communities amplifies the consequence of students' cognitive and affective maturity levels. Increasing incidences of terrorism at home and abroad and increased incidence of lethal violence in our schools necessitates the need to develop the highest levels of morality, compassion, and decency in our students (Friedland, 2003). Volunteer service influences the development of important life skills such as leadership, social self–confidence, critical thinking, and conflict resolution.

Student Reflection

The reflection step provides insight into the process of implementation and the effect that change has on the participants. Reflective thought can add new meaning to service experiences, enrich the academic content of the course, and develop students' ability to take informed actions in

the future (Dewey, 1916, 1933; Hatcher, 1997). In an effort to examine the implementation process, project outcomes, and its influence on the students, we conducted a review of written student reflections. The goal was to gather data from the students to validate service learning. Students from each discipline were asked the following question: "Describe your perception of the service learning project." The following responses reflect feedback from several students regarding this event. A nursing student said,

> I really enjoyed applying my nursing skills to a real life scenario and helping the community at the same time. It was hands–on application of my assessment skills that made it a real learning event. I could apply the textbook and lecture content into helping the community.

A law enforcement student stated,

> By engaging in security activities in the parking lot, I had an opportunity to be an active participant experiencing the role I hope to perform in the future as well as experiencing the perception of the public while I performed that role.

She felt that this learning experience could not have been replicated in an academic setting. A communication student said,

> One thing that I found really neat about it was how different organizations could all come together, for a common goal and purpose. We had people from several companies working together, donating time and resources, and it was great. It proved to me that we can all benefit from each other if we are willing to work together.

Conclusion

Service learning represents a paradigm shift in higher education because it heightens the role that students can assume as constructors of knowledge. Furthermore, service learning shifts the role of the instructor from the center of instruction to the facilitator of learning that occurs outside the classroom. During their educational endeavor, students should have a deeper understanding while reaching their educational objectives.

Service learning allows students to see the real world and gain insight

and understanding as well as envision themselves in the workplace (Hammer, 2002). Students participating in this service learning project reflected a higher level of appreciation for the complexities of a career than their classmates did. Service learning is a form of pedagogy that links the classroom to the community and the student to those in the community (Penn, 2003). Based on the reflected experiences of this multidisciplinary group of students, faculty, and community members, this pedagogy remains a cost–effective means for accomplishing Ohio University's service delivery mission for today's community and tomorrow's leaders.

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Biographies

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Implementing Physical Relaxation Techniques As A Class Or For Stress Reduction In Any Class

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Abstract

Many of our regional campus students are stressed and unfit, yet they tend to shy away from traditional physical activity classes. To cope with their stress, these students often turn to unhealthy life–style behaviors such as smoking and overeating. This paper will explain how to implement physical relaxation techniques to relieve stress. These techniques can be taught as a physical education class or implemented as needed into the classroom setting such as right before a test. These techniques give students a healthy alternative to managing stress while requiring little physical skill or fitness to participate. Benefits from such techniques include not only a reduction of stress but improvement in health indices such as blood pressure, and they increase the likelihood of retention and better academic performance for these students.

The Need

While too much or too little stress can have a negative impact on one's health and well being, a moderate level of stress is positive and beneficial. This moderate level of stress is often depicted as a bell–shaped curve known as the Yerkes–Dodson Law (Hebb, 1955). The key then to peak performance, whether it is in academics, music, or athletics, is to discover one's optimal level of stress and work to maintain this balance.

Maintaining optimum stress for good academic performance is extremely difficult for college students today. Stress among first–year college students has more than doubled in the last fifteen years according to research from Sax et al. 1999. Students at regional campuses are

often under even more stress than traditional college freshmen due to commuting, working, and the demands of child–care. Not only is maintaining an optimal level of stress a challenge to regional commuting students, they often use unhealthy strategies for coping with stress such as smoking and overeating while avoiding physical activity.

Healthy strategies for coping with stress include social support, communication skills, regular exercise, a nutritious diet with little or no caffeine, adequate sleep, productive time management, changing unhealthy thought patterns, and practicing relaxation techniques (Insel and Roth 2002). Unfortunately, many students at regional campuses have little social support, hesitate to sign up for physical education courses that could reduce stress, eat high fat foods, consume large amounts of caffeine, and fail to practice relaxation techniques. Introducing physical relaxation techniques provides a healthy method for stress reduction and can be done as either an entire course or implemented into any class when stress reduction might be beneficial to academic performance such as prior to a test. The following guidelines provide information on both implementing physical relaxation techniques as a course and on utilizing certain physical relaxation techniques for any class to reduce stress in one's classroom.

Getting Course Approval

Course Description And Identifying Channels. The first step in getting a course in physical relaxation techniques established at one's particular institution involves writing the course description and then identifying the appropriate channels at one's campus. A suggested description is: "introduces the student to basic physical techniques of relaxation including breathing, active and passive mindfulness, meditation, and beginning yoga. Also includes awareness of body tension and stressors." If you plan to add or delete other forms of physical relaxation, amend the above description as needed. Then determine what departments need to be contacted. Some departments have a speedier process if one first offers the course under an experimental option and will give the course a generic course number. If the course becomes successful, then procedures to implement it as a permanent new course can be followed.

Credit Hours And Prerequisites. The next step is determining credit

hours for this course. Most physical education departments give one hour of credit to physical education courses and expect them to meet two hours a week. It is suggested that this course be offered for one credit hour and meet either for one hour twice a week or for two hours once a week. Often students at regional campuses prefer courses to be offered less often for longer periods of time to decrease the days they commute. No prerequisites are needed for this course.

Marketing The Course

Make a list of all resources available to get the word out on this new course. Utilize student services, the physical education or sport science department and related departments such as health, psychology, and recreation. If there is a counseling service on campus, also advertise this course there as well as on Websites and brochures. Many regional campuses have the ability to mass e–mail students; take advantage of this opportunity if it exists at your campus. Some regional campuses offer an introduction to college class that every incoming student must take; such a course is also a good place to advertise this new course.

Course Location. Given that the objective of this course is to teach students physical techniques of relaxation, this course must be located in a comfortable, quiet setting that allows students to physically relax. Try to find a carpeted classroom, and arrange for mats for the students to sit or lie down upon. The temperature must be comfortable as well so that students are neither too hot nor too cold (ideally around 70–72 degrees). A soundproofed or very quiet room is also essential for this course to be successful—nothing can be more distracting to students trying to relax than hearing disruptive noise coming into the room. Also have available the ability to play soft music or sounds of nature.

Performance Objectives

Include the following objectives for the course syllabus or modify them to the needs of your particular institution. Upon successful completion of Physical Techniques of Relaxation the student should be able to:

A. Demonstrate proficiency in the following techniques:
   1. Deep rhythmic breathing

2. progressive muscle relaxation
3. mindfulness meditation: sitting or prone
4. mindfulness active meditation of choice: walking, jogging
5. yoga

B. Demonstrate theoretical knowledge of relaxation techniques, principles, potential stressors on a written exam.

C. Demonstrate a committed attitude toward the subject and class by regular attendance, participation, and prompt arrival to class.

D. Demonstrate proficiency in evaluating one's relaxation techniques and progress by keeping a written log.

E. Demonstrate proficiency in evaluating one's relaxation techniques and progress by doing an initial and final physical relaxation awareness assessment.

Topical Outline And Brief Descriptions Of Techniques

Initial Stress Assessment. During the first class meeting, establishing initially how stressed each individual is can be helpful to both the instructor and student. Bearing in mind that medications, diet, and room temperature can also alter these readings, the instructor may choose to measure physiological parameters of stress such as resting heart rate or blood pressure. New standards for normal blood pressure are now less than 120 for systolic and less than 80 for diastolic, with pre–hypertension starting at a systolic blood pressure of 120–139 and diastolic blood pressure starting at 80–89 mmHg (National Heart, Lung and Blood Institute, 2004). Normal adult heart rate values are 72–100 bpm.

Other stress assessments include surveys or questionnaires that score various components and then rate one's stress level. Insel and Roth (2004) have developed a helpful wellness worksheet on stress entitled "Identify Your Stress Level and Your Key Stressors." This questionnaire uses thirteen questions to which one answers yes or no. A majority of yes answers indicate high stress. Another helpful assessment is the "Life Experiences Survey" which has 60 questions which one rates from a minus three to a plus three (Sarason 1978). The more positive one's

score, the less stressed and the more negative, the more stressed one is. Hoeger and Hoeger (2005) offer a stress vulnerability questionnaire which assesses how resistant one is to stress. Students are asked to rate 30 questions from 1, strongly agree, to 4, strongly disagree. The lower one's score, the greater resistance one has to stress; the higher one's score, the more vulnerable one is to stress. All of the above are excellent tools to establish initial stress profiles of students, and the questionnaires can be repeated at the end of the course to see if utilizing physical relaxation techniques altered the stress profiles.

Relaxation Techniques: For Use In A Course Or Classroom. This section describes various physical relaxation techniques. The first two techniques can also be utilized in any classroom setting for stress reduction. The author has often used breathing relaxation prior to tests, especially in difficult courses like anatomy and physiology, and found that students with test anxiety reported they did better and also made fewer mistakes in regard to misreading questions or second–guessing their answers.

Deep Breathing. Deep breathing has been used for centuries as an antidote to stress. An advantage of this technique over some of the other relaxation methods is that it can be done virtually anywhere and during the stressful situation. To perform this technique, sit or lie comfortably while placing one hand on your chest and one on your abdomen. As you slowly breathe in, your abdomen should rise and the hand on your chest should not move much at all. As you exhale, the hand on your abdomen should feel the abdomen fall as you exhale, and the hand on your chest should not move much at all (Davis et al. 1988 and Hoeger and Hoeger 2005). Once this breathing technique is mastered, one can try alternative methods such as inhaling through the nose on a count of four, then holding for a two count, then exhaling through the mouth on a count of four.

To implement this technique prior to a test, have students sit comfortably and close their eyes. You may want to darken the room while you explain the above directions. It can also help to play relaxing nature sounds such as ocean waves. Allow students a short period of time, 2–5 minutes, to perform the breathing relaxation. Then administer the test. Students should feel less anxiety and hopefully report a better test experience.

Progressive Muscle Relaxation. Progressive muscle relaxation was described by Edmund Jacobson in 1929 and is still a popular method of relaxation today (Jacobson, 1942). To perform this relaxation technique, one sits or lies comfortably and begins deliberately contracting muscles, then relaxing them in sequence from head to toe. Jacobson believed that by teaching people to recognize the difference between a contracted (stressed) muscle and relaxed muscle they would be able to develop a sense of control over their bodies and the stress response. It is recommended that this technique be performed for 15 minutes twice a day. This technique is particularly beneficial in the classroom when performed prior to written tests and also prior to tests that entail some sort of physical skill as well. Students utilizing this technique in the author's courses have reported fewer migraines and better ability to concentrate on the task at hand.

Mindfulness Based Stress Reduction. Mindfulness Based Stress Reduction was developed by Jon Kabat–Zinn (1990) and colleagues at the University of Massachusetts to decrease physical and psychological symptoms of stress while promoting well–being. The keys to mindfulness are learning to be "in the moment" and to observe oneself and experience life without judgment, expectations, and preconceptions. Participants using mindfulness meditation are instructed to attend to the present moment, observe their breathing, maintain an inner focus yet pay attention to the outer world without judgment or expectations.

Mindfulness Meditation. Once students are introduced to the concepts of mindfulness (Kabat–Zinn 1990), one can proceed to use mindfulness in meditation. Meditation is best done in a quiet, comfortable setting and not in a regular class. Students are instructed to sit comfortably and to focus on being in the moment and utilize the following foundations for mindfulness practice: non–judging, patience, beginner's mind, trust, non–striving, acceptance, and letting go. This technique requires daily practice and can be challenging for students who have high anxiety and like to be active. For these students who have difficulty sitting still and focusing their mind on being in the moment, using a walking meditation can be very effective. Encourage students to walk in a safe location where they can be observed and at a comfortable pace while still practicing the foundations of mindfulness—being in the moment, focusing

on their breathing, focusing on their body while still observing the outside world without judgment and expectation.

Yoga and Mindfulness. Yoga is a school of thought in the Hindu religion that focuses on helping the individual attain peace of mind and a high level of spirituality. Those who practice yoga adhere to a system of mental and physical exercises that can be used as relaxation techniques for stress management. Yoga postures have been shown to be effective in lowering heart rate and blood pressure and have been recently found to slow down or reverse atherosclerosis (Manchanda 2000).

Yoga comes in many different styles. Most yoga practiced in the West World is known as hatha yoga, a form which uses several static–stretching postures. The postures are held for several seconds while one focuses on breathing, mindfulness, and meditation as well as scanning the body for stress. This technique of relaxation is best performed in a quiet, comfortable setting for fifteen to sixty minutes per session. For specific examples of exercises, please refer to Kabat–Zinn's book (1990, 106–113).

Methods Of Student Evaluation

For those offering physical relaxation techniques as a course, the following are recommended methods for evaluating students. The first method is to ask students to keep a stress journal noting what stress they felt, when it occurred and what methods were effective in reducing stress. Points can be assigned for weekly completion of the journal to assure regular compliance. Students can also receive points for active participation in the course. A written exam is also given to ensure cognitive retention of the material and understanding of proper technique and benefits.

Concluding Comments

Students today are more stressed than ever. Those of us who teach at regional campuses often face students who struggle to maintain a healthy balance of stress due to commuting, child–care, and work obligations. Introducing physical relaxation techniques can assist these students in reducing their stress, which in turn can lead to not only improvements

in their physical health but also in their academic performances.

Deep breathing and progressive muscular relaxation are two physical relaxation techniques that can be utilized by students in virtually any classroom setting to reduce stress. The author has used both of these methods prior to written tests and found that students with test anxiety reported better ability to concentrate and that they performed better on theirs tests by not making mistakes due to anxiety. These techniques are also the cornerstone for stress reduction if one is developing a course in physical relaxation techniques. The other relaxation techniques (mindfulness, mindfulness meditation, and yoga) require a quiet, comfortable setting and a great deal of time to master and perfect. These techniques need to be done daily and are best presented in a course to allow optimal time to perfect these skills so that they become effective tools in reducing stress.

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Biography

Kitty Consolo is currently an assistant professor in health sciences at Ohio University—Zanesville. She is considered an expert in the fields of health, fitness, and wellness and has developed many successful wellness programs for corporations and educational institutions such as Denison University and The College of Wooster. She is also a popular motivational speaker, national class runner, and writer. She currently writes a monthly runner's advice column. She was appointed by governors George Voinovich and Robert Taft to serve on Ohio's Physical Fitness and Sports Advisory Board. She has recently published a chapter in *The Runner's High* (Breakaway Books 2004). When she is not writing, teaching, or running, she takes time out to relax. She may be reached at drkittyconsolo@yahoo.com.

Native Americans And The Holocaust: Introducing New Literature Courses To A Regional Campus

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Bowling Green State University—Firelands, like most regional campuses in Ohio, serves a geographically defined student population. Although our service area seems to be growing both eastward and westward, we can fairly well count upon the locations from which students will come. We also have a general impression of the background that students bring with them regarding what they have been exposed to educationally and perhaps even culturally and socially. When introducing new literature courses to such a campus with this knowledge of our students, the work of creating the course itself and a climate for the course goes far beyond the selection of books to include marketing, media selection, cultural orientation, and historical context.

Native American Literature And Holocaust Literature

In recent years the college has offered two new literature courses: English 200, Native American Literature, and English 300, Holocaust Literature. In both cases the introduction of these courses has necessitated a wider introduction to these larger areas of study both in the classroom and the campus. A climate had to be created within which Native American literature and Holocaust literature could grow at BGSU—Firelands so that the meaning of the literature could be more fully appreciated. The first stage of this process is to develop greater interest in the subject so that a wide array of students might enroll in the courses. Additionally, the literature selected for the course had to be enhanced through the teaching of history and culture since they are related to the body of study. Multimedia texts and other resources broadened the students' awareness of the literature of a group or era as well as linking to current

concerns. Finally, a variety of genres served to further engage students in their literary study.

In order to generate interest in a new course, an instructor must make students familiar with the subject matter. While Native American studies are quite popular in the larger culture, specific academic literary studies might not have the same popular appeal. In order to encourage interest in a course that will go beyond the easy Hollywood access of Native culture and politics, the exotic powwow, and the meditative qualities of the flute, the instructor will have to make students aware of the literature that exists and the ways that the literature can deepen one's understanding. An effective way to encourage interest involves having other courses incorporate some Native American content.

Successful Tactics

The newness and uniqueness of the Native American literature course seemed to appeal to the students; during the first semester that it was offered, 33 students enrolled. The challenge then became to keep that interest level high so that subsequent semesters would also generate full classes. A number of tactics have proven helpful in ensuring the ongoing success of the Native American literature class.

For starters, it has helped to insert teasers into other courses. In the Literature of the American West class, one novel by an American Indian author is always included on the reading list. For example, in the fall semester of 2004, that class read *Black Elk Speaks,* which was also our school's chosen "All Campus Book" for that year, so there were ongoing programs related to the book itself. As a grand finale to the semester, the theater department presented the play *Black Elk Speaks,* which was a fitting way to end the All–Campus–Book project that semester. All of those activities provided additional opportunities for the students to learn more about the Native American experience, which successfully whetted the appetites for some to take a full semester of Native American literature.

In addition to the Western literature class, Native American information is incorporated into English 112: Varieties of Writing classes, where the students must write a synthesis paper in preparation for their longer research paper. In the spring of 2005, the English 112 students

were assigned a synthesis paper dealing with the topic of the Wounded Knee massacre. They learned about the incident through reading materials from three different sources and then writing a synthesis paper. This exercise revealed that nearly all of the students had no knowledge of the Wounded Knee Massacre, but most wanted to learn more about it. That was encouraging.

As the Western literature course functioned to draw students to the Native American literature course, English 300: Literature of Survival, provided a type of introduction to Holocaust studies on campus. Literature of survival was designed to bring attention to the traumas that the characters in literature experience, the coping strategies that they employ, and the model that these strategies can offer to a reader. For two of the semesters that this course was taught, one of the required texts included a Holocaust text, Miriam Winter's *Trains: A Memoir of a Hidden Childhood During and After World War II*. The introduction of this book into the survival literature course began to bridge the space between literary studies and Holocaust studies. Students were exposed to Winter's story in the context of a literature course and from that vantage point applied the Literature of Survival reading strategies that had been developing throughout the semester. Students began to think about and postulate what was unique to the survival of Holocaust traumas that might differ from other traumas studied during the semester (including traumas based upon gender and race–related violence, grief from loss of a loved one, socioeconomic struggle, and so forth). They brought a literary sensibility to bear upon a subject that had been predominantly historical for them, which in turn led to a core of students who wanted to further pursue such a study, and these students made up approximately half of the initial Holocaust literature course of 22 students.

Additionally, during the third week of the Holocaust course, 15 students from the course participated in a class trip during their spring break. This trip included visits to Ellis Island and then a tour of the United States Holocaust Memorial Museum. The Ellis Island component paralleled immigration stories that the students had studied. The trip itself enriched the readings of the course greatly. In addition, talk of the class trip throughout the campus prompted an interest in English 300: Holocaust Literature in the event that a similar trip would be offered.

Indeed, such a trip was offered, and a few students reported that the trip was their primary reason for taking the course.

History And Culture

Once the marketing has been successful, and the classes have filled, these specialized courses must include historical and cultural instruction. In the study of literature, it is very important to incorporate both the history and the important aspects of the culture, for without that knowledge the students will never come to a better understanding of the literature. Therefore, in the Native American course, the semester starts with an introduction to the culture. It is important for the students to understand that there are hundreds of American Indian tribes, and there are differences between those tribes, but there are, nonetheless, some cultural aspects that are general to all Native Americans. One of those key concepts is the oral tradition and the importance of storytelling. A DVD entitled *Tales of Wonder* has a Cherokee storyteller sharing some of the traditional legends of his people with a group of young children. This film vividly portrays the cultural tradition of storytelling for the Cherokee. Students are also directed to a number of Websites that contain myths and legends from various Native American tribes. And, for a textbook, *The Lakota Way* by Joseph Marshall, III, provides a source for the students' initial foray into the world of the Native American because it presents lessons on wisdom, ethics, and character as those qualities pertain to Lakota Indian culture. It presents the lessons in a most engaging manner, and students have been high in their praise of this book as an introduction to the Lakota worldview.

The historical background of the American Indian is equally important. Students are introduced to a number of historical incidents of major importance to the American Indian which are often mentioned in their poetry, novels, and short stories. Specifically, such historical incidents and issues include The Trail of Tears, the various broken treaties, the effects of the decimation of the buffalo herds, the various battles (Sand Creek Massacre, Battle of the Little Bighorn, Wounded Knee Massacre), the Indian Boarding Schools, and the Navajo Long Walk, to name just a few. Since these historical incidents are such important components for the students, one of their writing assignments includes

research on a specific historical incident involving the American Indian. They choose a topic from a list which is supplied to them.

Students in the Holocaust literature course experienced similar benefits from an emphasis on teaching history and culture. For many students, their exposure to Holocaust studies is limited to *Schindler's List*, *The Pianist,* and *Life is Beautiful*. The first two weeks of the semester were spent developing students' awareness of history. Film is especially useful toward this end since students are able to learn the chronology of events and also view images of the growth of the Third Reich. Students understandably have difficulty making sense of how Hitler came to power and was able to wield power as he did. They often question, as well, why the general populace and Jewish communities in particular didn't fight back. We are better able to grapple with these questions when we can see the devastation left by World War I, the propaganda created by the Third Reich, and the already existing depths of anti–Semitism. *Witness to the Holocaust*, a film, offers a detailed history of the years preceding the war. *Social Studies School Services* catalog is an outstanding resource for films dealing with history. In addition to providing visuals for the students, the course included a Ukrainian guest lecturer whose family is from the Ukraine and whose parents lived there in the 1930s. Listening to her talk about the devastation of the Russian instituted famine in the Ukraine, as well as the vulnerability of borders in the 1930s, provided a means for the students to begin to grapple with the ways that lives and communities were completely devastated and individual people were so quickly rendered powerless against these regimes. The next time that this course is offered, a presentation on the Jewish faith will be added. Most of the students in this region have no exposure to and little understanding of Judaism. Such background would help to contextualize some of the struggles that figure in the literature encountered and allow students to understand some of the decisions that they made.

Native American Literature

As for the study of Native American literature itself, it works best to use a mixture of fiction, nonfiction, poetry, essays, and reports for the assigned readings. Since most students have little to no knowledge of

Native American authors and their importance to the literary canon, it is necessary to introduce them to some of the major figures in American Indian literature, those authors who are responsible for the "Native American Renaissance" in literature. Accordingly, works by N. Scott Momaday (usually *The Way to Rainy Mountain* because it is so approachable and the students embrace it so enthusiastically), Leslie Marmon Silko's C*eremony,* and James Welch's *Winter in the Blood* should be included. Additional works that help to connect the history to the literature include "First Days at Carlisle" by Luther Standing Bear, "The Ghost Dance War" by Charles Alexander Eastman, "School Days of an Indian Girl" by Zitkala Ša, and "In 1864" by Luci Tapahonso. College students also seem to relate well to the stories of Sherman Alexie, especially those included in *The Lone Ranger and Tonto Fistfight in Heaven.*

Film adds another dimension to the study of American Indian culture, history, and literature. Early in the semester is a good time to show the documentary *More than Bows and Arrows*, which helps to form a basis for what the students will learn about American Indians in the weeks to come. Other films that have been useful include *Lakota Woman* (concerning the occupation of Wounded Knee in 1973), *Incident at Oglala,* (a documentary about the violent events that took place in 1975 on the Pine Ridge Reservation in South Dakota), and *The Lost Child* (based on the autobiography *Looking For Lost Bird* by Yvette Melanson). A nice finish to the semester is the film *Thunderheart,* a fictionalized account of the 1975 incident at Pine Ridge. By the end of the semester the students are able to appreciate the cultural references and allusions in the film that they would not have noticed prior to taking this course.

A final chapter of the course includes information on the current state of affairs for American Indian people. It is important for today's students to understand that American Indian people still exist and still encounter challenges and conflicts in their everyday lives. Various Websites are provided which keep the students advised of what is happening in the world of today's American Indian. I also bring in my personal knowledge of what is happening specifically in the state of South Dakota, based upon my thirty years of residence in that state and my existing connections and interest in news from that area. That

knowledge is instructive and eye–opening for the students, and it will serve them well as they continue their education and become well–rounded citizens of both this nation and the larger world community.

Holocaust Literature

Because the body of literature pertaining to the Holocaust is so vast, it was important to create a reading list that allows students to read each book in relation to the other books for the course. Two books that deal with the experiences of children in hiding during the war are helpful. Miriam Winter's *Trains: A Memoir of a Hidden Childhood During and After World War II* examines the life of a girl who was in hiding in a number of cities and small towns in Poland, while *Hiding to Survive: Stories of Jewish Children Rescued from the Holocaust*, by Maxine B. Rosenberg, offers stories of children in hiding across Europe. What these books share is a common set of struggles of identity, faith, hunger, and safety. The students were quick to make connections between the two books. All of the other books for the course have as their settings Poland, with the main focus on the struggle of Jewish people. Each book centered around survival in a concentration camp, the primary camp represented was Auschwitz. Being able to rely upon a set of common elements helped to root our discussion more deeply in specifics rather than broad generalizations.

In addition to the traditional texts which made up the assigned texts for the course, students were required to select outside texts. One of these requirements was to find a book for young readers (ages 5–17). The intent of this assignment was to challenge students to think about ways of representing and teaching about the Holocaust to all ages. The books were then shared among class members through student presentations which further exposed students to the body of Holocaust works available. Because the focus of the assigned readings was on the struggle of Jewish people, students studied additional topics relating to the Holocaust. Students were required to go to the United States Holocaust Memorial Museum Website as their source for this assignment. The museum Website (www.ushmm.org) is a remarkable scholarly resource. The museum created a site that is designed for teaching about this period, so the students were able to use the site as a

primary source. They were asked to explore an area about which they did not have much previous knowledge and to limit their studies to only this Website. In addition to a formal paper, students also presented their topic and what they learned from the site. Completing this assignment early in the semester familiarized the students with the history and culture of the literary texts. Throughout the rest of the semester the museum Website became an additional and important text for the course.

There are many similarities between these two courses and the manner in which they are delivered to the students. The importance of the history cannot be overlooked in either of these particular courses for it informs the literature in both cases. Bringing these two courses to campus has been a rewarding challenge—sometimes even an inspirational one. The reward comes from seeing the students discover new information and expand both their knowledge base and their critical thinking skills in ways they perhaps never thought possible. The inspiration comes from seeing how they react to this new information and how they process the historical and cultural aspects that are so important to developing a respect for and an understanding of not only the literature but also the people about whom and by whom that literature is written. Bringing all those pieces together in a semester course serves to help our students broaden their own worldviews as they prepare to leave our institution and move on to become responsible citizens of the world.

Biographies

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When The Tail Wags The Dog: The Strategic Use Of Distance Learning Technology To Provide Access To An Associate Degree

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Abstract

Distance learning technology has been widely used as a means of delivering individual courses to offsite locations. Success in providing access to course work in the Business Management and Related Technologies Associate Degree program to students at Kent State University and its surrounding communities hinged on the ability to carry classes with low enrollment during the initial phase while allowing awareness levels of the course offerings to build. The question became "Could distance learning technology be used as a strategic tool rather than as a primary means to offer courses leading to a degree?" This paper will present a model which depicts how this associate degree program at Kent State University—Trumbull, through the strategic use of distance learning technology, answered this question. The strengths and weaknesses associated with various types of distance learning technologies and their appropriate application will be presented from both the instructor's and student's viewpoints.

Challenges

Access to the Business Management and Related Technologies (BMRT) coursework in Portage County was facilitated by the BMRT program on the Kent State University—Trumbull (KSUT). As the courses were initiated, several challenges arose. The first obstacle was the number of resources available to staff the courses. Because a sufficient number of courses would need to be offered in a given semester to capture the attention and create student interest in the program, there was a

constraint on the limited available resources. Effective utilization of faculty was needed, but of equal importance was the quality of the resources. It was essential for us to use faculty familiar with the program in order to establish relationships with students in the courses and strengthen retention.

The next challenge was that of economics. Courses across all universities need sufficient levels of enrollment in order to be taught. However, during the introductory phases of the course offerings, it was recognized that time would be needed to increase awareness levels and to build a cohort of students in the courses. Canceling classes in this early stage would hinder the success of any future class offerings. Therefore, it was imperative to find a way to offer classes without significant economic loss.

Distance Learning As A Solution

To overcome these challenges, we considered the use of distance learning (DL) technologies. Could DL be used effectively to minimize constraints on existing resources in order to build enrollment? It is important to point out that the goal in using DL was not to supplant the traditional classroom but rather to use the technology as a tail to wag the dog of the traditional classroom.

Each technology was carefully considered on a course by course basis in order not to compromise the level of student learning for the sake of the technology. What follows is an assessment of each type of distance learning technology tool available at KSUT as a viable channel of distribution for coursework. Each medium was evaluated for its ability to accomplish the set objectives of effectively providing access to courses and building enrollment.

Asynchronous Learning

The DL technologies available to deliver coursework fell into two categories of learning environments, asynchronous and synchronous. Asynchronous learning environments involve communication among participants over elapsed time rather than real time. This type is most commonly associated with Web–based courses.

The benefits to using this technology to accomplish one of our objectives, that of providing access, are considerable. Web–based courses offer flexibility in scheduling and location. Students are not required to be at a particular location at a designated time, thus allowing greater access to the courses. This convenience can be well suited to our efforts to deliver the course from a regional campus. Individuals reluctant to travel to the larger parent campus could still have access to the course, needing only a computer and Internet service to participate.

While this technology would accomplish our objective of access, it was not considered initially as we felt other technologies would better accomplish the objective of building enrollment. We believed that the lack of faculty–student interaction, particularly in the early stages of coursework, might not be advantageous to retention. Another drawback to its use was the enormous amount of time needed to prepare a course for initial delivery via the Web. Simply converting material used in the traditional classroom method for Web use can be ineffective and does not take full advantage of the medium (Bourne, et al.). While user–friendly course management tools such as VISTA are available to Kent faculty to convert courses to an on–line format, such tools do require familiarity and training by the instructor to be used effectively. As Sigle noted, it is not reasonable to expect faculty to be effective using any type of DL technology without the proper training and experience (93).

Synchronous Learning Environments

The second category of learning environments available was synchronous. Synchronous learning environments involve communication among participants in real time. Two DL tools in this category have been utilized. Polycom was the first synchronous DL tool to be utilized for delivery of BMRT courses from KSUT to the parent campus. It was chosen initially for its portability and its ability to bring the students in on the classroom discussion with minimal conversion of course materials. The flexibility to move the equipment from room to room based upon class size was essential to success in synchronizing course schedules between the two campuses. It also gave the students at the remote site some advantages. They could control the camera's zoom lens's functionality for a closer view of work being presented if necessary or change the camera angle.

This ability lessened the burden on the instructor from having to constantly check the student's view and made the class run smoother. Polycom also employs an open microphone, which means that communication between sites can occur without requiring participants to press and hold a button in order to be heard. This feature created a closer resemblance to the natural interaction found in the traditional classroom.

In using Polycom, we discovered that it was highly suited for courses in our program that are lecture–based or require considerable group interaction. The style of its meeting format accommodates discussion. However, when we attempted to use the technology for more quantitative courses, its disadvantages became apparent. One of the drawbacks was its lack of built–in presentation tools. This lack would prove a problem for students at the remote site when trying to view a large number of problems on the board or to attempting to view overheads.

To accommodate the style of course that involves considerable board work computations and problems, VTEL was used. VTEL is a room–based video conferencing system and is considered the traditional distance learning system. One of the major advantages of this system is the number of presentation tools available to the instructor. In addition to the lecture view and standard whiteboard, instructors have a control panel which allows them to change the students' view from the instructor, to the Elmo opaque projector, to the spreadsheet on the PC at the touch of a button ("What is Room–Based"). This format was chosen for a BMRT finance course over Polycom for that reason.

One of the drawbacks discovered was the use of the students' microphones at the instructor's site. When the instructor was "live," the students would often forget to utilize the microphone so that their counterparts at the remote site could hear them. This failure made the flow of interaction somewhat awkward, but the problem can be easily overcome with an initial class orientation and repeated reminders.

For some of the courses, a hybrid of both Polycom and VTEL was used. VTEL was utilized at the instructor site in order to make available all of the necessary presentation tools. Polycom was

employed at the remote site. This capability gave the remote site flexibility in room scheduling, thus allowing for more effective space utilization. For instance, a small conference room could now be used as classroom space for courses with small enrollments. The students benefited from this arrangement as a result of the closer interaction with their peers and they could interact easily with the camera. The collaboration that was taking place among the students as they worked out computational problems was apparent throughout the semester. They took on the role of coaching one another. The main difference from a one–to–one Polycom connection for the students was their inability to control the camera. Their view was controlled from the instructor's site.

Another technology that is available throughout the Kent State University system but which has not yet been utilized for the BMRT courses is LearnLinc. LearnLinc is a PC–based conferencing system that allows synchronous conferencing to be both video and audio or just audio ("What is PC–Based"). The accessibility aspect of LearnLinc makes it an attractive alternative to the other synchronous learning tools. Because it is PC–based, the students must have a computer available to them. While a computer can be provided on a campus in a classroom specifically designed to support the technology, it is not necessary. A course can just as easily be accessed from a home computer that has broadband Internet capability, a microphone, and a camera ("What is PC–Based").

LearnLinc closely emulates the interaction of the traditional classroom by allowing discussion between the instructor and students to take place in either a discussion mode or in a hand–raising mode. Similar to the traditional classroom, the degree of interaction is controlled by the instructor.

One of the drawbacks to any DL tool is limited visual interaction. LearnLinc addresses this limitation with a feature called "glimpse" which enables instructors to see the desktop of individual students and monitor the progress of their work ("What is PC–Based"). Students can also provide feedback to the instructor regarding the pace of the class (too fast, too slow). In terms of helping the BMRT program meet its objective of providing access to coursework, LearnLinc is an exciting technology to explore for future classes.

Student Perspectives

Fifteen students who had participated in BMRT courses using distance learning technology were surveyed. The groups were comprised of students who had taken courses using either the VTEL or Polycom technology or both. The majority of the students surveyed had taken more than one BMRT course with different instructors each time.

The objective of the survey was to garner the students' perceptions about the courses delivered in the distance learning format as compared to that of the traditional classroom. Three areas were addressed: level of course quality, level of difficulty, and course areas most affected by the use of the technology. The results of the survey reveal the following:

1) Sixty–one percent of respondents perceived that the technology had slightly reduced the level of quality of the course.

2) Thirty–eight percent of the respondents perceived that the course was more difficult in the DL format versus a traditional classroom format.

3) The majority of respondents cited spontaneous interaction with the instructor and communication with other classmates as the areas most adversely affected by use of DL technology.

4) The majority of the students indicated that they would take another course using DL technology if given the opportunity.

While the results of this survey were not normed against those of students taking other DL coursework at Kent State nor could they be generalized, it is interesting to note the consistency of the findings to those cited in another experiment conducted at two foreign universities. In this particular study, two areas of difficulty that were identified in the synchronous learning environment were the delay in communication channels and the inability to gauge student reaction in parallel to the lecture (Esteve et al.). Each of these areas greatly reduces the spontaneous interaction between the lecturer and the students. As in our survey, these communication barriers may have influenced the students' perception of the level of quality about the course.

The perception of lower quality could also be due to equipment failures which can be detrimental to the effectiveness of the course.

Our survey indicated that every student who responded had experienced technical difficulty at least once during the semester. Despite the faculty's being well prepared, equipment failures can cast a negative light on the entire lesson (Valentine).

Conclusion

As courses in the BMRT program continue to be offered at the parent campus, the experiences gained from the use of DL technology and the lessons learned will play an important role in determining how the technology will be further utilized. Based upon our experiences, we learned that DL technology can be used as a strategic tool to attract and retain students to the program. However, based upon the individual strengths and weaknesses of each DL tool, it also became evident that the technology could not be effectively applied to every course in the curriculum. Yet, given its many advantages, the evolution from using DL technology as a catalyst to using it as a collaborative medium in which to deliver high quality instruction is likely.

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Biography

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Chemistry Or Mathematics?

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Abstract

This study identifies the problem that generally exists among the students and/or nontraditional students who are taking chemistry for the first time and attempts to find the best approach to teach a "Prep for College Chemistry" course. For this study two sections of the same course were chosen. Section one employed a traditional teaching approach, and section two adopted an integrated approach by teaching mathematics using chemical problems as examples. No significant difference in test scores between the two groups of students was found. Both sections were able to answer chemistry questions given in mathematical language (mathematical context), while both sections had difficulty solving problems presented in chemical language.

Chemistry And/Or Mathematics?

Due to the complexity of chemistry, in order to be successful in chemistry, students must be competent in mathematics, be able to conceptualize in chemical language, and be good problem solvers. Evidence strongly indicates a correlation between the degree of success in chemistry courses and mathematics competency (1–4). There has been some success in solving mathematics–chemistry connectivity deficiency by integrating mathematics into chemistry or vice versa (5–11).

The chemistry department at Ohio University—Zanesville (OUZ) offers a course called "Prep for College Chemistry, CHM 115" for those students who never had high school chemistry, those with mathematical deficiency, and those who have been out of school for many years and are not prepared to take a college chemistry class. The maximum class

size is 15, and students are randomly assigned to each section. The emphasis of the course is to prepare these students for freshmen chemistry courses by introducing them to applied mathematics in chemistry as well as very basic chemical concepts. The purpose of this study is to identify the need of these students and to address their deficiencies in the best possible way rather than trying to just cover previously defined course objectives.

In the fall of 2004, two sections of CHM 115 were offered. One instructor followed the traditional teaching approach when a specific formula such as d = m/v for density is given to solve all related problems rather than allowing students to approach the problem as a mathematical ratio problem. The second instructor started the other section with an introduction to mathematical procedures of solving proportions.

Traditionally, students memorize a number of equations and then try to figure out which equation to use for a given problem by plugging in the numbers. Most problems in the first freshman chemistry course (such as unit conversion, density, mole/molecule or mass, and stiochiometry, etc.) can be solved by one simple ratio setup.

To reduce the mathematics anxiety, the second section instructor approached the chemistry course from a mathematical perspective. The instructor started the class by introducing students to basic proportions with chemical problems as examples even before they were introduced to these chemical topics. It was envisioned that by the time students were introduced to these chemical concepts they would be mathematically prepared and could concentrate on understanding the chemical concepts rather than the mathematical procedures.

Methodology

To teach proportion, the lecture started with solving simple proportion problems such as

$$\frac{23}{7} = \frac{5}{X}.$$

Next, students were introduced to applied examples involving currency conversion. Even though the students were able to answer such questions very easily, they where encouraged to A) analyze the problem and B)

use a strategy by which they needed to identify the following three items:

1. define the given data (known);
2. define the sought data (unknown), and
3. state the relationship between the given and sought.

To teach students how to devise a proportion to solve problems, the instructor used examples. Two such examples are given below.

Example 1. How many cents are there in 5.00 dollars? It is obvious that students can do the necessary calculation mentally, but the goal was to teach them how to read a problem critically, analyze and organize the data, and then try to solve the problem. Therefore, students were required to solve the problem by using only the following steps to find the answer:

A. define the given data (known), 5.00 dollars;
B. define the sought data (unknown), number of cents (X);
C. state the relationship between the given and sought; there are 100 cents in a dollar.

Students were then shown how to use this information in the following manner:

If 1.00 dollar is 100 cents,
5.00 dollars are X ?

Next reduce this matter to,

1.00 dollar 100 cents
5.00 dollars X cents

They were told to note that data with the same unit are on the same side and then asked to draw a line between the upper and lower numbers on each side and place an equal sign between them,

$$\frac{1.00\,\text{dollar}}{5.00\,\text{dollars}} = \frac{100\,\text{cents}}{X\ \text{cents}}.$$

Students then were told to cross multiply these numbers,
(1.00 dollar) × (X cents) = (5.00 dollars) × (100 cents)
and then to divide both sides by the number that is multiplied by "X" (X's coefficient), thus

$$\frac{1.00\,(\text{dollar}) \times X}{1.00\,(\text{dollar})} = \frac{100\,(\text{cents}) \times 5.00\,(\text{dollars})}{1.00\,(\text{dollar})}.$$

Similar units are cancelled out, with the final answer being X = 500 cents.

After students were comfortable with setting up proportions, they were given questions on unit conversion, density, moles, etc. before they were introduced to these topics from a chemical perspective.

Example 2. If 1.00 cm^3 of a metal weighs 1.07 grams, how many grams does 27.3 cm^3 of the metal weigh? Following the same steps as in Example 1, students were able to solve this problem. For students to learn how to translate words into mathematical equations but not to become overwhelmed by the chemical language, the word "density" is intentionally not used in the problem. So that they could concentrate on the concepts rather than the mathematics operation, students were not introduced to chemical concepts until they were comfortable with doing the mathematics.

Evaluation And Result

A quiz was given to both sections three weeks into the course. The quiz consisted of ten questions, including three questions involving chemical concepts not covered in either class. The questions were:

1. There are three atoms of oxygen in one molecule of nitric acid. How many oxygen atoms are there in 7 molecule of nitric acid?
2. There are 6.022×10^{23} molecules of water in one mole of water. How many molecules are there in 5 moles of water?
3. Two moles of oxygen gas are needed to react with one mole of methane gas. How many moles of oxygen gas are needed to react with 3 moles of methane?

During the final week of class, after students were introduced to the concepts of mole, molecule, etc., a second quiz was given that included those three questions in altered language.

1. How many atoms of oxygen are there in 7 molecules of HNO_3?
2. How many molecules are there in 5 moles of water?
3. How many moles of oxygen are needed to react with 3 moles of methane gas according to the following reaction?

$$CH_{4(g)} + 2O_{2(g)} \rightarrow CO_{2(g)} + H_2O_{(g)}$$

The results are tabulated in **Table 1**. In the first quiz, as the results indicated, the section two group performed slightly better than the section one group. The results of the second quiz indicated that both groups had difficulty with problems given in a chemical format. However, with 90 percent confidence level there are no significant differences between two groups in each test.

			Percentage of Students with Correct Answer				
Quiz.	No. of Students*	Section	Question #1	Question #2	Question #3	Mean ± Std	Student's t
1	15	One	85	92	92	89.7 ± 4.0	1.53
	10	Two	100	89	100	96.3 ± 6.4	
2	13	One	60	73	0	44. 3 ± 38.9	8.5×10^{-2}
	9	Two	30	70	40	46.7 ± 20.8	

Table 1. *Two students dropped the class, and one student missed the quiz due to sickness.

The results indicate that most students had sufficient mathematical background or they could acquire enough mathematical skills in one or two class lectures to handle an introductory chemistry class. However, both groups had problems throughout the course in understanding the chemical concepts of mole, molecule, atoms, chemical formula, or stiochiometry.

Conclusion

Although there are differences in instructors' teaching styles, teaching style is not the only factor that has some impact on students' learning. The results of this study indicate that mathematics, at this chemistry level, is not hindering students' performance in these chemistry courses. Rather, it is the understanding of chemical concepts. Therefore, more emphasis should be placed on developing and employing different strategies to improve students' comprehension of chemical language

and concepts. Also, students should be taught certain skills to enable them to become better problem solvers. The following strategies are recommended:

1. To encourage active learning, students should use molecular models to discover the relationship between mole, molecules, and atoms. These models provide a visual aid for the students to conceptualize different basic topics in chemistry.
2. To facilitate meaningful learning, students should write short reports on the role of different elements/chemicals in our biological environment. This strategy allows students to have a better understanding of chemical concepts by relating class materials to real life applications.
3. To foster a sense of ownership of learning, questions and answers formed by the students should be included as supplemental learning resources. This approach gives students an opportunity to be on the other side of the learning process, thinking like a teacher.

Although similar strategies have been used as general pedagogy in several chemistry courses at the Chemistry Department at Ohio University—Zanesville, they have not been used systematically for the specific purpose of improving students' comprehension of chemical concepts and language. Further study is needed to assess the effectiveness of employing all three strategies for a specific instructional purpose.

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Educating The Next Generation: Community, K–12 Schools, And A Regional Campus Working Toward A Common Goal

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Abstract

As the new Ohio Academic Content Standards were under development, a need was perceived to prepare teachers for the Earth and space science they would soon be required to teach their students. Many in–service teachers, especially in the lower grades, have not been exposed to this area of science. The University of Cincinnati—Clermont Geology, Geography, and Environmental Science Area developed a model to offer content background and materials to teachers. Under this model, in–school demonstrations, workshops, tutoring, and professional consultation services that are designed to meet the specific needs of individual schools are provided through volunteer efforts and donations. These are, therefore, free of cost to the schools and the college. Graduate credit field–laboratory experiences, workshops, and classes are provided through funding from a variety of sources and are offered for minimal fees to teachers. Activities and events such as an annual Earth Day Celebration held on campus are cooperatively sponsored and free to the community. This model of volunteer community and school service enriches education students, science students at all levels, teachers, parents, schools, and the college at a low cost to the benefit of all.

Introduction

Geology is an important component of integrated science as students study the world around us. The large scale and scope of geological events can best be understood through field studies. Most K–12 teachers studied

geology from textbooks or not at all, and they are now being asked to teach students earth science as part of the Ohio Academic Content Standards and in preparation for the Ohio Graduation Test (OGT). This requirement has created an even greater need to provide Ohio teachers and students with earth and space science content material, specimens, and especially field observation experience in order to optimize the teaching of earth science competencies. In order to address these needs and provide field experience, UC—Clermont has established partnerships with the Clermont County Educational Service Center (CCESC), OSI–Discovery, and *i*Discovery. UC—Clermont also acts as an Earth Science Resource Center for the community by participating in community events, by visiting K–12 classrooms, and planning events for student (K–12 through college), parent, and teacher participation. These programs allow for the interaction of the primary parties in the education process. The thrust of the UC—Clermont approach is to emphasize field inquiry experiences. Field trips utilize local resources to teach earth science competencies and standards. More distant trips immerse in–service teachers in the geology of an area. They become focused on inquiry and discovery of phenomena they may have not yet observed much less have yet come to understand.

Integrated Engagement Program

A suite of courses and associated activities has been developed in order to bolster the available learning opportunities. The objective is to engage participants at all levels of expertise to optimize energetic interaction. The following discussion includes an overview of ongoing projects. A comprehensive plan has evolved for every age student in the educational system as well as parents and teachers. It initially began when we developed the Calico College geology program for children grades 3–6. Held on weekends, it introduced the course Paleontology and Geology for Young Scientists. The youngsters were given the story of earth science and experienced the excitement of actually holding and handling ancient specimens of rocks, minerals, fossils, and bones. They were given samples and learned how to hunt for more on their own with parents and siblings. Young children seem particularly thrilled with this kind of introduction to earth science, and there have been many gratifying results. Several of

the young students from this program have pursued this subject through school and on to the college level (personal communication).

We have built upon this foundation to develop other programs designed to foster relationships between students, parents, and teachers of our defined community and the students and faculty of UC—Clermont. Many of the K–12 schools in Southwestern Ohio now participate in these programs which include science fairs, judging science fairs, field trips, presentation visits, and Earth Day.

One such student organization of student volunteers uses the student–inspired acronym "eggS!" (environment, geology, geography, Science!). In the past years, these student volunteers have assembled hundreds of rock kits and distributed them to K–12 science students throughout the area. They take part in the school visits, science demonstrations for community activities, and field trips in their efforts to disseminate information about their field.

Six years ago, the impending and additional science requirements for in–service teachers became a primary initial focal point to be addressed. We developed two field and laboratory geology courses in an attempt to assist the teachers. In addition to these field and laboratory experiences, we provide materials for use with students. The experience is directed toward discovery and practical hands–on work with students rather than just textbook information. Earth science content background information and inquiry methods for science for use in K–12 classrooms are best appreciated in this environment. The courses require two follow–up sessions during the school year. Recently, participants have been offered the opportunity to participate in two semesters of follow–up through *i*Discovery as an on–line means of continued communication and growth in the subject. The courses appear to have been beneficial to the participants. This opportunity for distance communication and follow–up for the summer work is provided through Enhancing Teacher Quality Grants and may be accessed on–line at the Web address www.*i*Discovery.org.

The first course is Geology: Using Local Resources to Teach Earth Science Standards. Field trips are taken each day to explore the geology of the sedimentary rock strata of the Cincinnati Arch along with the fossils, history of plate tectonic origins, meteorite impact structure, Pleistocene glaciation, erosion, faulting, etc. This is a six–graduate–

credit–hour field/laboratory experience for teachers and has been offered for the last six years through support from OSI–Discovery, Clermont County Educational Service Center, and UC—Clermont. Through the generosity of these grantors, the participating teachers have received this course and accompanying materials at a minimal cost.

A second field course, the Appalachian Geological Field Inquiry Experience, enables approximately twenty science teachers to immerse themselves in the rock record of the processes and materials that tell the story of the building of the eastern North American continent. The terms, diagrams, and concepts presented in texts come into clear and present focus as field inquiry reveals the true magnitude of scope and scale of orogenic events. Forces and stresses along plate tectonic boundaries that moved thousands of feet of rock over thousands of miles can be fully appreciated only through field inquiry. The dynamic character of the Earth through billions of years of its history can be seen and touched in the outcrops, mines, and quarries visited. The origin, nature, and occurrence of raw earth materials used to manufacture the products of our society (e.g., computer chips, toilets, sparkplugs, gemstones, electrical components, cleansers, etc.) become connected to geological processes and geological history. The participants also see and share what earth science professionals do to prospect, find, evaluate, extract, and process minerals and earth materials. The primary objectives and goals of the field inquiry experience are to present the teacher an opportunity to see, touch, and become enveloped by inquiry into the ancient three dimensional structures, formed over billions of years, that surround them. They will relate the earth features that are right before them to the maps and diagrams used in the classroom to represent these features in two dimensions. The field inquiry will address the needs of many teachers who now need to teach earth science to their students but have not had a strong content background in earth sciences themselves. It is anticipated that the teachers will gain a greater depth of appreciation and the geological foundation and enthusiasm to present geological education to their students conformable with the Ohio Academic Content Standards and, therefore, lead to improved student performance in earth science on the Ohio Graduation Test (OGT).

Partnerships

Workshops on various specific topics are held for groups of teachers on campus or at individual schools in some cases. The following example includes a site–specific series of workshops tailored to the requirements of a particular group of teachers. In one case a school was selected for support by faculty and students through cooperative efforts between local school administrators' and teachers' requests for support from UC—Clermont faculty and students. One such school project was undertaken this past year with an apparent positive outcome.

Initially, faculty worked with administrators and then with teachers. Morning preschool geology workshops were held for teachers during the autumn quarter. The teachers were asked what materials, demonstration resources, and/or content background information they would like to have. Their responses were direct and readily addressed. A positive working interrelationship was established quickly. During the winter and spring quarters, in–service teachers, UC—Clermont education students, science students, and faculty worked together tutoring small groups of sixth grade students after school in preparation for the Ohio 6th Grade Proficiency Test. Improvement was achieved over the previous year's scores. Science scores were up from 60% the previous year to 89% this year with passing scores on all five parts this year. In–service teachers served as mentors to UC—Clermont education students, allowing them to acquire valuable service hours and experience in the field. Education students had the opportunity to make a difference and to experience teaching. Activities included a science carnival in which all parties involved came together: teachers, students, parents, UC students, and faculty. There are plans to build upon this foundation in the coming year to further develop this relationship toward the long term goal of ever increasing understanding (by students and teachers) of the world around us. A grant was received this year that applies this model to language arts. Next year the school will apply for a grant to apply the model to math and science. UC—Clermont plans to continue assisting this local school with its progress in the application of this model to enhance learning for students.

Conclusion

The work and projects described herein are examples of dedicated peoples' efforts to help children and teachers and parents with real problems in a real world. There was no literature review; there was no research goal. There was a desire to accomplish a set of concrete objectives. Among these were: to nurture a love and curiosity for science in children and in any willing participant; to turn around failing 6th grade science proficiency test scores for one school; to assist as many in–service teachers as possible with content background material for teaching the earth and space science to meet the demands of the Ohio Academic Content Standards; to establish mutually beneficial relationships between UC—Clermont geology, geography, and environmental science and the community. The rewards include the following: young adults who return to tell of their science career and/or academic achievements; passing scores on tests; usage of our model for acquisition of grants and teaching strategies; continued reports from teachers in the field of things that they have been given that work for them; continued invitations from teachers and administrators and community leaders; continued funding for courses based on successful outcomes; continued support for programs and activities to continue this work.

This report is offered in the hope that anyone who sees a need for education that he or she is capable of fulfilling will simply take the initiative to address it. As citizens, we must all accept the duty and obligation to share responsibility for education. As professional educators, we must assume the responsibility to be generous with our time and service in this regard.

Biography

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Challenging Mostly White Classrooms To Actively Consider The Impact Of Race On Their Lives

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Whether we are aware of it or not, an invisible ideology may quietly affect our classrooms. It gains its power when not acknowledged and stays in force when not confronted. While many college teachers assume their classes are race neutral, the values and perceptions many would consider natural may be infected with this ideology, recently identified as "Whiteness." People of color, such as Zora Neale Hurston, James Baldwin, and bell hooks (nee Gloria Watkins), provide a rich tradition of Whiteness critique. Recently, social and educational movements such as Critical Race Theory and Whiteness Theory have begun to expose its methods and mechanisms more systematically and visibly.

Whiteness And Race

Whiteness and race, from this perspective, are not just matters of study for specific courses in social science. As shown below, most college faculty are White, and because the various disciplines have emerged in cultures dominated by Whiteness ideologies, teachers from every discipline must actively address Whiteness assumptions and how they affect perceptions and practices. Before this process can begin, teachers and students must first actively engage Whiteness assumptions. This essay offers some perspective on how teachers may actively enter into an active questioning of Whiteness ideology in the classroom and thus encourage a broader discussion about how Whiteness may affect our disciplinary and pedagogical assumptions. My primary goal is to review and interpret—in terms of Janet Helm's model of White Racial Identity—student responses I received while examining Whiteness in two different writing

classes. Secondarily, in this context I identify resources others may use and adapt to their own ends.

Helm's model offers a framework by which the teacher may interpret responses, and more importantly, the effectiveness of methods used to help students progress in their understanding of race and their own racialized identities. White students, in particular, are most often unaware how race has shaped their perspectives. If Whiteness is to be challenged and displaced, then our White students must become more conscious of Whiteness as a primary force in White identity formation. For this reason, this essay focuses on White reactions.

Race here is not something necessarily intrinsic or scientific about human beings but a social and cultural categorization so entrenched as to become ideological, and thus representing cultural interpretive frameworks for perception. Because teachers may be just as influenced by Whiteness ideology as students, the approach I suggest here utilizes Paulo Freire's concept of education as interactive, teachers as co–learners with students. In both Helm's and Freire's approaches, the goal is raising critical consciousness, providing education, as Freire notes, that "stimulates the critical faculties and is not content with a partial view of reality but always seeks out the ties which link one point with another and one problem with another" (209). Learners become "re–creators" of reality, not "spectators" (211). Similarly, Helms finds little hope for "non–racist" White identity until Whites take an un–Whitewashed critical view of racial reality and the hidden entitlements of Whiteness.

This research reflects my experience as a White teacher in mostly White classrooms; however, Whiteness examinations need not exclude persons of color. In fact, approaching Whiteness directly places the focus on race itself rather than on the persons of color in the classroom as often the unofficial and reluctant representatives of their races or ethnic groups. Persons of color in my classroom have expressed that it is a relief to be out of the spotlight and to really get to the underpinnings of racial misunderstandings.

Whiteness And Ideology

Whiteness, the ideological framework from which race is constructed, reflects the systematic power imbalances based in visible and invisible

assumptions about what it means to be White, the unearned privileges of being recognized as White. Since racial definitions and categories emerged in White Western cultures, it remains the defining force in racial identifications. Yet, Whiteness defines while remaining invisible—the norm, the non–color. For instance, ask almost anyone what an "all American girl or boy" looks like, and he or she will picture a White person. Whites are not often identified by race without some reason. Whites normally do not have to think about their race. In fact, most Whites are not aware they have a race, though persons of color are never unaware of race. Whiteness rhetoric, the words and phrases and arguments that sustain Whiteness, offer only a "negative definition of White—not being black, Hispanic, or the like" (Nakayama and Krizek 299). As many Whites admit and even lament, Whiteness offers no particular ethnic identity, and many assert that "character is the issue, not color" (Nakayama and Krizek, quoting a research respondent 301), while ignoring the racial imbalances that actively hinder such idealistic goals.

Whiteness, however, does not apply equally to all White people, and its ideology, of course, extends even into the self–perceptions of people of color. As Ann Louise Keating points out, not all persons classified as White automatically exhibit the traits associated with Whiteness. She quotes Marilyn Frye as suggesting that "the connection between Whiteliness [characteristics of Whiteness] and light colored skin is a *contingent* connection: this character could be manifested by persons who are *not* White; it can be present in persons who are" (Keating 907). Nevertheless, examining Whiteness challenges White student identities to varying degrees.

Statistics

According to "U.S. Higher Education in Transition," "colleges and universities must ensure that their curriculums provide opportunities for students to learn how to function effectively in an increasingly diverse, multi–cultural global environment" (Morrison 1). Providing such opportunities may be complicated by invisible and unexamined Whiteness assumptions that posit diversity as something other people have since college campuses remain predominantly White. For instance,

in the year 2000, students in two–year and four–year colleges and universities self–identified as 68% White non–Hispanic, 11% Black non–Hispanic, 10% Hispanic, 6% Asians and Pacific Islanders, 1% American Indians and Alaskan Natives, and 3% Nonresident Aliens. Whites still clearly are the majority, though things are changing; White enrollment in 1980 was 81% (*Education Statistics Quarterly)*.

Moreover, college faculties remain disproportionately White. In 1999, 50% of college faculty were White males, and 35% White females (*National Council for Education Statistics).* Obviously, Whites still largely remain in control, and if Whiteness theory is correct, many Whiteness assumptions may affect teacher and student perceptions even among well–meaning non–racist environments.

Such statistics mirror the top levels of American society. As Derald Wing Sue notes, "[w]hite men comprise only 33% of the U.S. population, they occupy approximately 80% of tenured positions in higher education and 92% of Forbes 400 executive/CEO–level positions . . . 80% of the House of Representatives, 84% of the U.S. Senate, 99% of athletic team owners, and 100% of U.S. presidents" (763).

Imbalances also continue in social contexts. In 2003, Supreme Court Justice Ruth Bader Ginsberg observed that "[u]nemployment, poverty, and access to healthcare vary disproportionately by race," and "[n]eighborhoods and schools remain racially divided" (539 U.S. *Gratz vs. Bollinger*, Ginsburg J. Dissenting 2). Such statistics, as Christy Friend points out, do not express inequities in "nonmaterial concepts like rights, decision–making, power, and opportunity" (550).

Because of the naturalness of world order that places Whites in privileged positions, Whites often perceive racial issues as passé or irrelevant. Whites mature and form their identities within such a context, and many assumptions invisibly affect their perceptions. Race theorist Janet Helms offers a way to understand this White racial identity development.

She first delineates what she terms "Racist Identity Phases" as follows, each with its own defense mechanism that sustains it:

> 1) *Contact*: the person is "not consciously White and assumes other people are 'raceless' too" (24). Defense mechanism: *Denial*—"as long as one can pretend that race does not matter" (30).

2) *Disintegration*: conscious acknowledgment of being White, and that benefits accrue from being White. Defense mechanism: *Blame the victim:* "If they do not have anything, then they did not earn anything" (30).
3) *Reintegration*: "Denigrates, appropriates, and ignores the contributions to the society of groups other than Whites." Defense mechanism: "*blaming people of color for one's condition rather than Whites*" (31).

Classroom Tactics

To illustrate how these first three stages emerge in the classroom, I first offer some reactions obtained in a junior–level business writing class, followed by results obtained from a much more Whiteness–intensive course in argumentative prose. Examining Whiteness in the classroom, I have discovered, takes some time and interaction. When I introduced the subject in a business writing class, I first realized how incredibly entrenched Whiteness ideology is and began to devise the second course, which involved four weeks of active reading and discussion concerning race and Whiteness. In any case, Whiteness will not be displaced by a few short discussions but by a steady unified perspective and engaged interactions over a longer period of time.

In the business writing class, we briefly discussed the origins of racial categorization, the realities of racial imbalances, and some of the assumptions of Whiteness. (See Gregory Jay's Whiteness site for resources on these topics.) In spite of these discussions, White students showed little openness to such issues as affirmative action, and most were actively hostile to it—for reasons based more in Whiteness perspectives than logic or reason. Many responses clearly reflect Helm's first three categories. For instance, one student responded,

> I am a White female. However, I identify myself as an Italian–American b/c my family has continued many of the Italian traditions. But on the public surveys ACTs etc. I have to identify myself as White b/c there is not option for Italian–Amer. I am afraid to check "other." *The one thing that makes me identify myself as Italian is that everyone else has some kind of special privileges, scholarships, etc., for being a minority.* I feel

> like I have to work twice as hard to get scholarships. In many ways I feel like I experience reverse racism.

This response seems to compress all three of Helm's categories. By wishing for an alternative ethnic identity, she implies that what might be a raceless society has become a raced one and blames people of color for the problem. She seems to long for the world of the level playing field, a common Whiteness assumption that ignores the fact that the US is not actually a racially level playing field. She blames the victim (i.e., everyone else) for racial problems and even claims that now Whites have to "work twice as hard" to get anywhere. Nowhere is there any evidence of White privilege and how Whites might be involved in the problem.

Another student more clearly expresses the ideal of the level playing field:

> I hate affirmative action. Let the best man or woman get the job. If a black guy is better/smarter than me, good, give him the job. I have many non–White friends and it amuses me that they find their life a "struggle." *You know what, my dad came from nowhere to play football at Notre Dame. His family didn't have any money. He worked his ass off to get where he is. Maybe if black people tried that instead of bitching we wouldn't have this problem.*

These students would not, I do not believe, consider themselves at all racist, but their comments reveal that they feel that race problems originate with the other; they blithely equate White experience with that of people of color and avoid all admission of White privilege that affirmative action attempts to address. While their views are important, and I appreciate their honesty, they reflect Whiteness perspectives that keep real discussions about race from even occurring. Clearly, telling other people to quit "bitching" is not a solution. Race relations can only continue to sour when such victim blaming predominates.

Unhappy with these results, I created a much more Whiteness/race intensive segment for a writing course in argumentative prose. The class was composed of nineteen students (one African–American, one mixed heritage, the rest identified as White), mostly juniors and seniors. Our readings included Peggy McIntosh's "Unpacking the Invisible Knapsack," Gregory Jay's "Who Invented White People?" ("Whiteness Studies"

Website), *Race Traitor* (on–line journal), and/or other suggested or self–chosen Web articles.

To encourage critical thinking, I used three approaches to the readings. One, composition theorist Peter Elbow in "Believing and Doubting" game asks the reader to first list everything she or he finds believable about a text and then list what is doubtful. This approach ensures that students do not react before they have considered the relative strengths and weaknesses of a piece of writing. They were also assigned logical analyses, based in philosopher Stephen Toulmin's model of informal logic. They identified not only the claims and supporting data in readings but also the assumptions, the warrants, that drive it. Such distancing helps students to get a sense of how an argument works and what kind of reader it creates or anticipates.

We also used a method based on Richard Lanham's serious and rhetorical modes of thought in his *Motives of Eloquence*. To make it accessible, I call the approach "say" and "do," looking first at the message (what it "says") and then what it "does" (i.e., the rhetoric—the words and the structure of the argumentative approach, how each section advances the argument). All three methods promote critical reading, and after we practiced each, students would use the approach that made the most sense to them and that was the most productive in terms of interpretation, sometimes combining all three.

The four–week segment focused on reactions to the readings, culminating in a writing assignment focused on a reading of a racial boundary, a zone of discomfort. I was interested in where Whiteness identity and assumptions begin to visibly emerge, where the defense mechanisms spring into action, and helping students see possibilities beyond them. While some students wrote fairly traditional responses about the need for diversity and racial understanding, reflecting White reticence to really go to the edge, the responses I select here reveal the possibilities in the approach I suggest.

To interpret the following responses, we need the next two levels of Helm's model, part of what she calls Non–Racist Identity Phases. Most of these promising responses reflect some movement from Helm's fourth phase (well–meaning liberal) to her fifth, a person facing the truth about race and how it affects our perceptions of ourselves and others, one who begins to seek solutions and an alternate identity:

> *Pseudo–Independent*: "Let's help them become more like Whites." White liberal views assume that people of color need to be helped to become the equal of the Whites." Defense Mechanism: "*intellectualism and denial*" (32).

My target perspective, the one I hoped the class would encourage, was Helm's fifth phase—active awareness of and interrogation of Whiteness, a seeking of White perspectives and identities that resist Whiteness and racism.

A key aspect of confronting Whiteness ideology in the classroom is also facing my own relation to Whiteness. I am a White male teaching in a mostly White campus in Northern Ohio. My own investigation of Whiteness exposed many of my White liberal beliefs as stemming from only the first of Helm's phases, so my own search as a co–learner with my students meant I was also hoping to move more into Helm's final phases. Since part of this process is to find other Whites who also hope to grow beyond racism, the class may become a catalyst for such movement:

> *Immersion/Emersion*: "I'm White." This person makes an effort to understand an "unsanitized version of White history in the United States. It involves an active exploration of racism, White culture, and assimilation and acculturation of White people." The person assumes personal responsibility for racism and develops a realistic awareness of the assets and deficits of being White. "Primary self protective strategy": "*Sensitization*"—the person actively seeks out other Whites that will help her or him understand the meaning of being White, and thereby grow beyond racism." (33)

Responses took various forms. Dena, reacting to a White racist site, used Whiteness to consider various ways being White affects our perceptions. A key to this process is her growing awareness of how her more liberal views may be seen by Whites who interpret race quite differently. She wrote:

> For me, racism has always been something distant from my way of thinking or my way of life. It was not until I started exploring the various groups and Websites posted on the Internet that I began to understand racism's role in today's society. . . . My world never seemed affected by racism, after

> all I never personally experienced it; however, what I recently discovered was there are people standing all around the outskirts of my world judging me for the decisions I make or the way of life I choose to live.

Dena's response shows broadening awareness of the depth and scope of Whiteness. Just because she has been brought up in a relatively non–racist manner, that doesn't mean the problem is solved. Her response also exposes one of the elements that keeps Whiteness in power; she remarks, "after all I never personally experienced [racism]." The truth of that statement, in this context, works two ways. She, a White, never directly experiences racism (as she notes), but at the same time, she, as White, benefits from a racially imbalanced society that leaves her unaware of how she does indeed experience racism when she receives invisible benefits.

Two other students, more directly confronting Whiteness, more actively engage this problem. They both responded to Websites designed to raise White awareness of Whiteness and White racism.

Desiree realizes that the first step is an honest examination of her own Whiteness and White identity:

> I face an inner conflict that wants to help destroy racism but I do not want to destroy myself. I am part of the White race, though I do not always identify myself with it (I usually identify myself as Italian and German), and by destroying Whiteness, I am destroying a part of myself. I am White and there is nothing I can do about it. However, I also realize that I think like a White person. Any comparison that I make is based on my experiences as a White female. So, by saying that I cannot abolish Whiteness, I am thinking with the Whiteness mentality.

Interestingly, Desiree was in the business writing class noted above, and when she read the quotation from the student who felt like she experienced reverse racism, she wasn't sure that wasn't her remark. If that is the case (I collected the remarks anonymously), then she has shown remarkable growth in perspective. Even if not her words, the fact that she thought they could be means indeed she has grown in perspective, reflecting Helm's fifth stage, honestly confronting Whiteness and her own White identity.

Another student, Crystal, actively examines Whiteness theory:

> The study of Whiteness has become a crucial part of understanding racism. It is necessary to look at the feelings and perceptions of both sides, though, in order to determine what the best way to solve a conflict is. . . . There is so much focus on the past with little mention of what the proposed future would be like. If there is no more race called White, what will there be? Millions more ethnic titles that, as we have seen, serve to divide people based on differences rather than similarity. (6)

Crystal not only wants to escape Whiteness, she is searching for a clear alternative, a way out, the kind of thinking key to Helm's fifth stage.

In another passage, Desiree continues to look for solutions, ways of coming to terms with being White and possibilities for a less racist identity:

> I question whether I am supposed to assist in the abolishment of Whiteness, the abolishment of my own sense of self? Or should I preserve what my dominant White culture encourages—maintain the privileges of Whiteness? Both are extremes and neither seems to be the answer. . . . For me the middle ground concerns taking affirmative action and standing up for what I believe without being a traitor to myself. My place in the battle against racism does not involve abolishing the White race. It involves understanding differences between the ethnicities and ideologies which govern society. (8)

Desiree's comments perfectly illustrate why the focus in this essay is on White identity development. Whiteness is not just a perspective, but a way of perceiving oneself, and questioning Whiteness can threaten cherished notions of who one is.

All three responses actively represent movement into Helm's fifth phase. Each student becomes aware of what it means to be White. At the same time, each expresses a desire to resist the pattern of privilege and oppression common to Whiteness. They neither blame the victim nor express the often useless guilt often associated with simply focusing on racial inequities. They express a level of personal responsibility not found in the first responses. Each seeks an identity not based in Whiteness, one that actively resists racism.

As part of my presentation at the AURCO conference this year, I asked these three students to present with me, reading their own words in the

presentation. After the conference, I had them e–mail summaries or their experiences in examining Whiteness. Dena, listed first above, writes:

> When I began to explore the various Websites that encouraged extreme racism to the point of socialism, I was amazed at the author's ability to clearly state their argument and provide, though often unbelievable and completely heinous, support for their claims. As a White woman I never thought that I would be judged by other White people as being what these extremist[s] refer to as "race traitors." In fact, I had this distorted perception of racism—somehow it was beyond me or beneath me. . . . What I discovered was something totally new and frightening. Being White doesn't "protect" me from the discriminations brought on by my own race. Being White does not exclude me from race–based issues or arguments. In fact, attempting to understand Whiteness studies enables me to recognize the many levels of racism and the impact of race within one specific ethnicity of people. Make sense? I guess I was never conscious of my Whiteness, never fully in touch with the fact that there are people who share my racial identity, yet view me as different—a different degree of White. . . .

The key here is her remark that "I guess I was never conscious of my Whiteness" and finds context in the broad implications that wisely blur boundaries between White racists and other Whites. Whites do not have to be visibly racist to benefit from racism.

In her response, Crystal writes:

> The class was very helpful to me, because although our generation has been taught about the civil war and slavery in a perfunctory sort of way, we were never really allowed to discuss the aftereffects. To be able to identify myself as a racial being and try to sort out what that even means in a mature and objective setting was definitely a breath of fresh air.

The key here is Crystal's impulse, contrary to Whiteness, "to identify [her]self as a racial being."

Desiree writes:

> The Whiteness approach that we used helped me to have an awareness of who I am and what I come from. I always thought of myself as someone who was not ignorant to the lives of other people. I always thought I could easily place myself in other

> people's shoes. But this approach taught me a whole new way to do that. Instead of trying to understand what it was like to be someone who was not White (for example, an African American), I understood what it is like to be a White person trying to understand them and how ignorant I really was. I can never fully grasp what it is like to be a nonWhite, but I can attempt to understand their positions in life. One thing I learned that never fully occurred to me until this class is that it's not about ignoring someone's color and treating them like a White person. It's about embracing differences, seeing someone's color and not treating them any different b/c of it.

Desiree's remark that "I understood what it is like to be a White person trying to understand them and how ignorant I really was" reflects the kind of understanding I was looking for when I began this project. All three students show a remarkable consciousness of their own racial assumptions. Each seems poised to move into Helm's final phase in which Whites make every effort to become color conscious rather than color blind in a way that denies reality and disguises a deep–seated ideology of Whiteness:

> *Autonomy*: "I see color and I like it." Realistic self appraisal forces the White person to confront the loneliness and isolation of being a consciously positively White person in a White society that denies and distorts the significance of race and the societies of peoples of color who have reason to be suspicious of consciously White people. . . . The person begins to actively confront racism, as well as analogous forms of oppression in her or his own environment. Moreover, he or she seeks within race and cross–racial experiences that permit the person to develop an humanitarian or equalitarian attitude toward people regardless of race. Primary self protective strategies: "confrontation and inclusion." (33)

These responses reflect identity movement, and in some ways they raise more questions than answers, but time spent investigating Whiteness cannot help but increase race awareness and create a space for new interactions based in honesty and real social situations. We have to talk about it, and not just about the past but about the present situation, about Whiteness and how it developed and stays in power, and how we address and solve these problems.

Based on these findings, interrogating Whiteness ideology in the writing or other classroom includes

1) historicizing race as a social construction;
2) exposing the strategies of Whiteness;
3) encouraging the dissolution of racial binaries and boundaries, opening a space for positive, less racist, White identities to develop.

Conclusion

As for what I learned, I must say that now I no longer whisper about race, as I noticed most Whites do. I now have a language and a model for interpreting Whiteness and feel much more comfortable talking about race with Whites and people of color. We need to stop whispering and expose Whiteness misperceptions for what they are, hindrances to true racial understanding.

That being said, the task is to discover how Whiteness may influence our teaching and disciplines. For instance, in my field, assumptions about authors as neutral and objective in terms of arguments and essays needs to be reexamined, as do assumptions about standard English. Even ideas about what constitutes knowledge and reason need to be examined in multicultural contexts. Further, the field of English and writing is still dominated by White teachers. We need to ask serious questions about perspectives and realities that might discourage people of color from entering the field. Clearly, examining Whiteness in the classroom must move into ever widening perspectives.

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Biographies

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Dena Bartko, Crystal Berns, and Desiree Hoffman all graduated from Kent State University—Stark in 2005. Desiree tied for first place for the AURCO award for best student writing in Arts and Humanities in 2004, and won in 2005.

Folknography: The Foundation And Rationale

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Abstract

In this article, the author presents a theoretical, philosophical, and pragmatic basis for the qualitative research method called *folknography*. Between the more narrowly focused method known as rapid rural appraisal and the broader, more difficult to define method called ethnography, this article presents folknography as the method that fills a necessary niche in the area of qualitative research. The author highlights the measured academic impact of engaging students in this research method.

Introduction

The purpose of this article is to introduce and provide the basic foundation and rationale for the qualitative research approach known as folknography. This field research approach has similarities to others found in the list of qualitative methods. The importance and performance of this unique research method and its foundations and rationale will be detailed. Additionally, the impact of using folknography as a teaching tool in an undergraduate course will be presented.

Introducing Folknography

Folknography, as a research method, evolved through a series of recent field experiences which blend elements of rapid rural appraisal, ethnography, and concepts of phenomenology. Folknography also employs the use of the narrative paradigm theory (Fisher, 1995) along with the use of technology. The method can be implemented in metro, urban, or rural qualitative research projects, allowing collaborative and multidisciplinary participation. The method has proven very useful in

engineering educational opportunities for students for writing, journaling, observing, and collaboration.

Folknography operates as a modified version of rapid rural appraisal and ethnography. Folknography is designed to assist researchers who are interested in gaining a better understanding of the subjective perspective of a particular folk selected for investigation. A literal interpretation of the term folknography suggests that *folk* refers to people of a specified kind (www.folknography.org), while *graphy* is a direct reference to the use of graphic recording methods during research. Folknographers gather raw data for the purpose of gaining an empathic understanding of the social reality experienced by a particular folk.

The Roots Of Folknography

The old adage "necessity breeds invention" best explains the development of this method. Though other qualitative methods offered many attractive elements, no one method seemed to fit the need of searching out the perceptions of the folk. In early research projects, the author engaged in ethnographic studies but found the method lacked sufficient specific delineations. The author then migrated to rapid rural appraisal but found this method restrictive to agricultural applications. No method seemed to fit the need when studying a particular social group, hence the development of folknography.

Each method and theory contributed elements essential to the necessary roots of the method called folknography. The main focus of this method is to give voice to the folk resulting from mixing elements of various methods along with the addition of other, important components.

Reviewing The Roots

Rapid Rural Appraisal. First, folknography shares several elements found in rapid appraisal, also sometimes called rapid rural appraisal, rapid reconnaissance, or participatory rapid appraisal (Sweetser, 1995). Through this method, often designated by initials such as RRA, the researcher moves into an area and asks several questions of a rural population or ethnic group. Rapid appraisal research method assumes

that local, rural people have valuable knowledge regarding situations that affect their lives. The method also allows the locals to identify solutions to certain problems. This method provides for efficient and rapid identification of problems, issues, and situations affecting the lives of the rural peoples and communities (Sweetser, 1995; Beebe, 1995; Gibbs, 1985; Patton, 2002). Proponents suggest that rapid rural appraisal provides a much more thorough, comprehensive, insightful framework by which analysis can be achieved (Dunn, 1994; Chambers, 1992; Chambers, 1991).

Rapid appraisal is a process during which the researchers begin with information collected in advance, for example, through literature review or other research projects, and then progressively expand their knowledge and deepen their understanding by gathering new information through semi–structured interviews and direct observations and sharing their interpretations of this new information as it is collected (Chambers, Sweetser, Beebe, 1995).

James Beebe (1995), an experienced USAID field research agent, maintains that the rapid appraisal research method rests on three basic principles:

1. Engages a systems perspective. The elements of the system cannot necessarily be identified in advance, nor can decisions be made in advance as to which of the elements of the system are most important for understanding a given situation. Understanding is gained only when the researcher listens carefully to what interviewees mention.
2. Employs triangulation. This term refers to the systematic combination of observations made by various research team members coming from different backgrounds or disciplines. Rapid appraisal practitioners must triangulate methods of data collection, sources of information, and researchers' observations.
3. Interactive data collection and analysis. Researchers spend time in interaction, discussions, meetings, and contemplation. Sometimes not only the appraisal team but also the client/ partners are included.

For rapid rural to be scientifically effective, Christopher Gibbs (1985), an evaluation officer for the World Bank, maintains that the researcher

must take four actions in order to preserve the integrity and validity of rapid–rural studies. These include:

1. Investigators should have a sound conceptual framework for the investigation before the start of the project.
2. A variety of data collections should be employed.
3. Information gained through one rapid appraisal exercise should be crosschecked with another (triangulation).
4. Investigators must maintain high standards of self–criticism (Gibbs, 1985).

In rapid rural, the time for research is compressed, but, generally the questions are simple and straightforward. Time is allocated in order to ensure team members interact in an iterative learning process (Sweetser, 1995). For example, a few years ago, Ohio University—Southern received a request from colleagues in Mexico who suggested a study be made in a small village outside of a major metropolitan area. This village, General Cepeda, seemed to be suffering from high unemployment, exaggerated alcohol abuse in the adult population, higher mental depression rate in the adult population, and a lack of community action or involvement in social issues. The nonprofit client had some research monies to invest but lacked the expertise in the qualitative side of research techniques in order to mount a proper social science study. In a collaborative effort, Ohio University linked with the Institute of Technology of Monterrey (ITESM), Saltillo Campus, to organize and perform a successful study in the small village (Jarrett and Lucas, 2003). These problems surfaced, however, in an urban setting. Rapid appraisal was designed especially for land law and rural development (Dunn, 2004; Beebe, 1995; Chambers, 1994; Sweetser, 1995).

In order to further demonstrate that RRA functions as a more narrow research methodology and better suits rural, land development work, Ann Sweetser (1995), a longtime advocate of participatory research projects, maintains that

> Rapid Appraisal is a form of qualitative research derived from participant observation methodology of sociocultural anthropology. It is used for preliminary design and evaluation of applied activities. RA is fast and flexible but rigorous. It is grounded in recognition that all dimensions of a local system

> (be it an irrigation system or a political system) cannot be identified in advance, and that attempts to do so reflect primarily the outsider's culture. Instead, a team of individuals with contrasting expertise can develop an understanding of a system by synthesizing information from several sources: prior research and reports, direct observation, and semi–structured interviews. The goals are to grasp an insider's perspective on the system and to understand it as a whole, rather than to come up with a statistical description of its constituent units. This methodology has also been labeled as Participatory Rural Appraisal and/or Rapid Rural Appraisal. (Sweetser, Thomas–Slayter, 1994)

The question remains, however, what if the research questions are broader and uniquely fitted for a more general population instead of community leaders, land development customers, or rural, key leader informants? What if the research target area includes community neighborhoods or urban areas? The list of shortcomings of RRA for cultural research includes:

1. The method specifically fits rural agricultural projects.
2. Population targets are difficult to identify.
3. The name of the method restricts its use.
4. RRA is a method for systems analysis.
5. Proponents claim rigor but techniques remain difficult to identify.

The needs of many cultural research situations demanded a more versatile, flexible research method. RRA fell short of the desired results, proved too restrictive, and caused concerns in the data analysis.

Ethnography. On the other side of the method called folknography stands ethnography. Defined in the early 1900s, ethnography crossed the disciplinary lines of academe and is now recognized as a legitimate method of research in many disciplines. Writers such as Agar, Atkinson, Bernard, Denzin, Geertz, and a host of others have defined, refined, and described ethnography. Sometimes characterized as *hut sitters*, ethnographers move among their subjects and write thick descriptions about the people they study. Wolcott (1999) describes the practice of ethnography as "experiencing, enquiring, and examining." According to Alexander Massey (1998), ethnography includes seven essential

elements:

1. An elongated study of a culture. The very term, ethnography, denotes a study of an ethnic group. Often this research methodology requires a long–term commitment to the research process involving months or even years.

2. Multiple collection methods and diverse forms of data. According to most ethnographers, in order to reach even a rudimentary understanding of the culture, ethnographers must maintain their openness to looking into the culture in many different ways. Different situations must be sampled many times, including the parameters of people, place, and time in order to establish what and who counts as being a part of a culture (Fetterman, 1998).

3. Long–term Engagement. According to Denscombe (1995), the ethnographer believes that "observation of culture in situ" is the best way to get to know the culture intimately. Woods (1994), another ethnographic scientist, contends that "long term engagement in the situation as things actually happened and observing things first hand" is the way in which ethnographic work should be done. Spindler and Spindler (1992) write, "The requirement for direct, prolonged, on–the–spot observation cannot be avoided or reduced. It is the guts of the ethnographic approach."

4. Researcher as instrument. The ethnographer attempts to articulate the assumptions and values implicit in the research, and what the results mean while always acknowledging that researcher is a part of, rather than outside the research act (Hammersley and Atkinson, 1995).

5. Multiple perspectives. The researcher's power needs to be tempered to be credible so that the culture can be illuminated rather than obscured by the observer/commentator. This means of illumination can be achieved in three ways:

A. The ethnographers must be culturally open–minded.

B. Second, all claims about the culture must be based on some kind of empirical experience in that culture.

C. Third, the participants hold knowledge about themselves which nobody else possesses. Direct and intimate acquaintance

and contact with the empirical world of the culture assures that the data collected are grounded in the informants' actual experiences and lives (Gold, 1997).

6. Cycle of hypothesis and theory building. Ethnographers are committed to modify hypotheses and theories in the light of emerging data. Gold (1997) states that "there is a running interaction between formulating and testing both; then, a reformulating and retesting throughout the research process."

7. Intention and outcome. The ethnographer seeks to discover how people in the study area classify or label each other; how they find meaning in activities in life; how they engage in the process of defining who they are; and how they select and collectively define their cultural situation. (For a more detailed review of ethnography and numerous other qualitative methods, see Patton's *Qualitative Research and Evaluation*, Sage Publishing, 2002).

Massey (1998) observes that "the term *ethnography* will continue to be used to describe many different kinds of research activity. If ethnography comes to mean too many different things to too many different people, then it ceases to be a useful term at all, and we might as well describe or, at the very least, develop more precise terms to describe different activities which are supposedly encompassed by the word."

The question could be asked, has ethnography become so broad, so big, or so large and encompassing that beginning researchers face a near impossible task to practice the method? Can the veteran researcher adequately define the method? Another criticism that strikes at the authenticity of the method was put forth in a remark made by an American state department of education: "Anything anyone wants to do research on that has no clear problem, no methodology, and no theory is likely to be called *ethnography*" (Spindler, 1992). The specific objections for using ethnography include:

1. Ethnography, by strict definition, should be used in the study of ethnic groups.

2. The method has grown beyond any attempt to properly define the research method.

3. Attempting to teach undergraduates ethnography causes the students confusion and bewilderment.

4. Experts from different academic disciplines tend to claim ownership over the method.
5. The method, loosely defined or practiced, can lack rigor and respectability.

In any case, the author needed a method to study a specific people group but not necessarily an ethnic group. Many instructors, seeking to engage undergraduates in research, need a method in order to teach the research process within the capacities of thin department budgets. Ethnography proved difficult at best.

Phenomenology. Max Weber, one of the founding fathers of sociology, believed that there could be absolutely no objective scientific analysis of culture or social phenomena. Weber notes, "We can only understand human action by using methods of investigation requiring *verstehen*, or *empathic understanding*" (Coser, 1977). Weber's definition of social investigation aimed for an interpretative understanding of social behavior by penetration into the subjective meanings that actors attach to their own behavior and to the behavior of others (Coser, 1977; Patton, 2002). Yet, few would claim that Weber's concept of *verstehen* could be labeled or practiced as a research method.

Folknographers borrow Weber's concept and apply *verstehen* (or empathy) by using qualitative methods appropriate for interpreting the social world from the subjective perspective of folk in their natural setting, stressing their attitudes, their beliefs, their values, their social expressions, their interactive rituals, and their mode of communication. Folknographers actively listen for the voice of the people searching carefully for emergent themes and collective interpretations appropriate for gaining an empathic understanding of social reality as defined by a particular folk selected for investigation.

Folknography

Indeed, folknography strives to give voice to the people. If Wolcott (1999) is right and ethnography is a "way of seeing," then folknography is a way of listening. Folknographers want to hear the voice, concerns, needs, and hopes of the people. Folknographers listen to the expression of needs, hopes, dreams, desires, and stories and record them (graph them) for others. This kind of research results from one short story

after another (narratives). These stories, woven together, present a picture of a people, no matter their geographical space or their ethnic background. The research participants can inhabit huts, houses, or castles. Folknographers search out the people and discover their stories. Researchers are not as much concerned with discovering key informants, but rather common people (the folk) who have insights into the common life affecting community and country.

Folknographers seek to compile the feeling or perspectives of the folk. During this process, descriptive narratives are developed by researchers, posted to a dedicated Website, and combined with other emanating charts, graphs, photos, and other digital images. Folk tales, knowledge, art, religion, and food ways must also be considered (www.folknography.org).

Folknography works when the researcher does not have years to make a research study. As previously stated, ethnography works best in an elongated time commitment. Like rapid rural, the folknographic method works in shorter time periods, and students can be well trained in time spaces fitted for semesters or quarters. Additionally, folknography can be applied to people found in Appalachia, Alaska, the West Coast, Midwest farmlands, the Badlands, or Mexico. Because folknographers desire to study folk, the study is not restricted to an ethnic group or certain people group. Folknographers study people in a defined location, within a specified time allotment, and with defined parameters for a specific purpose or purposes. This method works well for teams, for a few, for two, or even a solo researcher. The method has been applied successfully numerous times in places such as the United Kingdom, the United States, Mexico, the Dominican Republic, and in Hong Kong by faculty and undergraduate students (www.folknography.org).

Technology has also helped to fashion this research tool. After each day of fieldwork, the folknographer returns to a team debriefing session and then the writing lab in order to review the day's findings (data) and then record and post them to the Web page dedicated to that particular study. These moments are some of the most vulnerable moments for the folknographer. The debriefing sessions help to crystallize the day's experiences and provide moments of synthesis and framing. The writing sessions provide the folknographer an opportunity to organize and express what data has been collected on that particular day. The digital

photos, narratives, and other expressions can then be posted to a dedicated Website so that students, participants, researchers, and all other interested parties can see the results of the research. Colleagues, families, and friends follow the narratives of the daily work posted on the Website for each folknographic project but also the folk being studied (the targets of the research have oversight rights and accessibility to the data).

In this instance, folknography includes a process known as *feed forward*. As the research project progresses, while researchers remain in the field, informants and folk participants can correct, criticize, critique, question, or comment on the description or narratives presented by the researchers. This is research in real time.

The Folk Defined

The reader may seek a specific definition for the term *folk*. As previously stated, the term originates from the German language which, in English, means people. In this method of research, the term folk refers to the identified population the researchers wish to study. The population can be delineated in many different or various ways. For example, in the previous ten different projects led by the author, clients have identified the population for the researchers in several cases. In other projects, the research project question actually identified the research population (i.e., equine owners in Great Britain). The folk are opposite from the elite. The basic premise of folknography is that the elite have been heard. Folknography seeks to give the folk their voice.

In practical application, folknography borrows from the research method called rapid rural appraisal. For a theoretical base, folknography draws from ethnography. Philosophically, the technique relies on phenomenology. Along with unique fieldwork and academic synthesis features, folknography blends the strongest elements of all three of these frameworks.

So What's The Difference?

The question has been asked, "What is the difference between ethnography, rapid appraisal, and folknography?" Folknography stands

unique because the method:

1. Works best in a team or group effort with a consistent, daily debriefing session with all participants involved. This trait allows adaptation and adoption by undergraduate students from the classroom to the fieldwork application.
2. Seeks out the unique knowledge, values, culture, and the voice of a certain cultural group. Folknography seeks the heart and the voice of the people.
3. Functions exceptionally well as a teaching tool for training undergraduate college students the research process, writing, and fieldwork. They learn about qualitative and quantitative research, theory, design, data collection, analysis, and other practical applications of research.
4. Employs new and various technologies, allowing hands–on experience by all participants in the research project.
5. Provides local communities (leaders and the folk) with the results of a research project with little investment by that community. The method provides instant results.
6. Allows colleges and universities to provide students with an experience in new, different, international, or unique cultures.
7. Permits a broader research application. In the strictest sense, ethnography deals with a certain ethnic group and rapid appraisal which generally applies to development or agricultural projects. Folknography allows for a diverse number of cultural research targets.
8. Demands that the participants engage their previously accrued skills in the project. In other words, employing folknography allows the researcher to draw on a synthesis of artistic and intellectual abilities on a daily basis throughout the project timeline. The researcher draws on writing and analytical and critical talents.
9. Offers Website field reports for instant access to the knowledge and observations being made. Scientists, family members, other field workers, and participants can access the site for information and research access.
10. Gives informants an opportunity to participate in the overall research project, including descriptions, results, analysis,

and summaries.
11. Engages a multiplicity of data collection activities, including single participant interviews, structured and unstructured interviews, focus groups, plenary sessions, structured observations, and artistic observations.
12. Employs a multiplicity of reporting avenues, including traditional reports and publications, Websites, narrative sketches, journal articles, photo journals, and creative, static displays.
13. Decreases the intimidation and/or fear undergraduate students feel concerning entering the academic research arena.
14. Fits the semester or quarter time frame.
15. Serves as a task specific research process with less ambiguity, fewer complications, and less technical implications than other methods heretofore defined.

Researcher As Listener

Many qualitative methods depend substantially on the research agent (Patton, 2002; Berg, 2001; Mason, 2002). In this research activity, the researcher actively concentrates on listening to the voice of the people. Naturally, people have a reality to convey. Everyone in the population has a story to tell. Folknography provides and offers an opportunity to many who would not otherwise be heard. Not only do folknographers seek out the key informants as other methodologies, but the common person must also be heard. Each person has perspectives and insights to offer to broaden the overall picture. By carefully listening to each person from the designated group of people to be studied (the target group), the researcher or research team finds more data to develop the description. The entire science of communication becomes vitally important to the operation of folknography.

Individual Interviews

As with many other methods, folknography depends on the person–to–person interview. The interviews can be structured, semi–structured, or casual. Prior experience in several previous studies demonstrates that

a blend of all three works best. In other words, if time allows, the folknographer should include all three approaches in the data collection process.

The structured interview follows a strict, written, predetermined list of questions that the researcher wishes to ask. Discovery comes much easier if the questions are arranged in a rational sequence. The experienced interviewer knows that questions can be asked in a certain planned order such as the hourglass plan, the pyramid plan, the funnel plan, or the pipe approach. A random arrangement of questions develops more like a casual interview. In a two–week research project in a small village in Mexico, researchers designed a structured interview to collect living condition data from the village:

> Basically, we wanted to know what life was like in a village located near a booming metro area. The interview questions were designed using the *pipe* method. This method allows an even flow of questions and generally does not appear threatening to the informant. The student team researchers could use the question guide with confidence and not get lost in the work. (Lucas, 1999)

In the final analysis, the folknographer, drawing on all previously learned skills, can choose the best interview method suited for the situation, case, or project.

The semi–structured interview allows the experienced folknographer to follow leads and comments made by the informant. The researcher has a series of questions in which to engage the individuals interviewed, but if an interesting lead develops, the researcher can follow that lead through the rest of the interview. This method becomes a valuable technique for seeking previously undiscovered or never–before described information. Once again, listening reigns as more important than the researcher's questions. The questions help to prime the pump. The informant, at some point during the interview, begins to take charge of the course and direction of the exchange, the desired result. The informant's voice can literally develop the theme and direction of the study.

The casual interview emerges as a useful tool in restaurants, markets, the streets, and before or after focus groups, town meetings, or plenary interviews. Actually, a more experienced researcher should engage in

the casual interview. Once a person has developed good interviewing skills using folknography, the information gained can be powerful. While in the midst of the study in General Cepeda, Mexico, a researcher recalled, "I waited in the reception area for a meeting with the mayor (el presidente municipal) when I met the old farmer. The conversation turned into one of the most remarkable moments of the entire study. Without the casual interview, the moments would have been lost without ever gaining the valuable insights" (Lucas, 2005).

Group Work

The focus group should also be employed when possible to allow multiple contacts with researchers and folk. The participants in focus groups have a tendency to tag on comments made by others and offer additional insights to the topic being discussed. These folknographic focus groups should follow a series of questions previously constructed by the focus group facilitator but can digress if the discussion direction changes due to the need or wishes of the folk being studied. In a lull, the facilitator can then bring the discussion back to prescribed questions. Much discovery can occur in these sessions. As many as four or five focus group sessions can be planned or organized even in a time limited research project.

Folknography offers the data collection technique called the plenary session. In this event, a crowd of folk gathers to express concerns, beliefs, hopes, or dreams. A good example occurred during the General Cepeda Project in Mexico (www.folknography.org). Researchers heard from many male informants throughout the study but felt concerned that the female expressions and comments seemed limited. In an effort to glean more female perspectives, the research team planned a women's meeting at a meeting room in the hotel. Nay sayers predicted doom and failure. Yet, at the prescribed time, hundreds of women, both youth and adults, arrived at the meeting room, and a lively plenary session ensued. While the female researchers listened to the heart of the women through their expression and declarations, male researchers cared for the children in the hotel plaza and then served refreshments. The entire event made history in that small, Mexican village. The plenary session also worked well in South Carolina with the Gullah community (Jarrett

and Lucas, 2003).

Other data collection techniques include:

1. Structured observations (researchers have a previously compiled list as to what actions, behaviors, or situations to observe).
2. Film, digital video, digital still photos, along with the more traditional photographic recordings.
3. Digital and/or analogue sound recordings (for music, meetings, demonstrations, speeches, and other cultural sounds).
4. Artistic renderings such as poetic descriptions, artistic drawings, paintings and/or sketches.
5. Notations taken throughout the research project, carefully dated, time referenced, and located. These field notes become especially valuable as the researcher synthesizes and records the narratives in the daily writing process at the end of the research day (Dunn, 2004).

Assumptions

As with any practicing theory, folknography makes three basic assumptions. Although these assumptions seem elementary, three basic assumptions support the scope of the method.

Assumption 1. Community. One of the very basic components of society does exist. In other words, the notion of community must be understood and recognized by the investigator before this method makes sense as a research template. If the investigator or discipline questions the existence of community, this methodology offers little scientific reward.

Assumption 2. These associated groups (i.e., communities or folk) offer innate knowledge and information that can be extracted and recorded. The investigator operates on the notion that, at least by experiential learning, these identified and/or selected people groups have knowledge that can and should be heard, recorded, and disseminated.

Assumption 3. These community groups should have voice. In other words, the folk have a message that, given an opportunity, they will voice to others. Thus, the primary obligation of the folknographer is to

listen to the voice of the people. In other words, the researcher must record their perceptions, narratives, values, beliefs, and traditions.

The Researchers

Although this method fits the needs of various researchers, undergraduate students are prime candidates for operating as research agents in this method of research. Several reasons make folknography well suited for use with undergraduates in special field research projects. These include:

1) Undergraduate students need to learn the scientific process in order to prepare for future employment opportunities or possible graduate work.

2) Undergraduate students provide valuable resources to help faculty members in research while the students learn about science and discovery of new knowledge (Atkinson and Ruzin, 1992; Joseph, 1998).

3) Undergraduate students experience deeper learning by direct experience with methods and processes of inquiry. Students that experience a supportive environment gain an excellent education when their education involves scientific inquiry (NSF, 1996).

4) Science and learning are active, not passive, endeavors. Students engaged in active scientific inquiry as a way of learning become holistically involved in the creative process of scientific methodology and practice (Abraham and Hoagland, 1999).

5) Undergraduates involved and engaged in research data collection and analysis develop insights into how research is done, thus leading to scientific literacy (Abraham and Hoagland, 1999).

6) Undergraduates, according to empirical evidence, learn best when they actively construct their own knowledge. According to studies, the students who are exposed to research examples and activities tend to remain more interested in science and the scientific process (Lanza, 1988; McNeal and Avanzo, 1997).

7) Such projects provide undergraduate students with capstone experiences, opportunities for synthesis, reflection, and preparation for the future. Such projects develop and engage

the students' skills in communication, teamwork, critical thinking, and a foundation for lifelong learning.

8) Such projects help develop and build collaborations, partnerships, and relationships with other departments, disciplines, cultures, and businesses.

9) Undergraduate research projects enliven and enrich the student's experience and learning. These projects have a positive effect on the instructor's teaching and provide opportunities for students to do research with faculty mentors.

10) Faculty who lead these research experiences are research active and have firsthand experience with what practitioners do and have a storehouse of personal experiences to relate to their students.

11) The active research classes, led by faculty offering their students a firsthand experience with cutting edge, inquiry–driven research projects, has emerged as one of the most effective and engaging forms of education (Council on Undergraduate Research White Paper, 1999).

Results Of Folknography In Teaching

The author, a professor of communication studies at Ohio University—Southern, has used this teaching technique in ten separate studies. Each study project coincides with an Ohio University course in the regular academic quarter. Students enrolling in the class have full knowledge that the ultimate goal of the class is to make an authentic research journey that includes well–planned field research (Woods, 1994). The author has led students in folknographic projects in Mexico (four studies); the Dominican Republic; Shawnee, Oklahoma; West Virginia; Ironton, Ohio (two studies); and Porter Gap Road in rural Ohio. A total of 126 students have participated in these efforts.

Students are enrolled in a qualitative research course and then carefully taught the process of research along with the techniques of interviewing, observation, and writing. Specific plans for the particular study are created using the classroom experience as a planning session and collaborative meeting. During classroom work, the students, under the guidance of the professor, move through the entire process, including

drafting and field testing questions, seeking approval with the University's Internal Review Board, practicing digital photography, writing narratives, and keeping field notes. At the close of each quarter, the professor conducts a survey of results of the students' class experience (Wolford, 1991). The collected data reveals that the students gain valuable skills through the research class room and field work experience.

Student Survey Results

The author keeps careful records of perceptions, comments, and results of students' reactions in the folknographic projects at Ohio University—Southern. From the 126 Ohio University students surveyed over the past three years, the following results of the survey show that students respond favorably to the undergraduate research projects and enjoy learning using folknography as a research method.

Survey Statement	Percentage that Agreed
1. I learned the steps of the scientific process in this experience.	1) 68%
2. I gained valuable experience that will help me in my career.	2) 72%
3. I became academically engaged and motivated in this project.	3) 88%
4. I learned more through this research project than in a normal classroom experience.	4) 92%
5. I learned interviewing, collaborative and group communication skills.	5) 89%
6. This experience has taught me about myself and others.	6) 95%

Course Curriculum Plan

Week One:	Qualitative research methods
Week Two:	Qualitative research techniques
Week Three:	Field work with folknography
Week Four:	Qualitative narrative construction
Week Five:	Questions, Design and Literature Review
Week Six:	Journals and field notes
Week Seven:	Field test the research questions
Week Eight:	Practice narratives and debriefing
Week Nine:	Final preparations and review
Week Ten:	Field work
Week Eleven:	Final work due (narratives and summaries)

Conclusion

Between the stricter method of research known as rapid appraisal and the broader research method called ethnography emerges a new, practical qualitative research method called folknography. Folknography functions as a viable way for instructors to train and teach students the research process. Engaging students in this research process provides them with challenges in writing, group communication, cultural awareness, organizational communication, intellectual synthesis, and planning. Numerous undergraduate students in several different field research projects have successfully used the method of folknography over the past few years (www.folknography.org). The method of folknography provides educators with a flexible framework for leading undergraduates in deep learning and meaningful research opportunities.

This method also offers the community college, regional campus, and small liberal arts college faculty an affordable, collaborative manner in which to conduct research. With limited budgets and time constraints, this method works well for two or three colleagues entering a field to perform a research project effectively. The method offers numerous possibilities and potential applications.

In reality, this method fills a void. The method fits a need. Qualitative research depends on rigorous implementation in the field. If a researcher seeks to discover more about a particular culture not ethnic in nature or

rooted in agriculture, now the researcher has an additional choice in field method design. Folknography offers the cultural research practitioner a suited method that produces notable results. Now the social scientist, the graduate student, or even the undergraduate student team can implement this method in the field and produce dependable, qualitative data. Folknography offers a blend of popular research method with teaching components and effective design, giving the researcher a viable research method and the folk a voice.

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Biography

David Lucas completed his undergraduate degree in speech communication and theology at Kentucky Christian College in Grayson, KY. Lucas completed his first master's degree in communication at Marshall University in Huntington, WV. He did a second master's in international studies and completed his doctorate at Ohio University, where he currently serves as an tenured associate professor who directs the communication studies program at Ohio University—Southern. Lucas travels extensively throughout the United States and the world as a consultant and noted public speaker. He has published several articles, coauthored books, including a book of poems, and has directed numerous research projects. His research interests include Native American culture (especially Shawnee), Gullah/Geechee culture, Appalachian culture and architecture, Australian culture and architecture, qualitative research methods, and research applications and activities for undergraduate students. He may be reached at lucasd@ohio.edu.

Reflections On Reflections: Service Learning and Oral Histories

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Abstract

Service–learning research has addressed extensively the necessity of sound reflection models to assess student outcomes. This paper describes a particular service–learning component of a communication in the family course in which students are partnered with senior citizens in the community to record oral histories. In this paper, I describe the process of the project in detail and suggest ways that the general concept could be applied to a variety of disciplines. Second, I share excerpts from students' reflection journals regarding the project. Finally, I assert that while the study and development of more formalized models of reflection are certainly useful, the importance and impact of the experience of service to students can be revealed in free form narrative and informal class discussion.

Introduction

The incorporation of service–learning courses in the educational experience continues to increase (Rhoads, 1998; Rhoads and Kezar, 2001). The increase in attention given to service–learning reflects a growing concern that universities become more committed to community partnerships and to making contributions to the public good (Rhoads, 1998; Bringle and Hatcher, 2000; Rhoads and Kezar, 2001). Based on the philosophy of John Dewey, who argued that education plays an imperative role in democracy and should contribute to the social good, formal definitions of service–learning vary (Rhoads, 1998). For example, Bringle and Hatcher (1996) define service–learning as

> . . . a credit–bearing experience in which students participate in an organized service activity that meets identified community needs and reflect on the service activity in such a

> way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility. (222)

Rhoads (1998) states that "service learning includes student participation in community service but with additional learning objectives often associated with a student's program of study" (279). Speck (2001) argues that the primary purpose of service learning is "to ensure that academic study is integrated with the larger public life, generally conceived as life outside the classroom, although the classroom is a place where students also develop community relationships" (4). Further, service–learning can take a variety of forms. For example, a social problems class can work in a homeless shelter, or psychology students might spend a required number of hours working in a variety of social service agencies (Rhoads, 1998; Marchel, 2004). In addition to providing service, such hands–on experiences could teach students about public policies, funding issues, and care provided. Education students might participate in tutoring programs at local schools and thus gain insight to problems in education such as funding issues and overcrowded classrooms. Regardless of the formal definition adopted or the project designed, proponents argue that the merits of service–learning include additional means to obtain educational objectives, new life to the classroom experience, and a heightened sense of civic responsibility. Further, service–learning answers the call for stronger partnerships between universities and the public and can teach critical thinking and problem–solving skills (Bringle and Hatcher, 1996; Rhoads, 1998; Rhoads and Kezar, 2001). While the merits of service–learning are abundant, there is also a need for clarification of a number of issues such as the difference between service–learning and community service.

A review of literature indicates that service–learning scholars argue that a key element differentiating service–learning from community experiences lies in the quality and type of reflective activities (Hatcher and Bringle, 1997; Cooper, 1998; Eyler, 2002; Maher, 2003; Ash and Clayton, 2004). Specifically, Hatcher and Bringle (1997) note that "not all experiences result in learning, particularly discipline–based learning" (153). Calling upon Dewey's argument that education should be based in experience, service–learning research has addressed extensively the necessity of sound reflection models to assess student outcomes.

This paper describes in detail a particular service–learning component of a communication in the family course in which students are partnered with senior citizens in the community to record oral histories, and it suggests ways that the general concept may be applied to a variety of disciplines. Along with excerpts from students' reflection journals, I assert that while the study and development of more formalized models of reflection are certainly useful, the importance and impact of the experience of service to students can be revealed in free form narrative and informal class discussion.

The Project

"You want me to do what?" This is the statement that I often hear explicitly or I see reflected in the eyes of students as I explain the requirements of this project. Unquestionably, given that most if not all students are wandering into uncharted territories by engaging in a service–learning project, the trepidation from the students is quite expected. This fact coupled with the nature of this particular project typically results, at least initially, in moderate levels of anxiety and confusion.

This particular service project is a component of a communication in the family course which requires that students work alone or in pairs and partner with seniors in the surrounding community to record oral histories of senior citizens. The project developed out of a cooperative relationship with the activities director of an assisted living facility located in close proximity to the college. On the first day of the course, we discuss service–learning and specifically the project. At this time, I ask the students to decide by the next class meeting if they would like to work alone or in pairs, and if they would like to work with residents of the facility near the campus, a different facility, or with a particular senior citizen in the community. Once the number of senior residents needed is determined, I call the activities director of the nearby facility and inform her of the number of students who will need a senior citizen partner. The activities director then makes the initial contact with residents, explaining the project and asks if they wish to participate. Because we have worked with this facility for three years, many times the residents approached are already somewhat familiar with the project

from speaking to those who have participated in the past. However, we have never used the same resident twice. While generally the majority of the students work with residents of the facility located close to the campus, the students do have the option of choosing a senior citizen on their own (neighbor or family friend) or a resident of another retirement facility. In the case of another facility, I contact the administrative office, explain the project, and ask permission for the student to work in the facility and send information from the syllabus. At the present, all directors contacted at other facilities have been positive, enthusiastic, and have gladly assisted me in partnering students with residents. Thus far, only two students have elected to work with a neighbor or family friend.

The students conduct interviews with their senior citizen partner throughout the duration of the course, focusing on not only the senior citizen's personal history but also issues of family communication studied during the course. For example, the students might ask questions regarding rituals within the family that mark holidays and special occasions as well as everyday rituals such as praying before dinner. Other subject matters include explorations of gender construction, as well as descriptions of the roles that members of their families played. Additionally, students investigate intergenerational patterns such as family traditions and conflict management skills within the family. Rather than preparing formal, structured questions as a class, we discuss areas the students might explore with their senior partner as well as discuss subjects such as open–ended questions and follow–up questions. While the students have prepared areas of questions, I direct them, that above all else, they honor senior citizen's wishes. Therefore, we discuss extensively how students must be willing to allow the senior citizen to direct their own story and are not to force individuals to talk about issues they would rather not. The culmination of the project requires the students to write the story of the senior citizen's life and family and to then provide the senior citizen with a copy of the report for the senior to share with his or her family and future generations. Before submitting the report to the senior citizen, I evaluate the paper for organization, sentence structure, grammar, depth of material, and overall presentation of the story.

Learning Objectives

For the purposes of this project, the learning objectives are multiple and described in two categories: discipline–based and non–disciplined based. The discipline–based objectives include investigation and application of concepts and theories discussed within the communication in the family course. While students are not explicitly discussing the terminology of the subject matter, such as intergenerationality and relational dialectics with their senior citizen partner, they gather and analyze the information acquired through the interviews within the context of the course material. Hatcher and Bringle (1997) note that service learning also often contains objectives "that transcend a particular discipline" (154), for example the civic responsibility and personal growth that I have elected to call non–discipline based objectives. Beyond the application and analysis of theoretical concepts within the field of family communication, non–discipline objectives within this project include but are not limited to appreciation of the worldview and the living firsthand history of older generations, the development of personal responsibility and sensitivity to the problems and concerns of senior citizens, and comprehending the value of preserving the family through narrative. Additionally, students learn to consider and respond to some difficult ethical situations, such as the student who had to decide whether or not to include in the written history the clear indication that a mother favored one son over the other (a perspective she chose not to include).

On a broader perspective, a project that partners students with senior citizens might be applied to a variety of disciplines. Courses in psychology and sociology could develop projects in which students study and record topics not unlike those studied in the communication class. For example, the development of gender issues, conceptions of societal norms and roles, and perspectives of social problems could be analyzed and recorded for the senior citizen and their family as well. Health, gerontology, economic, and political science students might investigate the issues, concerns, and costs of senior health care in an ever–increasing aging population, perhaps leading to not only an insightful understanding of these issues but also a commitment from students to consider more carefully the needs of and difficulties facing our senior population. Accounting and business students might offer assistance with taxes and

financial planning. Computer science students might teach basic word processing and Internet skills to interested seniors. Additionally, the value of recording firsthand accounts of World War II, the Korean War, and other monumental historical events for family and future generations in a history course is unquestionable.

Learning Through Reflection

The importance and value of reflection as a part of experiential education has been extensively discussed in service–learning literature. Eyler (2001) notes, "Students who had been involved with service–learning, in which service and learning were linked through reflective activities, were more likely than their volunteer peers to identify learning as an important outcome of their experience" (36). Much of the research focuses on the questions of what constitutes effective reflection and explores ways to push students beyond superficial observations of the service–learning experience (Anderson, 1995; Hatcher and Bringle, 1997; Cooper, 1998; Eyler and Giles, 1999; Eyler, 2002; Ash and Clayton, 2004). For example, Ash and Clayton (2004) state that the "ultimate goal of reflection in service–learning is to help students explore and express what they are learning through their service experiences so that both the learning and service are enhanced" (139). Hatcher and Bringle (1997) argue that reflection is "the intentional consideration of an experience in light of particular learning objectives" (153). Cooper (1998) states that the most important element of effective reflection is "the challenge of pushing students to think critically and to engage issues in a more critically effective way" (54). Dunlap (1998) states, "Critically reflecting in journals and during class allows students to express emotions and experiences and to realize that much of what they experience is a normal part of the service–learning process" (209). Additionally, Eyler (2002) notes that while research on the effectiveness of service learning is mixed, service–learning reflection done well facilitates critical thinking skills and cognitive development in students.

Consequently much research focuses on developing models for effective reflection processes. For example, in Eyler, Giles, and Schmiede's 1996 *A Practitioner's Guide to Reflection in Service–Learning*, the authors argue that the critical principles of reflection in service– learning are

the four Cs of reflection: "The best reflection is *Continuous* in time frame, *Connected* to the 'big picture' information provided by academic pursuits, *Challenging* to assumptions and complacency, and *Contextualized* in terms of design and setting" (21). Eyler (2002) suggests that instructors utilize a reflection map as an overall organizational tool of reflection "in terms of both social context (i.e., with whom reflection is conducted) and chronology (i.e., before, during, and after service)" (524). Specifically, Eyler (2002) suggests that students engage in reflection not only during and after the service experience but to also engage in pre–reflection, or reflection before the service, in order to explore conceptions and assumptions of the community in which they will work. Maher (2003) developed the Cognitive–Experiential Tri–Circle reflection model which assumes that "depth of experience and depth of beliefs are equally related" (94). The more immersed an individual is in the experience, the more the individual will explore personal beliefs and vice versa. Ash and Clayton (2004) designed the articulated learning framework that consists of the students' engaging in a number of reflective activities and responding to a series of questions that the authors state

> brings each reflection activity to a close and establishes a foundation for learners to carry the results of the reflection process forward beyond the immediate experience, improving the quality of future learning and of future experience related to service or to other aspects of their lives. (142)

Marchel (2004) suggested a rubric "for evaluating the quality of reflective writing" that includes three levels: descriptive, analytic, and integrated that incorporates the "perspective of the student, the position of the clients, and the contextual features (both immediate and broader social issues) that influence events . . ." (120). Scott (2004) argued that the means to producing reflections infused with critical and ethical discourse is to integrate service–learning with cultural studies. Unquestionably, the study and development of sound reflective activities is considered essential among service–learning scholars to achieve the goals of service–learning that "enable college students to apply classroom knowledge in an effective, hands–on manner that provides a practical and meaningful learning experience, one that may stay with students long after they leave the classroom" (Whitbourne, Collins, and Skultety, 2001, 106).

Reflections

Within this particular service–learning course, the students engage in primarily two forms of reflective activities. First, throughout the quarter, class time is devoted to discussions of the service project. Because the communication in the family course is a senior level class, most of the students are quite adept at engaging in thoughtful, critical discussions regarding the service experience. These discussions range from addressing simple questions or updates regarding the project to critically considering both the discipline–based and non–disciplined based learning objectives. For example, some discussions center on the connections students make between the course material and their experience as well as engaging in thoughtful considerations of ethical questions. The second reflective activity requires the students to write a short paper at the end of the project that is described as a free form narrative journal regarding the project. As Eyler (2001) notes, journals can be structured around a number of themes, but in order to encourage students to think critically, some potential questions should be offered for guidance. For this particular project, the students are asked to consider addressing issues such as: 1) What are your general thoughts and feelings toward this service project? 2) What have you learned about yourself because of this project? 3) What surprised you in regards to this project? 4) Explain your reaction to the service learning experience. 5) What stereotypes, if any, are challenged because of this project? While the questions given to the students are mere guides, journal reflections are not without merit in the field of service learning. Saltmarsh (1997) notes that

> journal writing and reflection are enriched by storytelling as a way of collective constructing what is known and being receptive to others' ways of knowing. . . . We use stories to see how people perceive themselves in relation to others and their social context. Through stories, people unlock the basis of their values and commitments. In sharing stories, [sic] new interpretations are revealed that can clarify one's own experience in relation to others. (90).

Over the last three years, I have requested permission from the students in writing on a voluntary basis to use excerpts of their papers for the purposes of presentations and research. The following section

contains excerpts of their reflective journals organized by five recurring themes revealed in the papers collected over the last three years. The names of both the students and the senior citizens are fictitious.

Valued History

A common theme in their reflective papers is an increased sense of the importance and value of history and especially the insight that senior citizens provide from their lived experience. "Karen" states:

> I learned a lot about how the country was during the depression and World War II. I guess I did not realize how many jobs were created when all the men in the country were going over seas to fight against the Germans. . . I thought that the project was interesting because I never got a chance to study about the depression and what it was really like back then.

"Janet" states:

> I learned a great deal about history and myself by doing this interview with "Jacqueline." The information she revealed to me made me understand just how lucky I am to be a woman in this day and age.

"Bob" states:

> I have learned a lot from "Jacqueline." She has taught me history that I did not know existed and she taught me that everything that I have in my life should be cherished.

"Ashley" states:

> For me this experience was somewhat of a history lesson, and I feel like I have more understanding about the hardships that our elderly experienced. It is so easy to take for granted all of the things that we have. Life now is so much easier than what it was in the early 1900s, and yet we complain about what we have.

"Amy" states:

> One of "Cora's" stories was about the great depression. I had always heard of it, but I really wasn't aware of all the things that people actually had to go through. When "Cora" said that she was given a ration card for food, I had no idea what she was talking about. She explained that the ration card limited

> the amount of food that each family could have, and if the card was used up too quickly, then they would have to struggle to find food. Since I was brought up in a time where food is readily available, it was hard for me to imagine what she had to go through. I now have a better understanding and a greater respect for all those people who had to suffer and work so hard just to survive. I strongly suggest that everyone should do a project like the one I did. It was very rewarding to find out information about things that I would have never learned about otherwise. It is not good to forget the past, and it seems like so many young people today do not know much, or do not care to know the past. Taking a course in history is nothing like talking with and experiencing the past with someone who has actually lived it.

Challenged Stereotypes

Another commonly recurring theme of the papers is the revelation that despite expectations, these senior citizens have led interesting and accomplished lives. Specifically, the students comment that their stereotypes of gender roles are often challenged. "Janet" notes:

> "Jacqueline" has accomplished so much in her life. She was a very ambitious woman and was not afraid to try new things. I was really amazed that she was the first woman to go to college from her hometown. She did not want to live life in the "traditional" roles of that time, so she took it upon herself to get an education. She also took risks to be in the workforce. I knew in previous years woman [sic] were not accepted in the workforce, but I never really knew the impact this rule had on a person's life.

"Karen" notes:

> "Mary" was very open about how she worked all her life and went to college in Wheeling. She talked about how after her husband retired she still worked for the gas company. I found it very interesting that she was the one who worked and her husband did not.

"Kathy" notes:

> "Madeline" is a very independent woman who has lived a

> different life than most women her age. She refused two marriage proposals, worked through college and attained a degree in the field of nursing and even traveled to find where she would be happy. Overall, she is a very strong person who lives life through her own choices. These choices were not always the style that society would agree with because she is a woman who did not necessarily adhere to her socially constructed gender role. But her decisions and life history make her unique, and encouraging.

"Andrea" notes:

> "Madeline" also discussed how her parents encouraged her to go to get an education. Her parents wanted her to go into college as well. This was something that I did not think happened that often in the early 1900s. I especially did not think education was pushed for females. I mainly thought females were not encouraged to go to school because they were thought to play the traditional role of a housewife. If the woman were going to be a housewife, why would she need an education? Therefore, doing this project opened my eyes to see that things were not exactly how I thought they were in the early 1900s. There were exceptions to the rule and not all people demonstrated traditional roles. Along the same line, "Madeline" did not get married. Although she was proposed to twice, "Madeline" declined both times.

Frustrations And Trepidations

While the reactions from the students to the project are generally overwhelmingly positive, there is unquestionably confusion, trepidation, and pure frustration expressed as well. "Bob" comments:

> When I was first introduced to the idea that we were going to do a service project, I was a little uneasy about it. I didn't think that it was right to intrude into somebody else's life and talk to them about it. Now that the project is done and over with I'm very pleased that I have done it.

"Amy" comments:

> When I first found out that our class was going to be

> participating in a service learning project, I wasn't sure what to expect. I knew that I would be talking with and interviewing someone I had never met before.

"Leslie" comments:

> When I was told of the service project, my first thought was, "How will I find the time"? Then, there was the apprehension of what the encounter will be like. I love to talk with older people and listen to their stories, but this would be structured. I had a goal to accomplish, and wasn't quite sure of how it would go. And believe me, it didn't go anything like I thought it would.

"Nancy" comments:

> "Mrs. Baxter" is more of a quiet person like me and she did not elaborate very much. I think the project would work best with someone who does open up and gives a lot of information about how their family communicated with each other.

"Marci" comments:

> I enjoyed being with "Mrs. Brown" but I also ran into some problems as in she didn't want us to interview her, and when we did the tape didn't record. This by far has been the most hassling project I have done; nothing went good for us other than we enjoyed her sharing something's [sic] and her company.

During the first year of the project, the students worked with residents of the nursing home that is physically connected to the assisted living facility used in the last two years. The following excerpts explain some of their difficulties. "Maxine" observes:

> The most difficult part of this service project was talking to "Tamara." Any questions I asked would be answered but not elaborated on. For instance, I asked if she remembered any holiday traditions, and she simply answered "yes."

"Darla" observes:

> It was somewhat relaxing talking to "Betty," yet it was also frustrating. At first, "Betty" seemed to have it all together. Her memory seemed very sharp. She appeared to be full of information and willing to discuss her life. The more I tried to talk to her the more she insisted on telling the same story. For the experiences she had in her life that she talked about,

you would think she could tell awesome and intriguing tales. This was not the case.

"Barbara" oberves:

> Going to the nursing home for the first time can be a scary experience. You see people who seem to be normal, only to realize that the person may not be "all there." It also gives you a feeling of sadness. You see people sitting in chairs staring at the wall or a person lying in the bed with a look on their face that is unexplainable. I think that the fear you get from nursing homes may not be what you think, but what you often begin to realize, that some day, you may be one of the patients sitting in the chair.

Mutual Benefits

Frequently, at the beginning of the project, students mention either in discussions or in their reflective journals concerns regarding how they will complete the project. The implication is that there is a grade to be earned and the dependence upon their senior citizen's availability and cooperation is unsettling. However, another repetitive theme in the reflective journals is the theme of mutual benefit that signifies that after completing the project the students understand and relish the notion that they have actually done something for someone else and that the senior citizen provided more than just a means (participating in the interview) to an end (completing the project). "Ashley" concludes:

> I am going to continue to visit with "Margaret" even after the project has ended; her knowledge of the history of this area is amazing and will keep our conversations flowing. I have lived in this area my whole life and really know nothing about it; I would like to find out more about it from "Margaret." I really had a great time doing this project and I got to meet an amazing woman because of it. I hope this project continues because it benefits not only the students but the resident [sic] of the "Assisted Living Facility" as well. I have learned so much from "Margaret" and I hope to learn more from each visit.

"Darla" concludes:

> I learned a dose of reality more than I learned from the

interview. As healthy, strong, and independent people, we tend to take for granted what living really means.

"Edie" concludes:

> He was obviously so pleased that I thought he was special and interesting enough to get a bibliography [sic] of his life. It made me feel good to uplift him in this way.

"Cara" concludes:

> When I was given this assignment, I initially wanted to interview someone from my family. I wanted the memories recorded for my children and me. I found this project to be just a [sic] beneficial to us as it was to "Eve." I am very satisfied with the experience that has come with such a consuming assignment. I only wish that I had more time. Since I have turned in my final paper, I have come up with other thoughts that I wanted to include. I would have liked to interview some other members of her family and some of her friends. Those commentaries would have been touching to add to "Eve's" final copy. . . I have a new outlook for those of older generations who are lonely and simply would like someone to listen to the amazing stories they have to tell.

"Tammy" concludes:

> Overall, I enjoyed meeting "Rachel," hearing about her life, her viewpoints, and seeing life through another person's eyes. Communication is the mainstay of life. When people take the time to communicate with other [sic] around them, then things do not look as dismal or alien as once thought. Not only did I benefit from this experience, I truly believe that "Rachel" enjoyed the time we gave her even if it was time spent drilling her with many questions about her family. In this particular situation, the students made plans to take "Rachel" a cheese and pepperoni pizza after the course was over because "Rachel" did not care for the pizza served at the facility.

"Darla" concludes:

> The experience was powerful, and I would welcome the opportunity to complete another project such as the learning service project that was required for this course. If anything,

the personal growth and learning I received was worth more than the points for the grade.

"Leslie" concludes:

> This experience was wonderful for both of us. "Sheila" was surprised at all she had forgotten, and was thankful to see these life events from an entirely different vantage point. It showed me how much families have changed throughout the decades, and how much they have stayed the same. It gave me insight into my family of origin, with its own unique beauty and ugliness.

"Vicky" concludes:

> I hope that the things we recorded about "Mrs. Jones" will be valuable information to the future generations of her family. I hope that we recorded something that they never knew and never would have thought to ask about. I hope that in some small way, we have preserved a piece of history that someone will value when "Mrs. Jones" is gone and no longer able to share her life stories. I believe this was an incredible assignment and that it can definitely benefit families. Often times we don't realize how much we neglect our own families, and often times we realize that we have neglected them when it is too late. I hope that "Mrs. Jones's" family is not negligent of the information she has to share, but if they are, I hope that our record of the information she shared with us will bring them comfort and peace when she is gone.

"Kathy" concludes:

> "Madeline" is an inspiration to anyone on how to live life to the fullest with an optimistic attitude. "Andrea" and I speak with her through telephone conversations still and plan on visiting her for her upcoming birthday November 23rd. I would have never figured it, but I don't intend to not keep in touch with "Madeline." It makes me happy, and grateful, to hear from her. In a sense, I have become a part of her life story, as she has become a part of mine.

Family Reflections

As previously discussed, the task given focuses primarily on a service provided for the senior citizen partners. However, another recurring theme that emerges in the reflection journals is that through this experience, the students frequently develop the desire to connect with, reconnect with, or preserve the history of their own families. "Vicky" acknowledges:

> I found through this project that I often have a hard time talking to my family members about the things that my family went through in past generations. I know that my family members hold some very valuable and interesting stories and experiences that could benefit me.

"Cara" acknowledges:

> Time permitting, I would love to do more service projects like this one. I would give anything for someone to have done and [sic] interview with by Great–grandmother before she passed away five years ago. My younger cousins would have greatly appreciated it, as well as myself.

"Frank" acknowledges:

> The experience with interviewing "Charlie" was a good one. It helped me remember those times going to my grandma's house and sitting down with her every Sunday.

"Doug" acknowledges:

> There's a lot of untold stories out there. I hope someday someone will care enough about me to let me tell my story. Or maybe I'll have to do it myself. It's not anything spectacular, but I've already had some highs and lows in my life. Who knows what the future will bring. Just remember, everybody has a story.

"Ashley" acknowledges:

> In a way, I think that the loss of touch with family and the importance of God has made the United States the way that it is now. Maybe if we were still very close to our family and our community and more people had faith in God, we might not have as much violence, hatred, and drug addictions that we now have. People have lost touch with what is important in

> this world and that is our families and trust in God. I never thought about this aspect as much as I do now, and this is because "Cora" pointed this out to me. I love being with my family, but I don't spend enough time with my grandparents, aunts and uncles, or cousins. My goal that I have set after talking to "Cora" is to spend more time with all of my family, and to keep my sights on what is most important and that is trust in God. I really enjoyed this experience and I learned how important family is.

"Amy" acknowledges:

> When I listened to "Cora's" stories, it brought up memories of my own past that I had forgotten about. She would tell stories about things that her grandmother and mother would do, and those things sounded very similar to what my grandmother would do. I remember hearing stories from my grandmother about making clothes from things that were laying around the house, and "Cora's" mother would make her clothes from chicken feed bags. When I heard these kinds of stories from my grandmother, I was a young child and never thought too much about them. . . . Since talking with "Cora", I have recently visited my grandmother and asked her questions about her past. Most of the questions were very similar, if not the same, to the questions I asked "Cora." I wanted to hear about my family's past and things that happened when they were younger. I am glad that I had a chance to talk with "Cora" because she helped me open my eyes to a whole other world, and allowed me to see what I was missing in my own family's history.

Reflections On Reflections

One of the many complexities of service–learning is ascertaining the learning outcomes of the experience. To that end, a great deal of service–learning research is dedicated to the development of sound reflection models and tools, an endeavor that is without question worthwhile and a key to the pursuit of service–learning excellence.

Clearly, the reflective activities, classroom discussion, and the free

form narratives described in this project are less formalized than many of the reflective models discussed. However, in reflecting upon the reflections of the students, I assert that the descriptions and responses of the students reveal the impact and importance of this experience. Specifically, I argue that the journals the students write for this particular project divulge that they are indeed learning: learning and appreciating history, raising awareness of their own families and considering their own mortality, recognizing that education can be more than getting a grade, understanding the importance of being responsible and addressing sometimes difficult ethical situations, and finally, experiencing the value and reward of giving back.

However, it must be clear that this essay is absolutely not advocating for abolishing or ignoring the continued research and development of structured, reflective tools. On the contrary, this particular project is ripe with numerous potential avenues for more traditional research that I plan to implement in future classes. For example, one possibility is to implement reflective models to compare and contrast the content and depth with the free form narrative journal. Another idea is to track whether or not the students who proclaim they plan to continue a relationship with the senior citizen do indeed follow through. Another project may examine how the students' relationships with their own families has changed because of the project. This project is clearly in its infancy and could branch into a number of fruitful research avenues. Nevertheless, I also understand that even in its infancy, even without more structured reflection activities, these free form reflective journals reveal that something is happening to these students because of this experience. Even if it is just for a short while, there is some level of heightened awareness of either themselves and those around them and/or society in general. My fear is that for the novice service–learning instructor, (as I am), one can become so paralyzed with finding the right model that the possibility of the service–learning experience itself is lost. Are we in danger of becoming so enthralled with measuring the experience and directing student responses that we risk dictating what their experience should be and perhaps losing the point of the experience? Some might agree; some might not, but I believe it is an area worthy of discussion and consideration. Finally, regardless of the philosophical debate regarding measurement, I hope that all instructors will see the

value in the practice of service–learning and consider its incorporation into more courses.

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Biography

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Leveraging Distance Learning Technologies For Traditional Courses

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Abstract

Web collaboration technologies such as Web portal, asynchronous communication, chat, and media streaming, and Web–based assessment technologies are typically used for distance learning. However, one could also use such technologies to enhance learning experiences in traditional course settings. In this paper, the author presents his experience with using distance learning technologies in traditional undergraduate computer technology classes.

Introduction

Distance learning is gaining popularity in both higher education as well as in the corporate world. In higher education, it offers flexibility and access. At the workplace, it offers flexibility as well as cost effectiveness for training (Dodds and Fletcher 2004). Over the last decade, many institutions of higher education have deployed Web collaboration technologies to offer distance learning classes. But, traditional classes could also benefit from the use of some of these technologies—a kind of a "bricks–and–clicks" approach (Weigel 2002). In general, the literature also suggests that the use of technology could enhance learning experiences (Yip 2002; Heath 2005). During the last two years, the author has attempted to implement these distance learning technologies in traditional courses offered for an undergraduate computer technology program at Ohio University—Southern. This paper provides a brief overview of distance learning technologies and examples of how the author has leveraged some of these technologies to enhance learning experiences.

A Survey Of Distance Learning Technologies

In recent years, Web collaboration technologies and Internet access have made a significant impact on distance education and training. The on–line distance learning technologies could be classified into four categories: Web portal, communication technologies, presentation technologies, and assessment technologies. One could use a single distance learning platform that supports all these technologies or multiple platforms, with each one supporting a subset of these technologies.

Web Portal

The term "portal" refers to a door or an entrance. In the context of distance learning, a Web portal is the main Website for a given course that hosts comprehensive information about the course. It is basically a Website that is used to share course–related information, to provide links to resources or other information needed for a course, and to communicate with instructors and other students. HTTP (Hyper Text Transfer Protocol), Java Programming Language, and markup languages such as HTML (Hyper Text Markup Language) are examples of technologies that enable Web portals. However, to create a Web portal, one does not need to learn all these technologies. Systems such as *Black Board* and *WebCT* support a framework for creating Websites for courses.

Communication Technologies

There are two classes of communication technologies: synchronous communication technologies and asynchronous communication technologies. Synchronous communication technologies allow participants to communicate in real–time using the Internet or another computer network. Chat, instant messaging, Web conferencing, and audio/video conferencing are examples of synchronous communication technologies. In distance learning, synchronous communication technologies are often used for on–line classes, presentations, and group discussions. Asynchronous communication technologies allow users to communicate over a computer network without requiring the senders and receivers to be on–line at the same time. Some examples of

asynchronous communication technologies are e–mail and on–line discussion boards. One major advantage of an on–line discussion board is that all participants need not be available at the same time to participate in a discussion. Typically, discussions are held over a period of time, and the participants contribute to the discussion at their own convenience.

Presentation Technologies

Presentation technologies support digital content delivery for distance learning. *PowerPoint*, media streaming, application recording tools, and multimedia authoring tools are examples of presentation technologies

On–line Assessment Technologies

On–line testing engines and grade books are typical examples of on–line assessment technologies. These testing tools usually support essay and objective questions, automatic grading of objective questions, and automated responses at the discretion of the instructor. An on–line grade book typically allows instructors to maintain and share grades on–line without compromising a student's privacy.

Application Examples

This section presents the author's experience with some of the distance learning technologies in traditional computer networking, database management, programming, and other computer classes. The author used *Blackboard,* an integrated distance learning platform (*Blackboard* 2005), and *Macromedia Breeze*, *Breeze On–line*, and *Captivate* (Macromedia 2005) for this trial. These platforms were used because they were already available at the university and supported the needed technologies.

1. Course Website. Using Web portals for traditional courses has the same benefits as that of distance learning courses. Students need to go to one Website to access all course–related information and contents. **Figure 1** (next page) shows the Web portal used for a computer security class. Many instructors use Web technology for courses. However, using

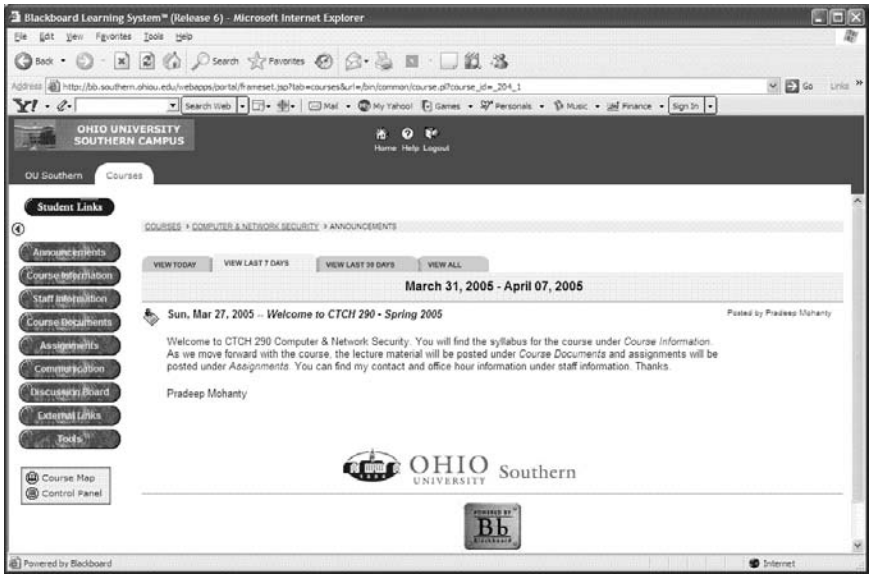

Figure 1: Web Portal for CTCH 290 Computer and Network Security

a central Website as portal for a course makes the difference.

2. On–line Office Hour Using Chat And Web Collaboration. Traditionally students need to physically stop by an instructor's office if they need to meet him or her during an office hour. Using text–based chat for office hour is a winning endeavor for both students and instructors. It helps students to get the benefits of office hours without commuting to campus and allows the author to hold office hours when he is out of the office. The author also uses *Breeze On–line*, a Web collaboration tool, during office hours when multimedia interactions or sharing of documents or applications was necessary to address students' questions.

3. Using Discussion Board For Team Projects. Ohio University—Southern has no residency halls. All students commute to the school, and most of them also work offsite. In such an environment, the logistics for finding meeting times that are convenient to all team members for working on team projects is difficult and often stressful. Encouraging students to use *Blackboard* discussion board as an asynchronous communication tool for the teams resulted in better involvement of the students in team projects. It also helped the author to monitor the

level and quality of participation of each student and coach them accordingly.

4. Using *PowerPoint* With Audio Streaming For Lectures. Sometimes lecturing in the class does not leave enough time for in–class discussions. When a topic required more discussion or hands–on exercise in class, posting voice annotated *PowerPoint* lectures on the course Website and requiring students to review them prior to the class allowed more time to be spent on discussions and hands–on exercises in the class. Students also found these on–line lectures useful since they could revisit specific parts of the lectures again and again if needed. This technology also allowed the author to hold asynchronous on–line class when going out of town on business. The author used *Breeze* (Macromedia 2005) to add voice to the *PowerPoint* presentations and to convert them to a format that is appropriate for efficient media streaming over the Internet.

5. Using Application Recording Tools For Teaching Software Applications. The author has found application recordings to be useful for teaching how to use particular software. To teach applications such as *Word*, *Excel* and *Access*, instructors usually demonstrate the software in class. In–class demonstration of software helps students; however, if a student misses the class or wants to see the demonstration again at a later time for whatever reason, he or she needs to make a request to the instructor to repeat the demonstration. Recording application screens with voice annotation during a demo and posting it on course Website avoids these issues. The author has used Macromedia *Captivate* to record demonstration of applications such as *Ethereal* and *Visio* for computer networking and database classes. Students found these recordings useful since they could view them for reference as needed.

6. Using Discussion Board For Asynchronous Class Discussion. The author found on–line asynchronous discussions to be useful for topics that are thought provoking and/or require research by the participants. Typically, such asynchronous discussions resulted in better student participation than face to face discussions.

7. On–Line Assessment And Grade Book. The author has tried proctored on–line quizzes and exams in the class. Most on–line test tools support displaying the correct answers for both objective and essay questions after a student completes the test. Students appreciated this

immediate feedback. From an instructor's perspective, automatic grading of objective questions saved time, and the typed answers for essay questions improved readability. Because the on–line grade book allows students to see only their own grades, it helped the author to share individual grades with the students on–line without compromising privacy.

Summary And Conclusion

The trials described in this paper were based on the premise that the use of distance learning technologies in traditional classes should enhance learning experiences. The overall student feedback on the use of these technologies was positive. The students got a firsthand experience on how the computer technology could be used for education and training. They also got exposure to technologies that their employers might want them to use for on–the–job training. From the author's perspective, use of distance learning technologies enhanced the overall classroom experience for students as well as for the instructor. However, it is important to note that the appropriate technologies for a course must be selected based on learning objectives, teaching and learning activities, assessment strategy, and situational factors for a course (Mohanty 2004). Further study involving statistically significant sample size is necessary to generalize the findings from these trials and to analyze the time and effort needed on an instructor's part for integrating such technologies into traditional classes.

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Biography

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Three Sites/Three Voices: Intercultural Dialogue And The Artwork Of Pepón Osorio, Fred Wilson, And David Hammons

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Abstract

This paper explores the practice of dialogic learning through the discussion of installation artwork by Pepón Osorio, David Hammons, and Fred Wilson. Their artwork will be examined in detail to present the role this work can play within the pedagogical practice of dialogic inquiry. A brief discussion of the basis of dialogic learning is also included.

Introduction

Generating dialogue in the art classroom around issues of cultural diversity can often be a difficult task when the student population does not reflect the diversity of broader society. Dialogic learning (Renshaw, 2004) and the pedagogical role of dialogue in education will be examined in this paper as a productive means to engage students in the investigation of social, political, and cultural issues pertaining to ethnically diverse populations living in the United States. Dialogic learning will be investigated through an analysis of the artistic production of three contemporary installation artists: Pepón Osorio, Fred Wilson, and David Hammons. Each of these artists has a multi–ethnic background and uses his work to provoke dialogue around issues of cultural representation, social justice, and personal and communal identity. The paper will explore the work of each of these ethnically diverse artists and explain how the art can function as a pedagogical tool to promote classroom dialogue.

Installation art is well suited for promoting dialogue. Installation

art differs from more traditional art forms in that the work is not presented in isolation, framed on a wall or placed on a pedestal, awaiting the curious eyes of the viewer. Michael Archer (1994) writes that installation "has been used to describe a kind of art making which rejects concentration on one object in favor of a consideration of the relationships between a number of elements or of the interaction between things and their contexts" (8). Installation art may occupy an entire room, thereby forcing the viewer to literally enter the art and negotiate its meaning from within as the boundary between art and everyday life is dissolved. Or, it may be a small gesture placed within a context outside of institutionalized cultural spaces such as museums or galleries. In either case, the work acquires its meaning from the dialogue generated by its unfamiliar presence in a familiar space, takes on meaning from the context within which it is exhibited, and activates new meanings within the spaces it occupies. An interactive dialogue develops between the artwork, its environment, and the viewer.

Cultivating Cultural Voice

> To learn about, appreciate and value difference, one first needs to get into conversation. (Renshaw, 8).

The artistic voices of the artists discussed here are of a particular kind. Osorio, Hammons, and Wilson have developed public voices through their work that are formed at the intersection of their communal and individual ethnic identity and a culture dominated by Western European values. Given their unique cultural positions, they frequently choose to exhibit their work outside of the gallery and/or museum system in the spaces of public life where their work is situated precisely within the social dialogues that both form their social environments and give form to their work. Their work acquires a pedagogical aspect in that it is intended to provoke and encourage cross–cultural dialogue as a means to promote learning and understanding about minority experiences in North American culture. The work does not offer solutions to an audience presumed to reside outside social and cultural experience of the artists; rather it raises questions about often hidden or unconsidered social conditions through the reconfiguration of particular forms and

images. For this reason, the artwork produced by these artists is particularly well suited to generate dialogue in the classroom.

Each of these artists has lived for many years in the United States, yet each maintains and cultivates a cultural identity reflecting their roots outside of North America. In this sense, each of their identities has become a sort of cultural hybrid. This position at the intersection of two or more cultures is not necessarily a source of confusion but one of unique cultural power. The Brazilian educator Paolo Freire developed his critical perspective by combining his experiences living in Brazil, Chile, Mexico, the United States, and Geneva. Freire was compelled to develop an intellectual identity that negotiates inconsistent and complex combinations of cultural, national, economic, and educational ideologies. Critical educator Henry Giroux (1994) uses the terms "border crosser" and "border intellectual" to describe Paulo Freire. He argues that "becoming a border crosser engaged in a productive dialogue with others means producing a space in which those dominant social relations, ideologies, and practices that erase the specificity of the voice of the other must be challenged and overcome" (142). In other words, it is precisely at these intersections that dialogue begins and questions are raised that challenge the very constructions that might limit minority voice. Similarly, Guillermo Gómez–Peña (2000), a Mexican–American performance artist, describes himself as a border crosser. As an artist who splits his time between Mexico and the United States, Gómez–Peña finds agency between cultures where he feels most free to define himself and present ideas as he chooses. His work borrows equally from both cultures without wholly rejecting or fully embracing either one. In essence, Gómez–Peña is perpetually homeless, a nomadic intellectual: "I wish to clarify: I don't aspire to find myself. I wholeheartedly accept my constant condition of loss. I embrace my multiple and incomplete identities, and celebrate all of them" (10).

It is through crossing borders and finding locations at the intersections of multiple cultural positions that the artwork of many multi–ethnic contemporary artists working in the United States operates. Installation artists who create work from the materials of everyday life and reorganize them in unexpected ways in public spaces are able to insert their cultural point of view into the ordinary spaces of the viewers' lives. In this manner, they literally create contact with their audience,

initiating dialogue. They maintain hybrid identities that often seek out cultural and political agency at the intersection of cultural values, attitudes, and ideologies of the multiple worlds within which they exist. For David Hammons, an African–American, Fred Wilson of African and Caribbean descent, and Pepón Osorio of both African and Puerto Rican heritage, finding a cultural voice is a matter of creating spaces within which new meanings and alternative understandings can be situated.

Examining contemporary installation art created by ethnically diverse artists such as Hammons, Wilson, and Osorio encourages open–ended dialogue. Each of these artists produces artwork in public spaces rather than within the walls of a museum or gallery, institutions that by their very nature separate their contents from the complexity and unpredictability of daily experience. By placing their work within this context, these artists push their art into the community, forcing viewers to contend with its presence and provoking questions about its meaning. Their work reflects Renshaw's (2004) description of dialogical inquiry, "Questioning in the form of dialogue is an invitation to propose ideas, explain one's reasoning, or clarify some ambiguous idea" (9).

The Artists And Their Work

This section will outline in greater detail particular works by Hammons, Wilson, and Osorio in order to show more clearly the value of their work for classroom dialogue. These artists communicate with art forms that are largely unfamiliar to the average student. They often embrace conceptual and confrontational styles that consciously disrupt the viewer's expectations. They create a visual poetry that brings new life to the most common and recognizable materials that are manipulated and reorganized in order to generate new meanings through an interactive and interpretive dialogue with the viewer.

Hammons views himself as a cultural outsider encroaching upon and critiquing dominant cultural values and ideals. His work tends to simultaneously dismantle cultural tradition and establish a conscious reconsideration and retrieval of African–American culture through a contemporary critique. In an early piece entitled *American Injustice*, Hammons created an image of his gagged body tied to a chair by covering

his body with ink and pressing himself against a large piece of paper which was then placed on a background comprised of the American flag (Powell, 1995). He alludes to the long history of printmaking that is part of the Western European tradition as well as the contemporary political environment and actual events of the 1960s. The work references the 1969 "Chicago Seven" trial in which Bobby Seale, Black Panther founder, was gagged during the court proceedings. By encroaching on the historic and public events with the literal intrusion of his body, Hammons places his work "in the domain of his audience, who are free to travel the interpretive spaces between the original concept and Hammons' representation of it" (Powell, 132). Furthermore, his inclusion of a recognizable image of American culture positions him and a viewer in a dialogue provoked by the idiosyncratic use of common symbols.

Hammons' more recent installation work in the Harlem community of New York City provides contemporary students, who may not be as familiar with the events of the 1960s, an effective bridge to more contemporary issues of black identity. In his piece *Higher Goals*, which was installed in a small park in Harlem, Hammons presents a more recent issue in contemporary African–American life. The work is comprised of 20–foot poles atop which are placed basketball hoops and backboards. The forms are covered entirely with found materials that Hammons collected throughout Harlem. The patterns formed by the materials covering the poles are reminiscent of the patterns found on African textiles and objects. Cultural debris is manipulated and reinserted into the environment, thereby making the presence of the work simultaneously familiar and alien, begging interpretation.

Basketball is a widely broadcast form of athletic entertainment that has become part of the American landscape. For some, including many of my students, the predominant presence of African–American players is an indication of just how far the African–American community has come. Yet for Hammons it is precisely this exaggerated presence in the sport that requires critical attention. Hammons thrusts an African awareness into a community for whom basketball has become a significant source of cultural identity, suggesting that there are perhaps higher cultural goals beyond the 10–foot height of a standard basketball hoop. For the vast majority of African–Americans, particularly those

who may come into contact with this work, the riches of the athletic world are far out of reach. This work makes clear the intricate, complex and ever–present hybrid quality of contemporary African–American identity. It references a culture that is a composite of a past that extends beyond slavery back to Africa as well as a present that is intimately tied to the business of contemporary athletics.

This work can initiate a dialogue that begins in the seemingly innocuous though familiar space of spectator sports. Students generally have a personal context through which to engage this work: they have either participated in the sport or watched basketball on television. When their experience comes into contact with Hammons' representation of basketball, it can stimulate questions and comments generated from a common experience situated at the intersection of different cultural perspectives. Each student has a different entry point into a discussion about basketball or sports in general and with the inclusion of Hammons' voice dialogue can expand beyond shared experiences from a common cultural experience to include ideas from a culturally unfamiliar perspective. It is through an examination of this work that the students can begin to recognize that their passive consumption of professional sports can in some way impact the cultural representation of African–Americans in this country.

Wilson's work also intentionally intrudes on the cultural spaces of dominant culture. He often works in collaboration with art museums and private collections of cultural objects. His work focuses on the exhibition practices of these cultural institutions and the representation of the African–American within this context. Wilson's installations draw attention to the way that curatorial practices affect our understanding of museums through a reinterpretation of their collections. Working with a particular collection of cultural objects, he re–presents these materials in a manner that exposes the historical biases of the selection and representation process. Rather than trying to present the objects objectively in a manner typically employed by museums, Wilson makes transparent his selection process by creating unusual juxtapositions, creating new exhibition labels, and even altering the environment in which the objects are viewed through lighting changes and the introduction of audio. By reorganizing and representing cultural objects, Wilson sets up a dialogue that begins among the objects themselves.

"As I see it," Wilson says, "juxtaposition is one way of unlocking [history] without a didactic tone—allowing the objects to speak to each other. I feel that there is a dialogue between objects—sometimes subtle dialogue, sometimes pronounced dialogue, depending on how diverse the objects are and depending on who is seeing them" (Wilson, quoted in González, 2001, 28).

Like Hammons' work, Wilson's work focuses on the representation of African–Americans within North American society, yet unlike Hammons, he chooses to locate his critique within the very institutions that have historically served to fix our understanding of cultural history. His installations provoke more questions than answers, asking viewers not only to reassess the function of cultural institutions but also to reflect upon their presence within the histories on display. That is, when they can no longer passively consume and accept the presumed objectivity of cultural representation, they come to recognize our own biases and perspectives and the role they play in an understanding of the Other.

In 1992, working with the Baltimore Contemporary Museum and the Maryland Historical Society's permanent collection, Wilson created an installation entitled *Mining the Museum*, which was intended to challenge the presumed objectivity of museum installations. Using dialogue as a critical component of the work, Wilson directly engages the visitors in conversation about the exhibition with posters in the elevators with texts that read, "What is it?" Where is it?" "What is it saying?" "Who is represented?" Who is doing the telling?" "Hearing?" "What do you see?" "Where are you?" (González, 27). For this piece, Wilson searched the archives of objects owned by the Maryland Historical Society and found among them contradictory references to nineteenth century society. For instance, along with beautifully crafted silver pieces he found slave shackles, in addition to exquisite examples of furniture design he found a wooden slave whipping post. In both instances, the beautiful artistic objects had been previously displayed as representations of culture in nineteenth century America, the shackles and post had not. Wilson reinserted the omitted pieces in his installation along with the art objects, thus reinterpreting and presenting another history at the confluence of multiple historical dialogues.

Mining the Museum challenges the notion that meaning resides in

objects and history is revealed simply through their display. Dialogues always exist between historical and contemporary objects, between artifacts and the wall labels that serve to both decipher and define simultaneously, between the stylistic codes of museum exhibition and the artifacts on display, between the institution and the artist, between the spectator and the exhibition itself, and finally between cultural history and contemporary experience. Through often–contradictory cultural conversations, deeper social and cultural understanding can emerge.

In his 1990 installation, *The Other Museum*, Wilson focused on the practices of ethnographic museums. He drew attention to the exotic view of African culture often perpetuated by museums through their display of so–called primitive cultural artifacts from Africa. This frequent curatorial device serves to distance the culture on display from the culture within which it is examined by presenting the culture as an exotic other detached from the contemporary concerns of a twentieth–century viewer. Wilson complicates this practice by recreating a sort of pseudo–natural history museum which includes a display comprised of African masks blindfolded with the flags of the British Empire that had colonized the countries from which the masks originated. One mask has a video projection of lips that speak the words, "Don't just look at me, listen to me. Don't just own me, understand me. Don't just talk about me, talk to me. I am still alive" (Wilson, quoted in González, 25). The video projection makes literal his desire to establish a conversation by speaking directly to the viewer inviting dialogue.

Wilson's work rejects the assumption of a universal historical truth and acknowledges the conditional, partial truths that circulate within any collective context whether social, political, or aesthetic, and recognizes that meaning can be achieved only through an open exchange of thoughts and ideas. His work "brings the various languages and codes of culture into relationship with each other in an effort to reveal the contradictions and complexity of human existence" (Berger, 2001, 12). Wilson's work encourages opening dialogue since it relies on this conversation for its meaning. When asked about what he hoped a viewer would take away from his work, Wilson replied,

> Through the context of my installation you begin to see things differently. All of a sudden, the rest of the museum seemed to be very much someone's point of view about history and

> culture. . . . If you take away from my installation the idea of the museum's inherent subjectivity, that the institution is not entirely objective and that it is made up of various people's desires, biases, and assumptions about the world, you can rethink your own relationship to the museum. . . . Its seamless ability to encourage passivity among its visitors is shattered and is replaced by an actively engaged, thinking, feeling audience. (Wilson, quoted in Berger, 39)

Both Wilson and Hammons address issues of identity, social justice, and cultural representation through critiques of the influence of institutional power. Osorio does so as well but also inserts an intensely personal component into his work through critical examinations of intimate social structures such as family relationships, personal crises, and basic human interaction. His work provokes reflection from the viewer on the immigrant experience in North America by inserting private experiences into public space. Most of Osorio's installations are first presented in public spaces outside of the museum environment where they can be considered within the cultural discourse of everyday life. It is the infusion of the personal into Osorio's work that provides an opportunity for dialogue that begins with common experience.

Before embarking on a career in art, Osorio worked as a social worker in the Bronx. In this capacity he witnessed, first hand, family trauma that had unfortunately become such a common component of the minority urban experience. This work influenced much of Osorio's art, in particular his emphasis on the family as both a literal and a metaphorical site for critical reflection on the immigrant experience. Out of this experience, Osorio developed *Badge of Honor* (Serwer, 1996, 14).

For *Badge of Honor*, Osorio interviewed a young boy and his incarcerated father independently. By first videotaping the son's questions and then videotaping the father responding to his son's comments, Osorio was able to represent a conversation that did not and perhaps never could have occurred. To provide a context for the exchange, Osorio built exaggerated versions of both the prison cell and the son's bedroom and projected each half of the conversation on opposite walls facing each other but divided by a central wall. The prison cell was a stark, empty room with a cot and a pair of shoes, while the son's room was

literally filled with objects representing the youthful interests of a young boy such as, baseball cards covering the walls, the Puerto Rican flag, posters of popular movie and athletic stars, basketballs, an unkempt bed, etc. Osorio represents the reality of this family relationship and allows the viewer to visually enter these rooms and this dialogue as the only participant able to witness both sides of the conversation in real time. Since the work was exhibited in a storefront in a predominantly Latino section of Newark, New Jersey, viewers became not simply voyeuristic bystanders but rather the very link that connects the father and son. In this position the viewer becomes both social interpreter and translator of the conversation. Confronted by the starkly contrasting spaces of the nearly empty prison cell and the material extravagance and Latino *machismo* of the son's room overlaid with a conversation that speaks to family values, masculinity, familial roles, regrets, dreams and intimacy, viewers were forced to contemplate the role these issues play in the lives of other residents in the community as well as in their own lives. Yet these references also allude to broader conflicting issues relating to the immigrant experience in the United States: "empowerment and disenfranchisement, belonging and displacement, exile and transculturation" (Herzberg, 2000, 58).

Osorio's work centers around dialogue, yet that dialogue is not only between the viewer and the objects and characters represented in the work but also implies dialogue between the viewer and the world, between one viewer and another, between the artist and the viewer, and perhaps most importantly between the viewer and himself or herself. Describing another piece, Osorio makes this last point clear when he says, "As you stand and you are not allowed to come in[,] then you need to reflect and you need to confront yourself almost as if I stand a giant mirror right in front of you" (Osorio in Sollins, et al., 2004 *video*). Osorio's work can promote dialogue among students who are seemingly far removed from the concerns of minority culture in contemporary America since it makes clear the interconnected nature of any discussion that arises surrounding issues of political representation, cultural identity, and social justice. While we may perceive ourselves as socially outside these situations, Osorio, Hammons, and Wilson make it clear that we are always already part of the conversation.

Dialogic Learning

While one can learn facts through a unidirectional presentation of information, understanding occurs only when students can apply new ideas to everyday experiences and ask questions generated by new knowledge (Wiggins and McTighe, 1998). The difficulty encountered in this construction arises when the language of art is unfamiliar to students who have little or no background in the arts and when the artists' experiences are both socially and culturally alien to those of the students. Investigation of issues of diversity through art is enhanced when students are provoked by the art in a manner that encourages them to talk back to the artists and feel as if they are engaged in a conversation with the ideas presented by the art. Dialogue is a central component of the work described in this paper. It is the participation of a curious observer that activates the work, allowing it to speak to the viewer and encouraging the viewer to respond both intellectually and personally in order to create meaning. In my experience in trying to encourage thoughtful reflection on cultural diversity in classrooms with little ethnic diversity, productive dialogue is generated when the artist's work is explicitly designed to challenge common assumptions about cultural difference. Furthermore, artwork installed in public spaces addressing issues that resonate in the students' lives, although from a culturally unfamiliar perspective, seems to provide a familiar space within which students feel comfortable discussing the issues being raised.

Dialogue has been a part of the educational process since the time of Socrates. Using the Socratic method requires that the teacher "have the knowledge and experience required to ask appropriate questions and the capacity to reveal contradictions in the answers provided by the conversational partners" (Renshaw, 2). In this manner, dialogue replaces the simple transmission of information by placing both the teacher and the learner in the same "theatre of inquiry" (3). Paulo Freire (1982) embraced dialogue in education as a means to empower working class individuals by becoming literate in the language of the ruling class so that they might participate fully in social, cultural, and economic dialogue: "Dialogue for Freire was not simply the description of an interactive exchange between people but a normative definition of how human relationships would be formed, namely, on the basis of equality,

respect, and a commitment to the authentic interests of participants" (Renshaw, 1). In both cases, these educators rejected the notion of a model of education that situates authority in the instructor. Learning was not achieved through the consumption and recitation of information but in the subsequent dialogue that information provokes.

The philosophical construction of language and dialogue found in the work of Mikhail Bakhtin helps us to understand the function of dialogue pertaining to inquiry as it relates to cultural diversity. He suggests that dialogue that occurs between the self and the other comprises knowledge and understanding. "*To be*," he writes, "means *to communicate*" (Holloway and Kneale, 287). For Bakhtin, thinking is precisely located in speech "occurring between a speaker and a real or imagined audience without which one's utterances or thoughts could not make sense" (Renshaw, 4). Within this construction, the inquirer, or the student, is unable to complete his or her own understanding of himself or herself without a relationship with another through dialogue.

Part of Bakhtin's construction relies on location as a component of dialogue. That is, if I am located in front of another person, I cannot locate myself visually in the world that is behind me, while the person with whom I am speaking can situate me within my environment. As each individual in conversation relocates, the nature of the dialogue and the questions and knowledge arising from that dialogue continue to change, thus making simple conclusions not only incomplete but necessarily impossible. Dialogical knowledge is thus a type of understanding that relies on conversation, interpretation, and reinterpretation of our own position as well as our surroundings. In the context of cultural understanding, these surroundings include not only physical objects and spaces but also political, social, psychological, and ideological elements that compose our perspective on the world. Thus it is only through contact with others that our perspectives can be both challenged and reinforced. Bakhtin's analysis of dialogue "highlights how meaning necessarily is constructed interactively through drawing upon and revoicing the languages of others" (Renshaw, 5).

Dialogue resulting from contact with artwork is often of a different nature than conversations with individuals. Generally, students do not feel that the artwork speaks to them; rather, they understand that an artist is perhaps speaking through his or her art. The work produced by

Osorio, Wilson, and Hammons reflects each of their voices, yet it does not rely on their presence to communicate and provoke conversation. To spark such communication in their absence, these artists place their work in public settings and in spaces where a social dialogue already exists and so implicitly insert their voice into this conversation. Furthermore, through the placement of their works, they locate their voices in the everyday spaces of public life; those who come into contact with the work are compelled to respond. It is the public aspect of this work and its explicit desire to provoke and question that makes it a productive vehicle through which to promote dialogue about issues of diversity. Additionally, since each of these artists situates their work within the everyday languages of daily life, the environment within which viewers come into contact with the work is space informed by the common language and experiences of both the viewer and the artist. As a result, viewers can feel that they are already part of the social dialogue into which this work has been situated, thus creating an environment conducive to the sharing of ideas. In the classroom, I have observed that discussions regarding issues of diversity occur more easily when the content of the artwork presented and the language through which it is communicated is at least partially familiar. Dialogue in this manner is not simply conversation, it is a process towards establishing a community in which ideas and questions can be developed and exchanged in a common language. Renshaw (2004) argues that "coming together around agreed goals, beliefs, strategies and activities in the classroom is a necessary condition for the recognition of difference and the exploration of diverse viewpoints" (8).

Conclusion

Through their work, Osorio, Hammons, and Wilson represent the significance, the uniqueness, and the beauty of the complex experience of ethnic identity in the United States. These artists insert their voices into public spaces and infiltrate public dialogues through provocative manipulations of the familiar and through creating new spaces within which alternative discourse can be produced. Within an art classroom experience based on dialogue, artworks are incorporated as another speaking component of ongoing conversation rather than simply as

catalysts for discussion. Artworks are *spoken to* and *with* rather than merely *talked about*. By exposing students to unfamiliar representations of familiar places, activities, and experiences through the work of these artists, I have found that they do not remain passive or simply feel sympathy, which would not necessarily require self–reflection or induce action. They tend to respond and initiate a dialogue with other students, the artist, the artwork, and another culture. The students initiate a dialogue that only they can complete. It is within these conversations and the spaces they create that students, regardless of ethnic, economic, geographic, or social background realize that they are already part of the broader discourse that both develops and defines the multicultural experience in North America. Dialogue becomes not simply an intellectual exercise but an exchange of points of view that contribute to an understanding of the world and one's place within it.

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Biography

Jack Richardson is visiting assistant professor in the Department of Art Education at the OSU—Newark. His research is a philosophical examination of geographical and aesthetic explorations of space as they relate to everyday experience and understanding of our environment. His current work explores the relationship between space and vision and how our exploration and understanding of this relationship can be used to guide inquiry in art education. He has presented papers at national and international conferences and recently published "Creating Situations: Drifting as Critical Inquiry" in the *Journal for Cultural Research in Art Education* and presented a paper entitled, "Producing

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Best Practice Teaching For College Classes

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When people think back to influential teachers they have had in their life, it is probably not because of the subject they taught but because of a teacher's personality or how the subject was taught. Evidence for this observation comes from hearing a student say, "I love math because I had this awesome teacher, Mrs. Brown." Perhaps it was the teacher's classroom management style, the methodology utilized, or the sense of humor the teacher possessed; or perhaps it was a combination of these which is called Best Practices.

In defining the term "Best Practice Teaching," one may note many descriptive terms: standards–based, authentic, research based, etc. It is a phrase that was adopted after teaching practices that work were established. After the practices were recognized, the research began. Genuine Best Practice embraces certain educational ideas and activities while clearly ruling others out (Daniels and Bizar 11). An indisputable conclusion of research is that the quality of teaching makes a considerable difference in learning. Studies indicate that about five percent of the variation among children in reading achievement at the end of the school year is attributable to factors that relate to the skill and effectiveness of the teacher (Anderson 85).

The expression "Best Practice" was originally borrowed from the professions of medicine, law, and architecture, whereas "good practice" or "best practice" are everyday phrases used to describe solid, reputable, state–of–the–art work in a field (Zemelman, Daniels, and Hyde vi). Thirteen interlocking principles are identified by the same authors that characterize a paradigm of Best Practices:

> **Child–Centered.** The best starting point for schooling is kids' real interests. All across the curriculum, investigating students' own questions should always take precedence over studying arbitrarily and distantly selected content.
>
> **Experiential.** Active, hands–on, concrete experience is the most

powerful and natural form of learning. Students should be immersed in the most direct possible experience of the content of every subject.

Reflective. Balancing the immersion in direct experience must be opportunities for learners to look back, to reflect, to debrief, and to abstract from their experiences what they have felt, thought, and learned.

Authentic. Real, rich complex ideas and materials are at the heart of the curriculum. Lessons or textbooks which water down, control, or oversimplify content ultimately disempower students.

Holistic. Children learn best when they encounter whole, real ideas, events, and materials in purposeful contexts, and not by studying subparts isolated from actual use.

Social. Learning is always socially constructed and often interactional; teachers need to create classroom interactions which scaffold learning.

Collaborative. Cooperative learning activities tap the social power of learning better than competitive and individualistic approaches.

Democratic. The classroom is a model community; students learn that they live as citizens of the school.

Cognitive. The most powerful learning for children comes from developing true understanding of concepts and higher order thinking associated with various fields of inquiry and self–monitoring of their thinking.

Developmental. Children grow through a series of definable but not rigid stages, and schooling should fit its activities to the developmental level of students.

Psycholinguistic. The process of children's natural oral language acquisition provides our best model of complex human learning, and, once learned, language itself becomes the primary tool for learning, whatever the subject matter.

Constructivist. Children do not just receive content; in a very real sense, they recreate and reinvent every cognitive system they encounter, including language, literacy, and mathematics.

Challenging. Students learn best when faced with genuine

challenges, choices, and responsibility in their own learning. (Zemelman, Daniels, and Hyde 7 – 8)

Translating the first Best Practice to a college class means that the class needs to be student–centered. The effective teacher addresses people by name (Wong and Wong 77). Getting to know as much as possible about students not only makes them feel good, but it is also practical. At this point, the instructor becomes a real teacher. Also, it is important for teachers to share information about themselves. Such sharing obviously doesn't mean divulging the teacher's darkest secrets. It merely means that the teacher provides enough information to feel comfortable with students' knowing sufficient material so that the teacher and the students can carry on a conversation.

Classrooms can become experiential, the second Best Practice, by having the students actually do something more than just taking notes. Excellent teachers more often blend perspectives, intermeshing a variety of methods (Pressley 266).

The next Best Practice asks for classrooms to be reflective. Taking a few minutes at the end of the class to let the students reflect will positively impact any learning that occurred during the class. Simple journals, entrance tickets (questions answered based on the previous class), or exit tickets (questions answered upon leaving the class based on the day's presentation) are all effective teaching tools.

Outstanding primary–level literacy teachers (defined by their positive effects on the literacy achievement of their students) balance elements of whole language (e.g., immersion in authentic literature and writing experiences) and systematic skills instruction (Pressley 186). This practice can be carried through to the college level. Authentic classes are more than lessons from a text book; they are classes that are real and contain complex ideas. It takes a genuine and hard–working teacher to implement this type of instruction, but it is one that students will remember because the lessons will be internalized. Instructors need to take what they want to teach the students and have them translate that to what this personally means to them. If it sounds like considerable effort, it is; but without sounding redundant, it is worth it. Using labs, manipulatives, and real audiences are examples of how a classroom can become authentic.

Holistic classes present an entire image. How many times have we

all been in situations and ask ourselves, "Where is this going"? Many college students feel the same way. Simply tell the students your game plan. Better yet, write the day's agenda of your lesson on the board before you begin teaching. Trust me, the students will be impressed.

If one looks at the teacher as a person, he or she is portrayed as one who promotes social interactions with students (Stronge, Tucker, and Hindman 38). If a classroom is social, it certainly doesn't mean one based on parties or that it is a free–for–all. Social means your classroom is interactional; it is rich in discussion and active questioning, which you as a teacher support (scaffolds).

For years, when students were in grades K–12, we put the students in straight rows and told them not to look, touch, talk, and to do their own work. Later, when these same students found themselves in a team–oriented company, they floundered. Our students were taught not to collaborate. Collaboration gives students the social powers to work with a team. Give students the opportunity to discuss with partners, work on projects, or share a possible idea with a team member. Teachers will be surprised at the increased depth of the students' work. An example of this procedure at the college level would be to compare the depth and length of a brainstorming activity that is done with collaboration to the same brainstorming activity done as a solo project. As a caution and caveat, when students are working as a team, teachers should always give individual grades.

Making your classroom a model community allows it to become democratic. Won't these same students become better citizens if they have a say in what occurs in the classroom? Democracy certainly does not mean that the students take control; you as the teacher are still in charge. But educators can still be in charge and value the input of the students. Allowing open discussion is a winning situation for all. The more the students feel their input is valued, the more they will contribute to the class.

Best teaching practices state that classrooms must become more cognitive. The easiest way to do so is to revisit Benjamin Bloom's cognitive taxonomy. The lowest order of thinking skills is knowledge, and then the order spirals upward to include comprehension, application, analysis, synthesis, and finally, evaluation. The last three thinking skills, those being analysis, synthesis, and evaluation, refer to the area of critical

thinking skills. At workshops across the state of Ohio, it has been stressed that The Ohio Graduation Test has been constructed based on these three critical thinking skills. The SAT has been revised to include critical reading and writing skills; analogies have been replaced. Teachers need to examine and evaluate the products they ask their students to complete, from tests, papers, to projects.

In a previously defined list of Best Practices, it was stated that classes must become developmental. Children grow though a series of stages, and students do not enter the classroom at the same stage of development. Do professors accommodate these differences in our college classroom? Do college instructors make the erroneous assumption that everyone is at the same level? Minor changes to the curriculum, often based on Bloom's taxonomy, can raise the work to a higher thinking level.

As far as the psycholinguistic Best Practice is concerned, it is important to remember to listen to the college student. No matter what the subject material is, oral language is still the primary tool for learning. The quality of adult–child discourse is important, as is the amount of such interaction (Snow et al. 148). Are the students given the opportunity to ask questions as they arise? Are students put into cooperative learning groups with their peers? In this low–risk environment, students often venture to share ideas that they would not normally share. Do we as professors make ourselves available for the students to talk to us? Knowing as much as you can about your students is the benchmark of being a good teacher.

Constructivism means that students constantly re–create and re–invent the material that is given to them. The exemplary teachers use both transmission and constructivist models of learning (Morrow et al. 475). As stated earlier, the students come to college at different stages of development and have been exposed to a multitude of materials and experiences. Do the classes let the students take the material taught and permit them to file information in a manner that suits them? Do instructors let them use their material and take it to a higher level, or must the students stay with the rest of the class? Academic freedom is not reserved for teachers alone.

Finally, the last Best Practice deals with making the work challenging. Stars (good teachers) think in terms of maximum—not minimum—

standards (Haberman 28). Best Practices require that students learn best when we as teachers construct authentic and challenging materials. Don't teachers want the students to assume responsibility for their own learning? What's a good way to establish the student's responsibility? Give the students a choice. Tell the students that they must do either this or that, one of the three, or choose four of the five, but make them choose.

Using these Best Practices will hopefully promote lifelong learning for the student because the student is motivated. A motivational classroom is one that supports the development of active reading and creates contexts that satisfy the students' need for curiosity, aesthetic involvement, challenge, competitiveness, and social change. The most central of these needs is curiosity, the desire to know more about something (Guthrie 167).

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Biography

Ken Rosengarten graduated from The Ohio State University in 1972 with a B.S. in Education. From 1972–1995, he was a junior high language arts teacher in St. Henry, Ohio. During that time, Rosengarten earned his master's degree from Wright State University in classroom teaching with an emphasis on reading and language arts. In 1995, he became the Gifted Programs Supervisor for Mercer County Schools. While in this position, he earned licensure in gifted education, supervision, and a doctorate in education from Capella University. Rosengarten is currently an assistant professor of teacher education at Wright State University—Lake. He may be reached at kenneth.rosengarten@wright.edu.

Metacognition In Learning: Elementary Probability And Statistics

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Abstract

This study used qualitative research methods to identify metacognitive thoughts of adult students while learning concepts and solving problems, alone and in groups, in an elementary probability and statistics course. During data analysis, four common themes found in the literature emerged from the data: novice versus expert problem solving, statistics as a viable subject, self–reporting, and a cognitive–metacognitive framework. Interviewed students could be classified into one of two groups based on similar characteristics involving the themes. It was found that students can earn above–average grades using limited or no metacognition, but those who provided evidence of cognitive awareness and self–monitoring were better able to report an understanding of probability and statistics concepts.

Introduction

Cognition can be defined as the ability to think, including processing, storing, and retrieving information. Metacognition is a person's self–knowledge concerning cognitive processes and results that might affect learning. People have been interested in what others know about their own knowledge long before the word "metacognition" was coined. In the 17th century Descartes (1952) wrote that "if in the matters to be examined [,] we come to a step in [a] series [for] which our understanding is not sufficiently well able to have an intuitive cognition, we must stop short there . . ." (12). Descartes further indicated that "if we don't understand something [,] it helps to draw pictures or make a symbolic representation. This keeps easy facts clearly stated while we concentrate

on more complex ideas" (33). His set of rules for seeking truth was a very early predecessor to Pólya's problem solving work (Schoenfeld, 1992, 345).

In addition to Descartes, Spinoza (1632–1677) has been quoted as saying, "Also, if somebody knows something, then he knows that he knows it and at the same time he knows that he knows that he knows" (Weinert, 1987, 1). John Locke (1632–1704) defined reflection as the "'perception of the state of our own minds' or 'the notice which the mind takes of its own operations'" (Brown, 1987, 70). In their studies about mental processes, developmentalists such as Dewey and Piaget acknowledged that children learn by doing and by thinking about what they are doing (Kirkpatrick, 1985, 10). When Pólya (1957) developed his heuristics for problem solving, he was outlining ways for students to reflect on their progress and to assess the success of the procedures. He was providing "metacognitive prompts" for awareness of knowledge about problem solving and monitoring of work completed (Lester, 1985). Vygotsky's theory of internalization and zone of proximal development is closely related to the regulatory part of metacognition (Schoenfeld, 1987, 1992). According to Silver (1985), many other researchers have been interested in metacognitive skills but have labeled them as "control processes," "Test Operate Test Exit/TOTE," "reflective intelligence," and "executive scheme."

Another predecessor to metacognitive studies was Thorndike's (1917) study of 6th graders' errors in reading paragraphs. He reported that students read passages and failed to monitor their comprehension and even stated that they understood the reading when they often did not. He compared the novice students' mistakes in comprehension to the thoughts an expert reader might have while reading. The students would correct their mistakes if they were pointed out, but "they do not, however, of their own accord test their responses by thinking out their subtler or more remote implications" (331). Thorndike's work on improving the ability to think has had an impact on research in areas leading to mathematical cognition (Schoenfeld, 1992, 346).

In the 1950s researchers interested in the invention of computers and artificial intelligence refuted the then popular behaviorist movement and returned to the study of cognition and focused on metacognitive skills. Information processing looked at the structure of memory,

knowledge representations, retrieval processes, and problem solving rules. In a preface to a collection of edited doctoral theses, Minsky (1968) defined artificial intelligence as "the science of making machines do things that would require intelligence if done by men" (v). He explained that in order to make non–cognitive computers process cognitive information, researchers had to go beyond the behaviorist's point of view—input–output observables—to the mentalist's descriptions of thought processes which could also be called human cognition skills.

This renewed focus on the importance of human cognition supported the importance of humans reflecting on their cognitive processes (metacognition), but ". . . it was not until the early 1980s that control and other aspects of metacognition began to be a focus of attention for mathematical problem–solving researchers" (Lester, 1994, 671). Tulving and Madigan initiated the research field with metacognitive processes in their investigations into human memory (Campione, Brown, and Connell, 1989) and John H. Flavell (Flavell, Friedrichs, and Hoyt, 1970) transferred the interest in what humans know about their own memory to what they know about their own cognitive processes. His somewhat lengthy description of metacognition is often cited as a starting point for studies in mathematical problem solving (Garofalo and Lester, 1985; Lester, 1985; Schoenfeld, 1985, 1992):

> Metacognition refers to one's knowledge concerning one's own cognitive processes and products or anything related to them. . . . Metacognition refers, among other things, to the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects or data on which they bear, usually in the service of some concrete goal or objective. (Flavell, 1976, 232)

Today the leaders in metacognitive research agree that metacognition is an area that needs more research in domain specific studies (Kluwe, 1987; Lester, 1989; Shaughnessy, 1985, 1992). Cognitivists recognize that the problems students have in developing mathematical proficiency, a primary concern of mathematics education advocates, cannot be answered through intellectual concepts alone (Garofalo and Lester, 1985). Because we have not been able to pinpoint the reasons some students are successful in mathematics, we must go beyond strictly

cognitive issues; other factors that could include metacognitive skills may be involved as well.

Elementary probability and statistics curricula focus on data analysis and probability theory to build inferential skills. Answering novel, quantitative questions categorizes the subject as mathematical problem solving. Metacognition has been studied within problem solving, an area which has been difficult for many students for various reasons; learning to make decisions about collected data introduces additional difficulties. If students are aware of their own cognitive strengths and weaknesses and use them to monitor progress during problem solving, will they better understand probability and statistics concepts taught in undergraduate courses?

Relevant Research

Various methods for understanding the parts of cognition involve, among other things, the study of metacognition. Pólya's (1957) widely accepted phases of problem solving—understanding the problem, planning a method of solution, carrying out the plan, and verifying the answer derived—implied thinking about cognitive skills. Schoenfeld (1983) developed six transitional points at which thinking about cognition could be explicitly identified by the problem solver—reading the problem, analyzing what needs to be done, exploring different possibilities, planning the best solution, implementing the plan, and verifying the answer is an appropriate solution. Schoenfeld (1987) reported that explicit instruction on how to monitor progress was employed to teach problem solving skills to college students. His questions, (What (exactly) are you doing? Why are you doing it? and How does it help you? [206]) improved problem solving success. His work with students in small groups solving calculus, algebra, and geometry problems revealed the amount of thinking invested in appropriate and inappropriate solutions. In order for the subjects to develop into expert problem solvers (those who self–regulate their progress), they needed explicit instruction on how to develop a critical viewpoint (Schoenfeld, 1992). Lester, Garofalo, and Kroll (1989) developed a cognitive–metacognitive framework for determining appropriate mathematical problem solving instruction with seventh–

grade students and found that teacher modeling of metacognitive skills contributed to success during problem solving.

In an intervention program for students who had failed to learn the required mathematics for their biology program, Zan (2000) found that instruction in metacognitive skills improved attitude towards mathematics which in turn improved performance on assessments. Maqsud (1998) reported that attitude toward mathematics has a positive correlation with mathematics achievement and utilized individual discussions with students to emphasize the importance of monitoring progress in problem solving. His results showed that individualized, tailored teaching methods enhanced mathematics attitude and subsequently improved achievement with a group of students who previously did not score well on a mathematics achievement assessment. Anthony's (1996) study about active versus passive learning concludes that students' academic goals affect their learning strategies and that "to cope with the high level of cognitive, metacognitive, affective, and resource management demands, students must develop expertise in how to learn and use that expertise to construct useful knowledge" (365). These studies recognize the importance of looking beyond purely cognitive aspects in the processes of coming to know mathematics.

Many students come to elementary probability and statistics courses with weak mathematical and reading skills (Ainley and Pratt, 2001). These weaknesses perpetuate various types of anxieties, often resulting in a negative attitude that the course is more of a hurdle to be jumped to meet career goals rather than an area of viable knowledge. Many students conclude that statistics does not fit their professional goals because they are in school to achieve entry into a profession other than research (Beitz and Wolf, 1997).

Well, Pollatsek, and Boyce, (1990) researched students' difficulties in understanding good sampling procedures and found statistically that naïve students use inappropriate heuristics in attempting to reduce the complexities of some problems (289). In an attempt to discover why students make decisions (correct and incorrect) about sampling distribution questions, the researchers found that many students have misunderstandings in their interpretation of the law of large numbers. Tversky and Kahneman (1971) found that college students who hold a "belief in the law of small numbers" very often neglect the effect of

sample size and thus reveal a belief that sample size does not affect variability.

In addition, students bring strong intuitions to the classroom that could help in understanding probability and statistics concepts but more often cause obstacles to learning. Pre–developed obstacles make teaching elementary probability and statistics to college students a difficult task because pointing out misconceptions and explaining correct procedures often does not permanently change students' conceptions. Educators need to remember that students' intuitions may be at odds with theory presented in the prescribed curriculum. Fischbein (1975) states that "once the basic cognitive schemas of intelligence have stabilized (after 16–17 years of age), modifications to the intuitive substrate seem to be difficult, if not impossible" (12). Teaching probability and statistics should include refining primary intuitions into correct, secondary intuitions, an attempt which may be especially difficult for adult students.

Shaughnessy (1985) found that teaching successful problem solving requires the students' awareness of their thinking about cognition and suggested that self–monitoring and regulation should become a priority for instructors. Meaning is constructed through reflection, and metacognition is specific thought about one's own cognitive processes and how well progress is being made in solving problems: "For these reasons we believe there is much to be gained from studying the implications of probabilistic problem solving for general problem solving" (410).

Problem Statement

The principal tenet of "constructivism generally emphasizes that students construct knowledge by themselves, not by swallowing ready–made knowledge from the outside" (Hatano, 1996, 211). Facts can be passively communicated but meaning cannot. If it can be shown that self–monitoring of progress during problem solving results in students' successfully constructing meaning for probability and statistics concepts, mathematics educators could be better informed about the importance of identifying students' metacognitive thoughts: "If the critical role of metacognition can be made more clear, educators will be able to

incorporate metacognitive aspects into mathematics instruction" (Garofalo and Lester, 1985, 172).

The following three questions were addressed in designing, implementing, and analyzing this study:

1. What are the students doing cognitively to learn concepts in elementary probability and statistics?
2. What role does metacognition play when students are learning how to make decisions that require an understanding of probability and statistics concepts?
3. Is metacognition a necessary element for success in undergraduate elementary probability and statistics courses?

Before the study commenced, it was believed that college students who provide evidence of metacognition are more successful in learning elementary probability and statistics concepts. A successful student was defined as someone who earns a C or better on individual assessments or as a course grade.

Method

This study was conducted in one section of a college level elementary probability and statistics course at a Midwestern university during the ten–week, spring quarter of 2003. Forty–nine students were observed in their classroom setting. After the first midterm exam for the course was administered and returned, the students' test scores were arranged from lowest to highest and divided into quartiles. Ten students—five closest to the first quartile and five closest to the third quartile—were asked to participate in each of three types of activities outside the class—individual class notes review and individual and group problem solving. This method of selection was an effort to eliminate the top and bottom performers in the class from the rest of this study to examine similar types of students rather than include extreme performers and non–performers and to provide a cooperative mix of metacognitive and non–metacognitive thinkers. Because some students were willing to be observed in the class but did not wish to spend additional time outside class, only seven of the invited students continued with the study: four from the first quartile and three from the third quartile.

The individual class notes review sessions consisted of the

researcher and student reading class notes taken immediately preceding the interview. For approximately twenty minutes, the researcher read and asked each student questions such as "Why did you write this down?" and "What were you thinking here?" and "How well were you understanding this?" The questions were directed toward revealing metacognitive thoughts the student might have had in the classroom.

After each student completed the class notes review, he or she scheduled a time to meet with the researcher to solve one multistep statistical problem similar to one discussed in class. These individual interviews consisted of the participant solving, out loud, a problem similar to those discussed in class. Oral directions were: "As you solve this problem, please express out loud all your thoughts, attempts, mistakes, and restarts. The process of your thinking is what I'm interested in, not whether you solve it correctly." During the interview, questions such as "What do you find difficult?" and "How do you deal with that type of problem?" elicited metacognitive thoughts the student might have been using in statistical problem solving.

The third type of interview consisted of two separate sessions: one group of four students and another group of three students solving another multistep and somewhat familiar problem. The directions given to each group were: "Solve this statistical problem together as a group. Make sure you agree with each other and try to speak out loud what you are thinking and what you want the others to know. You are welcome to use the textbook, any calculator, your notes, or whatever you would like to use." During the two group sessions, the researcher acted as a guide, only answering students' questions and providing prompts when a group was "stuck" for too long of a time.

All of the students in the course could not be interviewed, which eliminates generalizing the results to all statistics students. The process of selecting the interviewees, however, did provide a sample representative of the students in this course section. The interviews were taped, transcribed, and coded for evidence of metacognitive behavior in these seven human subjects.

Results

Classroom Observations. Using Garofalo and Lester's (1985) metacognitive framework categories, orientation, organization, execution, and verification provided a method for organizing student behavior and comments. It appeared that the students who sat in the middle, near the front of the classroom participated (orientation) more than those seated in other locations. Few chances were given in class for the students to develop a plan before solving the problem (organization); the instructor presented various examples of the statistical theories and worked through the problems with guiding questions for the class to follow. Students did retrieve and use their calculators, which appeared to be evidence of organization. Students who participated in class, wrote in their notebooks, punched buttons on their calculators, and communicated with the instructor and with other students (execution). Examples of verification were students' finding the same number for a given problem or question, rather than addressing the reasonableness of the calculated number within the problem context. A fifth category, created by the researcher, called "lack" included possible missed opportunities when metacognitive skills would have been beneficial to the learning process but were not observed. Overall, the instructor provided many sample problems grounded in the statistical theories presented which he and students worked through together. This activity was beneficial for the students who participated; however, many students found other things to do in class or did not attend at all.

Out–Of–Class Interviews. The out–of–class interviews (class notes review, individual problem solving, and group problem solving) were recorded, transcribed, and entered into an electronic spreadsheet. As the data were coded according to the categories in Garofalo and Lester's (1985) metacognitive framework, evidence of otherwise invisible metacognitive processes became visible in the students' conversations while they discussed class notes and solved somewhat familiar problems individually and in a group.

Further analysis of the data resulted in identification of four literature–related themes: novice versus expert behavior (Schoenfeld, 1979), statistics as a viable subject (Greer, 1996), self–reporting (Ericsson and Simon, 1993), and Garofalo and Lester's (1985) cognitive–

metacognitive framework. First, a student was considered expert when he or she paid attention to the structure of a problem and posed critical questions while working through novel situations. A novice relied on intuition and feelings, rarely monitoring progress toward an appropriate solution (Schoenfeld, 1987). Second, indications that a student considered statistics to be a viable subject included the student's identifying areas outside the course in which statistics applied, such as polls and history courses. In contrast, if the student did not consider statistics related to real world applications or expressed a lack of interest in learning the concepts, he or she did not connect and/or recognize the potential usefulness of the concepts presented and had no reason to use or develop an understanding of probability and statistics concepts. Third, despite the problems identified with self–reporting, triangulation of multiple data types revealed various levels of awareness of and ability to report cognitive processes. "The difference between experts and advanced beginners is often not in whether they have the necessary knowledge in memory but in whether they can access it reliably when it is needed" (Ericcson and Simon, 1993, xli). Both accessing information and verbalizing thoughts aloud contributed to the students' evidence of veridical self–reporting. The fourth theme, the cognitive–metacognitive framework, provided the codes used in this study. Tallies of the students' evidences of metacognition and transcription page counts for class notes and individual problem solving interviews provided an estimate of how willingly students shared thoughts with the interviewer. During coding and data analysis, each of the four themes appeared somewhere in all seven of the students' transcripts.

Evidence from these interviews assisted in classifying students into one of two groups based on similar characteristics. In keeping with the four common themes of the literature on metacognition, the first category of students demonstrated expert problem solving skills, recognized benefits of knowing statistics outside the classroom, were fairly competent in reporting thoughts, and provided the most evidence of using metacognition while learning elementary probability and statistics. The second category of students demonstrated novice problem solving characteristics, either denounced statistical knowledge or failed to observe its existence outside the classroom, lacked self–reporting skills and/or abilities, and provided less evidence of metacognition use than the first category of students.

Discussion

This study addressed Shaughnessy's (1992) question about the role of metacognition in learning probability and statistics concepts. For these seven students, increased metacognitive thinking appeared to improve conceptual understanding or, perhaps, self–reporting of conceptual understanding. Each student's self–reporting efficiency was consistent across the interview types: students who revealed their thoughts in the individual interviews tended to contribute more to the discussions in the group interviews. Conclusions about the students who did not or could not report their thoughts required some speculation based on other behavior, such as identification of confusion or lack of participation, to form an opinion about successful learning of concepts. The data provided evidence of similarities of the interviewed students within the four themes from the literature.

The final course grade is the one characteristic that did not fall nicely into the two student categories. Six of the seven students earned a C or better, and only one student, who was categorized in the second group, earned a D–. The relationship between using metacognition and succeeding in the course was not evident for these students.

The fourth theme, Garofalo and Lester's (1985) cognitive–metacognitive framework, was a useful tool for identifying the students' comments and behavior. Categorizing observations according to orientation, organization, execution, and verification organized the data across the data sources (students), methods (interview types), and data types (cognitive–metacognitive framework categories) for triangulation across the four themes taken from literature. The framework provided a tool for making this study scientific.

The data results from both the class observations and student interviews provide explanation for the three guiding questions of this study. First, what were students doing cognitively to learn concepts in elementary probability and statistics? The students brought to the classroom previously constructed mathematical and social behavior knowledge developed through previous educational experience. Various levels of mathematical and reading comprehension skills were observed and most, if not all, of the students appeared to be aware of acceptable classroom behavior. They either paid attention to the instructor and

participated in class discussion or gave the impression that they were listening. Many students found other activities to do while instruction took place, such as reading other subjects, playing games, chatting quietly, or sleeping, but they did not disrupt the other students' learning. At times the students answered the instructor's questions and also posed some of their own to the instructor and/or to each other. It was noted that the students who participated outside the class, regularly attended class and paid attention.

In addition, each student had cognitively made a decision that the course met a requirement needed for graduation in their respective programs. After that decision was made, most of the students consciously made a decision, *a priori*, regarding the usefulness of learning the concepts presented. Students' beliefs about the course influenced the amount of work and participation they felt was necessary for meeting academic goals.

Second, what role did metacognition play when students were learning how to make decisions that require an understanding of probability and statistics concepts? The students who participated in class provided some evidence of metacognition, but because thinking is a covert activity, qualitative methods were necessary for uncovering thoughts and identifying learning. The seven students who participated in the out–of–class interviews provided the bulk of the analyzed data. These seven students used metacognitive skills at various levels.

Overall, each student's personal decision as to whether or not probability and statistics is a viable subject influenced how much and what types of metacognitions were employed to learn the concepts. The students who recognized probability and statistics concepts outside the classroom provided more evidence of metacognitive thinking than the students who either believed the concepts were not important or did not consider real world applications.

Third, is metacognition a necessary element for success in undergraduate elementary probability and statistics courses? Each of the interviewed students provided some evidence of metacognitive thinking, and six of them earned a course grade of C or better. Comparing the student categories by final course grade might reveal that metacognition is necessary for only some students. However, by comparing interview contributions to the four emergent themes, one

finds that a different definition of success emerges: conceptual understanding. Students in the first category could conceptually explain their thinking better than those in the second category. It appears that using metacognition is not necessary for success; it may be helpful for only some students.

Two limitations of this study were the ability to generalize and the definition of successful. First, not all students were interviewed, which eliminates inference onto the population of statistics students in and out of the classroom. The results of this study describe only what was observed during a ten–week period within the course environment. Second, midterm exams were not analyzed; students' errors were not identified. Were they simple arithmetic errors, or was there a lack of understanding calculated answers in the problems? To improve this study, a researcher must take a closer look at answers to the exam questions to help identify if course grades were based on conceptual understanding or only on ability to recall and follow appropriate algorithms.

This study adds to the literature by examining metacognition and problem solving in conjunction with elementary probability and statistics. It is still not clear as to what types of students benefit the most from metacognition. Another variable of affect and/or beliefs and success in learning probability and statistics concepts within a metacognitive framework would be a viable next step.

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Biography

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Improving Education: Partnering With Our Communities

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Abstract

As a land grant university, Ohio State University's mission is to serve the citizens of Ohio. The strength of K–12 Outreach at Ohio State—Lima is that all programs are developed in partnerships with schools and community members and all programs are designed to improve the quality of education for our youth. Currently, K–12 Outreach operates six outreach programs that serve youth in grades K–12 in our service area. Our programs fill a unique niche since these programs are hands–on interactive, experiential learning experiences that respond to an identified educational need. Most programs are offered in classrooms, although all programs are available to community agencies. Outreach staff has been successful in maintaining these programs over time through development activities, fees charged to schools, and contributions. Each year our K–12 Outreach programs reach between 6,000 and 8,000 students. Ohio State—Lima has established collaborations with schools, businesses, and local and state organizations that enable these programs to grow. Partnering with communities also meets another university goal: outreach and engagement with our constituents.

Outreach And Engagement

Ohio State University—Lima brings together an internationally recognized faculty and dedicated, professional staff to create a unique learning environment for all students. Here, students interact closely with faculty to pursue intellectual growth and prepare themselves for the future. We mobilize the resources of Ohio State University for the benefit of the communities we serve by bringing our programs to schools.

Outreach and Engagement at Ohio State University is defined in the Academic Plan as "a mutually beneficial collaboration with partners in education, business, the public and social services . . . and that aspect of service that directly benefits the public."[1] Education and educational systems are categories highlighted in the Academic Plan under Outreach and Engagement, which further states that there is an intent to "develop and support" a University wide initiative in K–12 education.

Universities interacting with their communities is not a new idea. The Kellogg Commission's report on *The Future of State and Land–Grant Universities* (1999)[2] suggested that universities strengthen the link between universities and communities and "revitalize our partnerships with elementary and secondary schools" (vi). Many subsequent reports have also called upon universities to reach out to their constituents. (See for example, Pasque, et al. [2005][3] which contains a series of articles articulating relationships between the university and the community.)

The mission of K–12 Outreach at Ohio State—Lima is to develop effective university community partnerships that are mutually beneficial to the populations we serve and that improve the quality of education for youth K–12. Therefore, K–12 Outreach:

Collaborates with schools and agencies to develop innovative programs;
Provides leadership to maximize community resources;
Responds to community needs, especially in the area of science and mathematics education;
Provides professional development opportunities; and
Brings the resources of the university to the community.

K–12 Outreach at Ohio State—Lima is a leader in providing quality hands–on educational opportunities for students in our 10–county area in Northwest Central Ohio. The area is composed of one urban district as well as suburban and rural communities. Many of the schools in our communities are facing severe budget cuts. Our response is to try to develop outside funding through local agencies and grants that help to support schools to continue to offer their students unique education programs.

K–12 Outreach at Lima, previously known as Education Outreach, has a history of developing and sustaining quality education programs that meet community needs, align to state curriculum standards, and

model effective teaching. Currently, we offer six different outreach programs. Last year we reached over 6,000 students, teachers, and families in nine different counties. However, there are still many schools, districts, and community agencies that do not realize what a significant resource Ohio State—Lima may become for their schools.

Programs

The following is a brief description of some of our K–12 programs. (For additional information, see http://www.lima.ohio–state.edu/academics/Outreach/programs.htm for a more complete description.) Each program meets an educational need identified by teachers. With the exception of the Starlab portable planetarium, all programs were created in partnership with grade level teachers in response to a request to develop an activity that would enable teachers to enhance the curriculum through hands–on interactive learning.

The Starlab[4] Portable Planetarium. Students become astronomers and view the night sky, the solar system, Lewis and Clark's journey west, and learn about mythology. The portable planetarium is inflatable and is 11 feet tall with a 16 foot diameter and accommodates 25 students. The planetarium operates with a projector and projection cylinders that are interchangeable and create the images inside the dome—constellations, planets, and more. Teachers have the option of choosing one of 11 different programs. In addition, given our increasing concern about childhood obesity in our area, the cylinder on The Cell familiarizes students with biology and nutrition as students watch cells move across the inside of the planetarium. Follow–up activities focus on innovative physical activities in which all students can participate and promote healthy life–styles. Activities that take place outside the planetarium and that can be used to complement the planetarium include learning about solar motion devices, circuits, tools for data collecting when conducting investigations, cells, inherited traits, and extinction of species. Each planetarium session is approximately 1–1.5 hours. Programs are tailored to meet curriculum K–12 and teachers' educational focus. Multiple classes in a school have the option to schedule the program for an entire day.

Inquiry, Scientists And The Environment (ISE)[5] is a two hour

classroom activity that links science and mathematics to real world environmental applications. Children become engaged in learning about and problem solving hypothetical local environmental issues related to the 5th and 6th grade science, mathematics, and social studies curriculum. Children don labs coats and become scientists as they have to decide where to build a new school (5th grade) or how to rebuild an area hit by a tornado (6th grade) and still protect threatened and endangered species and habitat.

The Many Hats Of Agriculture[6] is a different two–hour program for 3rd and 4th grade students. Students are divided into four different groups, and each team becomes a different factor of production in Ohio. Through hands–on art and creative dramatics, this classroom activity provides 3rd and 4th graders with an introduction to Ohio's big business of agriculture. Children (and their families) are introduced to over 30 careers related to agribusiness and agricultural products. This program was developed with an eye toward creating an engaging opportunity for children to begin to understand the importance of agribusiness in Ohio. The Many Puppets Of Agriculture[7] is a similar program for 2nd graders.

In addition to developing and implementing classroom–based traveling activities, K–12 Outreach also partners with schools and agencies to develop and implement going programs. Our Environment, Changing Over Time[8] is an integral component of the Lima City Schools 21st Century after–school program. We deliver the environmental education component of the program to 4th graders in each of three after–school locations.

High School

At the high school level, K–12 Outreach staff has provided an environmental education program to youth at three alternative schools in Allen County. The youth involved have all been at–risk youth, and all programs have been tailored to meet their needs by developing hands–on activities that engage students, reflect their reading abilities, and at the same time deliver high school environmental education curriculum. At this time, K–12 Outreach provides environmental education activities at the Opportunity for Parenting Teens Center, an alternative program that enables pregnant and parenting teens to complete their high school

education. In addition to this program, staff are aligning the Ford Partnerships for Advanced Studies (PAS)[9] curriculum, an integrated high school program, with Ohio content standards. The campus is also a partner in delivering the PAS program to pregnant and parenting teens.

Teacher evaluations of outreach programs are consistently high, and teachers state that their students remember these hands–on activities. One teacher noted that this program was better than a field trip to a hands–on science center. Amazingly, one student who had participated in Many Hats saved a picture of herself participating in the 3rd grade program and showed it to us as we began the 4th grade program with her class. Teachers who have participated in programs in prior years are now asking us to help find ways to continue to offer these quality innovative programs in times of financial need. All program activities are aligned to new state academic curriculum standards, benchmarks, and indicators. Teachers appreciate our innovative approach; students enjoy the activities and hardly realize they are learning information that they will be tested on in the future.

Diminishing Budgets And Maintaining Quality

When we began outreach activities in the mid 90s, school funding was radically different from what it is today. Levies were passed more often, and health care costs were not increasing at such a rapid rate[10]. Paying for Outreach programs was once routine; now it is a luxury to many schools. But even in these hard budget times, some schools are finding the resources to schedule K–12 Outreach programs. Many teachers have called to ask if we know about funding sources to help offset some of the cost of outreach activities and whenever possible Outreach staff provides a list of grant opportunities.

So, we need to ask the question, how can a regional campus maintain quality outreach programs in a time of declining school budgets? In part, our success stems from developing a dedicated clientele. We have also been smart about targeting grant funds. Many of these programs were developed with grant funding and were originally offered at a reduced cost. (Programs generally cost $100 per classroom session.) As programs continue and school budgets decrease, we have also asked our educational partners (career and

technical education personnel) and local businesses to provide full or partial support for classroom participation. Our sponsors have been very generous, and we acknowledge their support on all materials.

Lesson Plans

What have we learned over the past nine years?

1) Our partners and their support are crucial to our success.

2) Not only do they fund programs but they promote programs too.

3) Recognizing our partners in all program materials is important. All written materials and Web–based information highlights our sponsors.

4) One of the surprising things we have learned over the past few years is that offering programs "free of charge" is not necessarily a good strategy. It appears that requiring schools to have a "co–pay" increases the value of the program.

5) Developing a Web page that enables schools to schedule programs on–line has also increased the number of programs scheduled. Easy access to scheduling is a helpful strategy.

Collaboration is essential to survival, and partnerships need to be nurtured. Programs take time to grow, and we need to give activities time to show their value as related to curriculum and content standards. In an era of decreasing state and local educational budgets, it will become more and more difficult to sustain outreach activities. On the other hand, for Ohio State Outreach is now firmly embedded in the mission of the university. Our constituents expect us to be able to deliver quality programs that enhance curriculum, and we intend to meet this need. At this time, as long as OSU—Lima continues to offer unique programs that are aligned to state standards, we will be able to continue to offer outreach activities in our ten county area. However, it may be a time to create new alliances and partnerships both within the university and in the community to ensure that we can sustain quality programs that enhance the educational opportunities for student K–12 in our service area.

Notes

[1] http://outreach.osu.edu/.

[2] *Returning To Our Roots: The Engaged Institution*. National Association Of State Universities And Land Grant Colleges.

[3] Pasque, P.A., Smerek, R.E., Brighid, D., Bowman, N., and Mallory B.L. Eds. (2005). *Higher Education Collaboratives For Community Engagement And Improvement*. National Forum On Higher Education For The Public Good, University Of MI: Ann Arbor.

[4] The Starlab Planetarium is funded by American Electric.

[5] Originally funded by the Ohio Environmental Education Fund.

[6] Development funding from OSU Cares.

[7] Initial Funding from The Martha Holden Jennings Foundation.

[8] Funded originally by The Ohio Environmental Education Fund.

[9] For additional information on Ford Partnership For Advanced Studies, see http:// www.fordpas.org.

[10] Ohio's school funding system does not provide for routine growth in revenues but relies on school levies and, at times, local taxes (http://home.fuse.net/fixohioschoolfunding/index.html). In August 2005 only 37.2% of the school levies passed (http://ohiofairschools.org/).

Biographies

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Designing An Educational Game For The Fun Of Learning

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Abstract

This paper describes how to shake up teaching and learning with an educational game. It suggests how to borrow from a well–recognized game or game show format for use in class. Faculty and student challenges related to gaming are discussed. Examples of implementation ideas for gaming based on board games and popular game show formats are included. The importance of gaming evaluation is explained.

Introduction

Shake up your classroom and make learning more fun by choosing gaming as a learning strategy. Gaming is a way to encourage students to actively participate in the classroom. Gaming can provide the challenge of competition in a relaxed atmosphere. Gaming is an opportunity to inject humor and fun into student–centered learning.

Instructionally, gaming can be used to reinforce facts, acquire knowledge and skills, practice problem–solving and decision making, and promote team building. Gaming strategies can be designed in such a way to provide supportive learning environments in which students can experiment without the risk of failure that may exist in a "real life" situation (Sealover and Henderson, 2005).

Faculty members are faced with challenges when planning to add any instructional strategy. When considering gaming, faculty members may be too intimidated to try a new instructional strategy that could produce unknown results. Faculty challenges related to designing and utilizing gaming include increased planning and preparation time and increased costs to develop the game and maintain it for future classes.

Another challenge is that measuring learning outcomes with gaming can be difficult and requires the formation of an evaluation plan prior to implementation. A final challenge is that most gaming strategies do not allow for measuring individual student performance; therefore, it is important to plan alternate methods of assessing individual learning.

Student challenges related to learning by gaming include possible added stress or embarrassment when they answer incorrectly. Minimize embarrassment by structuring the game to include teams or pairs. The collaboration between students may have the added benefit of increasing critical thinking and therefore learning. Another student challenge is the potential threat that competition poses for some students. Student satisfaction with this learning strategy can be enhanced by providing opportunities for all students to be successful. Being successful does not necessitate winning. Some students are reluctant to actively participate in any learning strategy (including gaming) but once involved may enjoy learning through gaming. One strategy to entice participation is to involve students in choosing team members or naming their team. Enjoyment is enhanced by creating excitement through the use of props or choosing a popular game or well known game show format. Well known game types include: board games, card games, puzzle games, cash games, computer games, simulation games, paper and pencil games, and popular game show format games (Henderson, 2005, 235). Many types of games can be created or purchased commercially.

Implementing Gaming: Examples

Board Games. Board games can be created by the faculty or adapted from a commercially available game and used in a small group. A game board can also be created and projected on an overhead or from a computer screen for classroom participation. Some of the advantages of using a game that incorporates a game board include that it is inexpensive to create, it is reusable, and it is easy to transport.

Design your own game board and game. One example of how to do so is described. Cut out a pathway for your game using a dark colored felt or hard stock paper. Cut out multiple squares in four different bright colors, and glue them along the dark board sequentially (green, yellow, pink, purple, green . . .). Make four categories of cards out of

corresponding bright colors used in the game board. Each card should continue a question or situation, answers, and the instructions if the answer is correct (move ahead three spaces) or incorrect (move back two spaces). Make ample questions for each category. The student, pair of students, or even a row of students roll a dice and then move their game piece the number of squares on the dice. The color they land on will decide which color category of question they will receive. They are given the question with a chance to answer. They will then be given the directions on moving their game piece further based on a correct or incorrect answer. The first student or group of students to make it through the game board wins the game. Improve knowledge and critical thinking by discussing the rationale for correct or incorrect answers.

Game Show Format Games. Popular game show formats can be adapted for use in classrooms and smaller groups. There are many free or commercially designed game show templates available which can be customized to content of particular classes. Some templates have been created for use on presentation software and can be projected for use in a classroom. The game show *Jeopardy* is one such game that is commercially available and also available through freeware on the Internet. There are also commercially available products to allow a game to be played with electronic answering devices (buzzers) that will track individual answers. These devices have a range of complexities related to the number of students that can play at one time and ease of use. Some devices are hardwired connected to a main station which can be cumbersome in some environments. More expensive and complex wireless versions are now available. Some versions can save individual answers and tally results on an electronic score board. The expense rises with each added feature. You can also choose to develop your own props or add toys related to known game show formats. The literature suggests choosing toys for use only when they have a purpose and are directly related to the game (Malone, 1981; Malone and Lepper, 1987). Some examples of game show formats that can easily be adapted for use include: *Jeopardy*, *Wheel of Fortune*, *So You Want To Be A Millionaire*, *Family Feud*, and *Name That Tune*. Adapting a game show format requires creativity and identification of how the rules of the game can be adapted to fit your subject matter.

One example of how to use a well known game show format is

adapted from *So You Want To Be A Millionaire*. The faculty can develop multiple choice questions of increasing difficulty based on content in the discipline. Students can play as individuals, pairs, or on teams. You can have two or more groups of students compete with each other. As students or teams answer each question, you can increase the level of the reward. Examples of ways to reward students include points, play money, or candy. You can provide three "life lines" such as "call a friend," "poll the audience," or "50/50 answer elimination." This game can be played with cards, paper, or projected on a computer screen.

Evaluating Gaming Success

To help ensure instructional success with gaming, establish measurable learning outcomes prior to game selection. Faculty need to assess the value of a particular game based on learning outcomes and then determine that the knowledge and skills gained through the game will be accurate and reflect what happens in the real world. In other words, adding a game just to say you are adding fun to your course is not an instructionally sound strategy.

Assessing the value of the game will include considering validity, reliability, and utility (Henderson, 2005, 236–67). Validity in gaming is assessed by determining that the game does what it claims to do and has elements of tasks that learners would face in the real world. Reliability in gaming is assessed by determining that the game produces consistent and predictable outcomes. Utility in gaming is assessed by identifying the benefits that arise from the use of the game balanced against the investment of time, money, and resources.

Evaluation of student learning can be accomplished through formal assessment (testing and performance) and measuring student satisfaction with the game. It is important especially when utilizing new learning strategies to elicit formal student feedback and measure learning outcomes to help establish validity. Periodic measurement of learning outcome assessment and student satisfaction will establish reliability. Meaningful evaluation requires pre–planning and adoption of evaluation methods prior to utilizing the gaming strategy. Providing the opportunity for students to share their perceptions of learning will establish individual and group levels of satisfaction as well as provide valuable insight for

faculty about what works well and what does not when using a game.

Conclusion

Gaming can definitely shake up teaching and learning. While there are many challenges for both faculty and students, the benefits of actively engaging students in learning is well worth the effort. Once you decide to add gaming to class, allow time for planning and preparation. If a goal is measuring learning outcomes, include an evaluation method in the planning stage. Take a chance and see what gaming can do to facilitate learning in your classroom.

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Biography

Pamela S. Sealover is an assistant professor at Ohio University—Zanesville in the School of Nursing. Sealover received her Diploma of Nursing at Mount Carmel School of Nursing, her BSN from Franklin University, and her MS in Nursing from Wright State University—Miami Valley. She has greater than 20 years of experience in nursing and greater than 10 years in nursing education. She is very interested in active learning, gaming, and the use of innovative techniques to improve learning outcomes for students.

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Dick And Jane On–line: Implications Of Gender Differences For Distance Learning

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Abstract

This project specifically probed for the existence of any gender gap among acknowledged computer users with particular emphasis on distance education. The authors represented different disciplines and looked at different aspects of the topics: availability of computers, levels of Internet accessibility, rates of computer usage, specific software usage by different levels of education and age, disparities, preferences of learning styles, and cross–cultural preferences. The emergence of multimedia computing and the development of Internet facilities are being echoed now in distance education. Access to technology is key to the development and the process employed in that enterprise. That males and females differ in their access to and use of computers is well–known. How this affects distance education efforts is less understood. As educators, we need to understand the advantages and disadvantages of the Internet as a course delivery medium and the differences in usage styles and learning modes of men and women. The success or failure of distance education initiatives may ultimately depend upon a basic understanding of the audience's gender and age.

Review Of The Literature

The emergence of multimedia computing and the development of the Internet have had a profound impact on distance education. These technologies have led to the creation of interactive Web–based learning which integrates audio, graphics, animation, and text. The combination

has enhanced the educational interactivity of course delivery and facilitated learning for students separated from their teachers in time and space. The accessibility to and use of computer technology are of great significance to the process of distance education. They allow distant learners access to library and other resources. The availability and convenience of Web–based written communication helps reduce feelings of isolation. Distance education learners establish communications with university staff and with each other which help them establish a strong identity with the university culture while acknowledging their role as students (Hipp, 1997).

For many years, research has documented the existence of a gap between boys and girls in math and science (Aman, 1985; Wittenburg, 2000). Recently, research has addressed the gender gap in technology. Does it exist? Should it be a concern? What can be done about it? What are the differences between gender regarding uses of technology? Although the research indicates that math participation and achievement among females between 1990 and 1994 improved, this achievement did not happen in computer science and use of technology; thus, the gap was probably still present at that point (Wittenburg, 2000).

The 1998 AAUW Educational Foundation's Technology Commission report "Gender Gaps" noted that women held only 28% of bachelor and 24% of master degrees in computer science, and 19% in engineering–related technologies (Wittenburg, 2000). According to this report, women and men are not equally prepared for the job, and so women are not taking advantage of economic opportunities and not participating fully and meaningfully in the computer communication media. We know there are gender differences in cultural beliefs, learning procedures, and communication strategies. Women talk about technology as a tool to do things; men talk about it as a kind of "weapon." Women talk about using the tool, but men talk about the power the technology gives them. The psychologist Cornelia Brunner in her speech "The Internet and Computer Games Reinforce the Gender Gap" said that women ask technology for flexibility but that men ask it for speed. Women, Brunner said, use the computer to share ideas, but men think about the autonomy the technology grants them (Rabasca, 2000).

Males and females differ in terms of their access to and use of computers as well as when, where, and how they use them (Kirkpatrick

and Cuban, 1998). Compared to females, males have computers at home at the higher ratio. They also use computers they own twice as much as females who own computers (Kirkpatrick and Cuban, 1998). Another study indicated that the differences in use were mostly with home computers (Young, 2000). Shashaani (1994) indicated that the disparities increase with age, being much less at young school ages and more pronounced approaching college levels. Hoai–An (1993) stated that, in terms of on–line learning and Internet connectivity, females comprise between only 10 and 15 percent of the on–line population. This inequality in Internet connectivity is a cause for concern because distance education plays an important role in reducing the gender gap in terms of computer availability and accessibility by the very nature of the function of the computer itself to support and facilitate distance learning activities. The same study reported equal access to and use of computers between the genders. The study thus indicates that female learners gain as much experience and confidence as their male counterparts, leading to equal proficiency with computers. Universities and colleges play an important role in making female learners more competitive in computer–related skills. Computers are certainly going to dominate their work and home lives in the decades ahead.

Culley (1993) and De Castell and Bryson (1998) addressed the masculine culture of computing and the heavy marketing of computers and software as "toys for boys." The gender–specific nature of the computer industry and its marketing produces not only an image of males as "computer geeks" but also of females as passive and incompetent computer users. Both studies concluded that women were significantly underrepresented in images of computing and, furthermore, that those images that did portray women showed them in stereotypical roles such as clerical workers, sex objects, or runway models employed merely to emphasize ease of use of equipment. This sexist depiction of women in computer advertising is neither new nor surprising.

One of the early attractions of distance education was its presumed capacity to increase access and equity by removing some of the barriers to participation. Huff (2002) suggested that our social stereotypes, when they influence our actions towards others, can produce a self–fulfilling prophecy. Huff indicated that when girls used "boy" software in public and when boys used "girl" software in public, both felt more stress,

perhaps because they both felt they were doing a task that was not a good fit in the presence of others who could watch them fail. Kramare (2001) reported that the distance learning was a good option (or compromise) for women with children and little free time for education. Men also mention the value of distance learning with regard to family responsibilities. Both male and female respondents, however, noted that women in particular face time pressures when seeking education.

There is no doubt that there are differences between genders in the use of technology. It is granted that men and women learn and use technology differently. But is this gap larger than when computer technology was introduced to mass markets? Is this gap as large as it was before the Internet was widely available? One of the goals of the current study is to examine the growing breadth and depth of the technology's effects on human thought and action. We live in a world transformed by technology. The evolution of the Internet contains the cultural implication of free information for all.

This paper investigates these differences and seeks to identify differences in the use of technologies and the Internet along gender lines. If there are differences, how are they expressed? Which gender is more inclined toward distance education (possibly neither)? Is age related to a favorable attitude toward computer use? These questions were initially proposed in an ongoing, on–line survey of attitudes toward computer technology.

Design Of The Study

The survey was conducted on–line and advertised through listserves, word of mouth, and search engines. The research team sought as broad a range of people as possible to participate. The objective was to attract both genders, all age groups, and to represent as many different professions as possible. All attempts were taken to pull participants from different geographic locations, different ethnicities, and different cultures. The study is ongoing so the results reported here represent a point ten months into data collection. While the method of dissemination certainly limits the applicability of the results, the broad nature of the respondent pool allows the results to be used as guidelines. If one is asking about comfort and experience with on–line technologies,

using an on–line survey instrument is not unreasonable.

Data was written directly into an on–line database. The raw data was then processed using Minitab. Initially, simple descriptive statistics were collected. Variables relevant to the study of attitudes toward computer/technology use and on–line education were then identified and crosstabs derived.

The project sought to resolve three questions. First, to what degree do gender differences influence the decision to take initially or to continue to take courses on–line? Second, what other factors influence the decision to take initially or to continue to take courses on–line? Third, what interactions among these factors can be identified? The first concern was to identify gender differences. Beyond that, this preliminary data collection sought direction for further investigation.

Results

After an in–depth study of the statistics, the following straightforward facts about the respondent pool can be reported.

	<20	20s	30s	40s	50s	60s +	Total
Female	6	35	40	50	44	23	198
Males	3	21	20	15	24	14	97
Total	9	56	60	65	68	37	295

Figure 1: Respondents by Gender and Age

Respondents included 198 women and 97 men. The distribution by age revealed a nearly equal distribution in the age of 20–59 years. Of 287 responses, 249 said they were employed outside the home. Given this response, the distribution is entirely consistent with the age span of Internet–enabled professional men and women, by far the largest segment of respondents.

Respondents were asked if they considered themselves a member of an ethnic minority in their country. Of 287 respondents, 254 said they were not. The categories named on the form reported ethnicities which

included 244 White, 12 Black, 4 Hispanic, 14 Asian, 7 Middle Eastern, 1 European, and 4 other (total of 289). The clear majority of participants were White. The population was geographically diverse: United States, United Kingdom, Canada, Ross Island, The Netherlands, Japan, Northern Ireland, Israel, and Mexico. Reported occupations varied widely: college professor, upper–level manager (various types of businesses), accountant, lab technician, nurse, author, camp director, bartender, attorney, legal clerk, teacher, groundskeeper, administrative assistant, librarian, pastor, computer technician (various forms), hair designer, unemployed. These occupations represent the wide variety of backgrounds sought in the research design. This variety presented a great opportunity to investigate the views of regular computer users and to step outside the academic environment.

Because of the multi–disciplinary nature of the study, much more data was collected in a number of categories. However, the items of particular interest to this facet of the research addressed technical skills, emotional response to computer technology, and various factors directly connected to on–line coursework.

	None	1	2	3	4	>4	Total
Female	133	22	17	9	1	8	190
Male	61	10	7	3	1	10	92
Total	194	32	24	12	2	18	282

Table 2: Number of On–line Courses Taken by Gender

Table 2 shows the number of on–line courses taken by 282 respondents by gender. Only 31 males had taken on–line courses, but repeating the experience was not evident. However, 57 females had taken on–line courses. The difference by itself indicates that females in this study prefer on–line courses more than their male counterparts. However, the number of courses taken on–line does not really suggest that either sex prefers this mode for completing degree work. Both sexes were interested enough to try the medium, but the data does not show they would like to finish their degrees via this technology.

	None	1	2	3	4	>4	Total
<20	4	1	3	0	0	0	8
20s	30	7	10	4	0	2	53
30s	40	9	3	1	0	4	57
40s	45	3	5	6	2	3	64
50s	44	10	4	1	0	9	68
60s+	32	3	0	0	0	0	8
Total	195	33	25	25	2	18	258

Table 3: Number of On–line Courses Taken by Age Group

Only 92 had taken on–line courses, but repeating the experience was not evident. The numbers dropped rapidly: 32 took one course, just 24 took two, and only 14 took three or more. There was also a drop–off by age: 33 to 25 to 32, the last figure buoyed by nine people in the 20–49 and nine in the 50–59 age group who took more than four. This statistic warrants further investigation to determine factors of influence in each age group.

	Yes	No	Total
Female	82	55	137
Male	37	28	65
Total	119	83	202

Table 4: Would Take Another Course by Gender

	Yes	No	Total
<20	2	3	5
20s	19	21	40
30s	20	17	37
40s	27	22	49
50s	32	17	49
60s +	20	5	25
Total	120	85	205

Table 5: Would Take Another Course by Age Group

When respondents were asked if they would take another on–line course, the results by gender (**Table 4**, previous page) and by age group (**Table 5**, previous page) did not square entirely with the self–reported figures. In fairness, many of the respondents may have been in the 20% who had taken only one or two courses. It is worth noting that 69% of respondents had taken no on–line courses. Some 59% of respondents said they would take another course. Specifically, women in their 40s and 50s expressed the greatest interest (33.6% of the full pool). Among men, the potential market lies with the 50–somethings (29.6%). On the other hand, women in their 40s represent the most decidedly negative group (19.3% of the full pool). Among men, 32% said they would not take another course. Also, some of the numerical differences noted above were numerically large but may not be statistically significant. These analyses will be reported in future papers.

Discussion And Implications

This population is interested in taking on–line courses for reasons of time management. Time was the major reason 278 of 295 respondents took courses on–line. Time spent driving to classes and in the classes could be better spent on other activities in their lives. They see education as important and would like to earn the degrees and gain the knowledge which accompanies that process. At the same time, they seem willing to experiment with a nontraditional way of pursuing their education. Avoiding the classroom was reported as the reason 296 people took on–line classes. Furthermore, participants indicated that they learned best through hands–on methods and less well by simply reading and memorizing. It is noted that this reason did not match with their choices and means of taking classes. Therefore, on–line courses must employ a variety of teaching and learning styles. In the future, at least for those who can afford and who wish to use on–line courses, such additions as microphones and cameras may need to be part of the on–line class experience. This technology would provide additional flexibility to the on–line classroom.

According to the gender studies, women prefer to work in collaborative group settings. In this study, however, many women indicated a preference for on–line courses, which suggests that they

prefer independent study. Although the research indicates that women are more group–oriented and that they communicate more effectively in group settings than male counterparts, these results suggest that women preferred an independent mode of learning. They essentially eschewed the female norm for some expedient reason. To better understand this phenomenon will require additional study.

Certainly on–line coursework is a viable option in some situations and for some people. Colleges and universities interested in offering on–line courses must be concerned with the demographics of the potential student market. Two findings from the study stand out in this regard. First, the high percentage of respondents who had not taken a course on–line (69%), particularly in the middle age ranges of 20–59 (82%), is one available group. They represent a large market pool which could be exploited by a targeted promotional campaign. Second, a large percentage (59%) of respondents were interested in taking additional on–line courses. In this group, women in the 40–59 age range, although slightly less inclined to take another on–line course, do represent a viable potential market due to responsibilities at home and at work. Marketing the flexibility afforded by on–line courses to this group could attract a sizable population of students.

Finally, the reader is cautioned that this report presents merely preliminary results. Although some factors offer themselves as candidates for deeper inspection, a great deal of analysis needs to be done before a robust picture can be drawn. This work will be important to institutions considering on–line course offerings and evaluating potential market groups as they identify areas where emphasis should be placed and others where few resources need be expended. Planners will also be interested in the reasons for taking courses and for not wanting to take more. The latter reasons are qualitative and will be subjected to additional study and analysis.

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Assessment For Learning: Giving Multi–Style Learners The Opportunity To Learn Organic Chemistry

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Abstract

In recent years, many universities and colleges around the country have been developing specific assessment plans for their courses to determine a student's level of performance for specific academic tasks. Administrators and other advocates of the assessment plan have required their faculty to assess a representative portion of student populations under the plan. However, much of what most of the teaching faculty are already doing in their classrooms can be described as assessment. Surveys, pretesting, self–assessment, and observing students' engagement during lectures have already been used by faculty. It has been well documented that these assessment activities should be part of an instructional approach that accommodates different styles of learning. In my organic chemistry class, students completed a questionnaire to assess their preferred learning style. Based on the questionnaire, I design a variety of instructional activities and have been using a wide range of different styles of assessment activities, such as pre–lecture exercises, ConcepTest, self–assessment test, and peer–assessment activity to respond to different styles of learning. This paper provides an overview of assessment for learning and presents selected assessment techniques designed to enhance students' learning. First, assessment for learning is compared to assessment of learning, then students' multiple–learning styles are recognized and different types of instructions are suggested, and finally selected assessment methods are recommended and described.

1. Importance Of Assessment For Learning

The word assessment may strike anxiety in the minds of teaching faculty. For some people, this word is associated with paper and pencil tests only, a single instrument that is not the full measure of a student's achievement (Boston 2002). Others can see assessment as a loss of teaching time (Mehrens 1998). Indeed, over the past years, assessment efforts have been focused mostly on collecting statistics to evaluate academic programs, students, and faculty (Kulieke et al. 1990). The information gained from this kind of assessment is often used in reporting to the university administration and accrediting agency (Cross and Steadman 1996; McComis 2003). However, improving courses, programs, teaching, and enhancing student learning are better reasons for assessment than just reporting. As Boston (2002) noted,

> While many educators are highly focused on state tests, it is important to consider that over the course of a year, teachers can build in many opportunities to assess how students are learning and then use this information to make beneficial changes in instruction. This diagnostic use of assessment to provide feedback to teachers and students over the course of instruction is called formative assessment. It stands in contrast to summative assessment, which generally takes place after a period of instruction and requires making a judgment about the learning that has occurred. . . . Assessments become formative when the information is used to adapt teaching and learning to meet student needs.
>
> Assessment for learning uses a wide range of instructional techniques during a course of instruction to facilitate mid–course/next quarter adjustments (Boston 2002; Rogerson 2003). On the other hand, assessment of learning is conducted at the end of some sequence of activities to provide data on learning, teaching, and institutional effectiveness (Kulieke et al. 1990). Thus, we should talk more about assessment for learning, formative or classroom–based assessment, and less about assessment of learning, summative assessment. Assessment for learning should occur as a regular part of teaching and learning, and the information gained from these

> assessment activities should be used to improve the teaching and learning process (Hodges and Harvey 2003). Innovative assessment methods should guide students to learn through our assessments, emphasize deeper levels of learning, and give instructors feedback during a course. (Rogerson 2003)

A number of research studies have provided evidence of the importance of assessment for learning (Black et al. 2003; Boston 2002; Deese 2000; Steadman and Svinicki 1998; Black and William 1998). Having conducted an extensive research review, Black and William (1998) concluded that formative assessment significantly raises students' test scores. Boston (2002) stated,

> When teachers know how students are progressing and where they are having trouble, they can use this information to make necessary instructional adjustments, such as reteaching, trying alternative instructional approaches, or offering more opportunities for practice. These activities can lead to improved student success.
>
> Through learning activity assessments can be used to improve students' metacognition skills as well (Deese 2000; Steadman and Svinicki 1998). According to Angelo and Cross (1993), assessment that focuses on learning is exceptionally beneficial and provides feedback to both the instructor and the student. (Cross and Steadman 1996)

My call for focusing on the assessment for learning in our classes is based on the need to improve students' performance in two–year open access colleges. This focus is especially important in organic chemistry because, as many teachers reported, a significant number of students did not perform well in organic chemistry and either failed or withdrew from the course (Wamser 2003; Paulson 1999; Katz 1996). As Poon (2004) wrote, the organic chemistry course has been "a gatekeeper course." Paulson (1999) assumed that more than 50% of the students who failed in his organic chemistry class "were just not studying enough or were not sufficiently motivated to succeed." Further, "Colleagues have suggested a number of factors that may be contributing to such an outcome, including poor academic preparedness, a lack of good study habits, and the fact that students have off–campus jobs that significantly reduce the time available for their college work" (Rogerson, 2003). On

top of these observations, the organic chemistry course "bears the stigma of being one of the most difficult courses . . . and has the reputation for taxing the limits of student memory" (Poon, 2004). A number of other factors may play a role in failing organic chemistry, and those factors—such as unmet student diverse needs—require more consideration (Felder and Brent, 2005).

2. Recognizing Students' Multiple–Learning Styles

Surprisingly, understanding how individuals learn does not receive enough attention by teaching faculty. For example, consider the following scenarios:

> **Scenario One**: At a regional community college, a nontraditional adult student has experienced discomfort in most of her classes. While she listens to the rapid responses of her classmates—traditional 18– to 22–year olds—she has difficulty with the abstract nature of the course content and the examples the other students use. The nontraditional student also has anxieties about her readiness for college. How can the instructor better meet her needs?
>
> **Scenario Two**: At a Midwestern university, "technology in the classroom" has become the new mantra. Decisions about hardware and software do not follow a consistent pattern. High–performance and well–skilled students exhibit learning preferences that match the instructional styles of the university's highly analytical faculty. Average and less–skilled students are not yet at the level of analytical excellence that would facilitate their success. Their technological needs are different, and they prefer a different mode of classroom instruction, both with and without technology. What can be done for them?"

In these scenarios, James Anderson (2001) pointed to understanding learning styles and to relating them to different student needs. The theory that students learn differently is not completely new. Hundreds of models of learning styles have been described in the literature (Claxton and Ralston 1978; Kolb 1984; McCarthy 1990; Keefe 1991). There are some learning style publications provided on the Web, for example a free publication provided by "Memletics high performance learning"

at www.memletics.com. Researchers have found significant relationships between the learning style and the field of study (Kolb 1984). Claxton and Ralston (1978) defined learning style as "a student's consistent way of responding and using stimuli in the context of learning." Most of the literature appears to suggest that learning style preferences influence the teaching and learning process. However, there is some controversy over the importance of research findings in this area, and it is recommended that learning style data should be used with caution (James and Blank, 1993).

Kolb (1984) stated that the aim of understanding learning styles "is to make the student self–renewing and self–directed; to focus on integrative development where the person is highly developed." Therefore, on the first day of my organic chemistry class, students were asked to take a learning style test and to identify their preferred learning styles. After I found out the way my organic chemistry students learn, I was able to give them practical suggestions pertaining to each learning style; for example, if one is a visual learner, one should use bright color to highlight important information in text. Although most of organic chemistry students are visual learners, the analysis of learning style tests showed that students are learning using all different learning styles. For example, average class points calculated for visual learners were 33, for auditory learners 29, and for tactile learners 24. The main purpose of taking the learning style test was to help the students realize that we learn in different ways and we should study using a wide–range of approaches. If students wanted to be highly developed, they should not be limited to listening and reading but should use different approaches to learning through small group discussion, presentations, or concept visualization.

3. Involving Students In Different Learning Activities And Assessments

Recognizing that students have different learning styles is the first stage in raising the students' awareness of the alternative approaches available for learning and teaching. I agree with Barbra Given (1996) that

> teaching that honors learning style preferences can build high levels of comfort and ownership of learning process which, in

> turn, can produce positive learning states and subsequent academic achievement. Clearly, teaching that matches individual learning style preferences enhances academic attainment, is supported by [the] principle of accelerative learning, and can be implemented in incremental steps as appropriate for the individual teacher. Thus, alternative teaching procedures based on learning style instruction should receive deep consideration by all teachers.

However, in my organic chemistry class, since students are learning using all learning styles, a blend of methods was used.

There is evidence that learning is enhanced as more of the learning stages are being used (Paulson 1999). To maximize student learning, the instructors should engage students in a variety of activities independently and in small groups through presentations, visualization, small group work, and group discussions that bridge the different learning styles. The number of possible learning activities is limitless. Daniel Domin (1999) described different laboratory instruction styles such as expository, inquiry, discovery, and problem–based. Each of these styles is unique and offers different learning possibilities for students. In my organic chemistry lab students are involved in some discovery experiments in which the procedure is given to them, and for some labs they are asked to design their own experiment, collaborate with other students, or explore the chemical literature to find out how to relate chemistry to other subjects. The lecture course has gradually incorporated a number of new activities, including presentations, peer–assessment learning, group work, pre–lecture exercises, and use of the Internet communication (*Blackboard* and e–mail).

It has been shown that assessment and instruction are closely interrelated (Tobin, Tippins, and Gallard, 1994). Different ways of learning affirm the importance of providing different activities as well as different assessment. Paper and pencil testing is only one way to collect information about student learning. Along with the expanded concepts of learning, we should realize the importance of other procedures of assessment: observing students performance in class, self–assessment, and peer–assessment.

4. Methods Of Assessing Student Learning

Recently, educators have explored different ways to assess the quality of students' learning (Angelo and Cross 1993; Hodges and Harvey 2003). In my own classroom, I used many different instruments of assessment to promote the students' learning about organic chemistry. Some of the methods used to assess student learning in organic chemistry included surveys, comparing pre– and post–tests, pre–lecture exercises, ConcepTest, and analyzing self–assessment tests. These assessment methods play a very important role in increasing the students' learning and are worthwhile to mention in more detail.

Surveys. It is critically important to identify students at risk for failing an organic chemistry course at the start of the semester and to start intervention before the first exam. Thus, on the first day of organic chemistry class, students were taking not only learning style surveys but also a background and attitude survey as well. Although surveys may take many forms and address different issues, they typically consist of statements for which students are asked to express their agreement or disagreement (Angelo and Cross, 1993). The student background and attitude survey gave me valuable information about the students' social and personal needs, interests, technological abilities, expectations from the course, and preferences for learning. Based on this information, the material during the course is presented in a way to account for different student needs, expectations, and abilities. For example, the illustrations and references given during the course are related to the students' interests and majors; technology is used strategically for increasing the effectiveness of learning as well.

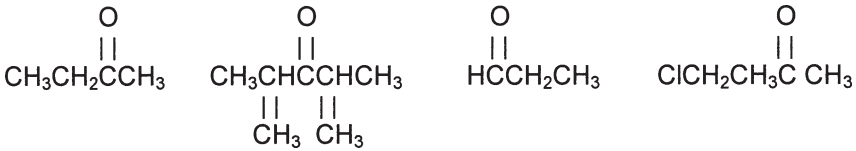
Pre– And Post–Tests. On the other hand, the organic chemistry pretest was designed to get information about background knowledge as well as the students' logical reasoning abilities and was very helpful in planning instructions. The same questions should be asked on the chemistry post–test at the end of a course to evaluate student learning in the course and to plan the next term's instructions. It is very important what kind of questions we use in the pretest. I agree with other educators that not all types of questions indicate student understanding of the material:

> Multiple–choice questions are usually employed in testing in

large science courses for speed, accuracy, and fairness in grading. A significant disadvantage is that students are often presented with an unrealistic choice of answers that may make it possible to work backwards from the answer, rather than forwards from fundamentals. In the real world, answers to numerical problems are rarely displayed in a list and waiting for the correct value to be chosen" (Toby and Plano, 2004).

The question as shown in **Figure 1** can give a teacher much more information about conceptual understanding and the depth of understanding chemistry material.

Q. Consider the following organic compounds:



A) Draw a ä+ and ä- on appropriate atoms.
B) List the compounds shown above in increasing order of reactivity toward a nucleophilic attack. List the least reactive compound first (#1) and the most reactive compound last (#4). Explain your reasoning.
C) Propose a compound that will be more reactive than the most reactive compound listed above.

Figure 1. An example of questions from organic chemistry pre– and post–tests

Pre–Lecture Exercises. Pre–lecture exercises were designed first as a learning tool and secondly to assess student knowledge gained from reading the organic chemistry textbook. I devised this assessment tool to guide and stimulate reading and promote preparation. It has been already shown that pre–lecture assessment was able to improve the preparation of all the organic chemistry students before lectures (Widanski, 2005). The explanations that the students gave to the pre–lecture questions allowed me to modify my instruction so that the

students could be challenged to develop a meaningful understanding of concepts. Therefore, assessment can influence instruction when it is used to discover student understanding prior to instruction. Organic chemistry students stated that this activity was worth their effort to increase learning in the course.

ConcepTest. Importantly, students are able to assess their understanding of the course material as it is being presented to them during the lecture. Use of the ConcepTest as an assessment for learning will be useful in this case. Conceptual questions have been posted in the organic chemistry lecture room along with a few possible answers. The following question can test an understanding of a few concepts at once and confront misconceptions: Does cycloheptatriene have a higher or lower pKa than cyclopentadiene?

From time to time during the lecture, I use short–answer format questions that have been designed with common misconception in mind. Students talk in small groups and vote on the possible answers, and then they have to provide the explanation to the whole class. Sometimes the class has converged on an incorrect answer as these questions identify a shared misunderstanding. Since this exercise is non–graded, it is n non–stressful way to test learning and provides an opportunity for all students to discuss a concept. While working in small group, students can develop a deeper understanding and problem solving skills through peer–led discussion. If the majority of the class has not reached the correct answer, a more detailed explanation can be presented. This form of peer instruction provides the instructor with quick feedback as to how well the class is following the lecture and what conceptual difficulties students are experiencing. Students obtain immediate practice in using the concept and terminology. Students are encouraged to be actively engaged during the lecture and have an opportunity to enhance their teamwork and communication skills. Knowledge of student learning during the lecture can help the instructor to improve student understanding of chemical concepts. This assessment is a valuable resource that guides my instruction. Thus, assessment following instruction can help teachers find out what and how well students are learning. Determining whether a particular classroom activity actually improves student learning is a crucial and difficult task. One

measurable indication is to see whether the students choose to participate in the activity that is optional. In my organic chemistry class, all the students actively participated in class discussion, and participation increased as the quarter continued.

Self–Assessment Of Learning. Another measurable approach is to ask the students for their opinions about the activity. Students can provide a very valuable perspective on their own learning. Therefore, at the end of the quarter, organic chemistry students performed the self–assessment of learning (**Figure 2**).

This self–assessment tool consists of a series of statements for which students, using a scale, are asked to express their agreement or disagreement. This instrument provides information about what students think they are learning. It can uncover those parts of the course that best support student learning and those that need improvement. This type of assessment is specific to the particular course and is the best formative evaluation of sequence courses offered throughout the year.

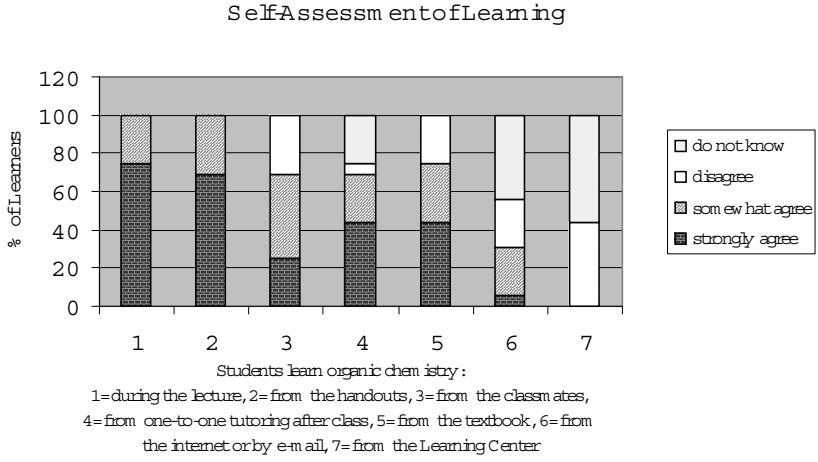


Figure 2. The organic chemistry class data from self–assessment of learning

5. Conclusion

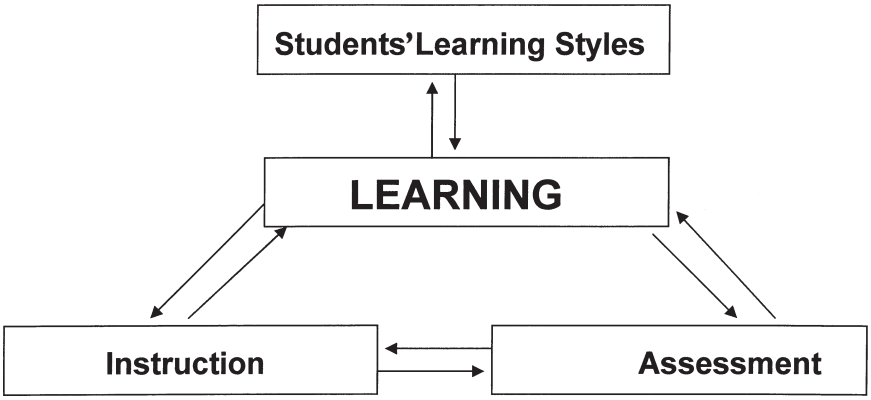


Figure 3. An interactive relationship between assessment for learning, instruction, and students' learning styles.

Lack of understanding about the learning process can serve as a substantial impediment to student learning and faculty teaching. Comprehensive knowledge of the learning process is a valuable skill for teaching and may help the teacher to be a more effective teacher who may help students to become more effective learners. College students, especially nontraditional students in two–year colleges, should be evaluated for their learning style and then be tutored and advised on the way to study that will match their learning style. Paying more attention to student learning styles should return our focus to student needs, enhance instructional practices, and engage students effectively in assessment for learning.

Assessment should be used not only for reporting but also to enhance instructional practices and increase the students' learning. Assessment for learning should occur as a regular part of every segment of teaching and learning. To support every student opportunity to learn through the assessment process, faculty should plan activities and design assessments that will be the essential means of guiding learning before the course, before the lecture, during the

course, and during the lecture. Thus, assessment *for* learning is not the same as assessment *of* learning but a broader concept. Knowing how students learn can help faculty to develop effective teaching styles that promote the students' learning. There is an interactive relationship between assessment for learning, instruction, and learning styles. (See **Figure 3** on the previous page.) By changing assessment practices, faculty will make the necessary changes in instruction and thus promote learning. The information gained from these assessment activities will be used to change instruction, assessment methods, and increase the students' learning process. Most importantly, assessment for learning should be a continuous process of learning about the students' needs and using that knowledge to guide instruction and to promote a continuous cycle that supports every student's opportunity to learn.

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Biography

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Conference Presentations

Echoes: Why History Is Important

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History doesn't exactly repeat itself. It's more like a river; what happens up stream affects what going to happen down stream. But we can and should learn from history. I spent the summer of 2001 researching the 1941 Japanese surprise attack on Pearl Harbor for an eight–week course I was to conduct in early fall at Bluffton College. It would be timely because December 7, 2001, would be the 60th anniversary of the event that shoved the U.S. into the Second World War. In the days and weeks after the destruction of the World Trade Center on September 11, 2001, many news stories and commentators compared that attack to the Pearl Harbor disaster. There are some valid reasons for the comparison.

The last and most comprehensive of the eight Pearl Harbor investigations were the 1945–1946 Joint Congressional Committee Hearings. Assistant Counsel Edward Morgan, author of the Committee's final report, wrote that the lapses and mistakes uncovered during the hearings provided lessons for improved national security in a world made more hazardous by new technology (Joint Committee 268). Morgan would be disappointed if he started to read *The 9/11 Report* because it is laced with noting many of the same problems highlighted in the Joint Committee's Pearl Harbor report.

Congressional attitudes contributed to both Pearl Harbor and 9/11. Members of Congress, especially those in the House of Representatives, pay little attention, if any, to external threats. They much prefer providing farm subsidies, listening to labor unions, and hustling new post office buildings for their districts as opposed to appropriating money for the military and intelligence agencies. During the middle 1930s, funds for the army and navy were regularly trimmed. In 1937, as Europe drifted toward another war, the U.S. Army was only the 17th largest in the world, actually smaller than the forces of Portugal (Prange, *Verdict* 7). According to a retired Central Intelligence Agency Branch Chief, in the 1990s with the threat of Soviet Russia removed, Congress seized the opportunity to divert funds from the military and

intelligence to domestic and social programs (Letter). Most congressmen don't like spies and suspect anything or anyone associated with intelligence work.

Pearl Harbor and 9/11 share one bit of trivia. In *Pearl Harbor: The Verdict of History*, historian Gordon Prange quotes the reaction of a segment of American thought: "The people of the United States had sinned, so the Lord punished them with Japanese bombs and torpedoes, the modern equivalent of fire and brimstone" (Prange, *Verdict* 4). A day after September 11, 2001, on his cable program, TV evangelist Jerry Falwell said,

> I really believe that the pagans, and the abortionists, and the feminists, and the gays and the lesbians who are actively trying to make that an alternative lifestyle, and the ACLU, People For the American Way, all of them who have tried to secularize America [sic]. I point the finger in their face and say, "You helped this happen." (CNN.com/U.S., posted September 14, 2001)

In The Beginning . . .

The Pearl Harbor story begins in January 27, 1941. Joseph Grew, American ambassador to Japan, cabled Washington that he had heard rumors from several sources that the Japanese military planned to attempt an all–out surprise attack on Pearl Harbor. No one in the State Department or in army and naval intelligence took Grew's information seriously. The Chief of the Far Eastern Section, Naval Intelligence, wondered why an experienced diplomat would take time to repeat such a wild tale (Prange, *At Dawn* 33–35).

Not all American officers ignored the possibilities of a sudden Japanese assault on Hawaii. General Frederick Martin, Commander of the Hawaiian Army Air Force, and Rear Admiral Patrick Bellinger, Commander of Naval Patrol Wing Two, on March 31, 1941, presented a report predicting any declaration of war by Japan might be preceded by a surprise attack on Oahu. An air attack from carriers would be most likely. The authors believed that a dawn attack could be a complete surprise. The complete report almost exactly matches what the Japanese actually did in December (Prange, *At Dawn* 93–94).

The openness of American society and the geography of Oahu made it easy for the staff of the Japanese Consulate in Honolulu to collect detailed information about the U.S. Pacific fleet and its activities. From public roads, clear views of the navy anchorage permitted discreet study of fleet movements and patterns. By October 1941, Imperial Navy planners in Tokyo had all the information needed to design the attack. During September, Tokyo asked an intelligence officer assigned to the Consulate to prepare a diagram that divided Pearl Harbor's waters into five areas and identify normal anchoring areas for each ship. The request was transmitted in Japan's diplomatic code. American code specialists had broken the code, and the request was intercepted and translated. No one in the Navy Department in Washington saw special significance in this harbor–mapping message or any reason to relay it to Hawaii, even though it went beyond normal diplomatic curiosity (Prange, *At Dawn* 248–249). Handling of the so–called bomb plot was one of the major intelligence failures in the Pearl Harbor saga. The Japanese also knew the U.S. fleet went to sea every week and returned to the base on Friday evening.

Ignoring the bomb–plot intercept was not the only symptom of intelligence failures in Washington. Neither Army Intelligence nor Navy Intelligence wanted to let the other claim leadership in gathering information. So they arrived at a clumsy and inefficient compromise. The navy code breakers would handle, translate, and analyze intercepts on odd–numbered days, and the army experts did the same work on even–numbered days. Navy men paid special attention to intercepts with implications for their service. The army took the same approach, with no unbiased analyst looking for vital clues in the total mass of intercepted information. The divided responsibility meant no one was in charge. A battle inside the Navy Department further weakened intelligence handling. Admiral Turner, head of War Plans, seized responsibility for estimating Japanese intentions from the Office of Naval Intelligence (Prange, *At Dawn* 82–87).

Something Big

By early autumn 1941, it was obvious the Japanese planned something big, and that something included the resource–rich islands and

continental areas of Southeast Asia. Because of American commitments to the Philippines, a clash with Japan seemed inevitable. The United States was not prepared militarily for a Pacific War; U.S. strategy in 1941 strived to avoid provoking Japan in order to buy time to rearm.

In October, the Japanese cabinet was reorganized with General Togo of the army as the new prime minister, a change that did not promise lessening of tensions between the U.S. and Japan. Admiral Harold Stark, Chief of Naval Operations, sent a dispatch to Admiral Husband Kimmel in Hawaii that included the following warning, "Since the U.S. and Britain are held responsible by Japan for her present desperate situation, there is also a possibility that Japan may attack these two powers." Copies of the dispatch were sent to army Chief of Staff George Marshall and General Walter Short in Hawaii. The following day in a personal letter to Kimmel, Stark commented that he didn't really believe the Japs were going to attack the U.S. In effect, he said, I warned you of a possibility, but don't worry about it (Prange, *At Dawn* 288–290).

By November 27, 1941, the message from Washington got tougher. The November 27th dispatch to Hawaii began, "This dispatch is to be considered a war warning. Negotiations with Japan looking toward stabilization of conditions in the Pacific have ceased and an aggressive move by Japan is expected within the next few days" (Prange, *Verdict* 651–652).

The November 27th warnings to Hawaii focus attention on another aspect of Pearl Harbor, divided command, a weakness that reappeared in August and September 2001. In 1941, there were three centers of authority and responsibility in Hawaii: Army General Walter Short whose mission was protecting the naval base and its facilities; Rear Admiral Claude Bloch, the Commandant of Pearl Harbor Navy Yard and Commander Naval Base Defense Force; and Admiral Husband Kimmel, Commander–in–chief of the Pacific Fleet.

General Short decided the only real threat to security was sabotage by the 40,000 or so inhabitants of Oahu who had been born in Japan. He ordered all possible precautions, including parking combat aircraft wing–tip–to–wing–tip for easy guarding and locking up all ammunition. No attempt was made to install and disperse antiaircraft guns, and only early–morning training use of the new radar equipment was in effect (Prange, *At Dawn* 404).

Historical records reveal that Admiral Kimmel did little at Oahu in response to the November 27th warning. In fact, he didn't even show the warning message to some of his key subordinates (Prange, *At Dawn* 409). The fleet continued operating on its peace–time routine. The entire fleet except two aircraft carriers and their escorts returned to Pearl Harbor on December 5 and 6. Crews got their usual weekend shore leaves for Saturday night. Kimmel and Short planned to play golf together that Sunday morning, but they had not discussed the war warnings or done any joint planning (Prange, *At Dawn* 408–413). No one in the navy or war departments had followed up the "war warning" to find out exactly what steps had been taken in Hawaii.

Neither navy nor army local commands gave any thought to possible attacks on the navy base. In his testimony before the Joint Committee, General Short said, "We were never alerted for an antiaircraft defense because we had not received information indicating a probable air attack" (Joint Committee 380).

During 1944 and 1945, Henry Clausen, a former prosecutor and a colonel in the army's Judge Adjutant General Department, conducted an in–depth investigation for Secretary of War Henry Stimson. After taking depositions from all surviving officers who had been present in Honolulu on December 7, 1941, Clausen concluded, "Throughout my investigation, I found the problem of co–dependency between the operations of the Army and Navy in Hawaii to be unworkable." Referring to Kimmel and Short, Clausen wrote, "They played golf together; they dined together, but they did not get together on official business" (Clausen and Lee 292). The Joint Committee's report agreed with Clausen by including this comment in its majority report, "Command by cooperation was unsound by its very nature" (Joint Committee 245).

On the morning of December 8th, American officers in Hawaii got advance warning about the nature of the enemy. There was one prisoner of war; the commander of one of the midget submarines that took part in the attack was found unconscious on an Oahu beach. He was ashamed because he had failed and was still alive. He pleaded with his captors to kill him. When they refused, he begged them not to inform the Imperial Navy he had been captured (Prange, *December* 7, 373). He held the Japanese belief that individual, even national, suicide can be better than actual or perceived dishonor. The Bushido code taught that dying in

the service of the divinity (the emperor was considered a god) brought honor and rewards in the afterlife. The code explains the fanatic mass charges into Marine machine gun fire on Guadalcanal and the kamikaze attacks late in the war. When he was in Japan in 1947 and 1948, Prange interviewed most of the surviving officers of Imperial Navy. He became a friend of Imperial Navy Captain Mastaka Chihaya. Chihaya told Prange, "Sometimes we die for death's sake, making the attainment of the objective something like a by–product" (Prange, *Verdict* 19).

The Bushido code obviously is echoed in the beliefs of radical Islamists, although I have never seen the comparison. Any U.S. Navy veteran who served in the western Pacific in 1944 and 1945 could have testified how difficult it was to defend against an attacker who means to die. On one of the final pages of *Pearl Harbor: the Verdict of History*, Prange or one of his collaborators offers this advice: "Never be guilty of foolishly underestimating the will and ability of have–nots" (Prange, *Verdict* 565).

Historical Repetition

The majority report from the Joint Committee concludes with recommendations to correct "supervisory, administrative, and organizational deficiencies" in the handling, interpretation of, and action based on intelligence. Committee Counsel Edward Morgan's comment, "The day before Pearl Harbor we didn't know what we knew," was also true September 10, 2001. Eleven of the recommendations have some application to conditions preceding September 11, 2001. The pertinent recommendations follow:

> 1) Operational and intelligence work requires centralization of authority and clear allocation of responsibility. [This idea eventually led to the creation of the Central Intelligence Agency.]
> 2) Supervisory officials cannot safely take anything for granted in alerting subordinates.
> 3) Any doubt as to whether subordinates should be given information should always be resolved in favor of supplying the information.
> 4) Delegation of authority or the issuance of orders entails the

duty of inspection to determine that the official mandate is properly exercised.

5) Implementation of official orders must be followed with closest supervision.

6) Complacency and procrastination are out of place where sudden and decisive actions are of the essence.

7) Coordination and proper evaluation of intelligence in times of stress must be insured by continuity of service and centralization of responsibility in competent officials. [Changing senior intelligence managers every time a new president moves into the White House is a mistake.]

8) There is no substitute for imagination and resourcefulness on the part of supervisory and intelligence officials.

9) Communications must be characterized by clarity, forthrightness, and appropriateness.

10) Procedures must be sufficiently flexible to meet the needs of unusual situations.

11) Officials, on a personal basis, should never countermand an official instruction. (Joint Committee 253–266).

The nature of American society played an important role in both Pearl Harbor and 9/11. Japanese agents had no trouble studying the movements and patterns of the Pacific Fleet. The 9/11 plotters roamed the country freely, entering and leaving frequently with many opportunities to detect any gaps in airport security.

The first recommendation from the Commission on Terrorist Attacks was the unification of the intelligence community (*9/11,* 399), an exact echo of two of the recommendations by the 1945–1946 Joint Committee.

Congress was not happy with the CIA as the dominant intelligence agency. Representatives and senators did not like CIA agents snooping around U.S. citizens and residents. As a result, CIA activities and information gathering were limited to other countries. The FBI was assigned the responsibility for intelligence gathering in the U.S. CIA people could and did communicate and cooperate with FBI and State Department personnel. The retired CIA executive commented, "Perhaps at the very top levels there were some differences . . . but at the working level the cooperation was good and most questions were worked out

amicably" (Letter). Using information supplied by the CIA, the counter intelligence unit of the FBI regularly turned to the FBI's criminal investigation side to locate, track, and provide surveillance of high profile individuals. After tracking possible terrorists all over the world, the CIA could easily lose them when the suspects entered the United States, which is what happened with key figures in the World Trade Center attack (*9/11*, 216).

The CIA branch chief wrote that he did not know the details of directives limiting cooperation and exchange of information between the CIA and the two sides of the FBI. The directives were issued after he retired. During the summer of 1995, the Clinton administration became concerned about the use of FBI agents to "spy" on residents of the United States. Deputy Attorney General Jamie Gorelick headed a work group that developed procedures regulating the manner by which information could be shared from the intelligence side of the FBI to the criminal side of the bureau. Communications between intelligence and criminal investigations needed permission from the Justice Department's Office of Intelligence Policy and Review. Such permission was hard to receive. CIA and FBI personnel called the procedures the "wall" (*9/11*, 79, 269). The situation sounds like the information gap between army and navy intelligence in 1941.[1]

The FBI's anti–terrorist unit was centered in Washington. Agents in charge of field offices were evaluated on their success in reactive investigations (bank robberies, kidnapping, racketeering, etc.), not for their contributions to the antiterrorism program. Still, some field offices were observant. Agents in Phoenix and Minneapolis filed reports about Middle Eastern men taking flying lessons. The Minneapolis agent added that his suspect, who had no other flight training, had asked to learn how to take off and land a Boeing 747. Neither report stirred any interest in Washington (*9/11*, 272–273). The CIA, FBI, State Department, and Immigration and Naturalization Service all worried about al Qaeda. It had been credited with U.S. embassy bombings, the explosion in the World Trade Center garage, and the attack on the *USS Cole*. In the summer of 2001, intelligence reported all kinds of "noise" about al Qaeda activities. In July 2001 George Tenet, Director of Central Intelligence, commented, "The light was blinking red" (*9/11*, 259). The Federal Aviation Administration and North American Aerospace Defense

(NORAD) shared responsibility for safety and security in American air space.[2] In the event of an airliner hijacking, the standard operating procedure assumed the first knowledge would come from a flight controller. In fact, that is what occurred on September 11. The controller notifies his or her supervisor, who then relays the information to FAA headquarters. The FAA relays the news to the Pentagon to ask for fighters to escort the hijacked plane. This request is forwarded to the proper regional military command. In the next step the command center asks for approval from the Secretary of Defense. With that approval, the order goes to NORAD central command center in Colorado Springs, where the actual order to scramble fighters is sent to a NORAD base. On September 11, 2001, by the time two fighters were in the air off the coast of Maryland, all four hijacked planes had crashed.[3] This complex procedure makes quick decisions and sudden and decisive action unlikely (*9/11*, 14–18).

During spring and summer 2001, the FAA got 52 warnings of possible attacks. FAA officials believed the most likely danger was some type of sabotage (*9/11*, 82). The FAA bundled the warnings on a CD–ROM and sent it to the airlines and airports. With the CD–ROM, the FAA added this note, "We have no indication that any group is currently thinking in that direction" (*9/11*, 264). In an Associated Press story February 2, 2005, an FAA spokesperson further explained, "We had no specific information about means or methods" (*The Lima News*). To paraphrase General Walter Short's testimony: If we had been warned about using airplanes as guided missiles, we would have taken precautions. At no time did the FAA check with the airlines or airports to see what actions were taken as a follow–up to the warning (*9/11*, 264).

Concluding Sentences

The final two sentences in *Pearl Harbor: The Verdict of History* warn: "Humanity cannot afford to forget the lessons of Pearl Harbor. The world is much too small; the risk is much too great; the time is much too late" (*Verdict* 567). *The 9/11 Report* adds a footnote to the warning in *Pearl Harbor: the Verdict of History*: "The methods for detecting and then warning of a surprise attack that the U.S. government had so

painstakingly developed in the decades after Pearl Harbor did not fail; instead, they were not really tried" (*9/11*, 347–348). I wonder if tomorrow's leaders will ignore the lessons in *The 9/11 Report*.

Notes

[1]The USA Patriot Act (HR 3162) passed by Congress after the September 11, 2001, eliminated the "wall." The CIA and both sides of the FBI were free to exchange information and develop joint operations. Watching hearings about the extension of the Patriot Act leaves the impression that Congress would like to rebuild the "wall."

[2]U.S. airport security almost worked on the morning of September 11. Eleven of the 19 hijackers were pulled out and detained at security or at the gate. Carry–on luggage was screened but not searched. Three of the men triggered the metal detectors. Two set off a second detector; all three were permitted to board their planes, even though the security people did not as required determine what metal articles caused the alarms. Airport personnel did not load the men's checked luggage until after the 19 had boarded. No one on the airport staff was thinking about suicide (*9/11*, 1–3).

[3]Recordings of telephone calls to and from the four hijacked airliners provide a fairly complete picture of events after the hijackers took control. Flight attendants on two planes were on phones almost until the moment of impact. Some passengers used their cell phones to call people on the ground, and people on the ground called people on the planes. The United flight from Newark took off 25 minutes late, upsetting the hijackers' plan for closely synchronized attacks. As a result, passengers on United 93 knew about the World Trade Center. After the hijackers seized control, passengers realized they were going to die, leading to the decision to try to take back control. They had nothing to lose. This plane crashed in Pennsylvania. If it hadn't been for modern phone technology alerting passengers on United flight 93, a successful attack on the Capitol or the White House probably would have taken place (*9/11*, 4–10).

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Biography

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Engaging Students: Taking On–line Courses

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Engaging students is a challenge when teaching in any format but particularly when teaching on–line. The difficulty is due not only to the physical distance between the instructor and the student but also because of the unfamiliarity with and limitations of the technology being used. Although there are many aspects to engaging students that are common to both face–to–face and on–line formats, there are also many issues that are specific to just an on–line format.

On Saturday April 9, 2005, a workshop was held at the 2005 AURCO conference. At this workshop participants were asked a series of questions to help address many of the challenges involved in engaging students in on–line courses. The following paper presents a summary of this discussion. The listed comments were provided by the 18 participants during and after this workshop. Also, included with this summary are additional resources that were provided to the participants during the workshop (highlighted with italics). I would like to thank the participants of this workshop who generously provided their time and insight.

Introduction

In Order To Better Understand Who Is Attending This Workshop, Why Are You Here? There was a wide variety of on–line teaching experience among the workshop participants. Roughly 20% regularly taught on–line, 30% had never taught on–line, and the remaining 50% used some on–line teaching tools in their face–to–face courses. The experienced on–line participants were interested in improving their on–line teaching, and wanted to see how their courses compared to other colleagues' courses. The comments from the remaining participants included the observation that they were curious about what was involved in teaching on–line or that they were considering developing an on–

line course.

What Makes A Bad On–Line Course Bad? Although many participants mentioned technical difficulties were a significant problem when teaching on–line, the overwhelming response to this question was that a lack of interaction was the cause of a very bad on–line course. Participants' comments included "poor communication," "a lack of interaction with instructors," "limited student to student contact," "lack of feedback," and "poor feedback that is not in a timely manner." These comments suggest that engaging students is one of if not the most important aspects of teaching on–line. In this respect teaching on–line is no different than teaching face–to–face.

A good on–line course will adhere to the same principles listed in "The Seven Principles of Good Practice in Undergraduate Education." These principles were published in 1987 in the American Association of Higher Education bulletin by Arthur Chickering and Zelda Gamson (http://www.aahebulletin.com/public/archive/sevenprinciples1987.asp?pf=1). The seven principles of good practice in undergraduate education are:

1. Encourages contacts between students and faculty.
2. Develops reciprocity and cooperation among students.
3. Uses active learning techniques.
4. Gives prompt feedback.
5. Emphasizes time on task.
6. Communicates high expectations.
7. Respects diverse talents and ways of learning.

Although not necessary, a successful learning experience is also related to how the students feel about the instructor and the course in general. Likewise, it is important that the faculty member enjoys teaching the course for the course to be successful. An additional 8th good practice therefore might be:

8. Provides an enjoyable experience to students and faculty.

The seven practices were revised in 2003 by David Brown (http://www.campus–technology.com/article.asp?id=7365) to specifically address how technology enhances these practices. The use of technology in such courses is found to allow for quicker feedback between students and their instructors, enhances cooperation between students, and provides more customization in learning.

Course Setup

What Are The Ground Rules Necessary To Ensure A Good On–Line Course? Similar to a face–to–face course, an on–line course requires a syllabus that outlines the deadlines and requirements of the course. However, when teaching on–line courses, faculty must also ensure that the students have the computer skills as well as the equipment, software, and connectivity necessary for success. Since on–line teaching does not allow students to ask immediate questions, and it is more difficult to clarify items, it is important that the procedures and expectations are made explicit.

How Will The Students Be Graded And What Activities Or Resources Will Be Available To Otherwise Engage The Students? A wide variety of graded assignments were recommended by participants. These graded assignments included on–line quizzes and exams, posted discussions, e–mailed papers, discussion posts, and homework.

In order to ensure active engagement students should have a wide variety of on–line materials and activities available to them. Participants suggested the following:

1. Syllabus
2. Lecture Notes/*Power Point* Presentations
3. Exercises that require students to visit Websites
4. Interactive examples that provide immediate feedback
5. Group activities that force students to interact
6. Instructor–led discussions
7. Chatroom office hours
8. In–person contact with professors or at least by phone once or more

How Will Cheating Be Addressed? One particular concern when teaching on–line is the problem of cheating. The student–to–student interaction that is often encouraged in order to facilitate learning has the negative consequence of making it easy for students to illegitimately share their work. Participants recommended specifically identifying in the syllabus and in an e–mail at the beginning of the course what is considered cheating. In addition, participants suggested frequently changing project topics, picking questions randomly from large test banks, assigning common deadlines so all students must complete the work before answers are posted, and forcing students to take exams in–class or taking proctored exams

at an alternative location.

How Do You Communicate These Ground Rules To The Students? An important aspect of teaching on–line is to ensure that the students understand what is required of them, what is available to them, and how they should proceed through the course. Given the on–line format, it was no surprise that e–mail was the most common form of communication noted by the responses of participants.

Students taking on–line courses receive their log–on information and the instructor's contact information through regular U.S. postal mail. Once the student enters the on–line course, there are a variety of ways to communicate the ground rules to the student. Participants suggested a welcome e–mail that would provide some of this information. Beyond the on–line syllabus, a FAQ page can be used to answer commonly asked questions. A graded syllabus quiz can also be used to ensure that the students have indeed read the syllabus. Other ways to ensure the students' understanding of the ground rules is to have them send a signed letter stating they agree to the course requirements. Alternately, the student may be required to participate in a scheduled on–line chat session.

What First Impression Will You Make? Although a good first impression is important when teaching in any format, making a positive first impression and conveying your personality can be more difficult when teaching on–line. Participants recognized the importance of conveying that notion that the instructor is professional, knowledgeable, and organized. The instructor should also be viewed as a facilitator who is personable, available, and caring, all while expecting high results.

Good first impressions are made by responding to students in a timely manner, being highly organized, and clearly articulating the ground rules and course requirements. Participants also suggested encouraging communication, being honest regarding the pitfalls students face, and having at least one face–to–face contact at the beginning of the course. In addition, in order to make a good first impression, the instructor should not overwhelm the student in the first week of classes or leave the student feeling that the instructor is very busy and should not be bothered. Telling the student you have too much on your plate right now or that your in–box contains 250 e–mails is likely true, but the student may take this response to mean that you are discouraging

contact.

Administering And Facilitating The Course

How Do You Ask Good Questions? Participants suggested a wide variety of questions are needed to elicit different types of answers, whether the questions are being used for assessment or to stimulate the student to take an alternative approach to thinking about a topic. Different questions can be used to force the students to apply their understanding of a topic or synthesize information. For example participants were asked, "What is a good question to ask students to elicit an answer that forces the students to apply their understanding of a topic?" Participants suggested open–ended questions, questions asking the students what stood out and why it was significant, and asking students to provide support for their answers.

In contrast, when participants were asked "What is a good question to ask if you want the student to synthesize information?" they would ask students to identify the problem or issue and apply it to themselves and/or the discipline. One participant suggested posing a hypothetical situation and having the student then relate it to the topics covered in the course.

Crafting The Questions

The primary reason for asking effective questions is to help generate more thoughtful answers. However, using good questions can also improve participation, help develop cooperation between students, and save the instructor time. Asking the right type of question is important to generate the answer you are looking for. Pennsylvania State University provides an excellent resource for developing questions for on–line courses (http://tlt.its.psu.edu/suggestions/on–line_questions/). Below are two examples provided at this site of when to ask a specific question and how to formulate this question.

1. To elicit an answer that forces the student to apply their understanding: Ask questions that present problems and approximate real life situations. These questions provide students with the opportunity to practice the principles they have learned in the course. This type of question encourages the student to go beyond recitation and apply their knowledge in a

> practical situation. Predict what would happen if, choose the best statements that apply, judge the effects, what would result, tell how, when, where or why, identify the results of, select, tell what would happen, tell how much change there would be. . . .
> 2. To challenge the student to synthesize information. Frame these questions in a way that encourages students to engage in creative and original thinking. Students should integrate and combine knowledge to clarify the topic. Create, tell, make, do, choose, develop, how would you test, propose an alternative, solve the following, plan, design, make up, compose, formulate, how else would you, state a rule . . . .

How do you provide constructive feedback? The type of feedback the instructor provides will often depend upon the type of question being asked or the quality of the answer the student has given. The participants recognized that sometimes it is appropriate not to answer a student's question. For example, the student might ask a question that is very broad and covered thoroughly in the textbook or in other available resources. In this case, the student should be asked to be more specific or to review a particular chapter. Providing examples of how a student should construct questions will not only force the students to take additional time thinking about and formulating their questions but will also serve to reduce the time the instructor takes to reply.

Participants suggested that feedback to students who provide correct answers is often needed to emphasize the portion of the students' answer that is most important or to provide additional direction for the students to extend their thinking. When responding to students who provide incorrect answers, participants felt instructors should follow–up to determine if the question was misunderstood, provide examples of correct answers, and encourage further study in a specific area.

How Can You Deal With The Time Commitment Involved In Discussions, Chatrooms, And E–Mail? And How Will You Deal With Students Who E–mail Too Much? Actively engaging students often places a large time commitment on the instructor. Although one participant responded that one only wished to have the problem of students "talking" too much, the majority of participants experienced significant time demands when communicating with their on–line students. To deal with this problem, participants recommended establishing set hours when

the instructor would be available, limiting the types of communication or at least what each type was being used for, or increasing the time between the instructor's replies as the number of e–mails from any one student increases.

Conclusion

What Can You Do To Make Sure You Are Doing A Good Job? Because the on–line courses are relatively new, they are more likely to undergo continuous revision than face–to–face courses. Asking students to provide suggestions to the instructor not only is another avenue to engage students in the course but will provide valuable help in the course improvement efforts. The participants suggested that students be asked throughout the course to provide input. One way to accomplish responses would be to devise a discussion topic that is devoted to posting problems and suggestions for course improvement. Another suggestion was to periodically ask students to respond directly to different aspects of the course as it proceeds. Participants also felt that formally providing students with the opportunity to evaluate the course is important. The student evaluations should ask questions specifically directed to the on–line course format, allow the student to remain anonymous, and be, of course, on–line.

To be an effective on–line instructor and to ensure a successful course, there are a number of necessary competencies. Patti Shank provides a list of instructor competencies in "Asynchronous On–line Learning Instructor Competencies." (See http://www.learningpeaks.com/instrcomp.pdf.) These competencies will not only help to ensure that the course runs smoothly but will also enhance the ability of the students to learn in this on–line format.

Biography

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Teaching Embedded Systems Design In Regional Campuses

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Abstract

Embedded systems design (used in products ranging from microwave ovens to weather satellites) is not currently being taught in regional campuses to computer science and electrical engineering students. Knowledge of embedded system design, however, enhances their potential for employment. This paper examines the possibility for teaching embedded systems design in a two–year program in regional campuses.

Introduction

> An embedded systems design is a special–purpose computer that is used inside a device. For example, a microwave contains an embedded system that accepts input from the panel, controls the LCD display, and turns on and off the heating element that cooks the food. An embedded system generally uses microcontrollers that contain many functions of a computer on a single device. (*Tech Encyclopedia*, http://www.tech–encyclopedia.com/term/embedded_system)

More than six billion microcontrollers are sold each year for use in embedded systems. They are cost–effective. Bassam Tabbara writes: "Hardware/software codesign is the goal of every (well, most) embedded system designers. To have the hardware and the software both springs forth from the same designer's pen is enough to make any manager glad" (6). The goal of this course is to train a student to effectively use microcontrollers and have the right skills to compete for jobs. Some industry segments that need embedded systems design are Industrial Engineering, Telecom/Mobile Communication, Computer/Peripherals,

Consumer Electronics, Government/Military, Electronic Equipments, and Medical Equipment.

Systems are built with microprocessors as diverse as 8–bit processors that cannot use external memory to power PC 32–bit microprocessors that access gigabytes of memory. A microcontroller is a single device containing many of the functions of a computer.

Comparisons: Desktop Computers And Dedicated Microcontrollers

Computers have a central processing unit that executes a program. Microcontrollers are embedded inside some devices, so they control features or actions of a product.

In a desktop computer, the CPU loads programs from the hard disk, whereas microcontrollers are dedicated to run one specific program. The program is stored in ROM (read only memory) and does not change.

In a desktop computer, a hard disk is an input/output device. A microcontroller has a dedicated input device and has a small LED or LCD display for output.

A desktop computer consumes fifty watts of electric power. On the other hand, a microcontroller is a low powered device. A battery–operated microcontroller will consume only fifty milliwatts of electric power.

Embedded Controllers

Microcontrollers are called embedded controllers. Programming a microcontroller to perform a specific design is one of the major tasks in embedded systems design. High–level programming languages have to be deployed effectively to run an embedded dedicated system which utilizes the limited available memory.

Real Time Operating System (RTOS) is another important part of embedded systems. It guarantees a certain capability within a specified time constraint. There are two types of real time operating systems: hard RTOS and soft RTOS. A real time operating system programmed for a certain object available to a particular piece of equipment at a given time is called a hard RTOS. Often these employ specific hardware

and special device drivers. On the other hand, a soft RTOS is one that has reduced time constraints. It must still operate quickly with fairly constant time constraints. As embedded systems design is a hardware/firmware design, the learning objectives should include both these elements.

Learning Objectives Of The Embedded Systems Design Course

1) Understanding the hardware and software design of a real time microprocessor based on an instrumentation and control system.

2) Understanding techniques for interfacing instrumentation sensors and controllers for the operation of a computer controlled electromechanical system.

3) The design and construction of microprocessor–based embedded systems using computer–aided design tools.

4) Learning how to program microcontrollers in C/C++ effectively.

Through such a course students develop the ability to justify the design techniques used in project design and communicate these to others.

Outline Of The Course In Embedded Systems Design

1) Introduction to embedded systems: categories and requirements of embedded systems, challenges and issues related to embedded software development, hardware/software co–design, introduction to IC technology, introduction to design technology.

2) Embedded software development: concepts of concurrency, processes, threads, mutual exclusion and inter–process communication, models and languages for embedded software, synchronous approach to embedded system design, scheduling paradigms, scheduling algorithms, introduction to RTOS, basic design using RTOS.

3) Embedded C/C++ language: real time methods, mixing C/C++ and assembly, standard I/O functions, preprocessor directives, study of C/C++ compilers and IDE, programming the target device.

4) Hardware for embedded systems: various interface

standards, various methods of interfacing, parallel I/O interface, blind counting synchronization and Gadfly Busy waiting, parallel port interfacing with switches, keypads and display units, memory and high speed interfacing, interfacing of data acquisition systems, interfacing of controllers, serial communication interface, implementation of above concepts using C language.

5) Study of ATMEL RISC (Reduced Instruction Set Computer) Processor or the 8051 microcontroller: architecture, memory, reset and interrupt, functions, parallel I/O ports, timers/counters, serial communication, analog interfaces, implementation of above concepts using C/C++ language.

6) Case studies and applications of embedded systems: applications to communication, networking, database, process control, case studies of digital camera, network router, Real Time Linux.

These elements can be taught as a lecture–and–lab course in two or more components. One introductory course should include within it the components that would enable a student to go out and build an embedded system, with follow–up courses in more advanced designs and methods. These courses can be a three– or four–credit hour course. Utilizing any of the microcontrollers and assemblers kits that are available will provide hands–on experience.

The Students And Their Background

Any student of electrical, mechanical, or computer technology can take this course. Any person working with programming/software can take this course to develop new skills.

Knowledge of microprocessor architecture and assembly language, microprocessor peripherals, digital design, and C/C++ programming language are required for this course. An understanding of compilers, assemblers, operating systems, analog design, diodes transistors, circuit/electronics and computer organization, electromagnetic fields and waves is highly recommended.

Background Material Taught In Regional Campuses

In the regional campuses most of these prerequisite materials are taught in the electrical/electronics and computer science disciplines. The following list enumerates the details of course work taught in regional campuses.

1) In the digital system fundamental course: logic gates, combinational logic, latches, flip–flops, number systems, storage registers.

2) In the electronics system course: diodes, transistors, circuits, analog/digital design.

3) In the electric– circuits course: electromagnetic fields and waves.

4) In the microprocessor and robotics course: computer organization, hardware architecture, assembly level programming, hardware/software interfacing, and input/output devices.

5) In the technical computing and computer programming courses, C and C++ programming languages.

Students majoring in the electrical/electronics/computer courses would invariably take the above mentioned course work. They would have adequate background for a course in embedded systems design to further their knowledge in technology and be competitive in the field.

Conclusion

Billions of microcontrollers are sold every year. Designers and engineers of embedded systems are in demand all over the world. The average salary for an embedded system designer in the USA is $80,383 and the mean age is early thirties. Microcontrollers are only 30+ years old and supply thousands of employment opportunities. Embedded systems courses are taught at the undergraduate level in Europe and Asia. We think this course can be taught in regional campuses in the Ohio University system.

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Biography

Chitra Rajagopal is an assistant professor of engineering technology at the Kent State University—Tuscarawas, where she teaches electrical and electronic engineering courses. She has published a paper on Model Following Control System. She is currently researching on embedded system design and model following control system. Rajagopal lives in Canton, Ohio, with her son and husband, a mathematics professor. She may be reached at crajagop@kent.edu.

Diaries And Performance: Transforming Everyday Women's Voices Into Teachable Moments

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Introduction

In the courses we teach in communication, English literature, and women's studies, students often balk at studying women from the past, largely because they imagine them to be uninteresting and irrelevant. They read of the Cult of True Womanhood—the virtues of piety, purity, domesticity, and submission—and assume that all women of the 19th century acquiesced quietly to those norms.[1] This presentation describes an approach to making the experiences of nineteenth–century women accessible, vivid and compelling for today's students using diaries and journals coupled with performance techniques.

Exploiting Exploitation?

Our work was made possible three years ago when Diane Chambers and Margaret Wick began a study of the contemporary diaries of exploited women. Finding contemporary journals and getting permission to use them, however, proved to be harder than they thought. How does one ask, "Have you been exploited? Did you keep a journal during the exploitation? Do you still have the journal? Would you be willing to let us read it? Will you let us use it for our research?" Realizing the unlikelihood of finding many people who would answer "yes" to all of these questions, they turned to published diaries. Their search led to two 19th century American women: Emily Gillespie and her daughter Sarah, two women whose stories resonated with their own life struggles.[2] They could see the plight of today's exploited women in what Emily and Sarah wrote.

The Importance Of Emily

Emily Gillespie's diary, in particular, depicts an ordinary woman, not famous for suffrage leadership or public resistance, who chafed at the expectations placed upon her. She even tried to shake them off. Emily's diary is valuable as a teaching tool because it dramatizes the conflict between role expectations and a woman's own desires and aspirations. It makes women like Emily visible and understandable. Moreover, it invites students to empathize with Emily and make connections between women's lives in the past and their own gendered experience.

In this presentation, we offer a taste of the many ways in which Emily's diary can be used to create teachable moments in varied disciplines. For students of literature, for example, Emily's diary makes plain what women were confronted with when they aspired to write for publication and what a gifted woman might do to overcome these obstacles. Emily wanted to be a writer, but she knew that her opportunities were limited. For students of women's studies, the diary shows how a woman might attempt to negotiate a domestic role for herself; Emily's role was not as rigidly defined as students of women's studies who read about women's roles in the 19th century might expect it to be. For students of women's history, the journal illustrates the challenges 19th century women faced in owning property and claiming income of their own. It also illustrates how the material conditions of Emily's life shaped her sense of place in relation to her husband, family, and society. For students of communication, sociology, or psychology, the diaries of Emily and her daughter display how roles, role conflict, and role expectations shaped the family's tumultuous interactions and repeated themselves in the next generation.

How could old diaries like Emily's possibly engage students? Penelope Franklin in her book, *Private Pages: Diaries of American Women*, noted that diaries "in the raw" are hard to read, repetitive, seem to lack a point, and go on and on about minutia (xxvi). Students struggling to read chapters in textbooks with pictures are unlikely to find raw diaries captivating; however, by creating readings and performances from diary excerpts, an editor can bring to life such diaries and compel responses to them. We contend that a diary used in this way will stimulate students' interest in learning more about issues raised by the diarist's predicament.

We also believe that students who read and examine diaries are likely to make connections between the lives of men and women of the past and their own. Performance of a diary from the past, when accompanied by observation and reflection, provides a comfortable starting place from which students can begin examining issues of patriarchy, exploitation, and gender inequality in both the past and the present. It opens a space in the classroom for students to realize that today's women do not have it all, as they often believe, and to become aware of the power dynamics inherent in their own interpersonal relationships. It allows students to confront the marginalization and victimization of women in today's world.[3]

Diaries, Performance, And Scripts

We have extrapolated a reading from excerpts of Emily's diary to illustrate its potential use in the classroom. In our presentation, we will be reading the roles. In a classroom setting, students would read, and they could even be asked to construct the script itself. Following our reading of the script, we will offer questions that focus on the problems raised by the text. These questions could be used in the classroom in a variety of disciplines to stimulate critical thinking about these issues.

Excerpts from Emily Hawley Gillespie's Diary 1858–1888[4]:

Narrator: Like many young women of her day, Emily was accomplished at making flowers from hair, but unlike most, Emily had artistic ambitions and imagined a career for herself. At the age of twenty–one, while still single and living in Michigan, she wrote in her journal:

> Sunday, October 10, 1858. [Sister] Edna has been sick all the week, is worse so Father called in the Dr. Mr. Armstrong called to see my flowers and to see if I could go to New York with them to learn to be an artist; he will pay my expenses there and hire me to paint for him enough to pay him when we get there. O, I would like so much to go but Mother says so much against it I will stay at home yet awhile,—though am sure I will regret. Rain.[5]

Narrator: Emily never realized that ambition; however, she continued to journal and framed that work for herself as a special achievement. Seventeen years later, while living in Iowa with her husband and two

children, she speaks of her journal in the same breath with professional publications:

> Sunday, January 30, 1876. We read in our new papers; we have seven, Phrenological journal; Live stock journal; Western Rural; Harpers Weekly; Youths Companion; Champion; and the Manchester press. Am writing as usual in my journal. Nearly ten. Yes journal, I love thee, and who shall dare
> To chide me, for loving a friend so fair.

Narrator: Her journal became like a companion to whom she could confide thoughts she could not share with her husband or children. Her ambition to write for publication remained strong. She writes at the age of forty–two:

> Thursday, September 29, 1881. Do usual work, knit. . . . James asleep. Children upstairs. I am writing. There is an offer, for a prize–story, in the *Companion.* I have a mind to try for it. All is well. Rain. Think I'll have for my Subject "The Declamation Contest" or Reminiscences of boarding school.

Narrator: Her home was hardly conducive to the work of writing, however, as an entry the following week shows:

> Saturday, October 8, 1881. We retire to sleep, our hearts filled with sorrow, yet with a prayer and trust that all will end well. James has one of his fits of—well I hardly know what—whenever he has to pay out any money for any thing he seems to think, I ought to get every thing for myself and the Children without calling on him for it. Henry and Sarah went out and got him to come in, they were afraid he would hang himself—well he *did*—as he has done many times before—get a rope and threaten. Alas! The trial to get along with such a disposition. We can only know and trust that God will help us to brave it through. [James] does not want the Children to go to school. Thinks there is no need of it—but wants them to stay at home and work—tis well for all to work—yet it seems to me we are placed here on this earth, for something higher than merely to use our hands, toil and toil—merely to eat, and die in debt to our brains—to hoard up money—he does not like me to raise turkeys because I use the money they bring to send the Children to school. I *do pray* that I may

> *know* and *do* right, they love to go to school—with Gods help I will try to educate them that they may through life have the advantage of a good education, with their noble hearts, their virtue, and industrious habits. . . . James told me to pay Mr. Trenchard. I could not make the right change with his money therefore, I took the money that I got for one of my birds and a turkey (2.50) to pay them. I told him how I done—he flew in a minute—said now I was planning to get all of his money again—that I grabbed every cent he got. Most truly I never spend one cent of his—except to buy something necessary to wear or to eat. I never get any clothing for my self only when I am obliged to—and then the money comes from my poultry—never give up—but strive for the right shall be my aim—commending ourselves to God I retire once more.

Narrator: This entry dramatizes the heart of the conflict in her marriage. James felt threatened by Emily's incursion into his domain, farm labor. He resented her control of the income from it. At the same time, James frequently complained that she did not work hard enough on the farm. But Emily desired to be seen as an educated woman and wanted the freedom of separate work that produced an income of her own. She managed her time accordingly:

> Thursday, December 22, 1881. Do usual work. Finish writing another story. "Sunshine after Shadow or How we spent Vacation," of 3825 words. It takes at the rate of ten minutes to copy 125 words, and about the same to compose. 31.25 evenings at 2 hours each evening. Well, I will know whether they are worthy their acceptance for publication or not, after awhile. The offer is $1000.00 for the two best stories, one for boys and the other for girls.

Narrator: Her need for money is clear:

> Sunday, December 25, 1881. Christmas. We have no presents to day. Tis too bad, but may be we can another time. It does seem lonely indeed, to go no where and no one come here. We can only hope it will not always be. Children and I will try another year if all is well to make a party. Tis a beautiful day.

Narrator: Unfortunately, Emily was not the only one who sent in a story, and she received disappointing news just a few weeks later:

Thursday, January 12, 1882. Henry brought me the stories that I sent to Boston. They returned them, with a letter, saying they had received near 3000 manuscripts for the prize. There will be many disappointed. Cold

Saturday, June 24, 1882. We read the Prize Story (The Little Keeper), in the Companion. I have read many better stories. It seems simple, and quite improbable.

Narrator: Things went from bad to worse in her marriage:

Sunday, March 25, 1883. We are all at home to day. The time as usual spent in reading and work. James is at the barn. He went without his supper because of a very unpleasant time we had—tis too bad—but I cannot always endure everything. He would turn us all out of doors if he could. (When a man lays his hands hold of his wife and Children I think tis time something was done.) Especially Henry—and for nothing—only that he wants him to do kinds of work that he cannot. I sometimes think tis a real disease that some people have to have a time every so often. They seem to get so full of some undefinable thing they *must explode.* We must not despair. I hope and trust all will be well at last. They want to go to college—and I will help them, all I can, to go.

Thursday, May 31, 1883. Almost seven. Supper ready. James has one of his crazy spells again. He has got the idea into his head that he wants a deed of the place. I think I had not best give it to him but I'll try to do right about it, I want it so we will all have a home while together. Then if Henry and Sarah both outlive James and me it shall belong to them equal. . . . James also has another idea that he will come to want or be turned out of doors—no one will ever turn him out of doors—as long as he lives. He knows he will have a home here and none but himself ever thought otherwise. I do hope and pray, if it be Gods will, I may do right,—and that I may always keep my right mind.

Friday, June 1, 1883. Half past seven. Well, I begin this June morning in sadness. James did not come in to supper last night nor to his breakfast this morning. He will not answer when spoken to. He has done his chores and gone with the

> team up west, but I do not know where. It is indeed trying to my nerves to live as I have had to for years. I am sorry it is so but I think something will have to be done. I do hope and pray it may be for the best. I did not sleep but a little while last night. Laid awake till after two—and then woke at every sound. Yes. I have not dared to go to sleep many anight, and it wears me out—I feel tis not right to live so. His whole mind seems to be that the children and I never work. I will trust in God for all to be right. Am sorry he gets in such a way. Sarah and I retire tonight sorry that James does as he does. Tis too bad. We can only hope he may feel all right again and do right. Pleasant.

Narrator: Despite her turbulent home–life, she continued to work on her writing. Just five years before her death she was working on an article that appears to have focused directly on the source of her domestic trouble, the ideology of conduct:

> Thursday, Oct. 4, 1883. Work. Finish writing an article on "Woman's Sphere," 26 pages. James chore and chop wood. He is tired and has one of his bad spells again. I am sorry and hope he will feel better in the morning. It makes my blood run cold and I shake like a leaf, as did Sarah, too. I sometimes hardly know what to do.

Narrator: When Emily's health prevented her from performing all of her wifely duties, the conflict with James escalated:

> Monday, August 10, 1885. I got up early (5). Commenced breakfast and fed turkeys. . . . James went after a man to help him finish stacking hay. . . . When he spoke of going I said "you can go and get that Philips girl to come and stay two or three weeks." Then he was mad in a minute—and began by saying he did not know where he could get money. . . . I said, "I'm not able to do the work and there's so much to do it got to be done and Im going to have a girl to help do it. You can work <u>one</u> day and pay <u>her</u> for a week and then you can tend to your own work and not be around the house puttering with a few milk things." But it is no use to say a word to him. He wanted me to get in the buggy and go and "divide up." "That I had never tried to help him. I had run him out of cows and

every thing else three or four times that Henry and Sarah might take care of themselves, that he was a slave to us all." I told him if he had any thing to settle to go and do it. He said we were like all the rest of my folks no reason in us etc. and started. I do *not* believe in twitting. But I did say to him. (Yes there is your own Mother was a slave to that old mans will all her life and you want me for the same purpose. But I'll not do it any longer.) It is very unpleasant to live so disagreeably—perhaps it may be best that the property be divided in such a shape as to give us both a home. . . . I am sorry for him for all. But he seems mad if I do not have an interest in every thing he does. But will not allow me to know what he does. and if I say a word about any thing he only tells me to attend to my own business that he will see to his own affairs so what can I do. I can as I have always done trusted in providence for right I hope justice may yet be done and all will be well at last. . . . I have just made up my mind that he says and does the meanest he can on purpose thinking to torment me all he can. . . I have never seen a happy day since less than two weeks after we were married. He told me how he had been tempted to kill himself as far as to get a rope and go to the barn to hang, he has threatened it many a time since. . . . We are all at home to night. . . . James so angry about hired girl etc that he will not eat his supper. I told him I should think he would want some supper that it was all ready. He says in reply—I dont care if you had forty suppers I would not eat them with you.

Narrator: Emily's declining health brought James into her sphere, however briefly. He tried to do housework to help his ailing wife:

Friday, November 20,1885. James washed. . . .It rather pleases me to see him wash dishes etc. because he has always intimated that I have done nothing. Now let him do *that nothing* (of a thousand chores or more everyday) and see how he likes it.

Tuesday, December 1, 1885. James is losing his love for housework. He cleaned up barn or stable etc. Churned too. I sew some and do what work I can. . . .

Narrator: Even in poor health, Emily fancied herself as an inspired writer who could publish her work:

> Monday, March 1, 1886. This is James' birth day. 50 years old. I would he might be happy all the rest of his days. O! Dear! I *am* tired. . . . There is one singular thing that appears to act upon my brain, or has done so at times when I am tired or need to sleep. A sensation—not of pain but like a flash, of some unseen object passing through or rather over the very top of [my] head beneath the skull. It must be an electric currant of an immortal hope; or a helper for invariably when such flashes occur my thoughts are active in extreme. My pen will go faster and faster untill a story founded upon facts is completed in romance. I believe I will write a novel and get it published. Will found it upon truth upon facts which have come under my observation. I only wish I had never burned my stories.

Narrator: Daughter Sarah recognized how important Emily's writing was to her:

> Sunday, April 11, 1886: Am 48 to day. I had hoped at this period of life to have good health. This morning Sarah said, "Ma reach under your pillow and see what you will find." I found this pen with which I am writing. It is a *very fine Gold Pen* with a Pearl handle and Gold base containing a slide to draw the Pen inside when not in use. Very fine indeed. It is my first birth day present of any value. I was so glad of it, that I must cry. Sarah is so kind. . . . *I am thankful* I am no worse, but feel better at heart, though I fear my disease is paralysis from over–work physically and mental trouble for the past ten years has been more than I could endure, especially the last five years, but I have tried with all my might to overcome the great strain imposed upon me by him who promised to protect and support through life. But my nerves broke down, my strength failed and now I scarce can walk. However I can not be too thankful I have been permitted to retain my mind. And still pray and hope to get better.

Narrator: But Emily did not get better and neither did her relationship with James. In August of 1886, James chased Henry with a pitchfork and tried to kill him. That was the last straw. Emily, Henry, and Sarah moved to town. Emily's health deteriorated. James put a notice in the

paper saying he would not support her. The month before she died at age 49, Emily wrote:

> Sunday February 19, 1888. Sarah is lying down to rest. She is tired. It grieves my heart that she has had to get up to care for me every night. I coughed so hard. Am better now. James was here every day this week. He says he can not earn any thing alone, that I must come and help him. That it is ended with him if I do not, that he will support me no longer. If I have anything I must get it myself. . . . It seems sad that we must give up all so young, yet truly happy that we leave this world with a clear conscience fully, truly trusting to go into the future in immortal glory. All is well.

Sample Uses Of Diaries In The Classroom

Emily's thirty–year diary, and even the short excerpt we have included here, can be used in countless ways. Here we offer just a few sample questions one could ask in women's literature, women's studies, and history classes. Next, we show how concepts associated with roles, commonly taught in basic communication, psychology, and sociology courses, can be illustrated via the diary excerpts.

Questions to Ask in a Women's Literature Course:

1. Why do we hear about so few women becoming successful, published writers during the nineteenth century?
2. What were some of the obstacles facing women who wanted to write for publication in the nineteenth century?
3. Were there productive writers who never got published? Is their work worth reading? Where can we find it?

Questions to Ask in a Women's Studies Class:

1. Why is it important to study the lives of nineteenth–century women? If women have it all today, what's the point of dwelling on the past?
2. Did women just accept their lack of rights? Were they really so passive? Did they really swallow the Cult of True Womanhood?
3. What makes a True Woman today? Does she have anything in common with her nineteenth century counterpart?

Questions to Ask in a History Class:

1. What was Woman's Sphere? How was it different from that of men? Did women really know their place and keep to it?
2. How could some women reconcile the public role they hoped for with the domestic role expected of them?
3. How did the material conditions of daily life shape women's concepts of their roles?

Questions to Ask about Roles in a Communication, Psychology, or Sociology Class[6]:

1. What roles did Emily play? How did she seem to feel about her roles?[7]
2. What role conflict do you see in Emily's life? How aware of role conflict does Emily seem to be? Does the role conflict of Emily's life resemble the role conflict of today's women?[8]
3. James undoubtedly expected that when his son Henry grew up, he would fulfill his role as a good farmer's son and become a farmer. Emily wanted her son to pursue a role with greater status. How did these differing expectations contribute to the marital conflict?[9]
4. What happened when Emily went through a period when she was too sick to meet the expectations of her role as keeper of the house? What happens today in similar situations?
5. Why was Emily so pleased with the reversal of roles that occurred when James had to assume the role of housekeeper and carry out her usual duties?
6. When Emily decided to leave James, how significant was this role exit for a woman of her era? Today, how significant is a role exit such as this one?[10]

Conclusion

This presentation has demonstrated how everyday women's voices can be transformed into teachable moments in our classrooms. Emily Gillespie's 19th century diary is especially valuable as a teaching tool because it gives voice to a woman in a troubled marriage. By using a diary such as this one, we can stimulate discussion of women's continuing exploitation in the home and in society at large. We join Cinthia Gannett

and others in their efforts to counter the marginalization of women's diaries. Like Gannett, we contend that women's diaries, contemporary and historical, are "vital and significant" (45) forms of writing that deserve to be preserved, respected, and used in today's classrooms.

Endnotes*

[1]For a discussion of this ideology, see Barbara Welter's "The Cult of True Womanhood: 1820–1860," *American Quarterly* 18.2, part one (summer 1966): 151–174. See also Helen Buss, "A Feminist Revision of New Historicism to Give Fuller Readings" in *Inscribing the Daily: Critical Essays on Women's Diaries.* Ed. Suzanne L. Bunkers and Cynthia A. Huff. (Amherst: University Massachusetts P, 1996), 86–103.

[2]Gillespie's diary has been edited by Judy Nolte Lensink in "*A Secret to Be Burried*": *The Diary and Life of Emily Hawley Gillespie, 1858–1888* (Iowa City: U Iowa P, 1989). Sarah's diary has been edited by Suzanne L. Bunkers in *"All Will Yet Be Well": The Diary of Sarah Gillespie Huftalen, 1873–1952* (Iowa City: University Iowa P, 1993).

[3]Although somewhat dated, the discussion of these issues can be found in a book edited by Kersti Yllo and Michele Bograd called *Feminist Perspectives on Wife Abuse* (New York: Sage, 1988). Daniel K. O'Leary and Roland D. Maiuro have edited a book devoted to psychological abuse called *Psychological Abuse in Violent Domestic Relations* (New York: Springer, 2001).

[4]We have chosen to retain Gillespie's capitalization, spelling, punctuation, and grammar. We have also chosen not to use [*sic*] when Gillespie's writing differs from today's prescriptions for standard or correct usage, as doing so would disrupt the flow of the diary passages. We have used brackets in the passages to add material that may help listeners or readers understand what Gillespie is writing. The words of the narrator are ours.

[5]Many of the diary entries have come from Judy Nolte Lensink's book *"A Secret to be Burried": The Diary and Life of Emily Hawley Gillespie, 1858–188* (Iowa City: University of Iowa Press, 1989), a book that represents approximately ten percent of Emily Hawley Gillespie's diary. In other cases, entire entries and portions of the entries have come directly from the unpublished diary manuscripts that are part

of the Sarah Gillespie Huftalen Collection at the State Historical Society in Iowa City, Iowa.

[6]For this section, we have taken sample definitions from basic texts in psychology, sociology, and communication. The sample definitions from psychology come from an introduction to psychology text by Dennis Coon, *Essentials of Psychology: Exploration and Application.* 8th ed. (Stamford: Wadsworth, 2002). The sample definitions from sociology come from an introduction to sociology text by Richard Schaefer. *Sociolog.* 9th ed. (Boston: McGraw Hill, 2005). The sample definitions from communication come from a small group communication text by J. Dan Rothwell, *In Mixed Company: Communicating in Small Groups and Team.* 5th ed. (Belmont: Thomson, 2004).

[7]In psychology, roles are defined as "patterns of behavior expected of persons in various social positions" (Coon 616). In communication roles are defined as "expected patterns of behavior" (Rothwell 346).

[8]Role Conflict is defined in communication as "playing two roles that contradict each other" (Rothwell 346), in sociology as "the situation that occurs when incompatible expectations arise from two or more social positions held by the same person" (Schaeffer 555).

[9]This conflict centered around differing role expectations or the specific behaviors people anticipate of particular roles (Rothwell 118). Gillespie wanted her son to pursue a career with greater role status. Role status is defined in communication as "the relative importance, prestige, or power accorded a particular role by group members or society" (Rothwell 346).

[10]In sociology, role exit is defined as "the process of disengagement from a role that is central to one's self–identity and establishment of a new role and identity" (Coon 555).

[*Editor's Note: I have regularized to a brief extent the capitalization and punctuation throughout the diary's entries.]

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Biographies

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Student Essays*

[*Editor's Note: For 2005, AURCO awarded scholarships of $300 each to the winners of the student essay contest in the field of humanities and science.]

Machiavelli's Prince Or Nobody For President: Sources Of Political Discontent In America

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Abstract

This paper was written for Keith Lloyd in an argumentative prose class in the Fall semester of 2004. The assignment, prompted from the 2004 election, was to explore politics in our contemporary society. By applying the ideas of Nicolo Machiavelli, we can attempt to understand the discontentment of the American public.

America And Renaissance Italy

In the American culture today, politics promotes a very heated debate, especially after the recent reelection of George W. Bush. There are many who support Bush and many who do not. However, for many citizens, it is not the person running for government. There are many citizens who simply do not support the American system of government. Since many would argue that the U.S. government is based on the ideas of Nicolo Machiavelli, this discontent may be rooted in the Machiavellian construct. Yet, others would claim just the opposite, that our democratic government is the reverse of a Machiavellian regime. Though arguments exist for both Machiavellian and anti–Machiavellian elements within the U.S. government, there seems to be a tendency towards Machiavellian ideas. This tendency may have added to the creation of discontentment among the American public. By understanding the characteristics of Machiavellian elements and their relation to the U.S. government, we may possibly then understand the discontent of the public.

Discontent is often followed by opposition. Opposition comes in a variety of forms. One such opposition to the U.S. government is a

Website created to oppose the generic ideal of a president. This Website, titled Nobody for President, is a pun on the actual political campaign and presidential candidates. The author of the site has created a faceless candidate, named Nobody. Nobody actually has a biography on the Website, along with a list of qualifications and his party platform information for the election. Though creative and in some ways even supportive of the American presidency, this website is the opposite to Machiavelli's ideas. It actually uses Machiavelli's own ideas to mock the ideological Machiavellian–based thinking of the U.S. government.

In 1505, Machiavelli wrote a text which featured the world–famous archetype of human politics, the Prince. His text, *The Prince*, is still often referred to as a model of the human psyche. In his book, Machiavelli detailed how to be a successful prince over one's state. The prince, surrounded by his officials, is a leader of a group of people or many people. His people are known as the state. In the U.S. government, the president would be the prince, and U.S. citizens would be the state. The Senate and House of Representatives would be the prince's officials.

Basically, Machiavelli said the prince of a state should be the strongest of men and that the prince should use whatever resources are available to become head of the state. Thus, a prince may be deceitful or righteous, cruel or compassionate, faithful or faithless, bold or cowardly, sincere or cunning (Machiavelli, Chap. XV, par. 2). A prince may possess all such traits, but he must be aware as to when to use which traits. Although many people believe a prince should possess only the positive qualities listed above, human nature prohibits such a reality (Machiavelli, XV, 2). Machiavelli knew that no man is totally good or totally evil. Therefore, a prince, possessing both positive and negative traits, must be aware of which traits will serve his purpose. Different traits may be used on different people and/or different situations. A prince should rely on both of these inner qualities in order to achieve success. However, though a man may possess both positive and negative virtues, he should still always appear to be virtuous and to have only positive traits.

In addition to his comments on the prince, Machiavelli also made statements about the state. The comments on the prince are geared toward the conduct of a prince, while the comments on the state are more geared toward the stupidity of people to follow any leader. Machiavelli implies throughout his composition that the people will

follow the prince so long as the prince seems virtuous. According to Machiavelli, people do not realize when they are being conned by a prince. These ideas, along with all of Machiavelli's ideas, have become the common ideology which the U.S. government embraces.

Nobody Is Nobody's President

Yet, the Website Nobody for President defies Machiavelli's perception of human stupidity because its creator saw through Machiavelli's politics. The creator mocks both the U.S. president as well as the U.S. public who votes the president into office. Although many citizens do see through the false promises made by politicians, they feel as though they have no other choice but to vote the incompetent candidate into office. Nobody for President offers an alternative to the American people. Vote Nobody into office. This play on words is intricately arranged. Nobody, as a candidate, is the alternative to the lying Machiavellian politicians that currently hold office. However, literally, nobody for president means we would not elect anyone to office. The people would not be led by a prince. The ideas on this Website illustrate how people see through the underhanded tactics of Machiavelli's prince (our president) while still using Machiavelli's ideas to mock all parties.

The homepage of the website brings up an image of a faceless person in a suit and tie with the subtitle, My fellow Americans. This faceless image is Nobody, the presidential candidate advocated by the Website. Also listed are links to Nobody's biography, qualifications, and party platform. The implication of this image and its quotation is that people do not really see who is in control; they only see the qualities that specific candidates want them to see: there is no real person running for president. The candidate for each party is a person who fits the molded ideologies ingrained in our hierarchical government. People are electing an idea into the presidential office. This image goes even further to suggest that all politicians are bogus and politics in general provide an illusion of a person. In this sense, the Website is very Machiavellian. Political candidates take on false personas in order to be elected, just as Machiavelli said a prince should do in using whatever traits they possess that will aid in their success. Additionally, if the American people actually voted a faceless character such as Nobody into office, they would be blind. As

Machiavelli notes, people of a state are stupid. American citizens who elect a faceless character into office are not only blind but stupid too.

On the other hand, however, the Website is very anti–Machiavellian because it relies upon a pun that actually mocks Machiavelli's ideas. Nobody is not a real person. If Nobody gets elected, literally, no one would be president. The people would not have a leader because they are electing someone who is not real. In some ways, a faceless image also means people do not need anyone to be president because no single person is president. The president is a man who represents a whole government. According to the U.S. government, the president is the head of state, but he is not supposed to have all the power because our form of government is a democracy. Perhaps the creator of this Website was also declaring the presidential election a pointless event because the president is not truly the ruler of the state. The government officials who actually do rule the state are not men that citizens elect. This idea is very anti–Machiavellian because the prince, in this case the president, does not control the state and, hence, is not a competent leader.

A link from the homepage navigates to the short biography of Nobody. It begins with Nobody speaking about his life: [He] is Nobody. [He] was born somewhere in the United States of America to [his] parents of Nobodies (Bio., par. 1). This short introduction demonstrates Nobody's sense of not belonging in the United States. He is not anyone special, and he was born to no one of any importance. This candidate is anti–Machiavellian because he is not the strongest of men and he is not extraordinary in any way, shape, or form. He is an average person of the United States. According to Machiavelli, an average person cannot rule a state.

Nobody, however, does not claim to be the best that he can be or make any false promises. He is simply giving the American people another choice. "Because somebody has to speak for all of the people who choose to stay away from the voting booths" on Election Day, Nobody feels he has to be the one to stand up for these people (Bio., par. 3). He is running for president for these people. According to the U.S. government, the American people have a right to choose their leaders. But Nobody thinks "that there [were] no real choices" in the election of 2004 (Bio., par. 3). When the American people went to vote in the 2004 election and realized "that [their] choice [was] no choice at

all," Nobody said they should have written in his name on the ballot (Bio., par. 6). The idea that people have no real choice is a Machiavellian idea which is based on the prince's having total control. The prince should always provide an illusion that the people are the most important entity, even if they are not.

After reading Nobody's biography, one can follow another link to his list of qualifications, the location where the pun on words is truly illustrated. The first statement on the page is "Nobody is more than qualified to be President of the United States of America" (Qual., par. 1). Nobody as a person is qualified to be president, but this statement is literally saying nobody is qualified to be president. Another statement is "Nobody wants to do nothing for you" (Qual., par. 2). Literally, everyone is out for himself or herself, but as a candidate, Nobody wants to help you. Another statement on the Website about Nobody as a candidate includes "Nobody is honest. Nobody always tells the truth. . . . Nobody never lies" (Qual., par. 7). All of these plays on words illustrate the persona of our government. Politicians frequently make these kinds of remarks, despite the fact that the remarks are completely against human nature. Nobody always tells the truth or never lies. The Website is simply pointing this truth out by mocking the government. In other words, the government makes numerous claims which are against human nature.

Although these statements make a point about the Website, all of them are Machiavellian while still being anti–Machiavellian at the same time. Nobody, as a person, is very Machiavellian because he is appearing to be virtuous. He is attempting to fit the protocol of the virtuous prince. In order for a prince to have total control of the state, he must always "endeavor in every action to gain for himself the reputation of being a great and remarkable man" (Machiavelli, XXI, 2). However, Machiavelli also points out that no human being can possess only virtuous traits (Machiavelli, XV, 2). So the prince must be aware of both kinds of traits and how each may lead to power over his state or ruin of his political rule. Yet, what may look like a virtue may cause a prince ruin, and what may look like a vice may give him prosperity (Machiavelli, XV, 2). So a prince must be careful as to the choices he makes after judging vices and virtues. What appears to be a virtue may not be a virtue in another point of time.

In spite of supporting Machiavelli's views, these statements also negate Machiavellian viewpoints because if taken literally, they are not virtuous statements. Therefore, they may cause a prince ruin. Some of the statements completely defy Machiavelli, such as, "I will get nothing done" (Qual., par. 8). This quotation reflects how many Americans feel about many presidents being representatives of the people. Yet, it is the opposite of what a candidate for presidency should say. According to Machiavelli, "nothing makes a prince so much esteemed as great enterprises and setting a fine example" (Machiavelli, XXI, 1). Nobody is doing either: he is not accomplishing anything and is not setting any kind of example. Though a statement about getting nothing done may show empathy towards Americans, it may cause him ruin in the end. To many, he is not creating a reputable image of himself because he is not doing anything. This view is against Machiavelli "because squandering your own [reputation] injures you" (Machiavelli, XVI, 4). If Nobody does not create a good name for himself, he may not be respected by those whom he wants to elect him to office.

Unintentional Truth

Although Nobody is the opposite of all other candidates because he willingly states the truth that no one wants to admit, he is still like the other candidates when he makes one unintentional positive statement. He makes the statement, "nobody wants to do nothing" (Qual., par. 2). Literally taken, the name nobody combined with nothing creates a double negative which is actually positive, another example of the Website's play on words.

The final description of Nobody concerns his party platform. It follows the example of the qualifications of Nobody. It is mainly a play on words because of statements like "Nobody cares about the environment" (Party Plat., par. 2). Again, literally taken, this comment means that no one cares about the environment, which is untrue since somebody does.

Nobody, as a candidate, uses many of the tactics which are concerned with keeping the prince held in high esteem with the people. This is very Machiavellian because Machiavelli believed "it is necessary for a prince to have the people friendly, otherwise he has no security in

adversity" (Machiavelli, IX, 5). In a democracy, it is essential to be in good favor with the people because the people are the ones who elect you to office. However, on the other hand, the Website contradicts Machiavelli's ideas when phrases are taken literally, as has been previously illustrated.

This Website, in an overall sense, is very Machiavellian because of its puns. By attempting to illustrate the true nature of human beings and the politicians who rule our government, this Website has illustrated the point that Machiavelli makes about human nature. According to Machiavelli,

> how one lives is so far distant from how one ought to live, that he who neglects what is done for what ought to be done, sooner effects his ruin than his preservation; for a man who wishes to act entirely up to his professions of virtue soon meets with what destroys him among so much that is evil. (Machiavelli, XV, 1)

Perhaps this view shows why U.S. politics are considered immature and unsuccessful in our ideological thinking by other countries, despite our militaristic world–power status. Nobody illustrates how people really think and live their lives while real politicians attempt to live the perfect life, telling the public they are honest and virtuous persons. But no one is perfect. U.S. politicians try to live up to the standard of an ideal leader who has no flaws. Perhaps U.S. politicians should show their real character, like Nobody, and then the U.S. citizens would be more realistic in their thinking.

Nonetheless, the Website does do one thing which might meet with Machiavelli's approval. It is a product of our time. According to Machiavelli, "he will be successful who directs his actions according to the spirit of the times, and that he whose actions do not accord with the times will not be successful" (Machiavelli, XXV, 4). Although it is not the prince who keeps up with the times, the people show their disgust with U.S. politics and government. If a prince such as Nobody is smart enough to embrace the feelings of the U.S. citizens and use them to advocate himself, he would be successful in the sense that he would be keeping up with the times and reacting to the concerns of the state.

Though this Website may be very Machiavellian in some senses, Machiavelli probably would not approve of the Website's attitude toward

the authority figure. The attitude that the Website exemplifies is one of discontent. People who share this attitude are unhappy with the current governmental system. They do not say they want to overthrow the government or cause any harm to anyone, but they do blatantly advocate no person for president, which is not a democratic ideology. Machiavelli believed the leader who is in power should only take an upheaval that is "hostile and bears hatred towards him" as serious (Machiavelli, XIX, 8). Such controversies should be feared. Though this Website may not be blatantly hostile, it can be taken as a threat to the current governmental powers. Machiavelli might go so far as to say the prince is not doing his job. If he were, the people would not be discontented.

Nobody As Threat

In some ways, it is a threat merely because it advocates a different kind of candidate, a truly honest person. But this truly honest person does not really exist because he is being honest about being dishonest. This Website does not give the impression of being perfect, but at the same time it uses Machiavelli's ideas, including the idea that all people are dishonest and nobody tells the truth all the time. It mocks the virtuous identity that all presidents and governmental leaders claim to hold. Basically, this Website illustrates how Machiavellian tactics are no longer working. The Machiavellian assumption that the U.S. public is stupid no longer holds true. Additionally, our presidents do not do a good job of hiding the fact that they see people like Machiavelli. People see through this act. As the public becomes more educated, people begin to realize the non–virtuous identities which our leaders possess. This Website is an example of how people see through the intentions of our political leaders. By making fun of the virtuous traits, this Website is implying it is catching onto the deceitful Machiavellian ways that leaders use to try to fool the country. As a stepping stone to an alternative political party, perhaps Nobody could be the middle–ground party everyone wished would have been on the ballot in 2004.

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Biography

Last year, Desiree Hoffman, Kent State University—Stark, submitted an essay exploring the characteristics of a specific Caribbean author, Zee Edgell, under the supervision of Keith Lloyd, associate professor, Kent State University—Stark. Her paper was ranked second, and she was given the benefit of presenting it at the AURCO Conference. The opportunity to submit her paper again this year, as a senior Kent State—Stark, Hoffman considers "a privilege." She may be reached at deshoffman@msn.com.

The Stabilization Of Garlic Compounds Via Refrigeration

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Abstract

Thin Layer Chromatography was performed on fresh garlic and Nature Made garlic tablets using the solvents of distilled water and ethanol. Successive RF readings were taken on days 0, 2, 5, 7, and 14 to observe whether values indicated alterations in the chemical makeup of the compounds. The solutions were kept in a refrigerated state during the course of the experiment in an effort to stabilize the materials. No substances were manifest on the TLC plates from the tablet/ethanol solution, while a single substance appeared from the tablet/water solution, and two compounds were visible from each of the fresh garlic solutions. Every substance showed a similar nonlinear pattern in alteration over time, raising questions about the accuracy of the methodologies used.

Introduction

Garlic (*Allium sativum*) has long been considered a medicinal plant in many cultures. It is still popularly used for a variety of purported beneficial effects, including cardiovascular, antimicrobial, antifungal, antiprotozoan, and immunologic and antioxidant activities (Kasuga, Uda, Kyo, Ushijima, Morihara, Itakura, 2001). Though garlic has long been a staple of folklore medicine, Louis Pasteur was the first to report the antibiotic character of garlic (Sivam, 2001).

There are a number of chemical compounds found in garlic thought to be responsible for these things, but the primary substance is believed to be a modified amino acid called allicin. Allicin appears to be a defense mechanism native to garlic that defends the plant against various insects and diseases. It is formed when the compound alliin mixes with the enzyme alliinase, and this occurs only when the garlic bulb is

compromised by crushing or piercing. The fact that garlic can produce this substance only upon injury is a natural arrangement that works well for the plant because allicin is known to degrade rapidly into other substances (chief among them ajoene). For this reason, garlic extracts in tablet or powder form (e.g. brand names Kwai and/or Sapec) typically have little or no allicin content in them; but the products remaining are typically regarded as having many of the same healthful benefits. However, it is arguable from the multitude of studies done to date whether they are as effective as allicin itself, or whether indeed any of them work well in the absence of the others (Koch, 1993).

Some manufacturers have attempted to deal with allicin's short life–span by producing garlic products that separately contain the enzyme alliinase and its substrate alliin. The reasoning is that upon consumption the enzyme will react with the substrate to produce allicin within the stomach or intestines. The difficulty with this approach is that stomach acid quickly destroys alliinase (Freeman and Kodera, 1995). Furthermore, research seems to indicate that since allicin is so reactive that it is practically gone from the body within 24 hours of ingestion (Lawson, Ransom, and Hughes, 1995).

This view suggests that while allicin may not be tremendously useful by itself for achieving processes that would favor stable compounds, it might be extremely beneficial for its antibiotic properties (at least in topical use) if it could be both isolated and stabilized. According to a report by the BBC dated December 24, 2003, allicin had been found to be effective in treating Methycillin–resistant Staphylococcus aureus and had even been successful in dealing with strains that could ward off "last line of defense" antibiotics like Vancomycin and Glycopeptides.

A few manufacturers have made the claim to have found a way to stabilize allicin, but as "trade secrets" the methodology for doing so does not seem to be publicly available. The chemical formula for allicin (diallyl thiosulfate) and one of its resulting products (ajoene) is depicted in **Figure 1** (Kyung and Lee):

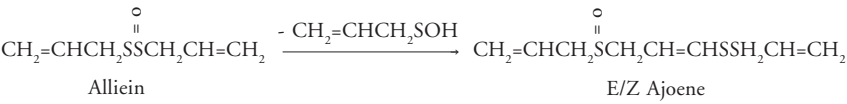


Figure 1. The chemical formula for allicin (diallyl thiosulfate) and one of its resulting products (ajoene).

Since ajoene is a relatively stable compound, it is tempting to think that if the mechanism of the reaction can be discovered it may also be reversed. The challenge would be to discover a simple, safe, and inexpensive means of doing so. Aside from the reversal of this mechanism, other possibilities that may be investigated are the use of a sulfhydryl compound such as dithiothritol or glutathione under anhydrous conditions.

The processes of isolating and specifically identifying the aforementioned substances, however, are far beyond the scope of this study. It is therefore necessary to restrict the endeavor to a more manageable first step. The purpose of the experiment is to gain insight into the stabilizing effects of refrigeration upon compounds found within garlic.

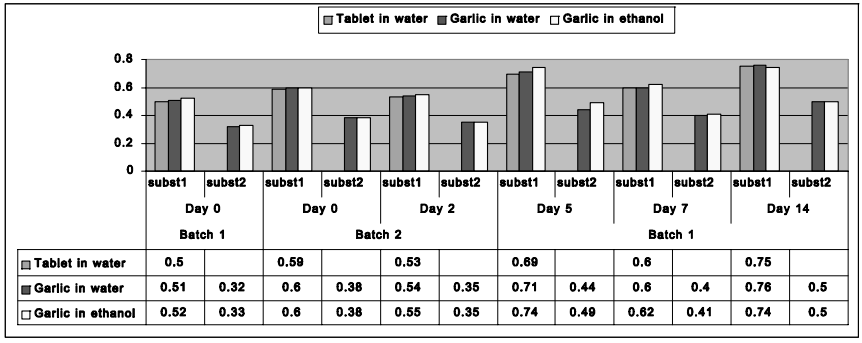
Methods and Materials

Thin layer chromatography was performed on fresh garlic and Nature Made (brand) garlic tablets. These two substances were crushed with a mortar and pestle to aid in solvation. TLC paper, along with hexane and ethyl acetate as a 50/50 eluent, provided a simple means of evaluating the stabilizing effects of refrigeration upon some of garlic's compounds. Two solutions of 10 mL dH_20 and 10 mL ethanol were each prepared with 3.0 g fresh garlic; likewise solutions were prepared using 8 mL of the same two solvents with 0.651 g crushed garlic tablet added to each.

TLC was performed on each of these four solutions over a period of days in order to study the stability of the compounds that appeared, with the initial day of preparation designated as "Day Zero." Between tests the solutions were kept refrigerated at approximately 0^{o} C. On Day Two a second batch of four solutions was prepared for concurrent study with the first batch. In order to eliminate confusion it may be pointed out that when the second batch was created, the reference time was Day Two with respect to batch #1, but Day Zero for batch #2. The first batch was tested on Days Zero, Five, Seven, and Fourteen, while the second batch was examined on its own Day Zero and Day Two. Each time TLC was performed, a single plate was prepared with all four solutions spotted ten times each in order to concentrate the solutes.

Results

In every test, two different substances appeared on the TLC plates for crushed garlic in water and in ethanol. A single substance was visible for the garlic tablet in water, while nothing appeared on any of the plates for the tablet/ethanol solution. There was a variation of approximately 14% between the two batches on Day Zero, with batch #2 displaying the greater RF value. Afterwards a test was run using different size TLC plates, and it was noted that the relative size of the plates had a direct effect on the RF readings (**Table 3**). Aside from this



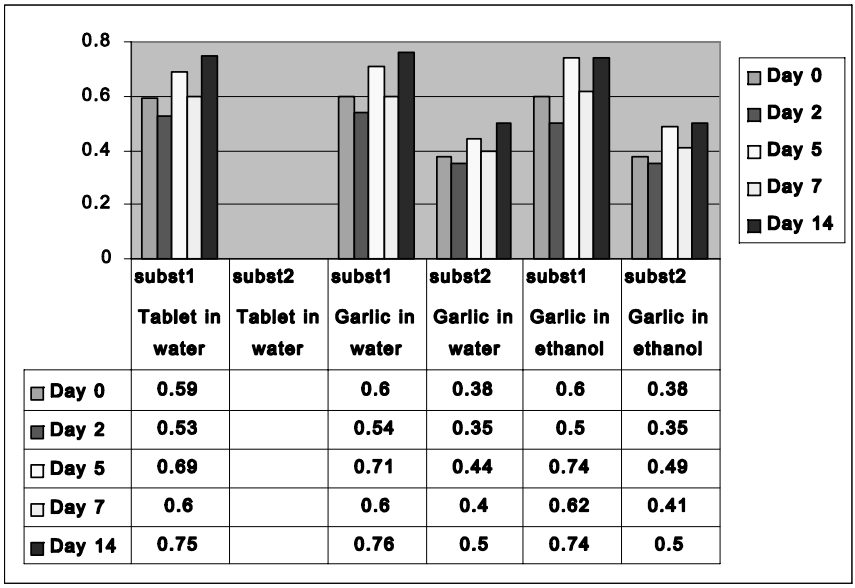
Tablet in water	0.5		0.59		0.53		0.69		0.6		0.75	
Garlic in water	0.51	0.32	0.6	0.38	0.54	0.35	0.71	0.44	0.6	0.4	0.76	0.5
Garlic in ethanol	0.52	0.33	0.6	0.38	0.55	0.35	0.74	0.49	0.62	0.41	0.74	0.5

Table 1. Raw Data of TLC RF Values.

discrepancy, the general trend seemed to indicate an increase in RF over time, peaking at Day Fourteen (**Table 2**).

Discussion

The time, skill, and materials limitations of this study made possible only a brief examination of the possibilities for stabilizing compounds found in natural garlic. Upon reflection and discoveries made during the course of the experiment, we note that a number of things could have been done to improve both the quality and quantity of the data. The fact that the two batches gave different Day Zero RF readings when they theoretically should have agreed raised concerns. More care should have been taken to ensure that all TLC plates were prepared in exactly the same manner (i.e., the same size). When data was reviewed, it was determined that batch #1 (Day Zero) was performed on a TLC



	subst1 Tablet in water	subst2 Tablet in water	subst1 Garlic in water	subst2 Garlic in water	subst1 Garlic in ethanol	subst2 Garlic in ethanol
Day 0	0.59		0.6	0.38	0.6	0.38
Day 2	0.53		0.54	0.35	0.5	0.35
Day 5	0.69		0.71	0.44	0.74	0.49
Day 7	0.6		0.6	0.4	0.62	0.41
Day 14	0.75		0.76	0.5	0.74	0.5

Table 2. RF Variation Over Time, Large TLC Plates Only.

plate that was significantly smaller than the others (which were all fairly similar in size). **Table 3** shows an overall 10.15% difference obtained when the two different size plates were tested concurrently. For this reason, **Table 2** was compiled excluding batch #1 (Day Zero). Another concern is that, even though each plate was spotted an equal number of

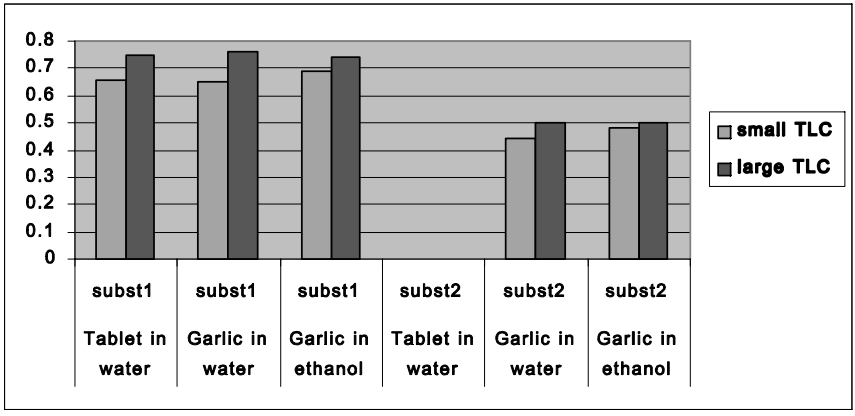


Table 3. Comparative Readings of RF Values of Small TLC Plates vs. Large TLC Plates.

times, greater care could have been taken to ensure equal concentrations of the solutes. It has since been determined that potency is an additional factor that influences RF values and may have played a part in the staggered values obtained (**Table 2**).

A further improvement that could have been made to the study would have been to include similar unrefrigerated solutions for testing. This procedure would have provided a helpful baseline to measure the usefulness of refrigeration in maintaining the stability of the observed compounds.

It was initially believed that some comparison of a fresh garlic bulb with a manufactured tablet (extract) would demonstrate that fresh garlic contained more of the active compounds allicin and/or ajoene. The fresh garlic TLC did in fact reveal two substances, while the tablet only disclosed one. The significance of this result remains in doubt. It is understood that TLC doesn't necessarily reveal all components of a solution, and the identity of what was discovered cannot be verified at present. The only observation that can be made in this regard is that the tablet lacked an unknown that was present in the garlic bulb.

Because all TLC plates shared the same pattern, it can be assumed that each instance of substance #1 or substance #2 is indeed some variation of the same compound. As the composition of the substances altered over time, it would have been expected that the RF values in **Table 2** might be more linear in nature. The curious stair–step pattern can be only partially explained by the fact that Days 0 and 2 were from a different batch than the others. On the other hand, it is not unreasonable to conclude that since TLC is simply a means of distinguishing substances via the degrees of polarity, any given compound could give erratic readings during its course of change. Intermediate forms of the substances may be more or less polar than the final products, or perhaps the values indicate formation of a product and its subsequent degradation (i.e., allicin).

Probably more questions were raised than answered in this study. It would be helpful to repeat the experiment making many of the corrections that have been discussed and perhaps armed with more previously determined data. Assuming that others have done more sophisticated TLC with identification of allicin, an identical methodology could be utilized in this experiment to identify the

compound and to observe whether refrigeration might be useful in its preservation.

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Biographies

Jun Yan and Andy Jackson are from the University of Cincinnati—Clermont. They prepared this essay under the direction of Barbara Widanski for Chemistry Lab 212.

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