Editor's DeskTop

As an indication of the concern and fostering attitude of faculty throughout Ohio's state–wide system of twenty–three regional colleges, faculty and administrators can take pride in the tenth volume of *AURCO Journal*. Since 1993, the Association for University Regional Campuses of Ohio has fostered the potential and the realized growth of faculty throughout Ohio. Through its commitment to bring a university education to local communities, Ohio's regional system of higher education has been supported by numerous faculty who are equally committed to fostering the best education and scholarship possible for both the students we serve and the demands of our various disciplines. As the official publication of AURCO, *AURCO Journal* publishes refereed articles by faculty who maintain the tradition of bringing knowledge to the classroom and to the community as well as serving in numerous capacities as resources for parent campuses and surrounding communities. As Stephen M. Flaherty, Associate Vice President of Regional Higher Education for Ohio University, noted in his plenary address for the 2003 Conference, the responsibilities of a regional campus are many, complex, and often replete with problems that require innovative thinking not only with regard to the educational demands but also with regard to the professional demands made on faculty. Tenure and promotion are but two instances that are easily noted. With institutional demands differing from institution to institution and from college to college within institutions, the place of regional faculty within a larger context often becomes one of competing interests and duties. Yet, as Flaherty notes, we continue to prosper and fulfill a mixed mission within the institution with poise, energy, and continued relevancy.

Nine refereed articles in the current issue present the work of eleven authors from seven of Ohio's state universities and eight regional colleges: Kent State University—Stark; Miami University—Middletown; Ohio University—Zanesville; Ohio State University—Marion; University of Akron—Wayne; University of Cincinnati—Clermont; University of Cincinnati—Raymond Walters; and Wright State University—Lake. In subject matter and approach, these articles are as distinct as the

regional colleges and communities they represent yet as common as the shared demands of each discipline and concern for the intellectual integrity of programs and approaches to instruction. Past president of AURCO, Gordon J. Aubrecht, II, Ohio State University—Marion, continues his work in examining how students reason mathematically in science classes. Joseph Cavanaugh, Wight State University—Lake, has studied just how much time it takes to adequately prepare online courses. Susan A. Baim, Miami University—Middletown, explains how a two–year business technology program attempts to meet the demands of the students and the communities which the program will serve. Shahrokh Ghaffari, Ohio University—Zanesville, explains how the common elements found in everyday media can enliven the study of chemistry at the same time as fulfilling an academic requirement in understanding important chemical principles. Keith S. Lloyd, Kent State University—Stark, is concerned with the study of various cultures and how students not exposed to such cultural differences react and are challenged to adapt to differing cultural perspectives and perceptions. Betty J. Rogge and Jonnie J. Phipps, University of Akron—Wayne, detail the use of multimedia applications on a limited budget. James Steinberg, Wright State University—Lake, indicates how Web resources can serve as the basis for writing assignments in traditional courses as part of a writing across the curriculum program. Mark A. Thomas, University of Cincinnati—Raymond Walters, simplifies the often bewildering language of computer programming with the most common elements of peanut butter, jelly, bread, and a knife. Lastly, Bozena Barbara Widanski and Debra Courtright–Nash, University of Cincinnati—Clermont, collaborate in assessing from a number of perspectives the causes of unmerited high self–assessment in students.

Acknowledgments

No journal is the work of one individual. I wish here to thank the many individuals who have helped to make *AURCO Journal* the leading publication of Ohio's twenty–three regional colleges.

First, Associate Editor Lee Fox–Cardamone of Kent State University—Stark has been my right–hand and online colleague through the inception of the journal as a refereed publication in 2000. Like an

academic trapeze artist, she has accomplished with the seemingly greatest of ease the very necessary and complicated task of securing referees, updating the publishing guidelines, seeing that referees receive the articles, making sure that the authors receive the referees' comments, and finally ensuring that the articles get to me on time for final preparation. Since her duties at her college now require that she spend more time given to its concerns, her position as associate editor ends with this volume of the journal; the remembrance of her efforts on behalf of the journal and the organization will not. Many thanks go to you Lee, as well as my best wishes for your continued professional success.

In her place, Robert Howell of the University of Cincinnati—Raymond Walters will be assuming the duties of associate editor for the 2005 edition of the journal, and hopefully for at least a hundred additional volumes. Howell, like Cardamone, is a past president of AURCO. Now that I have his full commitment, I will be able to tell him how much work he is going to have to do to keep the work flowing as smoothly as the previous associate editor. I welcome Robert to the task and look forward to his continued support of the organization and journal.

My thanks go to Managing Editor Robert Sturr of Kent State University—Stark. Without his attention to the details of managing our distribution and raising funds for the journal, the journal would not be on a sound financial footing or reach its intended audiences.

My many thanks go to all of the twenty–eight referees from ten institutions who oversee and maintain the quality of the publication through their reviews and comments.

My thanks go to Wright State University—Lake Faculty Secretary Carol Jones for her finding a place for 700 journals and assisting in communications concerning the journal.

Last but not least of all, my very special thanks go to Gretchen Bollenbacher, Public Relations Facilitator of Wright State University—Lake. I have worked with her in a number of capacities as both faculty and colleague. She has been responsible for proofreading every journal. Her attention to detail and to finding the most unnoticed errors of every conceivable type, pun intended, and differences in format have made the look and the substance of the journal appear as one of the best edited texts on any university library shelf. Gretchen's retirement

in December of 2004 will place a heavy burden on the journal, especially its editor, to find anyone with one half her skills. My thanks to you Gretchen, and my best wishes for your beginning of a new career.

AURCO Journal Online

AURCO Journal is now available online at Ohio University—Southern at the following location: www.southern.ohiou.edu/aurco. My thanks go to: Terry Quinn, Associate Editor of *ETUDE & TECHNE* and mathematics professor at Ohio University—Southern for arranging for the online version; to Dean Dan Evans for allowing AURCO to use the technical resources of Ohio University—Southern; and to Jed Utsinger and his assistant Porsche Dillon for taking care of the technical matters in maintaining the site.

Arthur A. Molitierno
AURCO Journal Editor
Wright State University—Lake

Plenary Address

University Regional Campuses

Stephen M. Flaherty
Associate Vice President Regional Higher Education
Ohio University

Thank you very much for inviting me to the 2003 AURCO Conference. It is nice to be here. This is my first AURCO Conference, and I want to take this opportunity to thank our host Dean David Devier for his warm hospitality, and I want to extend my gratitude to all of the regional campus faculty members with whom I dined last night and with whom I have had a chance to interact with in discussing issues related to the history of my home institution, Ohio University, and many other issues as well. It was great fun last night, and I am sure that you will have a great day today.

Now to my topic of today: university regional campuses. There are six subtopics that I want to touch upon today: relationship to the main campus, the faculty role, community relations, financial relationships, the future, and well–kept secrets.

Regional campuses are unusual entities, especially to those who might expect them to be like four–year institutions or like two–year institutions. They are similar to both of these, and yet at the same time they are very different. My old boss used to say that they are neither fish nor fowl. And to a large degree, I believe that he was correct. Because they are linked to universities, they are more than two–year colleges, and because they are linked to universities, they are less than four–year colleges. The relationship that regional campuses have to their home institutions expands and restricts their abilities to meet the programming demands in their communities.

Relationship To The Main Campus

This very nicely, in an unplanned fashion, brings me to my first subtopic: the relationship to the "main" campus. Whether we like if or not, we all have a main campus in places like Columbus, Clifton, Dayton, Kent, Athens, and so on. If we didn't have main campuses, none of us would

be here. We would be working at either community colleges or stand–alone four–year institutions. There are a plethora of different versions of university regional campuses throughout the country—some strictly upper division, some strictly lower division, some primarily offering technical degrees, some primarily offering a transfer mission, etc. Three predominant structures in Ohio are the college structure, the comprehensive regional campus, and the co–located regional campus. Regional campuses that are organized as colleges have separate curricula, separate college–like promotion and tenure criteria and approval processes, are often self–funded, and have strong technical missions. The University of Cincinnati's Clermont College and Raymond Walters College are excellent examples of campuses organized as colleges. Students earn the degree from the regional campus. The campus is identified on the transcript. These colleges are two of the several colleges that comprise the University of Cincinnati. These colleges award two–year technical and nontechnical associate degrees, certificates, and transfer programs. Regional campuses operating under the college structure can also offer bachelor and graduate degrees on their campuses, but they are not awarding these degrees. Such upper level degrees are awarded by the main campus or home campus (whichever you prefer) college.

Comprehensive and co–located campuses are generally not organized as colleges. Degrees offered on their campuses at all levels are awarded through main campus colleges or other college–like academic units. These campuses use university–wide college curriculum from many university departments and schools to meet their educational mission.

Comprehensive regional campuses are called comprehensive because at the lower division (first two years) they offer both a technical (Associate of Applied Science degrees) and a nontechnical mission (Associate of Arts and Associate of Science degrees). Co–located campuses, on the other hand, can only offer a nontechnical mission (Associate of Science or Arts) because the two–year technical college that they are co–located with offers applied science associate degrees as its technical mission. In a few rare instances, co–located regional campuses in Ohio do offer technical applied science degrees that have been "grandfathered" in because these degrees were offered before the absolute bifurcation of the regional campus and technical college missions in a co–located

situation. All of the Ohio State University regional campuses (Marion, Mansfield, Newark, and Lima), Kent State Stark, and Ohio University Eastern (St. Clairsville) and Zanesville are co–located.

In Ohio, most if not all university regional campuses offer bachelor degrees, and many offer graduate degrees; remember, they are offering and not awarding the degrees. These degrees are offered on their campuses, and regional campuses recruit the students and arrange for the clearance of faculty through the home department or school. The degrees are, however, awarded through the main campus college. So unless they are structured as colleges offering their own curriculum, regional campuses really function as distribution systems for university courses, programs, and degrees that are housed in main campus colleges. This is especially true for upper division degrees, but it is a little less common for lower division (associate) degrees, as you will see in the discussion of faculty that immediately follows.

Role Of Regional Campus Faculty

This brings me to my second subtopic: the role of university regional campus faculty. As you might expect, for all faculty (tenured, tenure track, nontenured, part–time, etc.) this role has much to do with whether or not the regional campus is structured as a college: for tenured and tenure track faculty, this role will be significantly affected by where (home academic school/department or regional campus) tenure is earned and held. If a college structure is in place, then faculty responsibilities can be clearly laid out to be consistent with the college's mission. College promotion and tenure criteria can be developed and communicated by the college's faculty in consultation with the college's academic administration. Nontenured and part–time faculty can be cleared and reviewed using criteria developed in a similar fashion.

But how are faculty responsibilities determined when the regional campus is not structured as a college, but rather, when it is structured primarily as an educational distribution system for the curriculum and degrees of many colleges? There are two extreme answers to this question: in one extreme, the academic extreme, the home school/department determines faculty responsibilities based upon traditional academic criteria prioritized as scholarship, teaching and service; in the other

extreme, the campus/community extreme, the campus itself determines all of these responsibilities based upon campus and community demands with the same list of traditional academic criteria but re–prioritized as teaching, service, and scholarship. For example, tenured faculty at the Ohio State University regional campuses hold tenure in their home (main campus) department. In my interactions with Ohio State regional campus faculty or former faculty, I have observed a heavy preoccupation with scholarship, research, and publications. Tenured faculty on Ohio University's regional campuses hold tenure on their regional campus. In my interactions with them, I have observed a heavy preoccupation with teaching and service. Of course, Ohio State regional campus faculty are concerned about and take pride in their teaching, and Ohio University faculty take pride in and are concerned about their scholarship, research, and publications, but the emphasis is different with these faculty because the tenure review systems are structured differently with emphasis on different criteria.

Despite the emphasis toward home department or campus, when campuses are not colleges, the home department will still always be involved in determining the role of all of the faculty through the evaluation and approval of faculty to teach specific courses, especially when those courses are at the junior, senior, and/or graduate level. This involvement may be in the form of completing a staffing approval after reviewing a resume for regional campus faculty members to teach specific courses, getting to know regional campus faculty through departmental or university meetings, being involved in and hiring regional campus faculty, and review of promotion and tenure credentials. In some cases, the home department may have veto power in these situations, while in others the authority may be only advisory. However, my observations over the years have told me that in all academic matters, when dealing with another college's curriculum, regional faculty will be much more successful at being approved to teach the courses that they want to teach, at serving on the committees that they want to serve on, and at being included in scholarly activities with home department colleagues when their home department knows them and feels comfortable with them, regardless of the emphasis of the evaluation process.

So there is a tension between campus and home academic department/school/college regarding determining the role of regional

campus faculty. I have observed what I would call an implicit assumption that regional faculty can pretty much do what they want in their specialty at the freshman and sophomore level without too much interference from their main campus home department as long as no issues (like bad student evaluations) arise. For junior and senior level courses, initial approvals to teach are generally required, and at the graduate level, approvals to teach are required each time a course is taught.

The one interesting exception to this is the approval to teach applied technology courses. In the distributive model (as opposed to the college model), the "home" department for these courses, in my experience at least, has been in a university college or in a college unit that has no real understanding of the content in these courses. Since all of the faculty for these courses reside on regional campuses (with a few exceptions where universities have university two–year technical colleges or outreach campuses on their main campuses such as urban institutions often have) the main campus college plays the role of advising students and implementing and maintaining academic policies that have been developed and approved primarily in consultation with regional campus faculty.

Community Relations

I think that one of the essential tensions that must exist for regional campuses to optimize their effectiveness in meeting the mission of extending the university is the struggle that they feel every day in their attempts to be microcosms of a university and at the same time to serve their communities.

To a certain degree, the priorities of university and community are consistent in areas such as educating students, extending cultural events, providing library resources, and maintaining and developing an attractive and functional university physical plant in the community. In other areas, such as supporting community recreational facilities, promoting economic development, and university involvement in contested community issues, there is less consistency as the strain of tension begins to show.

Despite these limitations, there are many notable success stories regarding regional campus and community relations. Service learning

projects linked to specific regional campus courses have had some real success. The involvement of campuses in programs such as Americorp and Appalcorp have also promoted community service through regional campuses.

In some situations, the community seems to want more than what the university is either willing or able to offer. For example, communities often want more on-site bachelor and graduate degree programs, and, understandably, it is difficult for community members to appreciate or to understand the politics, bureaucratic complexities, and time–consuming processes involved in the approval of such programs off–site. So, community members often ask, "Why is it so difficult to get more bachelors degrees out here?"

Sometimes I wonder myself why this has to be so difficult. Similar questions are asked about the use of land and facilities: Why can't the campus use some of its land and money to build a gymnasium and aquatic center for the community? Why can't the university make a larger impact on the economic development of the community? While the answers to these questions vary according to the regional campus model (college, comprehensive, co–located), in my experience, one primary factor plus several other factors have always played a major role. The primary factor is time. Main campus activities take precedence; so, getting regional campus issues on the list of university approvals takes time on the form of explaining, re–explaining, and continuously following up with the appropriate people to remind them about what they agreed to. My advice is, once something is approved, get it in writing. Time also plays a factor in getting faculty to commit to a new activity that may be an addition to what they perceive as heavy workloads already.

For approval of academic programs, the issues of market demand, faculty resources, and funding always seem to be major determinants as to whether an upper division program will be approved or not be approved. If the program is in high demand and it can pay for its direct instructional cost and academic support through tuition and state subsidy, and provide some incentive back to the home college/department/school/main campus general fund, then resources may be there for a quality program to be developed and sustained.

For approval of facilities projects, issues such as liability, onetime

funding, and continuing maintenance are significant. In addition, under existing state law, in an attempt to limit the growth of space at post–secondary institutions, campuses will have their instructional state subsidies reduced by the amount that they overspend their existing debt–service allocations. Since campuses really should be using their debt–service allocations to build, support, and improve facilities to meet their educational mission, spending funds for community projects may put educational mission support and community support on a collision course.

That is why I believe that campuses must understand and deal with this tension that in certain situations must exist between community and campus. There are some things that regional campuses simply can't do for communities if they are to be true to their educational mission, and there are other things that they are discouraged from doing by their main campuses but which they must continue to strive to do, such as bringing critical programs including more upper division and graduate offerings to their communities when they are needed.

Financial Relationships

One important fact to keep in mind regarding regional campus financial relationships is that in Ohio even though they are part of a larger university, regional campuses are allocated state funds directly from the state. Therefore, each campus knows how much money it is supposed to be receiving from the state. The state funding system in Ohio is based upon student FTE enrollment in thirteen state share categories. When there is new money in the system, the more a campus grows, the more it should earn. Since campuses know that they will earn more money as they grow, and since they have access to this information, successful campuses tend to want to keep their own revenue and operate based upon it, enabling them to capture more funding than they would if they operated on an expense budget through their main campuses. In my opinion, because of this, regional campuses in Ohio tend to be either totally or partially self–funded.

Therefore, the primary relationship that exists between regional campuses and their respective main campuses is an overhead charge for services. Some, who will go unnamed, have referred to this as a "franchise

fee," the cost of using the university's name. While many of us may resent having to pay this cost, in all fairness, there are actual costs incurred by main campuses associated with operating regional campuses. Some of the more obvious costs are registration, financial aid, billing, payroll, human resources, all of which may be centralized wholly or partially. Other costs may include oversight for grants, construction projects, and academic programming. What the service charge should actually be seems to be a moving target. Since this charge is one of the sources of income for main campuses, in tight budget times the main campus may want to negotiate them up; in flush times, they will probably leave you alone. I have never known of a regional campus service charge being decreased.

Service overheads are often calculated as a percentage of gross income––eight percent is a prevalent figure. I have also known percentages to be as high as seventeen percent and as low as five percent. However, there also may be other charges levied on regional campuses in addition to the service overhead charge: profit–sharing with academic units on programs, RCC charges, and the cost of specific initiatives. It is important to keep in mind that the service overhead charge does not cover everything, and I would venture to propose or perhaps even wager that at most, if not all, universities, it would be impossible to determine exactly what the service overhead charges do cover, especially for arrangements that have been in place for a long time. One of the major problems with service overhead charges is that these funds really can't be identified and used for desired initiatives; instead, they disappear, as many funds do, in that institutional black hole known as the main campus general fund.

Despite the many drawbacks of the service overhead system, I think that self–funding is a much better way to fund regional campuses than the other alternative: the expense budget. Self–funding provides incentives to regional campuses to operate efficiently by keeping costs in check and by maximizing revenues. Campuses must earn enough to cover expenses and to meet their overhead obligations to the main campus. While this approach may seem risky, it seems to work pretty well in most cases. The information that I have indicates that most regional campuses in Ohio operating on the self–funding model have survived and even flourished in both good and bad budget times. I

think that the reason for this is their ability to react to situations somewhat independently of their main campuses, especially to capitalize on opportunities to generate income through successful programming.

What if regional campuses did operate on expense budgets and had to come to the budget negotiation table to compete with main campus units for funding? Would they be more or less successful than they are now? Do you think that main campus priorities would take precedence in virtually every instance? My experience would indicate to me that regional campuses wouldn't do as well simply because the regional campus mission of access and outreach is not the same as the main campus mission, and, therefore, it wouldn't be funded very well.

The Future And Well–Kept Secrets

Certainly, throughout recent history, the existence of regional campuses in Ohio has been challenged several times. In the early 1970s with the advent of community and technical colleges, in the early 1990s with the initiative to convert all regional campuses into community colleges, resulting in the creation of co–located campuses, and now as I write this, negotiations are under way at the Ohio Board of Regents regarding the issue of co–located campuses. If regional campuses are to survive, they must maintain excellent working relationships with their communities because in every situation in the past the outcome has been determined by community response. In the early 1990s, Ohio University's position was that if communities want the regional campuses to remain, then the university would continue to operate them.

Regional campuses have a very bright future. They offer university credit hours and degrees to thousands of Ohio citizens across the state at relatively low (I would call bargain) tuition levels. They provide commuting students in many categories (adult, place–bound, single–parent, etc.) with an opportunity to earn a university education, either a degree or certificate or readily transferable credits. Regional campuses bring access to technology, library resources, and cultural programs as well. Enrollments on regional campuses in Ohio have continued to rise despite the onslaught of distance learning programs. I would suggest that distance learning opportunities will support a greater need for regional campuses as places where nonresidential students may complete

a university degree.

There certainly are challenges ahead. Regional campuses must be seen as true microcosms of the university having the ability to offer most if not all university programs that are in high demand and in a suitable delivery mode. Likewise, they must develop ways to effectively articulate with community and technical colleges so that graduates of those institutions, especially community residents, can complete bachelor degrees in a timely fashion. Enrollment patterns and market penetration data indicate that co–located campuses provide a significant value for a community—strong technical applied science programs and university programs. I think that regional campuses can learn something from this model, especially regarding the specialized expertise devoted to each side (technical/university) of the co–located equation.

Finally, I was going to give you that cliché about regional campuses being the best kept secret in _____. You can fill in the blank—universe, world, country, state, county, community, or public school district. But the point that I really want to make is that regional campuses shouldn't be a well–kept secret. They shouldn't be a secret at all. Often, I think, because they are always at best the second child in university family relationships and at most seen as two–year campuses by the state, regional campus tend to be a little shy about taking credit for what they do. Regional campuses supply significant educational opportunities. And no other educational institution can do what they do. And it's the regional campus faculty who teach the students and really get the job done in the classroom. Take pride in that.

Thank you.

Biography

Stephen M. Flaherty is Associate Vice President for Regional Higher Education at Ohio University, serves as chief business affairs and operations officer for the regional higher education system, and coordinates off–campus graduate programs, admissions, registration policies, and procedures with the Athens Campus. Flaherty joined the Office of Regional Higher Education in 1990. Besides serving as liaison with the University Planning Office for construction and renovation

projects on the regional campuses, he also serves on several committees: University Planning Advisory Committee, Benefits Advisory Committee, Assistant Deans' Council, Review Panel for Refund Appeals, Human Resources Executive Advisory Board. Flaherty holds a Ph.D. in Education from Ohio State University, an M.A. in English from Ohio State University, a B.A. in English from the University of Massachusetts, Amherst, an M.B.A. from Capital University, and an active CPA certificate from Ohio. Flaherty also teaches business communication in the College of Business and teaches engineering management writing in the College of Engineering. He may be reached at flaherty@ohio.edu.

Refereed Papers

Whole And Package Mathematical Reasoning In Science Classes

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Abstract

Many years ago, Arons pointed out the incomprehension science students exhibit for the basic mathematical operations of multiplication and division and the need to address the problem in physics classes to assure student understanding of the physical world. McDermott's and others' physics by inquiry program does address this need directly and in detail by defining two meanings for division. However, many students in my classes lacked the ability to explain their understanding of the simplest operations. I report here on ways to supplement the text that force students to come to grips with the actual meaning of division in terms of whole and package.

I. Introduction

The physics education research community has been active over the past two decades in investigating the ways students fail to grasp scientific ideas about the physical world. One important result of these investigations has been the new curricula generated by researchers who have found ways to address common fixed ideas students have before instruction (called misconceptions, or, more recently, preconceptions). Among the curricula now available, the program of research led by Lillian C. McDermott of the University of Washington has led to a curriculum known as *physics by inquiry*, which directly addresses many of the causes of distress we as physics teachers experience as we try to teach woefully inadequately prepared teachers and teachers–to–be in our classes.[1,2]

McDermott's research program is based on the pioneering work of Arnold Arons, the proponent of confronting student

misunderstandings of both mathematics and science. Arons has pointed out the reliance of physical models on mathematical language for clarity. To the exclusion of actual knowledge of how the world works, mathematically–inclined students who try to express scientific thought often rely on mathematical relationships (i.e., formulas) which may be totally misunderstood. They will often search through lists of formulas until they find one that may suit the situation and call it understanding. The less mathematically inclined have no basis except memorization for their understanding of science, a reliance which scientists find quite unsatisfactory. The incomprehension these science students exhibit of the basic mathematical operations of multiplication and division need to be addressed in physics classes.[3] Arons has especially pointed to ratio reasoning and fractions as needed foundations for reasoning.[3]

The physics by inquiry program was designed for preservice and inservice teachers and has been extensively tested with inservice teachers during summer programs at the University of Washington. Such students' lack of understanding of mathematical thinking would continue to span generations, making the current generations of schoolchildren as afraid of mathematics as are their teachers. Fear of mathematics among elementary school teachers is surely responsible for at least a portion of the inability of many elementary students to learn the fundamentals of mathematics and mathematical reasoning.

Physics by inquiry is based on two pillars: 1) Elicit–Confront–Resolve, a theoretical approach to the elimination of misconceptions; and 2) hands–on exposure to physical phenomena. It is assumed that many ideas students bring to introductory physics are shared and fixed misconceptions. This may not always be the case, as many others have argued, but it has provided the guiding paradigm for physics by inquiry. In the elicit–confront–resolve method, students are asked a question that research shows has often been answered incorrectly (speaking scientifically). This elicits the misunderstanding. Then students do an experiment whose result contradicts the specific incorrect answer (this is hands–on learning). They are asked questions that force them to reflect on their understanding and see what was right and wrong about their initial suppositions (the confront phase). Finally, with the help of student statements from interviews quoted in the text, and the instructors' questioning, students resolve the seeming contradictions in a way that

builds scientific understanding into their worldviews.

II. Student Preparation In Module 1: Properties Of Matter

In the first module of the physics by inquiry program, issues of density, sinking and floating, and solutions are addressed. Students are first forced to define mass operationally. By an operational definition, we mean that we define a concept by explaining how to measure it. While operational definitions may be expressed in simple language, they set out a process, a series of steps that give directions for measuring the thing, and a criterion by which the measured thing is defined.

Students in the class have already faced the problem of how to define area and volume, in addition to mass, operationally. For example, they end up defining area as follows:
(1) Choose squares whose sides are 1 cm long as standard squares.
(2) Fit the standard squares inside the boundaries of the figure.
(3) Count the number of squares that fit inside the boundaries, estimating the contribution of the partial squares.
(4) The number is the area of the object.

They can realize that the standard square could be 1 meter by 1 meter (or anything they decide), but they see in any case how to tile the area by using the standard squares. At this point, they are asked to explain why the area of a rectangle is length times width. The aim is to have the students recognize that if a rectangular area is tiled with standard squares, three rows of four columns, for example, then repeated addition—3 + 3 + 3 + 3, or 4 + 4 + 4—is the same as multiplication.

Some students, despite having taken many mathematics courses in their careers, only realize what multiplication is in my class when confronted with a need to produce an explanation such as this. The students taking my physics by inquiry class are mostly elementary education majors (or are aiming ultimately to teach in elementary school). They are not sure of anything having to do with mathematics. Many of them have struggled with mathematics for years—and have lost.

Somewhat later, the students are led to define volume analogously. The methods suggested by the book should allow the student to see

immediately what the meaning of density is when they come to it, but McDermott's original research showed that this was not the case.

While the physics by inquiry program at the University of Washington has succeeded in getting students there to an understanding of fractions and proportional reasoning with this background, plus an additional two pages of explanation (Sec. III), I found myself dissatisfied with my own students' understanding even after instruction using the physics by inquiry materials. I describe here a way I found to make sure that the ideas implicit in the text are made explicit.

III. What Is Whole And Package Reasoning?

Consider the following problem encountered in thinking about density (but before the word density has been mentioned):

A piece of metal has a mass of 125 g and a volume of 32 cm^3. Draw a diagram that shows the thinking involved.

A. What is the mass of 1 cm^3 of this metal?
B. What is the mass of 12.3 cm^3 of this same type of metal?
C. What is the volume of 80 g of this metal?
D. What is the mass of 134.2 cm^3 of this same type of metal?
E. What is the volume of 225 g of this metal?

How would you work the problem? There is a natural tendency to do part (A) and find density, then use the density to solve each remaining part. There is nothing wrong with this method—if the student is sure of what to do. As I have already pointed out, my students were not sure of mathematical meaning.

The idea of the problem is to get students thinking of the meaning of the division in the definition of density and of the meaning of fractions in general. McDermott (following Arons) defines two meanings of division (she applies it to this purpose). The first is the standard definition of *division* that is done by mathematics students everywhere; Arons has argued that many science students have no idea why they divide, which sabotages their understanding of physical principles.[3] (**Definition 1**) "5 cm^3 has a mass of 15 g. We can find the mass of just 1 cm^3 by

dividing 15/5."

In the second definition (which comes after an extended two–page discussion of how to think in terms of packages), we find the idea of the package. (**Definition 2**) "We want to find out how many packages of 3 g fit into 60 g. We can do this by dividing 60/3."

Note that both the physical quantities in the second definition have the same unit, while they are different in the first. The discussion includes instructions for drawing the situation, which shows the volume as an area and shows the packages tiling the space just as was done for the operational definition of area. Because area had been assimilated by the students, and volume had been discussed in the preceding section as very different from area, there is only a small chance that students would be confused by the representation of a volume by an area. Discussions with students during the checkpoints verify that this is not a cause for their original difficulties with whole and package reasoning, as defined by McDermott et al.[1] The implicit message of the package idea is that in division we are tiling the space in pieces and counting the number of tilings, just as in the previous finding of the area by our operational definition.

The book also writes the one meaning for *multiplication*, already discussed above, in terms of packages: "We need to add up 120 of these 3 g packages. A quick way to do this is to multiply 120 x 3."

The students used the method of definition (1) exclusively, even in the exercises in which they were supposed to apply the definition (2). I noted this with concern the first time I taught the course with a colleague. We then asked extra questions and tried to use the text exercises to get students to understand the whole and package idea, but I felt dissatisfied with the outcome. This implicit analogy between division and multiplication suggested by the picture was not grasped by those students or the students I taught for some time thereafter.

IV. Using Whole And Package Reasoning To Solve The Problems Of Part III

We show the method we finally have the students do here. To illustrate the versatility of whole and package reasoning, we explain how to solve the exercise of III using the reasoning method. First, we will implement

the method by drawing a diagram. We shall do this for each part. **Figure 1**, parts a–e correspond to the diagrams we draw for each of the parts.

A. What is the mass of 1 cm^3 of this metal?

Refer to **Figure 1 a**. (See page 30.) Now, the number of packages in the whole is the whole volume divided by the volume of the package: 32 cm^3/1 cm^3 = 32. This number, 32, is a pure number, the number of packages.

To find the mass in each package, we divide the whole mass by the number of packages: 125 g/32 = 3.9 g. (Of course, this implies the density is 3.9 g/cm^3.) Students do this as they did the same question in the text, except now we know they have a mental picture of the process because they have succeeded in drawing a diagram to illustrate it.

B. What is the mass of 12.3 cm^3 of this same type of metal?

Refer to **Figure 1 b**. (See page 30.) The number of packages in the whole is the whole volume divided by the volume of the package: 32 cm^3/12.3 cm^3 = 2.6. This number, 2.6, is a pure number, the number of packages.

To find the mass in each package, we divide the whole mass by the number of packages: 125 g/2.6 = 48 g. (Note that this is not the density, though the answer is found by the same method as part A.) In this case, students see that the method can work the same way for any size tile, though so far all are smaller than the whole.

C. What is the volume of 80 g of this metal? Refer to **Figure 1 c**. (See page 31.) The number of packages in the whole is the whole mass divided by the mass of the package: 125 g/80 g = 1.56. This number, 1.56, is a pure number, the number of packages.

To find the volume in each package, we divide the whole volume by the number of packages: 32 cm^3/1.56 = 20.5 cm^3.

Students see from this part that the method can work for either attribute, volume or mass. It works the same way.

D. What is the mass of 134.2 cm^3 of this same type of metal? Refer to **Figure 1 d**. (Seepage 31.) The number of packages in the whole is the whole volume divided by the volume of the package: 32 cm^3/134.2 cm^3 = 0.238. This number, 0.238, is a pure number, the number of packages.

To find the mass in each package, we divide the whole mass by the number of packages: 125 g/0.238 = 524 g. In this case, we see that the

method even works when the tile is much larger than the whole. This would be the case for area if we were using squares 1 m on a side to measure the area of something 10 cm by 10 cm, for example. The area can be found in square meters as easily as in square centimeters.

E. What is the volume of 225 g of this metal? Refer to **Figure 1 e**. (See page 32.) The number of packages in the whole is the whole mass divided by the mass of the package: 125 g/225 g = 0.56. This number, 0.56, is a pure number, the number of packages.

To find the volume in each package, we divide the whole volume by the number of packages: 32 cm^3/0.56 = 57.6 cm^3. Again, for the mass, we see that the method works even when the package is larger than the whole.

Note that in all these parts of the problem, the question defines the package size, and the whole is the same every time. Also, since the point is not to know the answer ahead of time, the teacher can be accepting of pictures at various scales—the sizes need not be accurate (one would have already solved the problem to achieve absolute accuracy). Clearly, if the student's picture is grossly out of scale—for example, showing half the whole as a package when it is more like one–tenth, or vice versa—the reasoning should be considered unacceptable.

V. The Intervention

At first, I tried to get students to answer the questions as the book intended, but it was frustrating for both students and me. For my students, those two pages of explanation did not seem to be enough, though obviously they were deemed sufficient for the University of Washington inservice teachers on whom the materials were tested. They almost unanimously (and stubbornly—and pretty successfully, too) resisted doing the problems as the book intended. In subsequent courses, I attempted to force students to go back and recalculate the parts of the questions in terms of whole and package reasoning after each explanation was given as the book had *not* intended.

I remained convinced that they did not understand the problem. My students at this point seemed unable to reproduce the sort of diagram that the book had presented and that the question asks for. They almost could not be convinced to apply the method at all except in the somewhat

artificial case that they were to have the mass of 1 cm^3 of the material. Subsequently, they would find that that was often possible because that number was the density. At this point they have not yet defined density, the idea they prefer to use in their calculation. Because of extensive experience by the University of Washington researchers, we know students generally lack understanding of the meaning of division; this lack is meant to be remedied by the *Physics by Inquiry* book's presentation. In the following section of the book, students are asked to explain what density means in words. We expect them at that point to be able to say something like: "for a homogeneous material, every 1 cm^3 piece contains the same amount of mass; density measures this ratio of mass to volume."

I reasoned that I had to do something different to help students to learn for themselves. Eventually, I made a procedure out of the method (as described in Sec. IV above), adapting McDermott's discussion. Now when the book presents the question about clay given in Sec. III, I first allow students to use their natural inclination—to use the answer to the book's question "What is the mass of 1 cm^3 of this clay?" to answer the remaining questions. Virtually none of the groups choose to use whole and package reasoning to do the problems. At this point, having answered the questions as they are inclined first, they then seem much more willing to consider changing.

I give them several opportunities to practice the method and to see how it works in different circumstances. The first questions in the additional material are exact repeats of the book's preceding two problems. (See the Appendix, page 29.) After the students do answer these questions as the book originally intended, further questions are asked that build on the tiling that students had previously learned to do to define area (and volume) operationally. These questions draw the parallels explicitly between division and finding area by tiling.

The additional material apparently works because, having been allowed to answer the questions as they wished (without demonstrating a clear understanding of the meaning of their answers), they seem more willing to try to do as I asked—to draw the requisite diagram for each part of the problem and to repeat the reasoning problem part by starting each time from the given mass and volume and recognizing the size of the package from the way the question was posed. Frustration for both student and teacher is thereby reduced.

The extra time spent by students to do this material is no more than two hours, and generally much less. Moreover, student performance in using whole and package reasoning has so improved that I do not have to repeat such questions on subsequent tests, as I had had to do before I introduced the additional material.

VI. Another Context For The Use Of Whole And Package Reasoning

Finally, to illustrate how the method can be used in another context, we give a slightly different example of whole and package reasoning. In this case, both the attributes—mass and volume—of the package are known, but only one of the attributes (mass or volume, as the case may be) of the whole is specified. Here is a problem that shows how this works.

The problem: Your family has an ornate antique tea service that you suspect is made of silver. Since you do not wish to damage the set more than necessary to test it, you measure its mass on a very accurate balance to be 437.3 g and cut out a very small piece from inside one of the legs of the stand. It has a mass of 0.21 g and a volume of 0.020 cm^3. What is the volume of the tea service? Was it silver?

So, what do we do first? Draw a diagram, of course. **Figure 2** shows the diagram we will use. (See page 33.) Note that we make the package relatively tiny because it is clear that its volume is under one–hundredth of the whole. We apply the identical reasoning. The number of packages in the whole is the whole mass divided by the mass of the package: 437.3 g/0.21 g = 2082. This pure number, 2082 (2082.4 rounded off), is the number of packages in the whole.

We are trying to find the volume of the whole. Each of the 2082 packages has a volume of 0.020 cm^3. We must add the volumes of each of the packages together to find the total volume. The quick way to do this is to multiply: 2082 x 0.020 cm^3 = 41.65 cm^3. The tea service therefore has a volume of 41.65 cm^3.

To see if it's silver, we need its density. Our operational definition (op. def.) of density is $\frac{\text{op. def. volume}}{\text{op. def. mass}}$.

So, we take density = $\frac{0.21\ \text{g}}{0.020\ \text{cm}^3}$ = 10.5 g/cm^3.

It is silver because the tables give this as silver's density.

VII. Discussion

Let's see how two typical students did a similar whole and package reasoning problem (**Figure 3**). (See page 34.) One of the students was an A student, the other a C student. Note that both got respectable scores on this problem. Actually, one student got an A, the other a C (in physics presentations, typical data often means best, but these students represent the typical range of achievement since few students get a grade of D or F in this course, which is aimed at mastery). One cannot easily tell which of the two got the A.

Our conclusion is that the students are at least able to follow the steps, no matter whether they are good or less good students. They know when to do what in the calculations, and discussions with them confirm that they understand division and fractions better after this extended treatment.

References

[1]L. C. McDermott et al., *Physics by Inquiry* (New York: J. Wiley and Sons, 1995). Vol. I: Properties of Matter; Heat and Temperature; Light and Color; Magnets; and Astronomy by Sight: the Sun, Moon, and Stars. L. C. McDermott et al., *Physics by Inquiry* (New York: J. Wiley and Sons, 1995). Vol. II: Electric Circuits, Electromagnets, Light and Optics, Kinematics; and Astronomy by Sight: the Earth and the Solar System.

[2]The University of Washington Physics Education Group researched student knowledge and investigated (if not developed) physics education research techniques to identify student problems and proffer suggestions for remedies. Their method consisted in interviews to find student ideas (often called misconceptions); devising questions to investigate these conceptions to use in additional interviews; and creation of draft materials that address the conceptions, which are

then tested in the classroom and revised. The books of Ref. 1 originated in this way.

[3]A. Arons, "Cultivating the Capacity for Formal Reasoning: Objectives and Procedures in an Introductory Physical Science Course," *American Journal of Physics*. 44, 834–838 (1976). See also A. B. Arons, *Teaching Introductory Physics* (New York: J. Wiley and Sons, 1996), Ch. 1.

Appendix: Additional Handout Material Used With Section 9 Of Module 1, Vol. I Of *Physics By Inquiry*.

Exercise 9.4 A

Explain every step in the following problem **using whole and package reasoning**. (The whole is the same for each part.) A piece of clay has a mass of 14.1 g and a volume of 12.2 cm^3.

A. What is the mass of 1 cm^3 of this clay? Draw a diagram that shows the thinking involved.

B. What is the mass of 15.2 cm^3 of this same type of clay? Draw a diagram that shows the thinking involved.

C. Suppose we have a 68.8 g piece of the same clay. By how much would the mass increase if we added a lump of clay with a volume of 3 cm^3?

Exercise 9.4 B

Explain every step in the following problem **using whole and package reasoning**. A piece of metal has a mass of 125 g and a volume of 32 cm^3.

A. What is the mass of 1 cm^3 of this metal? Draw a diagram that shows the thinking involved.

B. What is the mass of 12.3 cm^3 of this same type of metal? Draw a diagram that shows the thinking involved.

C. What is the volume of 80 g of this metal?

D. What is the mass of 134.2 cm^3 of this same type of metal?

E. What is the volume of 225 g of this metal?

Exercise 9.4 C

A piece of wax has a mass of 10.20 g and a volume of 14.20 cm^3. What is the mass of 1.50 cm^3 of the wax? What is the volume of 22.22 g of the wax? Explain.

Exercise 9.4 D

Explain how the pictures we use to illustrate whole and package reasoning resemble those used for finding the area operationally. Is this a coincidence? What can you say about using an area to represent a volume or a mass?

Figures

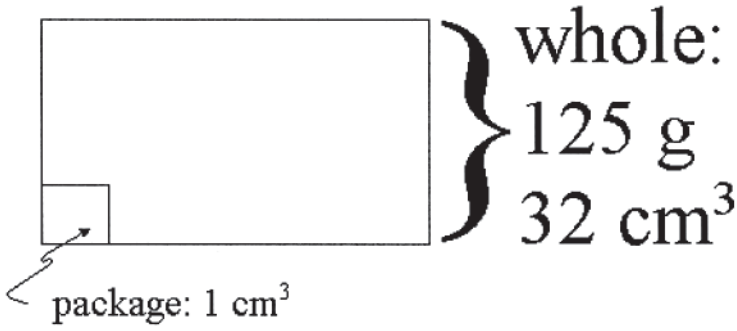

Figure 1 a. Diagram illustrating the situation for part A.

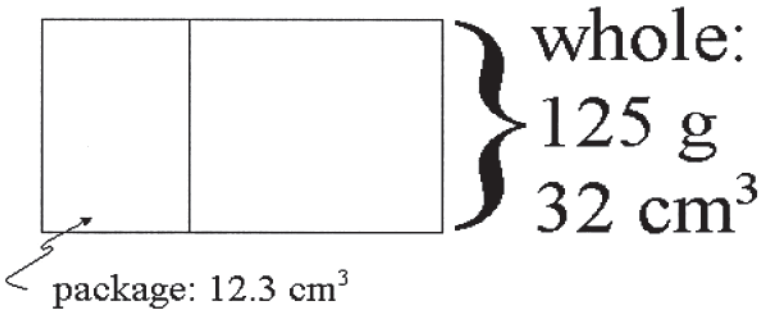

Figure 1 b. Diagram illustrating the situation for part B.

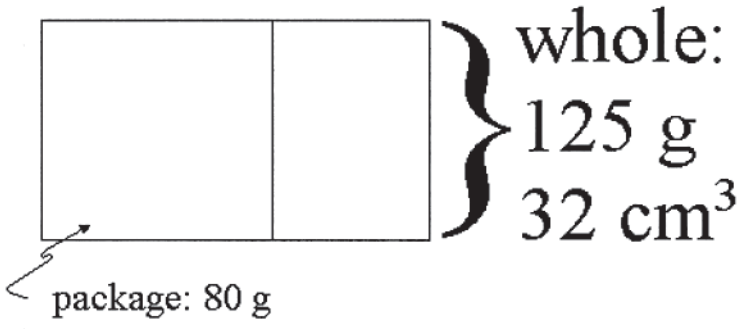

Figure 1 c. Diagram illustrating the situation for part C.

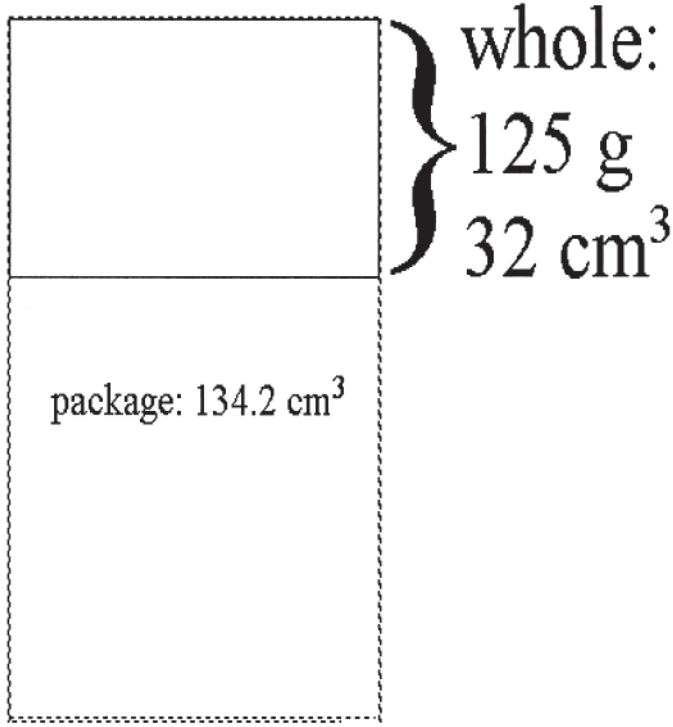

Figure 1 d. Diagram illustrating the situation for part D.

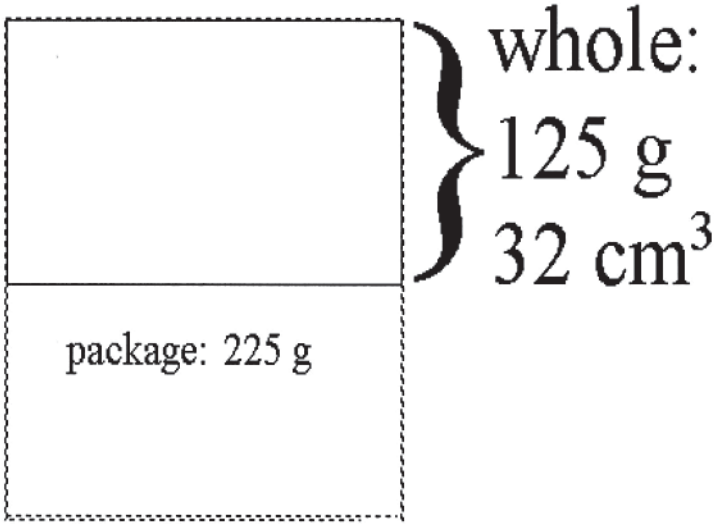

Figure 1 e. Diagram illustrating the situation for part E.

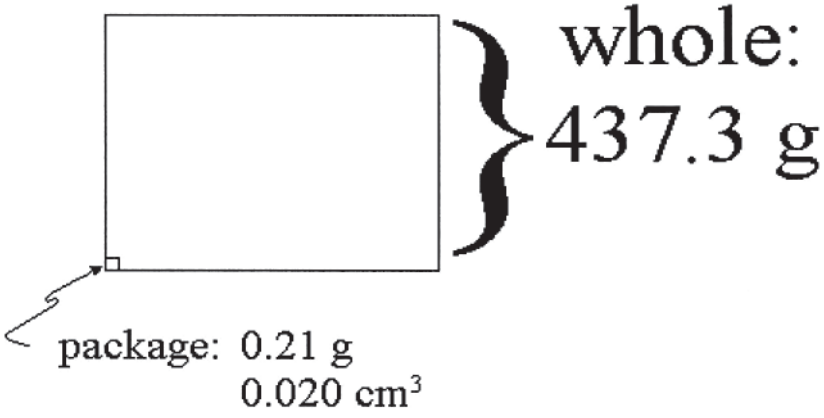

Figure 1. Whole and package diagrams for the problem of Sec. III.

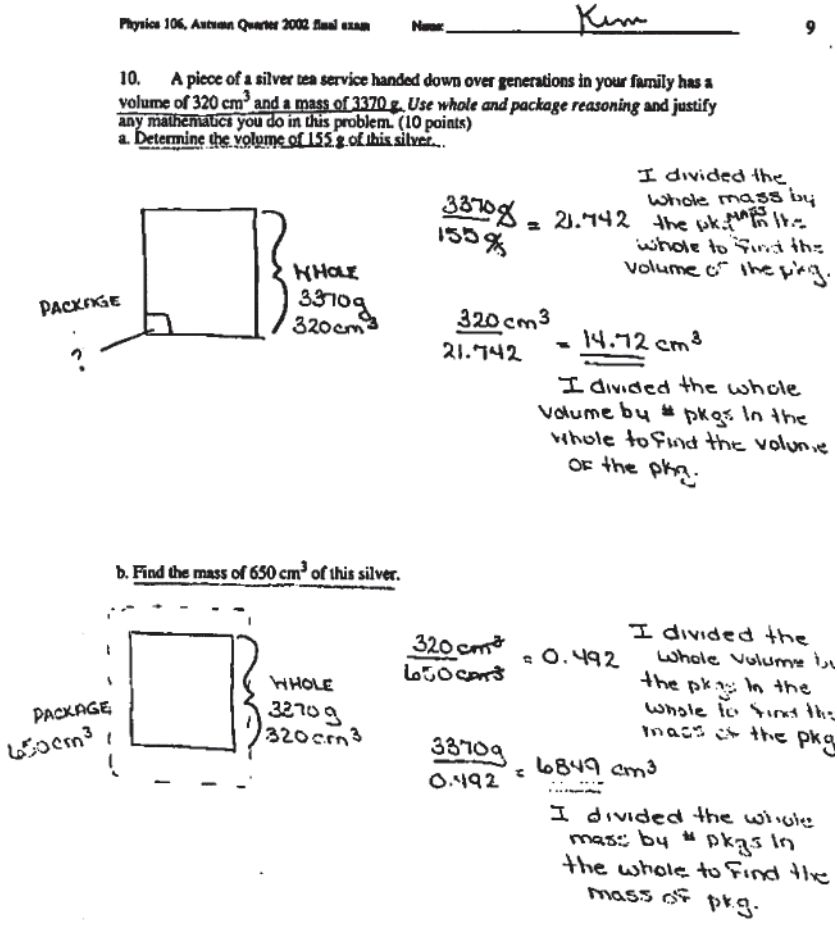

Figure 2. Whole and package diagrams for the problem of the silver tea set.

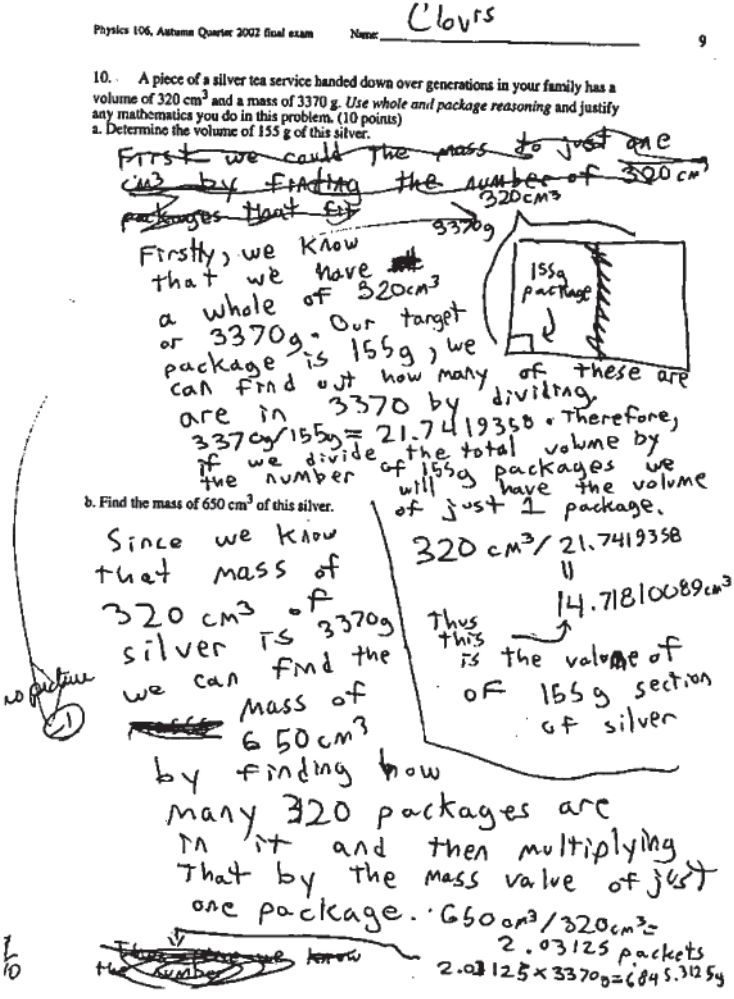

Figure 3. Actual samples of a final examination question involving whole and package reasoning for two "typical" students: Kim and Clovis.

Biography

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Stakeholder Satisfaction Survey For A Two–Year Business Technology Program

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Abstract

Located on its two regional campuses, Miami University's two–year Business Technology (BTE) program is preparing for a program review to be conducted during the Fall Semester of 2004. Part of this preparation process includes developing a detailed profile of what BTE stakeholders (current students, alumni, faculty and staff, regional campus administrators, members of the BTE advisory board and current/future employers surrounding the Miami University Middletown and Hamilton regional campuses) need and want in a two–year business program.

This paper describes insights into the theory and the logistics of conducting an online stakeholder satisfaction survey for an academic program, plus an analysis of specific survey findings as they relate to the Miami University BTE program. As a critical source of meaningful and actionable information, the role of a program advisory board is noted. Key online stakeholder satisfaction survey findings include a desire to emphasize problem solving skills in coursework and the need to provide real world work experiences for students as a means of preparing them for future employment. Discussion about applications beyond this small scale Internet–based survey effort is presented, along with cautions for researchers who may wish to conduct online surveys in their own research work.

Introduction

Two–year academic programs at the post–secondary level face a variety of challenges in meeting the needs and wants of their stakeholders. From the point of view of the students, selecting a program that is affordable, a program that offers the type and quality of degree that is

desired, and a program that allows sufficient freedom to meet their other daily obligations are critical, multi–faceted concerns. Department faculty and regional campus administrators seek to offer degree programs and coursework that are rigorous in maintaining appropriate academic standards yet flexible enough to attract the desired mix of students in an environment of increasing competition for each tuition dollar. Alumni and advisory board members serve as important checks and balances to ensure that the optimum program offerings are available and that the program graduates will have the skills and knowledge sought by area employers.

Understanding and acting on a diverse spectrum of opinions can present a formidable challenge to those who are responsible for determining the future direction of a two–year academic program. Not only must department faculty and regional campus administrators seek to maximize value to students who enroll in the program, they must also justify operating budgets, new courses and ancillary activities (such as faculty training and development) to their main campus administrators who face an ever–tightening budgetary bottom line. In academics, like in the world of business, there is no luxury in moving forward with experimental programs or in keeping any current programs that are failing to deliver in terms of the university's mission and vision. In this day and age, decisions to keep and/or to expand academic programs are often based on hard, objective data. Departments with both meaningful and actionable data to support their positions stand the best chance of remaining viable and strong.

Facing a major program review during the upcoming 2004 Fall Semester, the Business Technology (BTE) Department on Miami University's two branch campuses (Hamilton and Middletown) is seeking to establish an objective measure of what stakeholders expect in a two–year business technology program that focuses its primary attention on preparing students to enter the workforce directly after completion of their degrees. To better understand and act on the opinions of its highly diverse group of stakeholders, the BTE Department conducted an extensive online stakeholder satisfaction survey covering topics ranging from course expectations and faculty teaching styles to the non–course–related attributes of the current BTE program. Seeking to reach the maximum number of stakeholders, the survey was

conducted over the Internet using a questionnaire that could be filled out and returned online. Stakeholders responded enthusiastically, providing a survey database rich in information that is currently being used by the BTE Department to plan its future program revisions and upgrades.

The Critical Role Of The Advisory Board In Academics

In any academic program charged with the goal of rapidly integrating its graduates into the local or regional workforce, like Miami University's BTE program, it is imperative to stay abreast of the changing needs and wants of area employers. A valuable source of such input is a program advisory board, consisting of members from local/regional businesses, governmental agencies and non–profit organizations. At the present time, two BTE Department advisory boards exist with one advisory board representing employers from the Hamilton, Ohio, area and the other advisory board representing employers from the Middletown, Ohio, area. In existence for almost thirty years, the BTE program's two advisory boards have continually been monitored and benchmarked against other business technology advisory boards at other regional campuses in Ohio. Maintaining healthy, participative BTE advisory boards requires a tremendous amount of time and effort on the part of the BTE faculty and the regional campus administrators who must continuously track employment conditions to make sure that the BTE advisory board membership accurately reflects local and regional economic conditions. The results, however, are definitely worth the additional work as noted by Miami University Professor of Business Technology R. V. Sommer when he states, "Experience clearly indicates the importance of advisory boards in ensuring that our programs continue to meet community and employer needs" (personal communication, November 10, 2003). The BTE advisory boards in use for the Miami University BTE program are characteristic of business technology advisory boards at other regional university campuses across the state and also of business school advisory boards in general.

The use of advisory boards is a common practice in both two– and four–year business programs, as noted by researchers Kaupins and Coco (2002). Based on a survey of 114 business school administrators, these

authors established that approximately 56% of business schools have departmental advisory boards and nearly 48% of business schools exist in institutions that have college–wide advisory boards (353).[1] In either case, the main function served by the advisory board is to analyze curriculum issues. Advisory boards develop ideas for new program offerings, help to publicize the school's offerings and they also work to develop a mission and vision for the business program. According to the administrators surveyed by Kaupins and Coco, two–year business programs had more active boards that met more frequently and advisory board members who served longer terms. Somewhat surprising was the finding that while approximately 90% of the advisory boards had members from for–profit businesses, only about 50% had advisory board members representing governmental agencies and/or non–profit organizations (355).

Due to a commitment in understanding diverse viewpoints, Miami University's BTE advisory boards meet this latter criterion by having a generous representation of individuals across all three sectors that represent for–profit businesses, governmental agencies, and non–profit organizations. The membership of each board fluctuates slightly from year to year although, on average, each board is made up of approximately twenty individuals. Board members are available to department faculty and regional campus administrators throughout the year, but two formal advisory board meetings, one meeting held in the fall semester and one meeting held in the spring semester, serve as two–way communication forums and opportunities to build alignment on key BTE program goals.

Utilization of business school advisory boards has been increasing over the past several years. The rationale for this trend includes a desire for schools to achieve or maintain a competitive edge versus other local or regional academic institutions, a desire to move into new subject areas and/or a desire to explore new methods of instruction—such as distance learning approaches that can be added to a traditional lecture–based program. Researchers Vazzana, Elfrink and Bachman (2000) cite another, somewhat less obvious, driving force behind increasing advisory board use. According to these authors, the late 1990's push to increase the use of Total Quality Management (TQM) principles in the operation of business schools has fostered increased reliance on advisory boards.

The TQM process, as applied in business schools, relies on close collaboration between students, faculty, school administrators, and business leaders to develop high–quality curricula. This recent trend in increased use of an advisory board in business schools is not expected to change any time soon.

The most advantageous way to enlist the ongoing support of area employers is through the formation of a formal advisory board. Whether acting as a group during formal board meetings or acting individually in a one–on–one advisory capacity, advisory board members can offer important insights into how business school programs will be perceived by employers and by students who will be seeking employment within the local and/or regional area. Ireland and Ramsower (1994) observed in a research study polling individual advisory board members that information on upcoming business trends is typically the most universally applicable data generated. Although business faculty members may be well–versed in their disciplines and keenly aware of important global trends in business, the intimate knowledge of how those trends play out in the workplace on a day–to–day basis is often best understood by the employers that make up a business school advisory board. As the authors note, harnessing the power of the information available from advisory board members can significantly improve the curricula offered by undergraduate business programs. Program reviewers consider advisory board input as a critical piece in the continuation of a business program's accreditation (3–4).

Tapping the wealth of information about local/regional business needs and wants present within the membership of a business school advisory board can be a difficult task. In the case of the Miami University BTE program, the spring and fall advisory board meetings are often filled with specific critical agenda items that do not permit advisory board members to converse at any great length or in depth with department faculty and/or regional campus administrators. One solution to the dilemma of how to better capture this critical advisory board knowledge is to include advisory board members in stakeholder satisfaction surveys. By including advisory board members as an integral part of the survey population, researchers can analyze data sets as a whole, including advisory board members' responses within the overall pool of responses and/or they can choose to compare and contrast

advisory board members' responses with those of the other population segments. With two advisory boards, the BTE program is also able to compare and contrast stakeholder satisfaction survey data across both of the regional campuses at Miami University, should the need arise to understand issues that may appear to differ between the two branch campuses.

Survey Design And Logistics

At the end of the last academic year, the Miami University BTE Department sent out an online stakeholder satisfaction survey to everyone currently listed in the TeamBTE/E–BITS database.[2] The purpose of this survey was to solicit BTE stakeholders' needs and wants in a two–year Business Technology program. Following a brief set of demographic questions, the respondents were asked 40 questions on what people expected in business technology courses, 10 questions on what people expected of the business technology faculty, and 28 questions on what people desired in BTE program attributes outside of the classroom. A complete breakdown of all of the individual attributes covered on the survey questionnaire is presented in **Table 1 a** and **Table 1 b** on pages 43 and 44. The online stakeholder satisfaction survey concluded with a follow–up section for current BTE students and recent BTE graduates to help the BTE Department understand how the present BTE program is being utilized in terms of employment and additional education opportunities.[3]

Several factors played a role in the decision to conduct the survey electronically. First, the E–BITS database provided access (at the time that the original survey was fielded) to slightly over 800 e–mail addresses, all known to be "good" addresses, actively in use. Second, it was known that recipients were either interested in the subject matter themselves or at the minimum knew someone who had an interest in the Business Technology program. Third, electronic responses tend to make data compilation and data analysis relatively straightforward and much less labor intensive than in mail or phone surveys. Fourth, BTE stakeholders with a strong preference for interacting with the BTE Department electronically had traditionally been reliable barometers of thoughts, trends, and concerns affecting

Course Attributes Included on the Survey Questionnaire

Course Attributes	
• Abstract Theories to Practical Issues.	• Improve Writing Skills.
• Synthesizing Knowledge.	• Opportunities for Public Speaking.
• Understand Yourself.	• Ask Questions in Class.
• Develop Leadership Skills.	• Express Views/Opinions in Class.
• Utilize Problem-Solving Skills.	• Use Internet for Assignments.
• Sm. Group Class Projects.	• Apply Quantitative Reasoning.
• Sm. Group Out of Class Projects.	• Manage Time and Tasks.
• Define Strengths/Weaknesses.	• Integrate Ideas from Various Sources.
• Study Ethics/Morals.	• Meet/Exceed Instructor's Expectations.
• Analyze Real World Problems.	• Develop Code of Values.
• Analyze Ideas, Experiences or Theories.	• Expand Computer Skills.
• Develop Self-Esteem.	• Hands-On, Applied Experiences.
• Writing Papers.	• Discuss Beliefs from Different Cultures.
• Learn Diverse Cultures.	• Use E-Mail for Communications.
• Memorize Facts, Ideas or Methods.	• Judge Value of Information.
• Synthesize/Organize Ideas in New Ways.	• Read Supplemental Texts.
• Have Students and Teachers in Same Room.	• Gain Information on Career Opportunities.
• Listen to Guest Speakers.	• Participate in Career Planning Activities.
• Regularly Attend Class.	• Learn Independently.
• Learn Skills for Real-Life Work Assignment.	• Interpersonal Relationship Building Skills.

Table 1 a. Compilation of all Course Attributes used in the online survey questionnaire. A total of 798 individual attributes were examined across three categories.

the greater population of individuals interested in the Miami University BTE program.

Prior to rolling out the online stakeholder satisfaction survey, we found it necessary to consider sources of bias that could interfere with either the accuracy and/or the precision of the final results. One such source of bias, referred to as self–selection bias, occurs when individual survey recipients are able to choose whether or not to respond. This source of bias can be especially troublesome in situations when individuals are either asked to call in to participate in a phone survey or are asked (via any type of general advertisement) to sign onto a Web site

Faculty and Program Attributes Included on the Survey Questionnaire

Faculty Attributes

- Concern for Learning and Development of Students.
- Real World Work Experience.
- Accessibility – Office Hours.
- Accessibility – Voice Mail.
- Incorporate Related Current Issues/Events.
- Interact Outside of Class for Feedback on Work.
- Interact Outside of Class for Help.
- Accessibility – E-Mail.
- Advising on Course Selection/Academics.
- Interaction to Discuss Career-Related Issues.

Program Attributes

- Business Clubs/ Professional Activities.
- Assuming Leadership Role in Activities.
- Read Business Newspapers/Magazines.
- Read Business Scholarly Journals.
- Talk with Friends About Class Topics.
- Talk with Family About Class Topics.
- Meet Other Students from Your Online Class.
- Availability of Required Non-Major Courses.
- Availability of Required Major Courses.
- Availability of Independent Studies.
- Flexibility in Scheduling Evening Classes.
- Flexibility in Scheduling Saturday Classes.
- Flexibility in Scheduling Day Classes.
- Flexibility in Scheduling Online Classes.
- Specific Campus Location for Classes.
- Proximity of Class Location to Home.
- Proximity of Class Location to Work.
- Cost of Program.
- Preparing for Future Employment.
- Availability of Paid Internships/Research.
- Availability of Unpaid Internships/Research.
- Length of Time to Complete Two-Year Program.
- Preparing for Additional Coursework.
- Transfer to a Four-Year Program.
- In Two-Year Program, Obtain a Second Concentration.
- Earn a Mini-Certificate in Two-Year Program.
- BTE Department Reputation.
- Miami University Reputation.

Table 1 b. Compilation of all Faculty and Program Attributes used in the online survey questionnaire. A total of 78 individual attributes were examinedexamined across three categories.

and complete an Internet–based survey (Salant and Dillman, 1994, pp. 10–16, Dillman, 2000, p. 401). The latter point can be especially troublesome because it assumes that the desired population has access to appropriate computer equipment and that potential respondents have the skills to use it. Although the risk of bias may be reduced by personally inviting all members of the desired population to participate, it cannot

be eliminated unless 100% participation is assured.

In this BTE project, it was desired to survey a population that was already known to communicate frequently, efficiently, and effectively with the BTE Department using the Internet and e–mail. The odds of potential respondents self–selecting out of the online survey based solely on the inability to complete an electronic questionnaire were therefore minimal. Steps taken to further reduce the risk of self–selection bias in the online survey included sending out a pre–survey notification letter and simplifying the survey instruction steps required to complete the questionnaire.

An initial e–mail contact with the survey population was made to introduce the upcoming online survey one week before the actual questionnaire was sent out. For the online survey itself, a brief cover note, typed directly into the body of an e–mail message personally addressed to the recipient, asked for 15–20 minutes of the recipient's time to complete an online stakeholder satisfaction survey on issues of importance in two–year Business Technology programs, including Miami University's BTE program. (*GoldMine 5.0* ® from GoldMine Software was used to manage the mailing lists and to personalize all correspondence.) The questionnaire was appended to the bottom of the cover note. Recipients were instructed to hit "reply" to the e–mail message and then to type directly on the questionnaire to provide their responses. A brief set of instructions was also included to assist individuals who may have encountered computer difficulty due to differences in personal e–mail software configurations.

The questionnaire, prepared using a common word processing program, posed most of the questions in a multiple–choice format which allowed respondents to check a response box corresponding to the desired answer. Some questions involved expressing a degree of agreement/disagreement to a given statement using a common five–point Likert scale to gauge respondents' opinions. Open–ended questions were kept to a minimum and primarily requested information on how exposure to the present BTE program, if any, had influenced career selections and/or career progressions of employed BTE students.

Survey responses were returned via e–mail to the TeamBTE e–mail account at Miami University (TeamBTE@muohio.edu). After tabulation and analysis using *SumQuest 7.0*, survey data analysis software, the final

results were interpreted and presented to a joint meeting that included the BTE Department faculty and the regional campus administrators, plus the two BTE advisory boards representing both the Hamilton and the Middletown communities. Based on both quantitative and qualitative data, a detailed final 200–page report has been produced for use by the BTE Department, the regional campus administrators, and the main campus administrators at Miami University for the upcoming BTE program review during the Fall of 2004.

Results And Discussion

The overall response rate to the online stakeholder satisfaction survey was about 13%, which although low was actually somewhat higher than the response rates of other broad–scale business–focused surveys generated by Miami University researchers in recent years. In the literature, many electronic surveys of this type cite very low response rates unless the researchers have taken great pains to limit the survey questionnaire length, enhance user friendliness and/or provide respondents with some form of incentive to return the questionnaire (Couper, Traugott and Lamias, 2001, p. 231–232). With an abundance of topic areas to cover and 112 questions, the BTE survey consisted of 14 pages. It was sent electronically to 800 people, and no incentives were given to respondents. Nevertheless, when all of the responses were tallied, there were a total of 104 completed questionnaires, providing a sufficient data sample to do a proper statistical analysis.

Selected demographic data characterizing the pool of respondents includes the following:

- Females (N = 67) outnumbered Males (N = 37).
- The age distribution of respondents was relatively uniform, with respondents from 18 years of age up through 65 years of age (Mean = 38, Std. Dev. = 13.5).
- The major subgroups of respondents included Current BTE Students (N = 47), Recent BTE Graduates (N = 19), BTE Advisory Board Members (N = 18), BTE Faculty Members (N = 12), and a miscellaneous combination of area employers/employees and friends of students (N = 8). (**Figure 1**, page 47, provides a graphical representation of this demographic breakdown, including the percentages of respondents in each subgroup.)

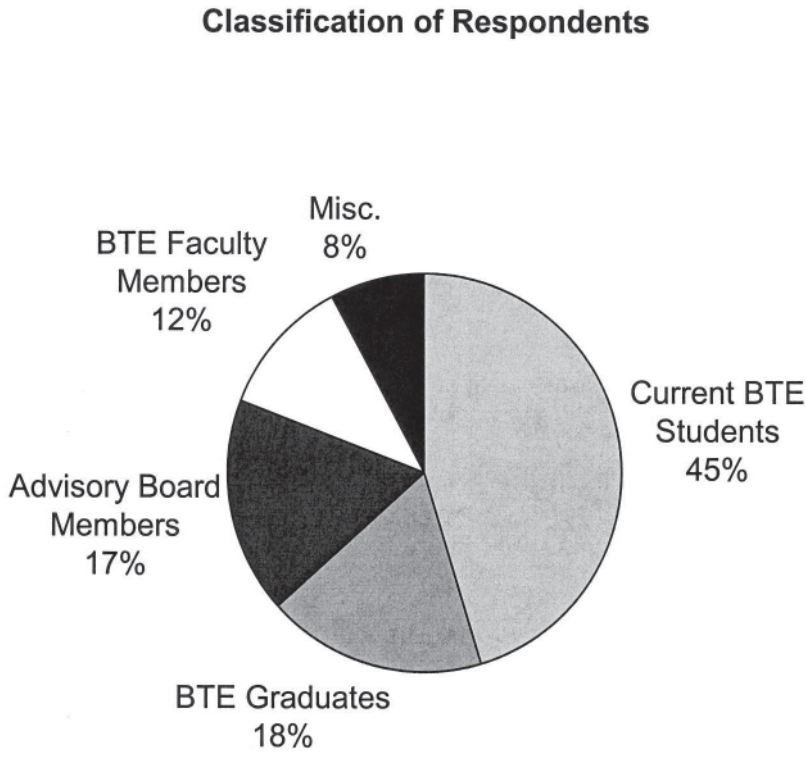

Figure 1: Classification of respondents by self–description for 104 online survey responses received. Current BTE Students represent the highest percentage of respondents, with BTE Graduates second and the BTE Advisory Board Members third in response number. The "miscellaneous" category includes area employers/employees and friends of students.

■ Web usage was very high among respondents with the majority (N = 100) indicating that they sign onto the Internet at least several times per week. Of these 100 respondents, 71 report using the Internet daily.

■ Demographic trends show a nearly equal balance between full–time enrollment (N = 19) and part–time enrollment (N = 18) among those respondents who are currently in the BTE program. (Ten Current BTE students chose not to reveal their enrollment status.)

- For Current BTE Students, the numbers of courses taken per semester were distributed as follows: one course (N = 6), two courses (N = 8), three courses (N = 5), four courses (N = 7), and five courses (N = 11). (Again, ten Current BTE Students chose not to reveal their course preferences.)
- For Current BTE Students, evening courses (most preferred, N = 30) and afternoon courses (second most preferred, N = 17) clearly outranked less–popular morning (N = 8) and weekend (N = 1) offerings. (Respondents were allowed multiple votes on this question.)
- Current BTE Students showed a positively skewed bell curve for the number of credit hours earned to date, with most of them having taken between 13 and 48 hours.
- Current BTE Students most often (N = 21) reported that they live within ten miles of campus vs. more than ten miles from campus (N = 16).
- For those who work while attending school, however, the predominant driving distance from work to school was in the 10–25 mile range (N = 18) vs. less than 10 miles (N = 7) and more than 25 miles (N = 8).

Intriguing data were generated from the survey questions that asked whether or not a Current BTE Student or a Recent BTE Graduate had received a promotion and/or made a job change as a result of being enrolled in the BTE program. For Current BTE Students, 30% (N = 11 out of 37) of those responding indicated that they had been promoted and/or had changed jobs while enrolled in the BTE program. For Recent BTE Graduates, 67% (N = 4 out of 6) of those responding had been promoted and/or had changed jobs after graduation. (**Figure 2** on page 49 summarizes th e numerical results.) With the small numbers of respondents answering these specific questions, no implication of statistical significance is intended. Nevertheless, the findings are worth investigating further among larger samplings of Current BTE Students and Recent BTE Graduates.

Representative verbatim comments from individuals experiencing a change in employment are shown on page 50.

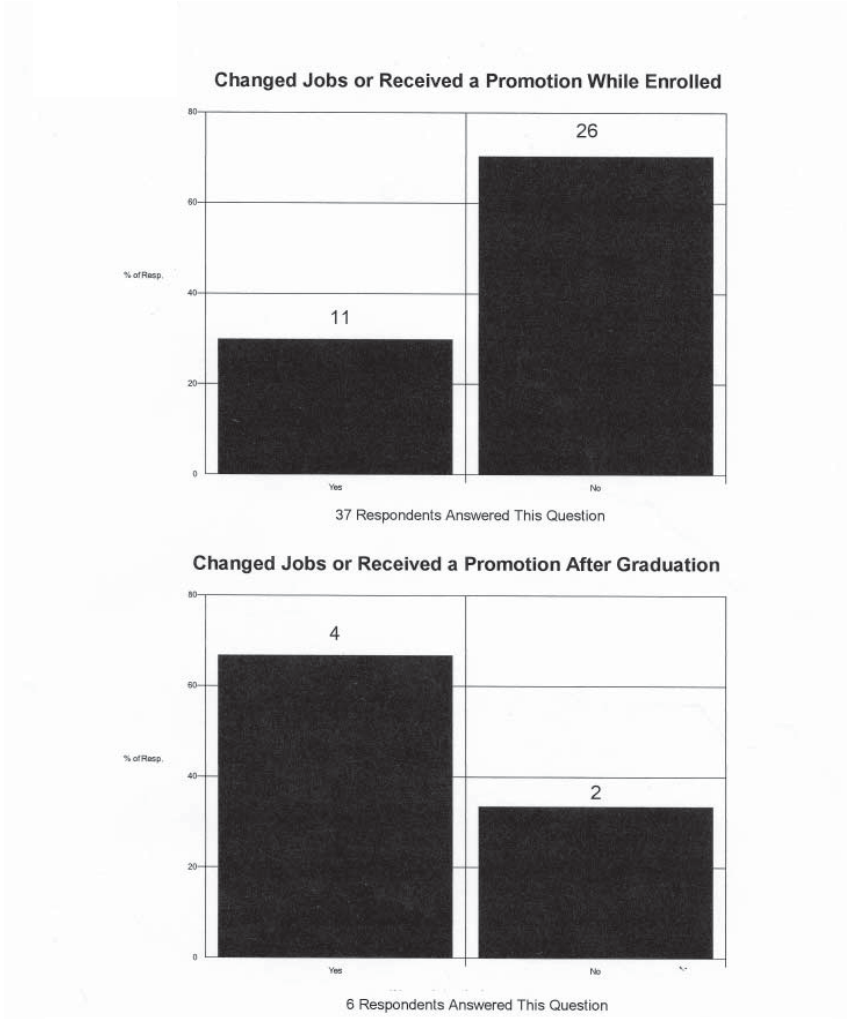

Figure 2: 30% of Current BTE Students changed jobs or received a promotion while enrolled in the BTE program. This figure jumped to nearly 67% of Recent BTE Graduates. Due to small sample sizes, these findings will be investigated in more detail.

Representative comments:

"Promoted from Accounts Receivable Coordinator to Business Office Manager."—Current BTE student.
"Promoted from student–status position to classified employee in same department."—Current BTE student.
"Began association work as Executive Secretary to the City Manager. Promoted to Chief Administrative Assistant, City Manager's Office."—Current BTE student.
"Got an excellent job after being a stay–at–home mom for eight years."—recent BTE graduate.

Using *SumQuest*, we performed a statistical analysis across all different groups of respondents (Current BTE Students, Recent BTE Graduates, Faculty, Staff, Advisory Board Members, etc.) to check for uniformity/nonuniformity of opinion. (*SumQuest* handles statistical evaluations by constructing crosstabulation reports and then looking for the presence of significant differences in the responses to each question between all possible combinations of selected respondents.) The Chi–square statistic associated with each crosstabulation report was examined as an indicator of potential significant differences in the dataset. (The Chi–square statistic uses frequency data to determine the significance of a relationship between nominal variables—in this case, the subgroups of respondents and the individual questions that were asked regarding course, faculty, and program attributes.) The *SumQuest* "Cell Search" function was also used to perform an analysis with a user–defined alpha value set at $p < 0.01$. The software program was configured to search for any significant differences between responses made by each of the identified subgroups of respondents across all of the attribute questions.

Neither statistical analysis described showed significant differences at the 99% confidence level when examining answers to each of the attribute questions posed in the questionnaire. This finding is very important to the BTE Department since it is one indication that the respondents are largely of the same mind in stating what is important for the future of the BTE program. While it will always be important to poll each of the major stakeholder groups when considering changes

to the BTE program, the relative uniformity of responses across all of the stakeholders lowers the risk of inadvertently leaving out a critical point of view. Due to the relatively low subgroup populations for some of the groups of stakeholders (only the Current BTE Students, N = 47, had a subgroup population of 20 or more), it must be stressed that these results are a preliminary indicator of subgroup agreement rather than an absolute guarantee of uniformity of thought.

For the final survey report, graphs were prepared for each question to illustrate what differences in responses were observed between all of the respondents analyzed as a whole and the three most critical subgroups of the survey population—Current BTE Students, BTE Advisory Board Members, and BTE Faculty.

Results from the online stakeholder satisfaction survey questions regarding course, faculty, and program attributes reveal useful information regarding the rank ordering of attributes in each category. A complete listing of the most critical attributes determined from the survey data is given in **Table 2**. Attributes are listed in order, based on

Category	Attribute	Average Score
BTE Course Attributes -- Top 5	• Utilize Problem Solving Skills.	4.62
	• Regularly Attend Class.	4.56
	• Manage Time and Tasks.	4.52
	• Expand Computer Skills.	4.39
	• Develop Leadership Skills.	4.34
Faculty Attributes -- Top 3	• Real World Work Experience.	4.38
	• Concern for Learning and Development of Students.	4.37
	• Incorporate Related Current Issues/Events into the Course.	4.32
Program Attributes -- Top 5	• Prepare for Future Employment	4.58
	• Transfer to a Four-Year Program.	4.49
	• Miami University Reputation.	4.45
	• Availability of Required Major Courses.	4.38
	• BTE Department Reputation.	4.36

Table 2: Within a category, attributes are listed in descending order of importance. Averages are based on 1 = Not At All Important through 5 = Critically Important.

the average score for each attribute (1 = Not at All Important through 5 = Critically Important) as determined across all survey participants.

These data should be viewed qualitatively as an indicator of issues having the greatest importance to respondents. An examination of the "top critical attribute" lists will give the BTE Department faculty and regional campus administrators an excellent idea of what BTE stakeholders would like to see as the primary foci of the BTE program in coming years. The "course" questions clearly indicate the practical workplace skills and the professional behaviors that the respondents would like to see emphasized. The "faculty" questions indicate a strong desire to make the BTE program relevant to real–world situations. The "program attribute" questions reveal concern for the future and how a BTE degree may be perceived by those outside Miami University.

As a final examination of all responses to course, faculty, and program attribute questions by all respondents, we performed a statistical analysis to ascertain whether or not one of the three categories (course, faculty, or program) was generally perceived to be of higher importance, overall, than the other two categories. To perform this analysis, we calculated mean scores for each category by pooling all individual responses within a given category and dividing by the number of responses in that category. Mean scores were course category = 3.89 (N = 4160), faculty category = 4.10 (N = 1040), and program category = 3.75 (N = 2912). A comparison of means using the appropriate F statistic shows that the three means are not significantly different.

The apparent slight preference in favor of the importance of faculty attributes is worthy of note and of further investigation. If borne out in a more carefully–controlled study regarding program expectations, this trend could indicate a need to place more emphasis on faculty development within the BTE program. As a caution, however, it must be acknowledged that the difference observed may not be significant under more carefully–controlled conditions. It is also possible that the inclusion of some questions in the other two categories (that turned out to be of universally low importance to all stakeholders) could account for the lower mean score values in these categories. An intriguing approach for examining this issue in more detail would be to survey stakeholders in a manner that would allow respondents to rank order attributes across all three categories combined into one. If conducted

appropriately, this additional survey technique could provide important complementary data for use in charting the future of the BTE program.

Returning to the issue of developing strong communication links that tap into the resources of advisory boards, we note that Miami University's BTE program's students and faculty are well aligned with the ideas put forward by the BTE advisory board members. The fact that no significant differences were observed in terms of the critical program attributes between each stakeholder group agrees with the alignment that has long been perceived to exist in a qualitative sense. The BTE Department has a history of engaging its advisory board members in many aspects of the BTE Department's operations, and this effort has consistently paid off for students and faculty within the BTE program. While current results appear to corroborate this point, it is important for BTE faculty, regional campus administrators, and main campus administrators not to overanalyze the dataset. With the small size of some of the subgroups, additional research on larger populations should be undertaken to confirm or refute any statements made regarding the statistical significance of the findings.

Conclusions

Stakeholder satisfaction surveys can provide an insightful look into the alignment of goals between various groups of stakeholders in an academic program. Aside from the more common practice of generating overall satisfaction scores, survey analyses can identify issues and/or concerns that may detract from the measurable performance goals of an academic program. In the case of the Miami University BTE program, alignment was found to be very strong, although this may not be the case for other academic programs in other venues. The procedures employed here, based on a simple, easy–to–follow online survey questionnaire, may be used to generate stakeholder satisfaction data in a wide variety of disciplines.

Researchers in other academic disciplines are urged to keep four thoughts in mind when attempting to replicate this work.

First, having a known, well–characterized population to survey is of critical importance. The survey described here proceeded smoothly due to having ready access to individuals with a known level of interest

in the subject matter. Even with such access, survey response rates may be low, so a relatively large population should be selected to ensure the receipt of a data set that can be analyzed and interpreted with confidence.

Second, researchers should be certain to include not only questions that rate critical attributes of the academic program of interest but to also include questions that probe the outcomes generated by the academic program. As an example, the survey questions having to do with job changes and promotions addressed the impact of the BTE program on actual employment choices and/or additional educational work (during and/or after earning a BTE degree). Responses to these questions were among the most enlightening of the survey, giving the BTE department incentive to probe this issue more fully using a larger population of current students and recent program graduates.

Third, researchers must be willing to survey the stakeholders in their academic programs on a regular basis. While there is no set frequency that works in all cases, it is imperative to survey stakeholders often enough to stay abreast of the changing trends that might be expected to alter the offerings of an academic program. In the absence of other clear–cut and detailed information, an annual survey may make the most sense to confirm the reliability and validity of a program's overall impact with respect to its stakeholders.

Fourth, researchers are cautioned to be cognizant of the sampling artifacts and biases that could infiltrate the dataset based on the mode of survey delivery. For this initial survey of BTE stakeholders, it was desired to query individuals who regularly interact with the BTE Department electronically. This criterion may not be appropriate for all researchers in all situations, however, because Internet users often represent a specialized sub–segment of a greater population. A careful study of population demographics will assist researchers in selecting an appropriate survey delivery approach for a specific application.

At this point in time, the stakeholder satisfaction survey conducted for the BTE Department at Miami University is expected to assist the department's faculty members, regional campus administrators, and main campus administrators in its Fall 2004 accreditation review. More importantly, however, the meaningful and actionable conclusions generated in this stakeholder satisfaction survey will provide definitive confirmation of the BTE program's strengths and its opportunities for

improvement. Ultimately, many of the recommendations from the BTE program's diverse group of stakeholders will provide guiding lights as the BTE Department plans its future program revisions and upgrades in order to meet the difficult challenges posed by today's ever–changing workplace.

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Notes

[1]Information on a number of excellent business school advisory boards may be readily obtained from the Internet. See, for example, sites at Baylor University (http://hsb.baylor.edu/advisory), University of Washington (http://depts.washington.edu/bschool/corp/boards/bschool_board.shtml), University of Wisconsin–Madison (http://www.bus.wisc.edu/about/dab.htm), and the London Business School (http://www.london.edu/rab/). Some advisory boards serve the faculty and administrators simultaneously while others function primarily as resources for department chairs and academic deans.

[2]TeamBTE, a student–focused organization, provides a forum for business students to interact, generates interest in the various business

disciplines and shares ideas on future career objectives. *E–BITS* is the official electronic newsletter of TeamBTE.

[3]A compete copy of the survey questionnaire, including instructions to respondents, may be obtained by contacting the author at baimsa@muohio.edu.

Biography

Susan A. Baim is an assistant professor of Business Technology (BTE) at Miami University—Middletown. She joined the faculty in August 1999, teaching marketing, internet marketing, economics, online economics, finance, and management courses. She is also Coordinator for the Miami University Business Technology Marketing and E–Business programs. Baim earned her MBA in Marketing Management from the University of St. Thomas in Minneapolis/St. Paul, Minnesota, in 1998 and is currently studying for her Ph.D. in E–Business through Capella University. She was named a Service Learning Ambassador at Miami University in 2000. Baim may be contacted at 229 Johnston Hall, Miami University Middletown, 4200 East University Boulevard, Middletown, Ohio 45042, or by e–mail: baimsa@muohio.edu.

Time Teaching Online VS. Time Teaching In–Class

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In the study of economics the value of any choice can be evaluated by looking at the opportunity cost (or what was sacrificed) as a result of making a decision. The choice of teaching a course online involves a significant opportunity cost in terms of the time spent teaching the course that could be spent in other ways.

This study investigates the reasons for why online courses require more time to teach than in–class courses. A number of authors have found that online courses have significantly larger workloads and that teaching online is more difficult than teaching an in–class course. For example, Hartman, Dziuban, and Moskal (2000) investigating 32 online courses find that 90% of the instructors believe online courses are more difficult to teach. Sellani and Harrington (2002) discuss many of the unique challenges that administrators and faculty face when teaching online. They find that "faculty complained that the online delivery was more labor–intensive in the amount of time to grade papers and respond to questions." In a survey of 1150 distance educators, Berge and Muilenburg (2000) have discovered that the strongest barrier to distance education is an increased time commitment. All of these papers take a broad look at many distance education issues. In doing so, they often make generalized conclusions based on the experiences of many instructors teaching differing courses. This study focuses on one instructor's experience which allows for a more detailed explanation for why online courses require more time to teach.

This study breaks down the time spent into various categories in order to better evaluate the time demands of teaching an online course. The two courses were taught simultaneously by the same instructor. This comparison provides a rough estimate of the time spent teaching courses online relative to teaching in–class as well as reasons why online courses require additional time to teach. Specifically, this study results in three conclusions:

1. When teaching online compared to in–class, the total teaching time increases at a rate that is directly proportional to the number of students.
2. Many of the tasks that demand the largest amount of time when teaching online cannot be significantly reduced without having a detrimental effect on the quality of the online course.
3. The time demanded for even a relatively small online course exceeds the time demands of a significantly larger in–class course.

Background Course Information

The two sections of Introduction to Economics, EC 201, being compared were taught during the Fall Quarter of the 2002–2003 school year. This course is the first of a three course sequence that all business majors are required to take. In order to minimize the amount of preparation time and to keep the courses similar in coverage and difficulty, I tried to keep the courses as similar as I could. Both courses used the same textbook, covered the same material, and had many of the same assignments. I have taught EC 201 over fifty times in the past 10 years and have taught EC 201 in an online format three times. Although there are many similarities between the two versions of the course, there are significant differences that are important to consider when performing this evaluation.

The online version makes use of *WebCT*, an online course development package. There is one quiz for each of the 10 chapters covered in the course, a midterm, and a final. The quizzes each consist of five multiple choice questions and one essay question. The midterm has 35 multiple choice questions and four essays, and the final has 40 multiple choice questions and four essays. The final is cumulative and must be taken by all students. The student is also graded on 8 one–page current event write–ups. The course materials a student receives when taking the course include:

- The Text
- A CD containing electronic presentations for each chapter
- The Syllabus
- A Getting Started Packet containing information about taking this course using *WebCT*

The student will receive extra–credit if they participate in the chat rooms or contribute in the online discussion groups. There is a 15 student class size limit for the online course, and 15 students enrolled.

The in–class version has two tests with 25 multiple choice and 4 essay questions and a final with 40 multiple choice and 5 essay questions. Students with a "B" or an "A" going into the final do not have to take the final if they wish to keep their current grade in the course. The student is also graded on three homework assignments and five write–up assignments. Two days a week there are office hours, about an hour and a half in length. I encourage the students to stop in anytime, to make an appointment, or to contact me by phone or e–mail. The class size is limited to 40 students, and 40 students enrolled.

Preparation Time

The course preparation time was significantly longer for the online course. Updating the online portion of the course, contacting the students, and getting the students started, for example, were all necessary for teaching the online course but not required for the in–class course.

The online course I've developed uses *WebCT* version 3.6 as the courseware. *WebCT* is one of the many online course development applications. *WebCT* provides the ability to easily manage the course and the content and provides assessment tools that aid in testing and grading. Although *WebCT* is a complete package that makes the development of an online course without any HTML programming, it still requires the instructor to provide the content. The majority of the course content needs to upload and set–up only once. Still, a fair amount of this same content is inevitably added to, reworded, or eliminated each and every quarter. For example test questions are added, changed, and deleted every time the course is taught. (Kaiden [2002] in a detailed review of *WebCT* specifically describes the time–consuming process of

creating a multiple choice question using *WebCT*.) In addition, many items are specific to the particular quarter and therefore have to be changed and/or uploaded into *WebCT*. Each quarter, I upload the syllabus, discussion questions, and calendar entries and change the due dates of each of the online quizzes and tests. Also—falling into the category of course preparation time—I arrange for distance learning packets to be sent to all students that gives them instructions about obtaining their Student Campus ID and password. I coordinate the cutting and labeling of the course CD that provides students with electronic presentations for each chapter. Every quarter minor changes are made to the CD that necessitates cutting new CDs. I also revise and provide the bookstore with a Getting Started Packet that helps the student with navigating though *WebCT*, a Sign–Up that helps me keep track of which students still need the course materials, and a paper copy of the syllabus. Time Spent: 28 hours.

A few students contact me before the quarter begins, and I have a chance to provide them with the information for obtaining the course materials and logging onto the *WebCT* site. The majority of students wait until they are contacted before they take any action with respect to taking the course. This means that I call about two thirds of the class by telephone the first week of classes to prod them into getting started. I reluctantly leave messages with roommates or answering machines if I have not gotten in contact with the student after the second or third attempt. Time Spent: 4 hours.

For the in–class section, I had to update my syllabus and make any revisions to the CD containing the course electronic presentations that are covered in–class. The in–class presentations are significantly smaller, containing outlines of the material and very little media. For example, only in the online presentations are there multiple choice questions and essay questions using internet links. The simplicity of the in–class presentations and syllabus significantly reduces the time needed for any changes that are made from quarter to quarter. For example, the syllabus for the in–class course is two pages, and the online course has a syllabus that is six pages. The typical presentation has half as many slides as the in–class course. Time Spent: 3 hours.

Time Spent Teaching

The actual time spent "teaching" consists of one–on–one e–mail, phone conversations, discussion group and chatroom questions and answers, and help in my office. This is one of the most time–consuming part of teaching an online course. Although this time could be reduced by limiting students' interaction, it would certainly have a negative impact on the quality of the course.

I have averaged between 300 and 600 e–mails per class over the past ten online courses I've taught and had 429 for the EC 201 course I used for this comparison. This includes my replies which make up a quarter to a third of these e–mails but does not include any mass e–mails that I send to the entire class. I usually only send about five of these each quarter welcoming the students, reminding them about test dates, telling them if I will be out of town for a few days, and thanking them for taking the class. The time I have spent reading and responding to these e–mails has varied considerably. Most e–mails just said that the e–mail had their article write–up included as an attachment. But many e–mails asked multiple questions that required me to write lengthy replies. On more than a few occasions, I suggested a telephone conversation or a meeting in my office after multiple e–mails made it clear the student was still having problems with a concept. The average e–mail contained a bit over 100 words in the body of the e–mail. Time Spent: 36 hours.

Both on my home phone and the time spent in my office, I spent a significant time spent on the telephone answering course questions and dealing with issues related to technology. The calls taken at home were usually more urgent and took on average five minutes longer and often required me to make a long distance call back to the student when the student left an urgent message often about technology–related problems. The questions answered on my office phone were more often over the course content or problems early in the course with computer/browser compatibility with *WebCT*. I also included in this time spent the phone calls from students who were interested in taking future online courses but did not include this as time spent preparing the course. Total Time Spent: 30 hours.

Participation in the discussion groups and using the chatroom were

not required for the course, although the students did receive extra–credit for contributing. I limited the chatroom sessions to two days a week, which provided 20 opportunities to chat over the 10 week quarter. I provided questions and answers to stimulate discussions for 12 different threads. The time devoted to asking and answering discussion group questions and monitoring and responding to questions in the logged chatroom was fairly small due to low student participation. There were 46 discussion group entries; of those, I asked 12 questions and replied to 20 discussion group topics. Less than half the class participated in the chatroom, although this amounted to over 20 pages of logged chat conversations. Total Time Spent: 7 hours.

The office hour times were the same for both sections. Surprisingly, I had far more students from the online section come to my office for help than from the in–class section. About half of the students taking my online course were also simultaneously taking other in–class courses at our campus. These students would often call to schedule meetings in my office or would just randomly stop by my office hoping I was available. Whenever possible I tried to coordinate these meetings during my normal office hours, but this rarely would fit into the student's schedule. I had on average 2 students per week come to my office for help. Less than half of these visits were scheduled ahead of time, and only once could the student meet during my normal office hours. The time spent per student was also longer for the online students. Without exception, they would have many questions over material spanning numerous chapters. Total Time Spent: 44 hours.

The time spent teaching the in–class section consisted of my time in–class for lectures and exams, the office hours, and the time spent meeting with students outside of my office hours. I had only four students come to my office during office hours, and they all came up together asking the same question. I had five other visits by students that were not scheduled and not during my office hours. Total Time Spent: 60 hours.

Time Spent Grading And Preparing Tests

The online course required a significant amount of time spent grading. This was both due to the larger number of graded assignments and the

increased difficulty grading online compared to grading a paper version of the assignments. However, the time required for the preparation of tests each quarter was less for the online section. In looking at the time spent grading and preparing tests, I found a direct relationship between the amount of time spent grading and the number of students taking the course. By reducing the number of quizzes, assignments, or exams, I could reduce the time spent grading. Unfortunately, this would certainly eliminate some of the feedback the students receive and make it easier for students to cheat by enlisting another student to do their work.

There are 10 quizzes, a midterm, and a final to grade. Each of the quizzes consisted of 5 multiple choice questions and 1 essay question. The exams each had 35 and 40 multiple choice questions and 4 essay questions. The grading of the multiple choice questions was automatic, but the essays were graded, with feedback given to the student for every question or section of a question that was incorrect. Although I give similar essay questions in my normal in–class sections, it is considerably more time–consuming to grade and provide feedback for the online courses. For example, a student can be asked to provide a circular flow diagram and use it to name and explain the three main economic markets and label it to describe how the student might participate in each one as a consumer or owner of a carwash. Since the student can not answer the question by drawing online, the same question as given on the online test is:

> Use the circular flow diagram below to name the three main economic markets, and describe how you might participate in each one as a consumer or owner of a carwash by defining each of the rectangles and arrows.
> a. The left rectangle is:
> b. The top rectangle is:
> c. The middle rectangle is:
> d. The right rectangle is:
> e. The bottom rectangle is:
> f. What flows along the bottom arrow from the left rectangle through the top rectangle and to the right rectangle?
> g. What flows along the top arrow from the right rectangle

through the bottom rectangle and to the left rectangle?
h. What flows along the bottom arrow from the left rectangle through the middle rectangle to the right rectangle?
i. What flows along the top arrow from the right rectangle through the top rectangle and to the left rectangle?
j. What flows along the bottom arrow from the left rectangle through the bottom rectangle and to the right rectangle?
k. What flows along the top arrow from the right rectangle through the middle rectangle to the left rectangle?

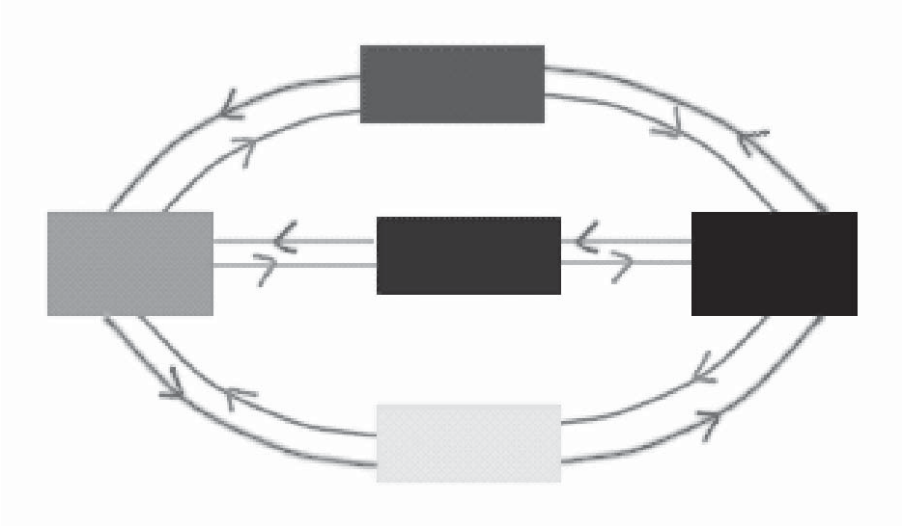

Figure 1

The grading of this question and providing the correct answer are significantly more difficult online than looking at a diagram the student draws and labels using a pencil and paper. In addition, it took additional time to grade online because the essay question for each quiz or test came from a bank of between 3 and 18 essay questions that were chosen randomly. The essays students received were often not the same for each quiz and exam. In the in–class section, the essays were the same for every student.

Also included in this section is any time spent replying to students concerning the multiple choice questions. Students would occasionally ask for explanations for why their multiple choice answer was graded incorrectly or why the provided answer was the correct one. Interestingly, I did not receive any student follow–up questions about the feedback provided to the students on their graded essay questions. Time Spent Grading Tests and Exam Essays: 22 hours.

In addition to the quizzes and exams, the students are also required to e–mail, as an attachment, eight one page write–ups. For these write–ups, the student relates the material covered in the course to a current event article. For the reasons outlined above for the essays, the correcting errors and providing other feedback when grading these write–ups is significantly more difficult than grading the same assignments for the in–class course. Time Spent Grading Article Write–Ups: 10 hours.

For the in–class section there were three homework assignments to grade. These were made up of about 5 essay questions. Time Spent: 3 hours. The in–class section had five article write–up assignments that were identical to the write–up assignments given to the online section. Time Spent: 5 hours.

There were also two exams and a final that were graded for the in–class section. In addition to preparing and grading the exams, I also spend time making answer sheets that are provided to the students immediately after they turn in their exam. The fact that the final was optional for some reduced the number of finals that were graded to about half the class. Time Spent: 14 hours.

All of these times included the time needed to record the grades. *WebCT* automatically posts the grades from the quizzes and exams, but a curve had to be applied individually.

Final Tasks

There were a number of miscellaneous tasks that required time and were only applicable to the online course at the completion of the course. The participation in discussion groups and chatroom logs were tabulated. The student course evaluations were downloaded and formatted into a Word document. The student grades were downloaded and formatted into an *Excel* worksheet. The *WebCT* course was backed up and re–set.

Finally, individualized e–mails were sent to each student thanking them for taking this course and reminding them to register quickly if they were planning to take the next course in the sequence since the online section closes quickly. Time Spent: 3 hours.

Results

Table 1 contains a summary of the total time spent teaching in the two formats broken down by the three major categories. Across all activities the longer time spent teaching in the online format was due to the individualized attention that the instructor provided to the students. This difference between instructor centered teaching and student centered teaching is a fundamental reason for why there is such a substantial difference in the time spent. The other common reason for the time difference was due to the additional time required to set–up, grade, and maintain an online course. It took over twice as much time to teach the same course online as compared to the in–class course. This is true even when the number of students in the online section were less than half the number of students that were in the in–class section.

Summary of Total Time Spent (Hrs.)		
Activity	Online	In-class
Preparation	32	3
Teaching	117	60
Testing	32	22
Final Tasks	3	0
Total	184	85

Table 1

As a result of the individualized attention that the instructor provides to students in an online course, the time demands on the instructor are closely tied to the number of students that are enrolled in the course. **Table 2** contains a summary of the time spent that can be directly attributed time spent with individual students. There were 13 students that completed the online course since one student withdrew and one student did not complete the course (including this student would reduce the online per student time to 8.93 hours). The average amount of time spent per online student was about 9.62 hours (9 hours and 37 minutes). After adds and drops, the in–class course contained 38 students. The amount of time attributed per student for the in–class section was .71 hour (43 minutes) per student.

The most dramatic difference is in the teaching and testing categories. To reduce the overall amount of time spent teaching online, one would have to shorten the time spent in these two categories. E–mail and time spent answering students' questions on the phone accounted for the majority of the time spent teaching (66 hours). Grading essays and other written assignments accounted for all of the time in the testing category that could be attributed to individual students (32 hours). Reducing the contact with students either by not answering their e–mails or reducing grading would provide students with less feedback, which would have a detrimental effect on the quality of the instruction.

Time Spent (Hrs.) Attributed Per Student		
Activity	Online	In-Class
Preparation	4	0
Teaching	87	3
Testing	32	22
Final Tasks	2	0
Total	125	25
Per Student	9.62	0.71

Table 2

Concluding Comments

The raw time amounts I have reported in this study are specific to this particular course. Since instructors teach their courses differently, the time spent administering their course will certainly be different than the time spent in courses compared in this paper. For this reason, these time estimates are, at most, rough guidelines of the time demands an instructor may face when teaching an online course. However, this study provides a means to focus specifically on the teaching time differences. Since both sections covered the same materials, used the same book, and were taught by the same person, the format of this study benefited by being able to minimize the differences in teaching times that would arise from differing instructors and/or differing courses.

This study found that the amount of time spent teaching an online course increased roughly one to one with the number of students enrolled. The amount of time spent teaching online was about twice the amount of time spent teaching in–class. Per student, the time spent online was over nine times longer than the time spent teaching in–class. The major difference in the time spent teaching online was in teaching and providing feedback. It is likely that any significant reduction in these categories would have a negative effect on the quality of the instruction. These conclusions are likely to be applicable to a wide range of online courses and should be considered carefully by an instructor or an administrator who is thinking about developing an online course.

Distance learning and specifically online courses are increasingly popular for students who because of family, work commitments, or location can not take a traditional in–class course. Every quarter I receive requests from students asking for more courses to be developed and offered in an online format. Online courses do provide advantages to instructors since they have greater flexibility with their daily schedules, and they get to spend more time helping students individually. But as this study finds, the time demands teaching online are significant—especially considering that this analysis did not even begin to address the large time cost of developing an online course. For example, I spent over 200 hours this past summer re–developing a course that I had been teaching online when the textbook I was using changed editions. What is the opportunity cost of a summer to an insturctor?

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Biography

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Using Media And Other Outside Sources To Engage Students In Chemistry Classroom Activities

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Abstract

The use of media such as newspapers and magazines as a supplementary tool for teaching at all levels is nothing new (McCallum, 2003, Dawe, 2002 and Strong, 2003). In such courses students are required to search media, both hard and soft, to find related articles and keep a journal or write a report. Research indicates the effectiveness of printed media to connect classroom to community and make a real–life experience (Jarman and McClune, 2001 and 2002). Because of the lack of training of reporters in areas such as the sciences, the accuracy and fairness of the reports have been questioned many times (Franknel, 1995). Allowing students to evaluate the validity of a report will help students to become critical thinkers (Myers, 1991).

This paper describes how various media such as newspapers and magazines in addition to other outside sources such as labels from food items are used to engage students in their learning process. This approach is implemented in a chemistry class, Chemistry Applied to Today's World, which is designed for non–science majors with no laboratory component and offered only in winter quarter.

Goals

Most conscientious grocery shoppers may pay attention to the number of calories or amount of fat or sodium content of the food items they choose to buy but completely ignore chemicals in these food items. This is also true when we read our newspapers or magazines or watch TV. When it comes to news related to some chemical, the majority of

citizens don't give the presence of a chemical a second thought.

It is not only important to teach our students the principles of chemistry but also to show them the importance of chemistry in the real world. In order for students to appreciate chemistry, they must see some personal connection and become active participants in their learning process.

My goal of using media and other sources is threefold:

1. to make chemistry more relevant to students' real world;
2. to have students become active participants in their learning process;
3. to encourage students to become analytical thinkers.

Methodology

As a part of class requirements, students must keep a journal containing articles gathered from different sources such as newspapers, magazines, or TV that somehow relate to chemistry. They must use the Internet to find all the information they can get about the chemicals discussed in the article and be able to critically judge the scientific accuracy of the news article and write a one page report for each article they use. They are also asked to go to the grocery store and list the names of the chemicals in different food items and again find as much information as possible about those chemicals.

Students' journals are regularly reviewed, and comments are added for improvement or change of direction when it is needed. By the end of the quarter, students must have a minimum of five reports.

During the quarter students must be prepared to present their findings as they are related to the topic of discussion in class either as a part of the lecture or as additional information.

Samples Of Students' Journal Presentations

A few samples of students' journal presentations during the class lecture are presented here. The news reports are edited to remove all names, exact locations of accidents, and brand names of products.

During the lecture on the periodic table and the general characteristics of each group of elements, students are invited to present

their findings.

Example 1. From a TV show, a student noted that as a part of an antismoking rally, a group of people was carrying a balloon which looked like a large cigarette. During the parade, it accidentally caught fire. The TV's commentator went on to say that the reason for the explosion was that the balloon was filled with flammable "helium gas."

The result of the student's research on helium indicates that helium is an inert gas and has many applications in chemistry. It is also a lightweight gas that is used in balloons and is not a flammable gas.

Example 2. From a newspaper, another student noted that a Connecticut High School teacher had substituted mercuric oxide for silver oxide in an experiment. Twenty–two students working in pairs heated 1.75 grams over a Bunsen burner for 15 minutes. After massing the heated material, the teacher realized that the mercury was being vaporized, and the students were evacuated from the lab. Three days after the incident, testing of the students revealed 8 of them had elevated mercury in their urine. Three months later one student still had an elevated mercury level.

The student found the following information about mercury on the Internet: Mercury is a very dangerous bioacumulative toxin that is easily absorbed through skin, respiratory, and gastrointestinal tissues. Mercury attacks the central nervous syste m and adversely affects the mouth, gums, and teeth. High exposure over long periods of time will result in brain damage and ultimately death. Air saturated with mercury vapor at room temperature is at a concentration many times the toxic level (the danger is increased at higher temperatures). Mercury should therefore be handled with great care. Containers of mercury need to be covered securely to avoid spillage and sublimation. Heating of mercury or mercury compounds should always be done under a well–ventilated hood.

The following is a student's presentation during the lecture on the chemistry of water and water pollution. Example 3. Two cities and one village were warning about high levels of nitrates found in drinking water. Municipal water and environmental officials said the dry summer season had left high nitrogen levels from farm fertilizer in fields, and heavy rain and snow in December washed the nitrates into streams and rivers.

Infants less than 6 months of age are not supposed to drink water that is high in nitrate levels because it can allow certain bacteria to survive. Those bacteria turn nitrate into nitrite, which can restrict the blood's ability to provide oxygen to the rest of the body.

The student presented her finding on health concerns of nitrate contamination. Infants less than six months of age are susceptible to nitrate poisoning. Bacteria that live in the digestive tracts of newborn babies convert nitrate to nitrite. Nitrite then reacts with hemoglobin, which carries oxygen in the blood, to form methemoglobin. Methemoglobin cannot carry oxygen; thus, the affected baby suffers oxygen deficiency. The resulting condition is referred to as methemoglobinemia, commonly called "blue baby syndrome."

When the air and air pollution were the topics of a class lecture, students were asked to share their findings with the class. The following is one of their reports. Example 4. State officials indicated that people who lived near a soda pop plant during the 1990s were more at risk for cancer than almost anyone else in the world. The Ohio Environmental Protection Agency estimated that one of every 500 people exposed to airborne benzene and other chemicals from the plant has a higher–than–normal risk of developing cancer.

A student presented his research on benzene. It confirms the above report. Benzene is an aromatic hydrocarbon that is produced by the burning of natural products. It is a component of products derived from coal and petroleum and is found in gasoline and other fuels. Benzene is used in the manufacture of plastics, detergents, pesticides, and other chemicals. Research has shown benzene to be a carcinogen (cancer causing). With exposures from less than 5 years to more than 30 years, individuals have developed and died from leukemia. Long–term exposure may affect bone marrow and blood production. Short–term exposure to high levels of benzene can cause drowsiness, dizziness, unconsciousness, and death. The current permissible exposure level is 1 part per million (ppm) in air for an 8 hour average with a short–term exposure limit of 5 ppm. Benzene can also be absorbed through the skin.

The following report was presented by another student who found the recipe for preparation of tea on the back of a Japanese green tea. Example 5. Bring water to full boil; let stand for 2 minutes (Approx.

180°F). Put one teaspoon of tea leaves per cup into teapot. Pour water over tea leaves.

The student indicated that the boiling point of water is around 100°C and showed the correct way to convert degrees Celsius to degrees Fahrenheit using the following equation:

$$°F = 1.8(°C) + 32$$
$$°F = 1.8(100\ °C) + 32 = 212\ °F$$

Conclusion

Students were more attentive in class and became more willing to participate in class discussions or answer questions. The accumulative class average in winter of 2003 increased from 75% to 83% when compared to that of the previous year, winter of 2002. However, more than one factor (such as student population or change in the evaluation procedure) can affect class averages. Therefore, more data are needed for a better quantitative evaluation.

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Biography

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Teaching The Illusive White Student: Encouraging White Students To Think Multi–Culturally While Challenging The Myth Of Whiteness

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> *The mere fact of San Antonio's growth is considerably less interesting than the peoples who comprise it. […] San Antonio offers a splendid site for our conversations, with its [...] history as a complex crossroads of Native American, Mexican, and European languages and traditions. To ask how composition matters in this place and among its people, in the heart of Texas and the umbra of Mexico, is to ponder composition's future everywhere.* (Call for Program Proposals, Conference on College Composition and Communication Convention, San Antonio, Texas, 2004)

My father often considered things in reverse; when someone would be on the news thanking God that the person survived a plane crash, he would muse ironically, "I guess God didn't care about all those other people." From his point of view, the first line of this ad for the conference, in reverse, might imply that if there is not a mix of peoples, the place involved must be "uninteresting." I teach in such a place, and I suspect that many teachers in the Midwest and other areas do also. While the influx of "other" nationalities and peoples is evident everywhere, it is not so evident in my classrooms, which are predominantly white.

With all the talk of diversity and multicultural emphases surrounding academia, this almost seems embarrassing. When applying for my job, I noticed that almost every school emphasizes diversity. Most universities include it not only in curricula but also in goals and assessment. Again, in reverse, this implies that teaching white students is backward and boring. Worse, it implies that I am a boring white male. However, to read *that* in reverse, I believe this is an exciting time to teach white

students because what it means to be white is in question as never before. This essay concerns bridging that gap between mostly white classrooms and the "everywhere" surrounding us, motivating students to see their existence within a fuller context—without the benefit of fully diverse classrooms.

Whiteness As Hidden Racism

Whiteness is not about skin color; it involves invisible boundaries, hidden racism, the inability to *see* and *relate* to the "other." Whiteness involves a system of assumptions whereby the dominant culture assumes its own superiority. Though I was already concerned with incorporating multicultural concerns in the classroom, the idea for this paper emerged when I learned that a student at a university in Alabama said, referring to her Hispanic teacher, "Well there is white and there is *white.*" Clearly, white students need to look beyond the confines of whiteness which are systematic and mostly invisible. In short, the reason that my students seem colorless is that, to be exact, they are not "colored;" they are, in a sense, invisible, part of no particular culture or even ethnic group. They are simply, "white," and that is the whole problem.

Being white means fitting no other category. Traditionally and pseudo–scientifically, it is defined by the absence of any "other" blood. Though such policies were not uniform across the U.S., a rule that identified black as "one drop" of black blood lasted in U.S. courts until at least 1986 (Hodgkinson 158). While most today would relate race to skin color, historically, that has not been strictly the case. The term whiteness presently serves more as a metaphor than a description, a sign or symbol than a signifier. Realizing one's whiteness as a white person is like realizing that fog is a cloud on the ground. What you thought could only be far away can surround you, shape everything you think you perceive. To be a part of whiteness means that you do not have to think about race in America. Race as an issue of discussion doesn't matter to you. In other words, white students are not exactly going to line up to discuss being white since the issue does not *seem* to exist.

Nevertheless, if I want to raise student awareness of multicultural concerns, I first have to find where they live, and many of them live

within the safe confines of whiteness. Recent world events definitely illustrate, however, America cannot simply live in a whitewashed world—though many elements wittingly and unwittingly perpetuate it. This essay offers some discussion on the problem of whiteness in order to construct possible alternatives to white identity, particularly in the ways whites perceive the racial category and the ways whites self identify.

Most multicultural literature ignores or assumes white culture as a given. Yet, if we want to challenge white students to think multi–culturally, they must first understand something about what passes for white culture, or they may always see the present intermingling of cultures as an us–vs.–them scenario.

Social Construction Of Race

The truth is, there is no white us. As is well known, "the differences that divide one race from another add up to a drop in the genetic ocean" ("What is White Anyway?" 65). Whiteness, indeed, is a concept rather than a scientific fact. This has two important implications. As Elizabeth Denevi notes, whiteness "is socially constructed, and that encompasses many different ways of being white" (1). Second, an ability to see all races as social constructions enables the white student to cross racial boundaries in forming an individual identity. This already, somewhat invisibly, occurs since American culture is a reflection, not of European ideals alone, but of African, Hispanic, Native American, Asian, and many other cultures. In other words, whiteness by definition is an identity crisis.

Recognizing these needs, I have focused on two basic tactics in the classroom—to expose the racial fallacy of white identity and to rethink white identification. Both are aspects of whiteness. The first concerns how whites perceive themselves culturally, and the second who, or what, they identify with while negotiating the relation of self and other.

Challenging Whiteness

First, to challenge whiteness as a racial concept, one may illustrate its illusory nature by pointing out the historical inconsistencies in its definition. In order to incorporate and justify such concerns in the

classroom, I use different approaches in different classes. In freshman writing, we study and discuss literary and other multicultural texts. In linguistics, we study language use, second language acquisition, and other issues. In grammar, we focus on usage, dialect, and the controversy over Standard English. The discussion could take many forms in a variety of classes.

To begin, being white did not even become significant until very recent times. Michael Omi and Howard Winant reveal, quoting Winthrop Jordan, "From the initially common term Christian, at about mid [seventeenth] century there was a marked shift towards the terms English and free. After about 1680, taking the colonies as a whole, a new term for self identification appeared—white" (89). Even the term "Christian," according to James Oliver Robertson, in *American Myth, American Reality*, meant something considerably different than current definitions which focus on beliefs or social groupings. He identifies four elements that defined the term Christian to the early settlers of the New World, including "clothes of the proper kind;" the use of houses—"or at least acceptable huts"—and agriculture; church attendance and allegiance to the church calendar and sacraments; specific sex roles, sexual acts, and child rearing practices. He notes that the early settlers were far more concerned with hairstyles, dress, customs, and lifestyle than skin color (37–38).

Things changed, however. According to Joel Kovel, author of *White Racism: A Psychohistory*, which interprets psychologically the roots of American racism through historical documents, English Protestantism and emergent capitalism redefined human relations, creating new concepts of human and property rights, key aspects of the incipient United States. Unfortunately, while human rights began to define relations among whites, property rights began to define blacks. For example, he cites a Virginia statute from 1669 which held it "not to be a felony should a master kill a slave who resisted punishment: 'It cannot be prepensed malice (which alone makes murder felony) should induce any man to destroy his own estate'" (20). As Kovel notes, the combination of the pre–sixteenth century English association of black with the devil and uncleanness, and the parallel association of white with goodness and reason, led to a radical interpretation of the existence of black peoples in Africa. This, coupled with the Biblical story of Ham,

supposed father of the people of Africa, and the only one of Noah's three son's cursed (marked on his skin) by God, began a process by which skin color became not only a marker of race but also a marker of inferiority (Kovel 61–63).

By the American Revolution, skin color meant everything in America. The first census of 1790 identified four categories of beings living in the United States: "free white males, free white females, other persons (including free blacks and 'taxable Indians'), and slaves" (Hodgkinson, 158). At the same time, naturalization was limited to "aliens being free white persons," a practice which basically stood until the Civil War for blacks, and "well into the twentieth century [for] persons of various hues and ethnicity" ("What's White, Anyway?" 64).

In the nineteenth century, racial categories became legitimized by science. An 1879 geography book allowed six races, "Caucasian or European"; "Mongolian"; "Ethiopians,"[…] "comprising the negro, or black, race"; "Malays," "encompassing Southwestern Asia and the islands in its vicinity"; and "American Indians," identified, ironically, as "Americans" (*Colton's Common School Geography* no page number).

By the early twentieth century, immigrants of various groups were forced to become white to become citizens. In 1922, a "Japanese national who had lived in America for two decades" took his case to be legally recognized as white to the U.S. Supreme Court, basing his case on the fact that Hawaiians were part of the U.S. and considered white. He lost. In 1923, a high caste Hindu attempted the same thing. According to *Newsweek* magazine, Justice George Sutherland argued: "It may be true that the blond Scandinavian and the brown Hindu have a common ancestor in the dim reaches of antiquity, but the average man knows perfectly well that there are unmistakable and profound differences between them today" ("What's White, Anyway?" 64). Racial restrictions on citizenship were not removed until the McCarran–Walter Act of 1952 ("What's White, Anyway?" 64–65).

The census process, however, reflected changing perspectives. The 1960 census offered only two categories, "white" or "nonwhite"; the 1970 census, offered "black," "white," or "other" (Hodgkinson 158). The absurdity of racial categorization is highlighted in interpretations of Hispanic culture. In the nineteen eighties, Hispanics were a race; by the 1990 and 2000 censuses, they were identified as an ethnic group.

The 2000 census, interestingly, shifts the categories almost back to the 1870 textbook definitions, separating "white," "black," "Pacific Islanders," "Native Americans," and "Asians"(Hodgkinson 157). Interestingly, racial categories never address in any broad manner the racial makeup of Arabic peoples. Logically, since they do not fit any other category, they would be listed as white, as would most Hispanics, who may be of any "race."

Students may get a little nervous when they learn that even what we refer to as white today has shifted. At one time, white meant "Anglo–Saxon–Germanic" stock, and Europeans were divided into three distinct races: "blond, blue–eyed Teutonics (who were at the highest stages of development); stocky, chestnut haired Alpines, and dark, slender Mediterraneans," a list put forward by then Stanford University president in 1899. The result was that "not all white races were considered equal to each other." As America has changed, new groups have entered, and "much of American history has been a process of embracing previously reviled or excluded groups" ("What's White, Anyway?" 65). In short, what *Newsweek* refers to as America's "cult of whiteness" [...] "was never about skin color, hair texture and other physical traits," and over time, almost any group can be "made white" ("What's White, Anyway?" 65). Add to this the argument that "the differences that divide one race from another add up to a drop in the genetic ocean" ("What's White, Anyway?" 65), and the fictional, but very political, nature of whiteness becomes apparent.

Such a discussion cuts into the surface of whiteness, but it may encourage what most writers on whiteness believe to be a key sustainer of the white rhetoric—that all of us should be colorblind. While this approach might stem from very noble motivations, America has simply not dealt with the reality of race thoroughly to dismiss it as insignificant. Indeed, the pseudo–scientific and cultural arguments that sustain racial differences and whiteness stand discredited, but systematic whiteness still widely influences the social and political landscape. We need a second tactical move to address white identification with whiteness.

Whiteness is most often interpreted as systematic white privilege, which of course, is invisible to anyone who benefits from it. And since losing privilege is threatening, the whiteness problem leads to certain resistances in the classroom. First, many white students do not want to

talk about race, or feel that since, in America, everyone is equal, the problem was mostly solved in the sixties and now we only have to stop racist actions and be colorblind. Second, talking about race in a classroom with perhaps one black student and one international student can seem not only awkward, but also a bit ridiculous. Third, white students may not value studying other cultures and may see multicultural centers as something for other groups of people. Unfortunately, since most multicultural programs virtually ignore white culture, they would be right. After all, what is white culture? According to most theorists, whiteness does not even exist except as a projection of our own minds. The second tactic, then, is both to reveal the impressive and pervasive power of whiteness and also to expose its vacuous nature.

Whiteness: No Benign Concept

As Joel Kovel's amazing book reveals, and other figures in whiteness studies concur, whiteness is no benign concept:

> The West is a white civilization; no other civilization has made that claim. White emblemizes purity, but purity implies a purification, a removing of impurities. [...] though scientifically the sum of all colors, to the symbolizing mind [white] becomes the absence of color, that which remains when color has been removed. And it is upon this symbol of whiteness that the psychohistory of our racism rests.
>
> Why be proud of such a negation? The answer is simple. Such a negation yields power, an energy so titanic as to shake the globe and perhaps even destroy it. The power has been made manifest in the West's economic amassment of sheer wealth, in its technological skill, and in the orderly organization of society. And these achievements depend upon the application of a pure form of thought—rational, scientific, whitened—to the diverse problems of civilization. But pure thought has not been sufficient; the power has derived from a combining of science with a purified will [...]. These two factors—pure thought and restless zeal—have been the guarantors of Western power. (107)

Kovel's full argument extends beyond the reaches of this essay, but it vividly illustrates the pervasive nature of whiteness as a construct. While negation is a term usually used of those who are oppressed, here the meaning is reversed. Whiteness, in its own non–existence, retains its power. As Peggy McIntosh writes, "I have come to see white privilege as an invisible package of unearned assets which I can count on cashing in each day, but about which I was 'meant' to remain oblivious" (358).

To challenge whiteness, then, may be to challenge the ways in which we think and organize the world—to rethink every association of white with success, reason, purity, and blackness with evil, ignorance, and impurity. If Kovel is correct, racism is only part of a larger trend in society to cleanse and dominate the planet. Even our interpretation of capitalism and free trade is based, according to Kovel, on our attempt to make everything in the world a commodity. Such a belief system created the concept of humans as property, which not only led to slavery, but even influenced such sacred institutions as marriage and divorce, both centering in property agreements which included women in the past and presently extends to children.

The black–white metaphor invades our basic notions of the world. For example, our concepts of "primitive" and "civilized," by which we interpret many racial distinctions, belie our fear of the animal nature that we all share. These distinctions go well beyond black and white, to our treatment of whole segments of the world we call "third." Even the communists, the so–called "second" world, fare better than those less civilized, i.e., non–white. If Kovel is correct, and I believe he is, our references to "Western Civilization" may only thinly disguise its roots in whiteness and white perspectives.

At risk then, is our whole concept of who we are. While many theorists confirm that to identify oneself with whiteness means to identify with power based in negation of its own existence, this does not mean identifying with any definable culture. As Nathaniel Gates notes in *Critical Race Theory: Essays on the Social Construction and Reproduction of Race*, "Whiteness describes, from the Little Big Horn to Simi Valley, not a culture but an absence of culture" (Gates 357). Nakayama and Krizek point out that, "Whatever 'whiteness' really means is constituted only through the rhetoric of whiteness. There is no true essence to whiteness; there are only historically contingent constructions

of that social location" (293). Sean Tierney and Ronald Jackson refer to whiteness as a rhetorical fantasy.

Nevertheless, whiteness, as unreal as it is, wields a considerable influence. Tierney and Jackson also note that "whiteness is defined as the ideological framework of the dominant segment of North America. . . . [It] is not simply of race but also of class. [It] is not simply physical. It is sociopolitcal and is characterized by very real and dynamic racial dynamics. Whiteness, regardless of class orientation, encompasses some measure of privilege, status, and power" (84).

The Lie Of Whiteness

Gates, concerned with exposing the lie of whiteness, believes that unless we do expose it, all talk about ridding the world of racism is useless. Whiteness pervades all of society invisibly in the form of key assumptions central to American culture. Nakayama and Krizek concur and list five such beliefs that they refer to as "rhetorical strategies" of whiteness, ways in which whiteness stays in power.

1. Whites are the "majority" and experience "privileged social position grounded in their racial identity" (298).

2. Whiteness is only "marked in reverse": It is seen as a "non–color," unpolluted by other blood lines, and as a "subject position" is otherwise unmarked and occupies a more universal discursive space (299).

3. White is a scientific definition. Whiteness is allied with science and allied with the tradition that "privileges the Mind in the Mind/Body hierarchy of knowing" (300).

4. Whi te means American. "The history and tradition of the United States is replete with relentless efforts to retain and guard the boundaries and nationality with whiteness. . . ." In 1790, at this country's beginning the first congress voted that a person had to be white to be a citizen.

5. White is a non–label; all other categories are labels. White people are simply "human." Such a point of view is ironically encouraged by Martin Luther King's belief that character should be the issue, not color.

Such a fantasy is a thin basis for an actual communal identity. According to James Baldwin, in "On Being White and Other Lies," "there is, in fact, no white community'" (quoted in Gates 13). Gates writes that "it is not that whiteness is oppressive and false; it is that

whiteness is nothing but oppressive and false. We speak of African American culture and community, and rightly so. Indeed the making of disparate African ethnic groups into an African American people . . . is a genuine story of a melting pot" (13).

Whites need, as Nakayama and Krizek note, to map out the territory of whiteness. But then what are they left with in terms of cultural identity? Even our idea of American needs to be overhauled. If Europeans are white, and they invented the highest culture, then they must be the best. This kind of thinking ignores the historical realities that American/European culture was built and sustained on the systematic exploitation of not only blacks and Native American groups of all sorts spread across the continent but also the "lesser" groups of Eastern Europeans, low status Europeans, peoples subjugated by the British (such as the Welsh and Irish), and others who came to America as indentured servants and slaves. As Gates writes, "There is an American culture, but it is 'mulatto,' to borrow Albert Murray's fine description" (357).

Addressing Whiteness In The Classroom

I seriously doubt, however, that any of this would ring totally true to any of my white students. I believe that addressing whiteness in the classroom, if we want to do it at all, must take various forms, some centering on identity, some on identification. I have used readings, post–colonial literature, minority literature, small group discussions, class discussions, journals, and other ways to find out student attitudes and bring them into discussion.

Within that context, whiteness emerges. A couple of student examples illustrate the concept's pervasiveness.

Freshman Leslie (not her real name) responded to the novel *Things Fall Apart*, by African writer Chinua Achebe. Her essay fits the general trend, the cold rational voice of whiteness in controlled space, evidencing Nakayama and Krizek's third point. In part of her essay, she quotes a very famous writer concerning Africa:

> Africa has improved over centuries in having an array of many people and customs. "White people [who] for a long time lived [sic] alone with Natives, get into the habit of saying what

> they mean, because they have no reason or opportunity for dissimulation, and when they meet again their conversation keeps the Native tone." (Dinesen 157)

She continues: "Although not all Africans have come to accept a different lifestyle, many have learned to respect the white man's way to simply learn and better themselves" (3). Note that she misses Dinesen's point that whites learn not to lie from interaction with "Natives." I would submit that she could not, because of certain assumptions revealed in her words, even "see" what Dinesen was saying. Safely within the confines of whiteness as identified in Nakayama and Krizek's list, she interprets the passage as referring to the need for the natives to "better themselves." Such a passage offers a way to discuss whiteness as a way of perceiving.

For a linguistics class, Carol (not her real name) remarks: "When you hear the word Ebonics, what do you feel? Many people feel Ebonics is an improper, lazy way of speaking, making the word derogatory" (1). Notice that "people" here implies "white," reflecting categories 2 and 4 above. White is "normal." White is "American," i.e., "us." I do not know if she would have written this differently if I had been African American. I suspect that due to our education levels and my status as teacher, I would still have been a part of the "people." She then challenges racist associations: "I believe there is a lot of racism put on Ebonics. People judge people for speaking Ebonics" (3). Here she reflects strategy five's emphasis on colorblindness.

As a future teacher, she is conerned with understanding Ebonics, but the words assume a certain stance, an assumed "we": "Children who speak Ebonics are getting let down. [...] Becoming teachers or educators in general we need to be educated about Ebonics so we do not look down on someone for speaking that language" (4). Yet, she says near the end of her essay (with irony?): "If the schools start at an early age teaching Standard English (which I feel should be called white or proper English) using the skills and rules from Ebonics, whether comparing or contrasting, the children will be better equipped to speak in this "White" world" (4–5). Strategy number one, that whites are the majority and that they occupy a position of privilege, is here readily assumed.

I honestly do not believe either of these women considers herself a

racist, and I do not find their remarks racist in any *intentional* manner. In fact, the second woman has an interracial child and deeply resents the remarks she sometimes endures. When I presented this paper in an early form, one professor suggested that the second writer's perspective may originate in her experiences with raising a child of color. She may be trying to protect that child by making sure it can function successfully in a "white world." Still, her remarks surprise us in their honesty.

What both of these passages reveal, however, is that addressing racism without exposing whiteness leaves intact a fictional, but very real, systematic and hidden standpoint that largely remains unquestioned by most whites in America. It is simply premature to attempt to be colorblind. There is work to be done.

Gates believes, as do I, that, "To make its fullest possible contribution to the growth of a new society, activism that draws on ideas regarding the social construction of race must focus its political energies on exposing, demystifying, and demeaning the particular ideology of whiteness, rather than calling into question the concept of race generally" (Gates 356).

Basing Our Identity On Lies

The two tactics I suggest begin such a process. In encounters between white and other, we will need to start having two participants, not one visible and the other invisible, one unmarked and the other marked.

One public conversation reveals that we still have a long way to go. In the recent Supreme Court discussion on Affirmative Action, one justice framed the question as an either/or choice—to maintain affirmative action, or to lower admission standards to universities. Following my father's read–backward method, one can see the hidden whiteness. What does this discussion imply about those normally entitled to affirmative action? Systematic whiteness by definition sets the standards and complains when "others" do not meet them. But more importantly, *both* choices are to some degree insulting to minorities, the lowering standards, I think, the most. Neither approach addresses injustices and imbalances in early black education that lead to the problem. Either decision leaves fully intact Nakayama and Krizek's rhetorical strategies. And until we disassemble those, all of us lose.

A serious questioning of whiteness cannot help but make whites feel threatened, yet some aspects of rethinking whiteness are easier than others. Specifically, addressing the first tactic listed, that of challenging race as a category, is relatively simple. Facts can be listed, information shared. Many whites generally do not have a problem questioning race as a category. Out of about fifty students whom I asked to define race, none appealed to scientific categories, all admitted that the terms mostly referred to how we identify and perceive ourselves and others.

The process of rethinking identification, the second tactic, is more complex. One way to begin is through literature from "other" cultures with Nakayama and Krizek's list in mind. Many of my white students responded very positively to Achebe's *Things Fall Apart*. Achebe's book humanizes the other, and none of my students missed that the book was about all of us. While they found the Late Nineteeth–, early Twentieth–Century African culture strange and somewhat uncomfortable, they identified with the characters. The book also illustrates, through the attitudes of the British colonizers, the fundamental inhumanity of "whiteness," with its assumptions of racial and cultural inferiority and objectification of both human and animal. That is only the beginning though, if white people are going to face the repercussions of basing our identity on lies.

In some ways, of course, the journey has begun, at least in terms of the racial category. American culture is indeed mulatto, and one could be an American without identifying with whiteness. In fact, as *Newsweek* notes, people of mixed descent currently are more inclined to relate to the non–white group, and "even as the boundaries of whiteness have expanded, the specialness of whiteness has eroded" ("What's White Anyway?" 65).

White identification with whiteness is also changing. According to Gates, while it remains less assimilated by white culture than its predecessor rock and roll, "hiphop offers white youth not only the spontaneity, experimentation, humor, danger, sexuality, physical movement and rebellion absent from what passes as white culture / but it also offers an explicit, often harsh, critique of whiteness" (Gates 359–60). From a reverse perspective, Harryette Mullen might refer to this practice as "white minstrelsy" (56). She believes that blackface minstrelsy enabled whites to show the emotion and expression of blacks while still

maintaining the superior white position. The current trend of whites to have "soul" or "become black" she sees as continuing the unbalanced relationship where the black represents the current shadow of the white mentality.

Indeed, Gate's remark unwittingly may reflect a white–mind/black–body mentality or a white–mind/black–soul mentality that pervades much the rhetoric of whiteness. This only illustrates how pervasive the problem is. Yet, he also notes that whites are already disaffected. Whites may seek identity in many of the surrounding cultures, as they, in truth, always have.

As Gates notes, "We cannot afford to ignore the political implications of the mass questioning of whiteness as a trend and a possibility in the U.S. . . . In a variety of settings . . . whites are confessing their confusion about whether it is really worth the effort to be white" (Gates 360).

White writer Krizek remarks: "When I started realizing that other people were able to articulate and appreciate aspects of their cultural heritage, I began to feel uncomfortable about being transparent. Although I understand that mapping the territory of white will be disruptive, I encourage the disruption. I don't believe that my identity is continuous with the white's invisible power, and I am searching for the discontinuities as meaningful cultural experiences" (Nakayama and Krizek 292). Yet, more is needed than finding "discontinuities." What is needed, for certain, is to resist what Kovel calls the general "thingification" (185) of the world, of which racism is only a part. Even as we dismantle whiteness as a racial concept and as a systematic cultural perspective, we need also to remember Kovel's simple advice:

> To go beyond racism genuinely means at bottom that the other is considered a human, not a thing; he [sic] may be a loveable human, he may be an unlovable human, or he may be, like most humans, an amazing mixture of strengths and weaknesses, assets and deficits, loveable and unlovable traits, all bound up in various conflicts. (213)

True identification starts first with being a human being, and, while only active rethinking of human identity could ever dismantle systematic whiteness, only those prepared to be human, with all its animal, natural,

and rational implications, can ever hope to begin the process.

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Biography

Keith Lloyd, an assistant professor of English at Kent State University—Stark, obtained his doctorate in rhetoric and composition from the University of Louisville. He has a B.A. in Religion and History, an M.A. in Humanities, and his research and publication interests are in rhetoric, race, and gender. He currently teaches courses in composition, linguistics, grammar, literature, and rhetoric. Lloyd may be reached at at klloyd@stark.kent.edu.

Multimedia Resources On A Budget: One Implementation[1]

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Introduction

Would you like to deliver a *PowerPoint* presentation that features audio and scripting for accessibility online or to enhance your classroom lecture? Do you want a way to create an orientation CD for your students? What about providing your students with "how to" procedures that can be accessed 24 hours a day? Accomplish these and many more tasks with software you may already have, such as Microsoft *Office* and Windows *Sound Recorder* (part of the Windows operating system), and a computer with some additional hardware: microphone, sound card, and speakers.

In addition to identifying the technical components needed, we will share with you the steps we took to create a multimedia tutorial using *PowerPoint*, Windows *Sound Recorder*, *SnagIt* and *DubIt*. We will try to point out our triumphs and tribulations encountered throughout the entire process. It is our intent to post the tutorial to our web classroom (*WebCT*) or burn it to a CD–ROM which will allow students to view it at a time most convenient for them.

What Is Multimedia

Anytime educators use more than one method to communicate content, they are using multimedia. This can be as simple as using charts and graphs in conjunction with a textbook and lecture. More recently, however, the term has come to apply to a broad spectrum of computer–related products and processes (Shuman 5). These computer–based products are interactive and can incorporate a variety of elements, such as sound, text, video, and graphics. Additional terms for this type of

presentation are computer–based instruction, digital multimedia, or digital technology.

Why Bother

Why should we take the time to add a digital multimedia component to our classes? According to DeSieno, using this technology can help to address the immediate instructional needs of the students and to make the information more vivid and instructive. DeSieno also states that "digital technology delivers the potential for enriching the curriculum, for helping students reason and learn, for applying pedagogical design more effectively. . . ."

In addition, it has been noted that for a number of years, a significant portion of the world's population has been getting more news and information through some form of multimedia (telephone, radio, television, and images) rather than the written word (Houghton, Politics section, par. 6). Because recent generations of students have used video as a primary source of information, what used to be a traditional relationship between reading, writing, and thinking skills has been radically altered (Short, Introduction section, par. 1).

Each year greater numbers of students who grew up with the digital revolution will enter the doors of our educational institutions. These technologically aware students will not only expect to learn about new technology and to use it as a tool for learning but also expect to have it used in the classroom to deliver and/or support instruction. A survey conducted at Northwest Missouri State University supports this idea. The findings indicate that "the use of information technology is an expectation of all students, in all academic departments" (Husain 9). In order to meet these expectations, institutions must move toward embracing the use of technology in the classroom and not just leave it to the realm of the technical faculty.

Because they are ideally suited for a student–centered educational environment, computer–based technologies have opened doors to an array of new learning opportunities (Albright 91). Even so, many in higher education have not shown a high degree of enthusiasm for multimedia, possibly because although they see its relevance, they are not convinced of its practicality. Once convinced of the advantages

multimedia offers, faculty will make exciting use of this educational technology (McFarland, par. 31).

Not forgetting that we also have older students who are not of this digital age, we must find ways to engage all students in the learning process while helping them to learn to use the technology. Therefore, we don't want to blindly implement technology, and we need to question how a particular type of technology would influence the learning styles of the students and, using that information, design a course that provides a justification for the method, assuring that it also fits into the philosophy of teaching and learning of the faculty (Grasha and Yangarber–Hicks 13).

We decided that adding a multimedia component offering text, images, animation, video, and audio to the classroom would help to meet the learning styles of a variety of students. In addition, it could provide a safe, supportive environment for students to become comfortable with using technology as a learning tool.

Where To Begin

First, faculty need to think about how technology can fit into their philosophy of teaching and learning while at the same time looking to see what type of technology will best support or enhance their academic goals. Technology–based instruction, as well as other teaching processes, should do more than simply introduce novelty into the classroom or just organize and structure time spent in or out of class (Grasha and Yangarber–Hicks 3). Keep in mind that even the best multimedia cannot make up for a lack of content, poor design, targeting the wrong audience, or delivery by a mediocre presenter (Shuman 20).

Second, decide whether this will be a tool used by the instructor in the classroom or by students outside of the classroom. In class, multimedia can support or enhance a lecture and help to hold the students' attention. Outside of class, it can provide students with additional explanations of and interaction with the course material.

Third, determine what resources are already available. Begin by identifying what computer components (hard drive size, RAM, speakers, sound card, microphone, etc.), peripherals (scanner, CD burner, digital camera), and software (operating system and applications) to which

you have access. When developing the list of resources, be sure to include not only hardware and software at your disposal but also look for individuals within your organization with whom you might collaborate. Sometimes other members of the faculty have already taken the leap into the digital world and are willing to serve as expert resources and share their experiences and expertise (Gloster and Saltzberg 31). If a faculty mentor does not exist, get acquainted with your technology support personnel. They can offer the technical expertise either to provide training on the equipment and software or assist with the implementation of your idea. Whichever method is chosen to prepare the project, remember, "No one can put an idea in context better than front–line teachers" (Houghton, Comprehensive Composition section, par. 8).

Finally, take a realistic inventory of your technical abilities, consider the scope of the project, establish a project time line, and determine how much time you realistically have available to devote to the project. These are all things to consider before beginning any type of project. It is no different when working with multimedia.

How Long Will It Take

How long will it take to learn how to do this? It depends. Shuman contends that anyone who has developed the concept, stated the purpose, identified the target audience, and determined the treatment (method of delivery) is well along in the Planning, or Phase 1, of creating multimedia (117).

Shuman goes on to identify Phase 2, Creating, and Phase 3, Testing (the multimedia), as the remaining steps in the process (117). So how much time will Phases 2 and 3 require? Again, it depends. Someone familiar with computers and software applications will have a shorter learning curve than a less experienced individual will. To help with the process, most software applications provide a constant fall–back position of help files, wizards, and assistants which teach about and guide users (Houghton, Problem Solving section, par. 3). These help files and wizards can significantly reduce the time needed to learn how to use the software. Additional assistance is available on the Internet in the form of tutorials. In just a few minutes of using the *Google* search engine (www.google.com), one can locate several websites that offer tutorials. **Table 1** presents a small sampling of the many

PowerPoint Tutorials	
PowerPoint Tutorials for Windows and Macintosh	http://www.quasar.ualberta.ca/edpy202/tutorial/PowerPoint/PowerPoint.htm
**Electric Teacher	http://www.electricteacher.com/tutorial3.htm
Powerpointbackgrounds.com	http://www.powerpointbackgrounds.com/powerpointtutorials.htm
How to insert a sound file into PowerPoint:	http://faculty.fmcc.suny.edu/tutorials/bkgrd_snd_ppt.htm
Windows Sound Recorder tutorials	
Faculty Development Center at Fulton Montgomery Community College	http://faculty.fmcc.suny.edu/tutorials/sound_recorder.htm
University of Washington	http://depts..washington.edu/trio/train/howto/pieces/audio/capture.shtml
Lycos How-To	http://howto.lycos.com/lycos/step/1,,9+27163+27173+27303,00.html
SnagIT tutorials	
TechSmith	http://www.techsmith.com/techsupp/snagit/default.asp
Lycos How-To	http://howto.lycos.com/lycos/topic/1,,8+44+31269,00.html
SnagIT and DubIT tutorials	
Lycos How-To	http://howto.lycos.com/lycos/step/1,,8+44+31269+31701+31712,00.html
Multimedia Resources for Educators	
Meridian Schools	http://ehs.meridianschools.org/m_cntr/mc_pgs/pro_dev/pd_t_s.htm

Table 1: Tutorials Available on the Internet

websites found.

In addition, how complex you choose to make the project will directly affect the time commitment to create the multimedia. The level of complexity can range from simple, such as a slide presentation created in *PowerPoint* or another presentation package, to complex where streaming video, Flash animation or high–quality sound are included. The more complex the project, the more time involved. McFarland suggests that converting one entire course to multimedia can take an average of 150 to 200 hours (par. 18). We cannot substantiate or dispute this estimate because we did not record the time invested in our project.

Finally, be sure to allot sufficient time to test the media thoroughly. Now is the time to find any problems that may exist with the content, flow, or accessibility. This means testing every component of the multimedia several times. If possible, ask someone who is not familiar with the project to try it out. Once all of the components are working as expected, run the multimedia on different computers to assure it is compatible with various computer hardware configurations. In addition, if the media will be available via the Internet, be sure to test whether it functions properly from both dial–up (modem) and high–speed (cable, DSL, T1) Internet connections.

What Is Needed

Many possible combinations of hardware and software are available; however, we did not attempt to research them. Instead, we chose to start with what was already available to us and then determine if we needed any additional items.

For our project, we used the presentation program, *PowerPoint*, which is part of the Microsoft *Office* Suite of applications. If you already have *PowerPoint*, you have the primary component needed for your project. To add sound clips to the *PowerPoint* slides, we used the Windows *Sound Recorder* software. *Sound Recorder* is part of the Microsoft Windows operating system installed on IBM–compatible desktop computers. To create the sound clips, we needed some hardware in addition to the *Sound Recorder* program, specifically a good microphone and speakers attached to a sound card inside the computer.

In addition, we added *SnagIt* and *DubIt* from TechSmith software. *SnagIt* captures either static or animated images on the computer screen. Its companion program, *DubIt*, is an audio recording application, like *Sound Recorder*, that offers more control and flexibility when recording and editing sound clips. Free evaluation copies of *SnagIt* and *DubIt* are available from http://www.techsmith.com. We decided to purchase both programs after evaluating them and finding them easy to use.

What Will It Cost

What size budget do you need? **Table 2** on page 99 shows a range of prices for the hardware and software we used. What you actually pay will depend upon any purchasing agreements your organization may have in place.

How Did We Do It

First, we identified what we wanted to accomplish with the text, audio, and video. The course we focused on teaches the beginning skills of computer networking. Since this requires special equipment and software that most students only see in class, we wanted to give them something to work with outside of the classroom to help them become familiar

Pricing		
Manufacturer	**Software**	**Cost**
Microsoft Windows Operating Systems:	Windows 2000 Professional Windows XP Professional	$223 - $280 $183 - $299
Microsoft Office Software:	Office 2000 Suite Standard Office 2000 Suite Professional Office XP Suite	$230 - $429 $270 - $490 $299 - $450
TechSmith Screen Capture and Audio Recording Software:	SnagIT DubIT	$ 40 $ 20
All are available from local retail outlet stores or via the Internet. No specific brand recommended for these items.	**Hardware**	**Cost**
	Microphone	$ 20 - $ 50
	Speakers	$ 45 - $ 200
	Sound Card	$ 20 - $ 91
	Personal Computer	$700 - $2000

Table 2: Hardware and Software Pricing

with basic concepts, terminology, and the main administrative utility they would be using in class. To keep the tutorial manageable, we decided to break it into individual sections that would correspond with the chapters in the textbook. By keeping the tutorial in sections, we maintained the flexibility to update or modify individual portions whenever the course content changed and did so without affecting the entire tutorial. In addition, it would give students the ability to view and listen to only those portions they needed without having to watch the entire tutorial from beginning to end.

With a plan in mind, we checked to see what resources were available to us. We found that we had access to computers with the necessary hardware (sound card, speakers, and microphone). These same computers already had the Windows operating system, which gave us access to *Sound Recorder*, and they had the Microsoft *Office* Suite, providing us with *PowerPoint* for our presentation software.

With the equipment in place, we began by developing objectives for the first chapter of the textbook. Then we developed an outline of the content that became the basis for the *PowerPoint* slide show. Our next step was to create the slides and write their corresponding scripts. Since *PowerPoint* comes with several professionally designed templates, we did not have to worry about color schemes, element placement, or font style and size. After looking at some of the templates, we chose one that matched the color scheme and look of the textbook. By using a

pre–designed template, we note that the placement of text and graphics are already marked; all we needed to do was fill the template in with our material. Since we used templates, we could have altered their appearance at any time if they had not met our needs, or we could have searched the Internet to find different ones. Some websites offer them free, while others do so for a charge.

Created from information in the textbook, outside readings, instructor knowledge, and tips from the textbook publisher, the scripts came next. Because they were for a tutorial, not a full lecture, the scripts were short and written in a more conversational tone. Their purpose was to add additional information, not to repeat what the student had heard in the classroom lecture. Once recorded, these scripts became the audio clips that we inserted into the slides which could be played automatically whenever someone accessed the corresponding slide.

At this point, we realized we wanted to offer more than just static slides with an audio lecture; so, we started to look at how we could enhance the tutorial. We decided to include images of the computer screens, but we wanted them to play like a video, not just be static similes. An Internet search located the TechSmith products of *SnagIt* (screen capture software) and *DubIt* (audio recording/editing software). Using the free trial versions available by download, we spent some time testing them. They were easy to use and met our needs; so, we purchased them both. We took advantage of the assistance available via the internal help screens and through the Internet support from the TechSmith website to learn the programs. After working with both programs for a while and becoming comfortable with their functions, we were ready to proceed. With these new tools in hand, we revised our plan of action. Because we could now include "screen videos," some of the scripts needed modifications.

With all the components and revisions in place, we were ready to begin putting it all together. Given that we had some of the *PowerPoint* slides ready, we decided to record their scripts first to test our plan. Before we started recording, we practiced reading each script to get a feel for the pace and timing. After becoming comfortable with the rhythm, pauses, and wording, we made the audio recording. This made the clip sound more natural and helped avoid the tendency to read each slide. We proceeded by creating a separate sound file for each slide

which will let us make changes to an individual slide or sound recording without affecting the entire presentation. We need this type of flexibility since the textbook for this course is generally updated each year, although not everything may change.

With the static slides and their audio files completed, we began working on the screen videos. Although one person can easily handle the static slides and audio, we found it easier to work together on the screen videos and their audio recording. By working as a team, we note that one of us could control the mouse and computer screens while the other simultaneously "read" the scripts. This helped to assure synchronization of the audio and video. **Figure 1** is an example of how a screen video looks when played from within a static *PowerPoint* slide. For easier viewing, the student can expand the video to full screen.

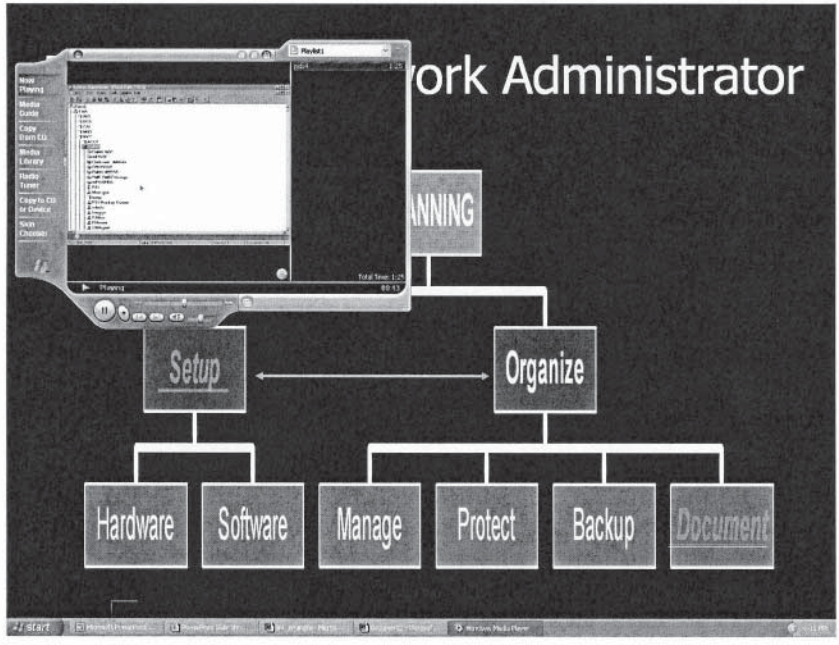

Figure 1: Screen video played from within a *PowerPoint* slide

Now that the audio, video, and slides were completed, we wanted to assure that students could use the tutorial without requiring them to purchase the *PowerPoint* program. To accomplish this we used a function included in *PowerPoint* that let us publish (convert to HTML) the tutorial. This allows the students to use one of the browser programs (*Internet Explorer* or *Netscape*) to view the tutorial. Once published, the title of each slide appears in the left pane of the browser window, and it automatically links the title to the corresponding slide. With just a single mouse click on one of the titles, students may jump to that section of the tutorial, giving them full control to view the various sections in whatever order they choose or to skip sections they may not wish to review at the time. Another method available for moving between slides is to use the navigation buttons (created by the publishing process) located at the bottom of the screen; however, this method does not offer the same flexibility and takes a linear approach through the presentation. **Figure 2** shows these features.

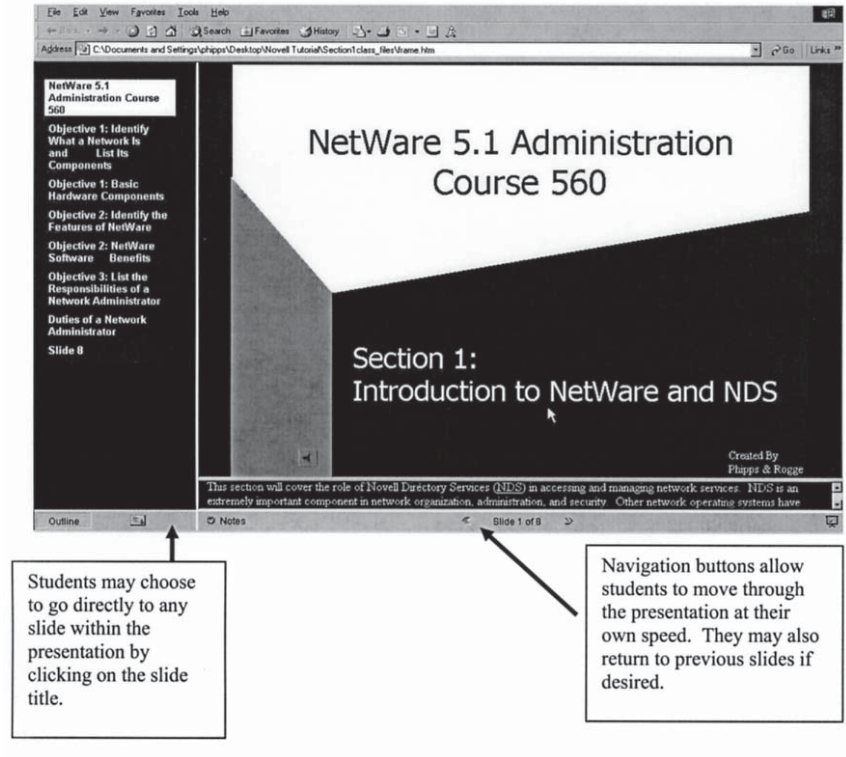

Figure 2: Two ways to navigate the tutorial

When designing the layout of our media, we wanted to keep our audience's physical abilities in mind. If a student is hearing impaired, the finest audio in the world will be of no benefit; therefore, we decided to assist the students by providing our script as notes that are displayed at the bottom of each slide. To expand the notes section for easier viewing, a student can use the mouse to drag the window to a larger size. If the students do not wish to have this information displayed, they can turn it off. The method for toggling the notes feature on or off, when using *Internet Explorer*, is to find the "Notes" button located at the bottom of the screen. A single mouse click on this button presents the options to display or hide the notes. **Figure 3** shows both the notes area and the "Notes" toggle button when the presentation is viewed through *Internet Explorer*.

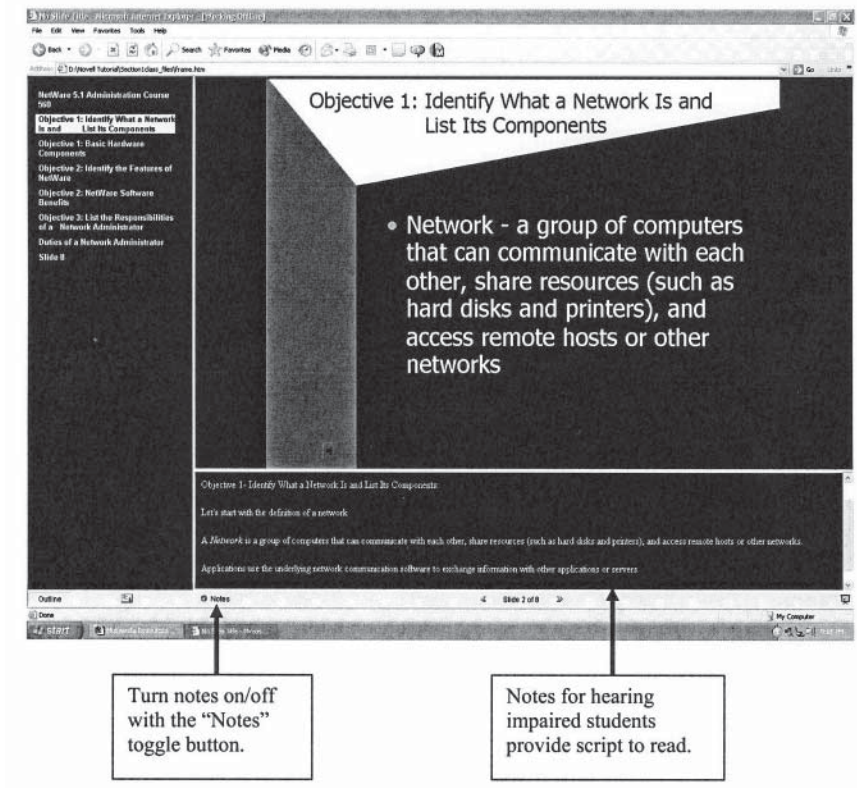

Figure 3: Controlling the Notes Display

Now What Do We Do With It

There are many possibilities for distributing our masterpiece. For students who have computers at home but who may have a slow or no Internet connection, we can burn the entire presentation to a CD–ROM and provide a copy to each student. One drawback to this method is that new CDs must be created every time the information changes. To run the tutorial from one of the computers in the college, we can post the files to our network. However, this limits when and where the student can access the material. In order to provide students with anytime, anywhere access to the tutorial, we plan to post it to a Web server and control access to it through our class management software, *WebCT*. By posting it to *WebCT*, we can be assured that only those students enrolled in the course can view the material, but they can do so from any computer with an Internet connection.

Did They Use It

Presently, we do not have student feedback to share regarding the viability of this project because it is still in the developmental stage. Students in two sections of the course received demonstrations of the tutorial to ask for their evaluation and suggestions. The test groups offered ideas on the flow and format of the tutorial as well as the content. We are assessing their ideas at this time. If they are feasible and pedagogically sound, they will be included in the final product.

Conclusion

With the prices of computer hardware and software continuing to drop, multimedia can find a place in the budgets of even the smallest educational institutions. Whether the institution has a resident expert available or not should not deter faculty from attempting to use this medium. The software we used provided informative help screens to assist with each step of the process. Coupled with the tutorials available on the Internet and the investment of some personal time learning the programs, anyone can learn to create multimedia materials.

It is becoming increasingly evident that we need to be aware of the

possibilities multimedia can provide to support the variety of student learning styles found in any given class. The use of multimedia offers a way to communicate more effectively with those students who are used to getting their information via technology while also helping the more traditional students become comfortable with technology in a supportive environment.

In the classroom, the use of multimedia gives educators another tool to add to their repertoire of instructional techniques. It can enrich the curriculum, provide variety to a class presentation, help address instructional needs of students, or it can offer ways for students to interact with course material outside of the classroom. However, multimedia does not replace the need for good objectives, solid content, and good course design. The integration of digital technology into a course must take a careful and thoughtful approach so it supports both the individual educator's philosophy of teaching and academic goals.

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Using Web Sites As A Basis For Writing Assignments: Enhancing The Traditional Course

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Abstract

While there is considerable growth in fully on–line university courses, there is an even greater expansion of Web–enhanced courses. This "mixed–mode" approach uses a blend of traditional instruction and Web site resources. One teaching method in this genre is providing Web–based writing assignments requiring students to access and study a number of Web sites. What is problematic for the instructor considering this format, however, is that there are unanticipated prerequisite steps in the selection of the Web assignments as well as the process of utilizing the materials on the Web sites to create effective writing assignments. I review various methods of selecting Web sites in the literature and illustrate how I have applied them to undergraduate sociology and regional studies courses. Moreover, I obtained student assessments to evaluate their reaction to the assignments. My findings show that student interest and learning are enhanced by extensive and structured, rather than loose and more extemporaneous, Web–based writing assignments. I have achieved even better results from assignments that are directly applicable to the text and/or lecture material. In addition, an emphasis on critical thinking skills is recommended when assigning Web sites containing propaganda and statistical information. For instructors looking to increase student interest and currency in a traditional class, adding Web–based writing assignments provides students with relevant assignments and a change of pace.

Introduction

By 2002, most college students have Internet access at home and half have Internet access from their residence halls (Wolfe 67). This use of the Internet in education was studied by Sorg who indicates that the annual number of university on–line and Web–enhanced courses is steadily increasing (139). An on–line course generally refers to a course taught predominately if not totally on the Internet, with little if any traditional classroom involvement. In most cases, specialized software such as *WebCT* or *Blackboard* is used to build the fully on–line course. In contrast, a Web–enhanced class uses the Internet in a more limited and specific fashion, for instance, posting syllabi, study guides, and on–line testing. So there are typically some regularly scheduled classes involving student and teacher interaction. Although on–line courses have been showcased by universities, Sorg found that, ironically, there were three times as many Web–enhanced course offerings compared to on–line courses at the University of Central Florida in 1998 (138). This phenomenal growth in Web–enhanced university courses suggests that instructors may prefer to use some face–to–face lecture and discussion with students. Another factor in the appeal of Web–enhanced courses is that they are less arduous to develop and less time–consuming to monitor than fully on–line courses. Many instructors transitioning to on–line course offerings use Web–enhanced courses initially, and for other instructors this type of course remains their preference. Boldt and Gustafson have studied a sample of economics instructors using the Web and found that as early as 1997 they had expanded their Internet use beyond posting syllabi, e–mail, and course information to assigning bulletin boards and out–of–class assignments (406). I have expanded on Boldt's use of out of class assignments and focus much more on developing students' writing skills. In particular, the use of Web–based writing assignments—where students access and use internet sites—serves as the source material for their writing assignment.

One of the advantages of using Web–based writing assignments is that they can take advantage of recently published, cutting edge, illustrations of course material. In sociology, for instance, several Web sites provide an expansion on the text and lecture treatment on racism through a more extensive critique and point by point refutations of

hate groups' arguments. In fact, this approach complements and could expand the scope of the course content considerably and provide students with a more in–depth treatment and illustrations of course topics. In this paper, I focus on building structured Web–based writing assignments that involve students' accessing a number of Web sites and then answering questions derived from the sites' content. In developing effective assignments, instructors need to consider steps in the selection of Web sites for assignments and steps in developing effective writing assignments based on the Internet sites.

Web Assignments: The Literature

There are two general approaches that can be used to develop Web–based assignments. The first type is the instructor–supplied approach that is based on materials that are developed by the instructor and which are placed on the Web, and the second approach is instructor–mediated in which educational and organizational Web sites are selected and assigned to students. These Web sites include publisher's books—specific Web sites supporting a textbook with student resources, practice test questions, chapter outlines, and perhaps textbook–based exercises.

In the first type of assignments, instructor–supplied material can include numerical data sets for student analysis, articles, lecture notes, slide presentations (using *PowerPoint*, *Astound*, etc.), maps, graphs, statistical tables, photographs, art, artifacts, video clips, critical thinking and problem–solving questions, bulletin boards for student questions or answers, and a list of relevant links (Sanders 252). These materials require that the instructor provide the Web site's URL address for students to access these materials. Access to this material could be from the instructor's home page (using *WebCT*, *Front Page*, etc.); in addition, most university libraries provide electronic reserve services for which password protected digitized readings and assignments can be accessed by the Internet. Instructor–supplied material eliminates the step of extensive reviewing and selecting preferred Web sites since they are not assigning many Web sites for students to access. In practice, however, as instructors become more familiar with technology, using instructor–supplied media may be combined with specific Web sites.

In the instructor–mediated type of assignments, Web sites are

screened beforehand to select the Web sites that are consistent with the instructor's course content and goals, which in many universities include the goal of critical thinking. For instance, in a political science course, May looked at interest groups and their importance in shaping public policy and assigned students to access various interest groups' Web sites to answer questions about each group's mission statements and the impact on the American political processes (44). As May demonstrated, by identifying a focused course–related problem—in this case a gap in student knowledge about the American political process—the instructor can select appropriate Web–based assignments:

> Often my students who ponder why our government does not "do more" assume that complex social problems can be solved overnight. What they apparently miss is that different politicians elected from different constituencies, have different solutions for various maladies. As a result, large doses of persuasion, deliberation, and debate are necessary if one's ideas are to be made public policy (45).

Thus the criteria instructors use in the screening and selection of Web sites is consistent with May's approach, the instructor identifies specific course–related problems and goals and selects appropriate Web sites that are developed into writing assignments.

The first consideration for offering assignments is to peruse relevant Web sites. There are many educational Web sites that have substantive academic information related to sociology, other social sciences, and humanities, for instance Web sites provided by National Geographic, the Discover Channel, Public Broadcasting System (PBS), and the Population Reference Bureau (PRB). In addition, there are many government Web sites that provide statistical information in text, graph, and data forms, for example, the Bureau of Labor Statistics, Office of Juvenile Justice and Delinquency Prevention, the Census Bureau and the Center for Disease Control. Interest–group Web sites may also be appropriate, such as labor unions (AFL–CIO), white supremacists, terrorists, animal–rights activists, and defectors of religious cults to name a few. There also are discipline–related Web sites that contain a wealth of information, for instance, *Yahoo–sociology*, the commercial *About.com*,

and sociology Web sites provided by publishers. Having selected appropriate Web sites, the instructor can use them singly or in combination and eventually place the developed writing–assignment questions on–line or distribute them in class.

Of course, the ultimate selection of a Web site involves extensive expenditures of time by the instructor to review and to evaluate Web sites and to select those that are relevant for the course. In addition to selecting particular Web sites that address a gap in student knowledge, as suggested by May, an additional guiding principle in selecting Web sites is that they should be expansions of the assigned readings and require more in–depth analysis and scholarship. Of course, in most Web–enhanced courses, using selected, publisher–provided text specific Web sites can be used in concert with instructor–mediated Web sites. This overlap in topics synthesizes the Web content more effectively with the course and enables students to be familiar with the topic in the Web assignment. I will now review the literature and considerations that guided the development of five Web–based writing assignments in sociology. The approach is intended to be applicable to other disciplines as well.

Publisher–Supported Web Sites

The majority of college textbook publishers provide text–specific Web sites to assist students. My first step is to review the text–specific Web site to identify potential assignments that students can do outside of class. For instance, after reviewing the site for Giddens' *Introduction to Sociology,* I have found that the practice quizzes and some essay questions have merit; thus, a review of the quality of both offerings has lead me to a selection of seven practice multiple–choice quizzes (including automatic grading) as well as two "canned" writing assignments. On the other hand, I have not used several of the chapter questions as prompts for writing assignments because the questions are poorly defined; so an instructor who is uncritical in using publisher–supplied Web sites runs the risk of being blamed by students for poorly conceived assignments. A very helpful aspect of many publisher–provided Web sites is the e–mail feature which permits students to send completed assignments directly to the instructor's e–mail account. So that students

clearly understand these assignments, I distribute a handout to students that includes the writing assignment URL address. In the Web site for *Introduction to Sociology*, the number of Web site resources was thin or inconsistent with the course goals. To find ways of expanding the number and variety of Web–based writing assignments, I turned to the literature on Web–enhanced instruction to consider additional types of Web–based resources that have been used in previous course developments.

Government And Private Data Web Sites

There is a plethora of government agencies that provide data for analysis and statistical summaries and reports which can be considered as raw material for Web–based writing assignments. The Center for Disease Control, National Institute for Mental Health, Census Bureau, and the Population Research Bureau are just a few of these agencies. Boldt and Gustafson have reported on their use of government reports in economics Internet assignments and, in particular, on the use of statistical reports of the Department of Justice's Antitrust Division (409). This Web site contains statistical data explaining the scope of prosecuted cases of consumer and corporate fraud, and this information was used by their students in a writing assignment on fraud. In line with this model, when statistical information may be helpful, government statistical databases can be used. For example, the Office of Juvenile Justice and Delinquency Prevention provides a Web site which includes a section entitled "Statistical Briefing Book" with an extensive series of questions and answers on the patterns of juvenile offending in 2002 and is applicable to sociology and criminal justice courses (*Office of Juvenile Justice and Delinquency Prevention*). This material expands and complements my course on juvenile delinquency as well as improving students' understanding of government uses of descriptive statistics. Prior to the assignment, it is helpful to prepare students for the assignment by giving them practice in the interpretation of graphs. In developing the assignment, I framed a set of at least ten questions that requires students to interpret trends and explain what the statistics and accompanying graphs indicate on patterns of juvenile delinquency. This assignment takes over an hour to complete and involves students in a more extensive interpretation of basic bar and line graphs that then

requires them to convert the graph information into a coherent qualitative answer. The information can be used to facilitate a discussion or as a lecture launcher; moreover, answers to the assignments can be applied as a study requirement for examinations. While government statistics is but one source of assignments, history and anthropology Web sites offer additional options for Web–based assignments in other social science courses.

Ethnographic Virtual Tour Web Sites

Web–based writing assignments can connect learning to real–life experiences of people, and I have sought to take students on a virtual tour following suggestions by Wookay (143). There are a number of Web sites that provide variations of the virtual tour which, in general, use photographs and narratives to describe an event or topic of historical or cultural interest. For instance, one educational Web site took the reader on a virtual tour of different destinations along the route of the silk road, China's ancient land trade route with Persia (*Silkroad Project*). In another Web site, photographs and text narrated the religious meanings of many stone sculptures of Buddhist deities (Ebrey). I ultimately selected a tour that is relevant to the textbook readings on third–world countries that are undergoing rapid modernization, namely the remote country of Nepal (Hafvenstein). My discovery of the trekking Web site was serendipitous and a pleasant surprise. However, I did not use it in my regional studies class for over a year after I had discovered it since it did not fit my goals until I added the region of Tibet in the course curriculum. Sometimes the usefulness or applicability of Web sites may not be immediately apparent, but an instructor who has bookmarked potentially useful sites always has the option of returning to them.

In the assignment connected to the trekking site, students follow an actual trek reported by a writer–trekker who accompanied a National Geographic expedition through five mountain villages at altitudes of about eight thousand feet. The Web site is divided into a dozen different trekking adventures, and the assignment questions focus on specific cultural and geographical aspects of each leg of the adventure. In addition to the Web–based writing assignments, I have integrated images and

maps in class as well as handouts, providing students with URL addresses of maps to facilitate independent learning of the geographical characteristics of Nepal: major cities, national parks, elevation, highway systems, neighboring countries, agricultural regions, national parks, key mountains, and key river systems. To add a touch of student involvement in my trekking assignment, I in my final question ask students to locate outfitters for several two–week treks in Nepal and to itemize the cost of the trip, including airfare and considerations for overseas travel. Overall, the Web site provides students with new insights into understanding the cultural systems in a third–world country. Beyond geographical and cultural Web sites, there are more controversial Web sites that communicate the views of groups with special political, social and cultural agendas.

Interest Group Web Sites

Interest group Web sites have been developed by organizations that have a particular mission or cause that they are advancing. Many interest groups advocate a worldview or ideology that is in disagreement with mainstream American values. For instance, longstanding white supremacist groups, such as the Ku–Klux–Klan, as well as more recent and more radical offshoots, have started to spread their ideology on professionally developed Web sites. I want to challenge students to develop critical thinking skills in identifying and critiquing assertions in propaganda. In our study of ethnic groups, Web sites are assigned that contain propaganda and inflammatory claims about minority group members. My goal is to involve students in the process of critically analyzing information and to discover on their own that some information on the Web is not substantiated and is as unreliable as urban legends.

This Web–based writing assignment uses several "contender" hate–group Web sites and also an "oppositional" Web site which condemns racism. Questions for the hate–group's "contender" Web sites ask for explanations on the group's ideologies on minorities, and some of the content involves considerable distortion of historical events (*The National Alliance, Tolerance.org*). In addition, I have followed May's suggestion to have students explain the Web site's mission or purpose as

part of the writing assignment (46). Students also review the commercial aspect of the Web site, including methods of advertising on the sites to teenage males who are the focus of the marketing. This exercise shows that these sites also engage in fund raising to continue spreading their views by generating income through sales of t–shirts and hate–inspired heavy–metal music. At this point in their analysis of racist Web sites, students are usually surprised not only by the inflammatory assertions toward people of color or religious groups but also by the extremist factual distortions of historical events and the savvy advertising methods and hate–products. With the students' curiosity piqued, they are given additional assignment questions that critically analyze the racist Web sites assertions from the information provided in the oppositional Web sites.

Students access a Web site of an organization advocating racial tolerance and write an essay based on the comparative analyses of the two vastly different Web sites; this exercise serves to enhance their understanding and use of critical thinking skills. The "oppositional" Web site includes a section that pointedly critiques "contender" Web sites, explaining falsified and inflammatory information that has no factual basis, as well as discussing how some prominent racists eventually learned to renounce racism. Assignment questions include how value systems serve as the basis for hate, for instance, anti–Semitic beliefs, particular extreme biblical interpretations, and detailing racist assertions and reviews of evidence that purportedly support such claims (*Tolerance.org*). Many students have reported that they were not previously aware of the depth and complexity of racial prejudice in the United States and that even in the face of evidence dispelling many racist claims, racism continues to be a social problem.

Controversy is not only found in propaganda but in labor union negotiations in American society. In fact, labor union conflict has flared up ironically in so–called communist China as her economy undergoes the process of privatization (and a mixed–market economy) and industrialization (Tyson and Tyson 43).

Globalization And Labor Union Web Sites

China's economy is moving to a mix of communist and capitalist economic systems; moreover, this transition is a major world event (Barrett 55). An event with equivalent significance has been the recent break–up of the Soviet Union and the formation of the Commonwealth of Independent States. Both of these events highlight the trend toward globalization as more and more countries move toward market economies. Tuathail has advanced the notion of using Web–based assignments to encourage students to use critical thinking on issues related to globalization, and one of his suggestions is to examine tensions generated by the shift to market economies (350). This tension also is noted by Tyson and Tyson, who have chronicled the arrest and imprisonment of Han Dongfang, a labor–union organizer within the democracy movement in China (207). The international spectacle of Han Dongfang's situation began when American labor unions condemned China for Han's incarceration for attempting to start a labor union (210). The tension generated by China's changing economy is shown by the "illegal" labor protests staged by marginalized and unemployed former state workers. I provide students with a handout of links to the Web sites of several labor unions as well as the Web site of Han Dongfang (Dongfang). Since this assignment involved labor conflicts, a brief in–class discussion is included to provide students with background information. I have developed a writing assignment that asks students to identify the chief concerns posted on the Hong Kong labor union Web site and the Web site of the American AFL–CIO labor union, for instance, "Log on to Han's Web site and peruse the items on his menu and links to each item; now identify and explain the key labor issues and abuses that he has identified, and compare them to the highlighted issues shown in the AFL–CIO Web site." Ultimately, students are asked to compare the mission and structures of labor unions in the United States and China (AFL–CIO). Students gain insight about the commonalities and disparate issues of concern of the two labor unions. This assignment also demonstrates the process of globalization in terms of how issues in market economies in one country affect other countries.

Student Responses To Web–Writing Assignments

There is a growing literature on student evaluations of Web–enhanced and on–line courses. Gillham (2000) used a Web site for posting class information and found that among a sample (n=38) of communication undergraduate majors the site had helped the students comprehend study material in the course. He has concluded that this type of site is a "static" Web–enhancement that is not as dynamic as one that integrates Web assignments into the course (332). With Web–based writing assignments, the instructor actively involves the students in the academic study of appropriate Web sites. Sanders surveyed undergraduate biology students taking a Web–based course and evaluated their reaction using her Web–based Instruction Attitude Scale (257). She reported that, overall, students indicated a favorable attitude toward using Web–based instruction in their classes. Furthermore, unlike previous research findings, hers has found no differences in age and attitudes toward Web–based instruction or in attitudes of nontraditional students compared to traditional students in attitudes toward Web–based instruction. We surmise that students of various ages are now reasonably familiar with the Internet and have been exposed to some Web–based instruction due to recent expansion in Internet use. Thus, in general, most students appear to have favorable attitudes toward Web–based instruction; however, the open question is what attitudes students had of the Web–based writing assignments provided in this article.

To evaluate attitudes on my Web–based writing assignments, I documented the written responses of students who wrote reactions to the Web–based writing assignments at the end of the course. These responses were not solicited in a fixed choice question, the comments section of the instructor evaluation is an open–ended question requesting any comments the student wished to share. The results show that, in general, about twenty–five percent of students volunteered written comments about the Web–based writing assignments in the course (with a total of 80 students surveyed). In most cases, the comments were favorable, and, in fact, students pointedly complimented the Web–based assignments in the course:

- "The assignments were fun because you could do them anytime and I knew it would be different than the book."
- "The Internet site helped me to understand the book."
- "It took a long time to do, but I was surprised to learn about racist groups out there."
- "The assignment on trekking was very interesting; I didn't understand why people would do this."

In contrast some student comments were more negative in tone:

- "The trekking assignment involved just looking up Web site answers to your questions."
- "The writing assignment was not specific in what I was asked to explain."
- "The Web site on white–collar crime only gave some short definitions and statistics."

In general the bulk of the responses were favorable, and the negative responses reveal that Web–based writing assignments require attention to depth and clarity to improve students' writing skills. The favorable responses identified several benefits of using Web–based writing assignments. First, they provide relevance to the course in showing that current events are applicable to course material. This enables students to use different examples and applications from the Internet and link them with text information. A second benefit of assignments is to improve several skills, namely students' writing skills as well as Internet skills in accessing and searching for information. Closely related is developing students' critical thinking skills through analysis of Web site information and to seek evidence prior to accepting information as valid and accurate. Finally, the Web sites can serve a debunking function in which students develop the skills of informed skepticism, to recognize that commonly held notions or stereotypes may be untrue and not substantiated by evidence.

The negative responses assist the instructor in improving the assignments so students have a more favorable learning experience. One concern was assignments that were loosely tied to textbook information; students felt that when the assignment was directly–applicable to text

information they had a more solid basis from which to write the assignment. A second concern was web-based assignments requiring students to read portions of a website to locate the answers to questions and "mechanically" transcribe their answers. Students reported that this is a facile learning experience when the writing requirement does not involve the interpretation and synthesis of web-site information.

When the Web site required extensive background reading, students developed more in–depth knowledge of the subject from which to write their paper. In fact, Web sites that were simply descriptive are thin in substance and used singly are inadequate for an in–depth learning experience. A third concern was that Web–writing assignments that were too brief and general in writing assignment directions did not provide students with sufficient direction in what are the significant points in the Web site. In this case writing assignments should link to related information in the text as a background leading to the Web–based assignment. Thus, more background and structure in identifying the expectations in the paper steer the student more adequately than a brief, open–ended assignment.

In general, I believe that the Web–based writing assignments have enhanced student enjoyment of my sociology and regional studies courses. In dealing with Web sites containing propaganda, I feel it is important for students to have a balance in the assignment by consideration of different group's views. By using critical thinking skills, students determine on their own that the views of racist groups show flaws in their assertions and reasoning. Moreover, students then form a sense that the assignment is not doctrinaire. Up to this point, the use of writing assignments serve primarily as supplements to undergraduate courses since Web sites are generally thin in depth in comparison to articles; thus, their strength is their currency and descriptiveness in issues, statistics, and media. However, their weakness is that the writing assignments are not a substitute for a research paper which requires syntheses of primary and secondary sources.

Summary Of Conclusions

Instructors may consider using writing assignments based on assigned Web sites that they predetermine have relevance and expand on the course content. We have shown that there are many Web site options open for instructors considering Web writing assignment, with the guiding principles being: 1) selecting Web sites based on filling a gap in knowledge; 2) selecting Web sites that are expansions and in–depth analysis that correlate closely with course material. Course evaluations have shown that students prefer structured writing assignments that are quite specific to the content in the Web sites in contrast to generally worded questions. With the Internet containing considerable undocumented material, use of critical thinking skills enables students to address assertions with skepticism. One limitation of writing assignments is that Internet Web sites, by their nature, tend to be more specific to a particular topical area in comparison to the depth of the traditional research paper. More importantly, when I recently reviewed the quality of the writing assignments that my students have produced over the last three quarters, I discovered that as my instructions and preparation of my students for these assignments have become more detailed, the work that my students have produced has also become more detailed, substantive, and even original.

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Introducing Computer Programming Concepts Using Familiar Everyday Tasks

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I. Background and Motivation

Computer programming students are typically barraged with a plethora of new and potentially confusing terminology and concepts as they begin their introductory programming courses. Such terms and concepts as requirements specifications, abstraction, mapping inputs to outputs, algorithms, dependencies, iteration, counters, and accumulators can be overwhelming to beginning programming students.

Once students find themselves overwhelmed with this new terminology, they frequently lose interest as well as focus and find themselves falling further and further behind. As their confusion continues, students frequently become so overwhelmed that the eventual result is course failure or withdrawal.

II. Solution Strategy

Thorough comprehension of the discipline's terminology and concepts is essential to eventually understanding computer programming and learning problem solving skills. Introducing such terms and concepts by relating them to commonly understood tasks helps ease the students into the mindset for problem solving and effective computer programming.

The strategy undertaken was to identify a common, familiar task that most (if not all) students would inherently understand. Once this task is identified, and the steps for completion of the task outlined, relationships can be established between the common task and programming to explain the terminology and concepts.

III. Introductory Programming Terminology

The following terms are typical of the terminology and concepts which introductory students have difficulty understanding. While some of these terms may be familiar to students, the different context used in computer programming typically causes students to be unsure as to their meaning.

The following terms are present in the task we will examine:

- algorithm—an unambiguous, finite set of steps for solving a problem
- input requirements—objects mandatory for achieving the desired solution (also called an input set)
- mapping inputs to outputs—mapping a finite set of required inputs (X) via a solution strategy (program P) to a finite set of desired outputs (Y)

$$\text{Inputs } X \boxtimes \text{Program } P \boxtimes \text{Outputs } Y$$
$$P(X)=Y$$

- abstraction—hiding the internal details of an object from the user
- dependencies—the reliance of one task on the successful completion of a prior task
- requirements modification—changing the stated requirements for a given task
- iteration—performing a series of steps more than one time (also called a loop)
- counter—a variable used to count a number of items (usually incremented by +/- 1)

IV. Relating A Simple Task To Computer Programming Concepts

With the goal of finding a common, familiar task which most, if not all, students would understand, I have selected the following task: Making a Peanut Butter and Jelly Sandwich (PB and J).

This task was selected due to its understandability, inherent

simplicity, and the fact that it would easily demonstrate the relationship of solving this task to understanding computer programming concepts.

A. Input Requirements

When asking students what is required to create a PB and J sandwich, one may expect the following items as typically offered requirements that make up the input set:

- peanut butter
- jelly
- bread
- knife

While it should be easy to understand that the first 3 inputs are certainly required, the knife is not actually a "requirement." It might make the sandwich building task easier, but even without it a sandwich can still be constructed. Each input to a given problem has an associated cost. While costs are not relevant in this example, in real–world scenarios, only those inputs that are truly required are considered to minimize cost (note that cost can be dollar cost, CPU processing cost, memory cost, etc).

B. Output Requirements

Students can easily understand that the required output resulting from this problem solution is the creation of a PB and J sandwich. Also note that our output requirements may (or may not) detail exactly how many pieces of bread per sandwich, what type of bread to use, what flavor of jelly, etc.

C. Abstraction

When students are asked what inputs are required to make a PB and J sandwich, they typically reply with the correct answer. When students are then asked if they need to know what ingredients make up the peanut butter or the jelly to successfully create a sandwich, they reply "of course not."

This process demonstrates for the student the concept of **abstraction**, that is hiding the internal details of an object from the user. Thus, a

student does not need to know what ingredients comprise the peanut butter or the jelly to use these in making a sandwich.

D. Mapping Inputs to Outputs

The key to communicating computer program concepts to students is the idea of mapping inputs to outputs, that is, taking a finite set of inputs and mapping these via a computer program to a desired set of outputs. We can offer this concept in a more technical format with the expression: given a finite set of inputs (X), and using program (P), we will map X to the set of desired outputs (Y).

$$\text{Inputs } X \boxtimes \text{Program } P \boxtimes \text{Outputs } Y$$
$$P(X)=Y$$

To make this expression understandable to introductory programming students, we must stress the importance of the language used to describe the input set, the desired output set, and most importantly the steps in program P.

To more easily describe the steps necessary in program P, we will introduce to students the concept of an **algorithm**: an unambiguous, finite set of steps for solving a problem. In this case, it is solving the problem of how to make a PB and J sandwich.

V. The PB And J Algorithm

To introduce the concept of algorithms and problem solving, we begin by presenting to the programming students the following sequence of steps (or algorithm) for making a PB and J sandwich:

Algorithm #1:
1. Open peanut butter
2. Open jelly
3. Get 2 pieces of bread
4. Apply peanut butter to bread
5. Apply jelly to bread
6. Assemble sandwich

We present these steps to the students and verify that these steps will indeed allow us to create a valid PB and J sandwich. (Note that these steps are informal and somewhat ambiguous with respect to the formal definition of an algorithm.) The students are then asked if this is the only set of steps (or ordering of steps) that will allow us to build a sandwich.

The following set of similar but different steps is then presented. Note that this series too will allow us to create a PB and J sandwich.

Algorithm #2:
1. Get 2 pieces of bread
2. Open jelly
3. Open peanut butter
4. Apply jelly to bread
5. Apply peanut butter to bread
6. Assemble sandwich

We can present yet another set of similar but different steps. Will these steps work?

Algorithm #3:
1. Get 2 pieces of bread
2. Open jelly
3. Apply peanut butter to bread
4. Apply jelly to bread
5. Open peanut butter
6. Assemble sandwich

The obvious answer here is "no;" this set of steps will not work. This example provides us with the demonstration to our introductory students that order is sometimes (but not always) important. Formally, this is the concept of **dependence** (or dependencies); i.e., some steps are required to be completed before other steps can be successfully completed. In algorithms 1 and 2, steps 1, 2, and 3 are independent of each other, but steps 4, 5, and 6 are dependent upon some previous steps (e.g., a jar must be open before its contents can be applied). Thus, a step that applies peanut butter, for example, is

dependent upon the step that opens the PB jar.

VI. Requirements Modification

Given that we can now describe how to make a PB and J sandwich, what if our consumer wants a peanut butter, jelly, and banana sandwich, or wants five PB and J sandwiches? Do we toss out our algorithm and start anew?

The point we present to students here is that often (but not always) we can take an existing problem solution, modify it somewhat, and solve a new, but related problem.

In the case of a peanut butter, jelly, and banana sandwich, all that needs to be done is add an additional step (or maybe two if you wish to slice the banana) as follows:

1. Open peanut butter
2. Open jelly
3. Get 2 pieces of bread
4. Apply peanut butter to bread
5. Apply jelly to bread
6. Insert banana ← new step
7. Assemble sandwich

What about the scenario where we want to make five (or 50) PB and J sandwiches? In this scenario, we introduce the concept that we can simply repeat some solution steps until we solve our new problem. This concept is formally referred to as **iteration**. But which steps to repeat? Do we repeat all of them?

Students should quickly see that not all steps need to be repeated since we only need to open the peanut butter and the jelly once. Thus, our solution now is:

1. Open peanut butter
2. Open jelly
3. Get 2 pieces of bread
4. Apply peanut butter to bread
5. Apply jelly to bread

6. Assemble sandwich
7. Repeat steps 3–6

The next issue to examine in modifying our requirements for more than one PB and J sandwich is when we should stop our repetition. How do we know when we have 5 sandwiches?

This issue introduces another new programming concept referred to as a **counter**. A counter is a variable that is used to count the number of things, e.g., sandwiches. Thus, we make a sandwich, increment our counter variable, and make another; stopping when we have reached the desired number of sandwiches. Starting the counter variable with an initial value of zero and incrementing this counter variable for this example would look like this:

```
num_sandwiches = num_sandwiches + 1
```

VII. Student Comments

When receiving feedback from student evaluations regarding this example, I have encountered the following responses:

- "At first I thought this was lame, but it really helped me understand this stuff."
- "As I continued through the course, I kept thinking about the sandwich example . . . it helped me remember the earlier definitions."
- "I really liked the Peanut Butter sandwich problem; it was pretty easy to understand, and it helped me understand how to use algorithms."

VIII. Conclusions

After presenting this example in introductory programming courses for the past two academic years, I note that most students successfully related this simple task to the new programming terminology and appeared less overwhelmed (and complained less). Students' classroom interaction (paying attention, asking questions, etc.) was also much better when compared to merely introducing tedious definitions. Perhaps most importantly, students seem able to apply the problem solving skill learned in this exercise to other problem scenarios.

Biography

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The Factors Involved In High Student Self–Assessment

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Abstract

In a recent study of the use of technology to enhance student learning, we discovered an interesting phenomenon. Students who took a pre–course self–assessment survey rated themselves higher than the faculty evaluation of their actual knowledge as displayed in Organic Chemistry Laboratory. Also, on their self–report of computer skill, we found that the male students rated themselves as more skilled than the female students did. As a result, we tabulated their self–assessment scores using several variables to discover what might influence students' inaccurate self–perceptions. After a review of literature in this area, we determined that there may be many factors involved: gender, self–esteem, culture, and prior experience. Other studies have also shown a correlation to gender in regard to self–assessment, as well as a need to maintain a good self–image. In our paper, we will share the results of our findings, a discussion of the findings in related literature, and our perspective on how both should influence faculty feedback.

Introduction

Student self–assessment plays a major role in the assessment of teaching and learning because it is inexpensive, easy to conduct, and elicits fast feedback. However, according to a review article by Taylor and Brown, many studies have noted that the majority of people's self perception and evaluation tend to be high and thus unrealistic in comparison to hypothetical peers or the general public (e.g., Alicke, 1985; Alloy andAhrens, 1987; Brinthaupt, Moreland, and Levine, 1991; Brown, 1986; Pyzczynski, Holt, and Greenberg, Agostinelli, Sherman, Presson,

and Chassin, 1992). They are also more apt to remember positive rather than negative qualities in regard to themselves (Buunk and Van Yperen, 1991; Larwood and Whitaker, 1977; Pelham and Swann, 1989; Svenson, 1981; Weinstein, 1980).

We found this to be the case in an Autumn 2002 Organic Chemistry Laboratory. In order to determine whether a new Web site to enhance learning would be useful, the instructor asked the students to self–assess their knowledge of chemistry laboratory methods at the beginning and the end of the laboratory course. In addition, the instructor kept records of the students' ability to identify and use the equipment efficiently without help.

An interesting finding was that students' self–reports did not show major change in knowledge from before and after completing the laboratory, whether they used the Website or not, because their self–perception of knowledge was overestimated. As we analyzed the results, we began to ask what factors might be involved in overestimating. We surmised that there may be many factors involved: gender, age, self–esteem, culture, and prior experience. Since had specific data on gender and age, we decided to look at these factors.

Other studies have found that self–assessment does not consistently correlate with other methods of evaluation (Forsterling 2002; Lind et al., 2002; Parikh et al., 2001). In the area of education, many studies have found that ratings of students, colleagues, and administrators were often lower than teacher self–perception (Carroll, 1981; Centra 1972, 1973); however, specific behaviors were accurately described in self–reports (Hook and Rosenshine,1979; Newfield 1980). If studetns were asked how well they performed a task, they would rate themselves high, yet if asked a more specific question about how many times specific tasks were performed or certain instruments were used, they would be more accurate in their response.

Overrating of self is usually correlated to high self–esteem. However, Colvin and Block (1994) call more attention to the need to measure self–evaluation against external criteria rather than generalized or hypothetical others. Colvin et al. (1995) conducted three studies that focused on "self–enhancement," or the tendency to rate oneself higher than actual performance. In all three studies, the subjects were between the ages of 18 and 24. The results indicate that persons who were self–

enhanced in regard to affective characteristics and personality would be more likely to have poor social interaction.

With these perspectives on self–enhancement, or overestimation, in mind, we began to scrutinize our data. We wanted to determine how age and gender might fit into the equation and whether we could draw conclusions based on differences and similarities.

Results And Discussion

In Autumn Quarter 2003, 13 students (6 male and 7 female, age 19 – 40 years) enrolled in two sections of Organic Chemistry Lab I course agreed to participate in our assessment study. Organic Chemistry Lab I at the University of Cincinnati—Clermont is a first semester laboratory course where second year science students are introduced to the laboratory techniques of organic chemistry for the first time. On the first day of class, a pre–course survey was conducted to give students the opportunity to self–assess their 1) computer skills, 2) pre–course laboratory knowledge, and 3) ability to perform specific laboratory set–ups and tasks. Following the self–assessment, the faculty evaluated the actual students' ability to perform the same specific laboratory set–ups and tasks. The assistance needed by the students to successfully perform the actual laboratory set–ups and tasks was a significant factor in faculty evaluation.

1) Computer–Related Skills

With regards to students' self–assessment of computer skills, we found that there was a difference between the group of young (younger than 30 years old) males and the group of young females. The survey results show that most of the young males had a fair amount of computer knowledge or were very experienced with computer. However, most of the young females said that they had some computer skills or a fair amount of computer skills. There was no difference in self–assessment of computer skills between two other groups: older than 30 years old males and older than 30 years old females. Older students said that they had some computer skills.

When we compared our results with other studies, we found similar

findings. Older adults tend to express less favorable attitudes towards computers, even anxiety, although they see them as useful tools. However, this may be a result of lack of experience rather than age (Baack and Brown, 1991; Turnipseed and Burns 1991).

In addition, Dickhauser et al. noted that "most of the reported gender differences in computer–related behavior include the variable choice or use" (487). Their review includes several studies from 1985 to 1996 that show that access to computers is greater for males than females. In their study of two hundred 19–36 year old males and females, by questionnaire, they found that positive attributions of past computer experiences, whether positive or negative, led to high self–concept of ability which in turn led to more computer use. Females scored lower on self–concept of computer–related ability. However,"...males and females do not seem to differ in the structure of factors underlying choice and use" (487). Since computers were focused on as a tool, which is what Hal and Cooper (1991) found to be the predominant perception of females, rather than as an area of expertise in the questionnaire, this may be why gender was not a differentiating factor.

Thus, age seemed to be a more significant factor than gender in regards to self–assessment of computer skills in our study as well as in others. However, in the case of self–assessment of pre–course knowledge, both age and gender were important factors.

2) Pre–Course Laboratory Knowledge

In the pre–course survey, students who were taking Organic Chemistry Lab for the first time assessed their organic laboratory knowledge. On a scale of one to nine, the average estimates of laboratory knowledge were 5, 4.8, and 2 for young males and old males, young females, and old females, respectively. Thus, the older female had the lowest self–assessment of laboratory knowledge.

This confirmed the findings of Lind et al. that "Women may underreport their capabilities when compared with men as a result of gender differences in socialization. These gender differences in self–assessment may be important to recognize when faculty provide feedback to students" (31). When gender is combined with age as a factor, the inexperience that Baack, Brown, Turnipseed, and Burns note may

contribute to feelings of anxiety. The older female in our study exhibited anxiety and a need for positive feedback and reassurance that she could succeed.

3) Students' Ability To Perform Specific Laboratory Set–Ups And Tasks

In addition to comparing students' self–assessment to each other, we also compared it with actual observation of their ability to perform tasks. Surprisingly, we found a significant difference between the faculty evaluation and self–assessment of young (less than 30 years old) male students (**Figure 1**). In the pre–lab survey, forty percent of young male

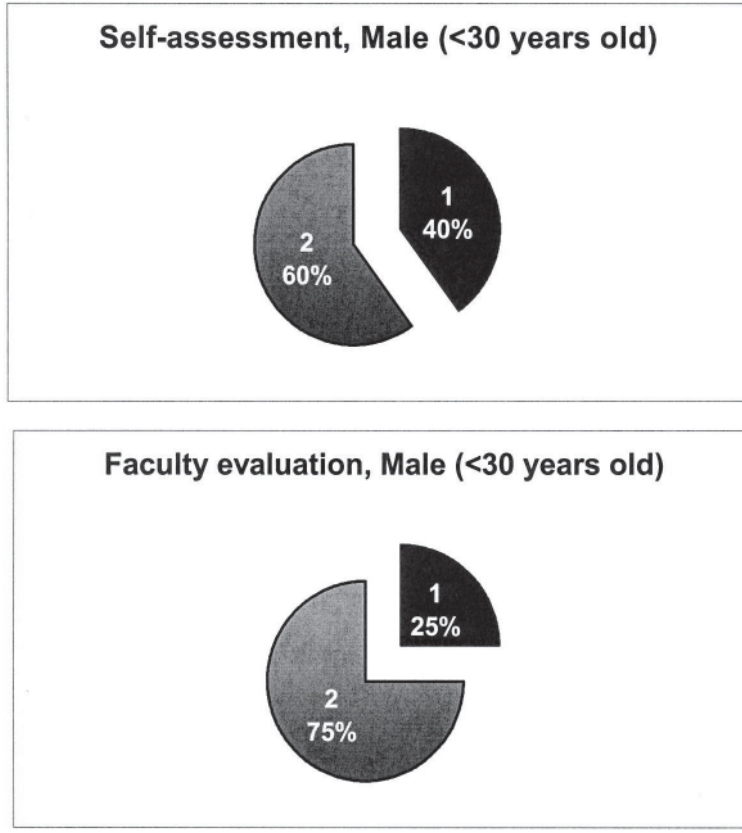

Figure 1

students said that they were able to set–up the sand bath as the heat source, suction filtration, pack the capillary with solid sample, and determine mixed–melting point. However, only twenty–five percent of all young males were able to perform these specific set–ups and tasks successfully without faculty help. Another interesting discovery was that there was no difference between faculty evaluation and the older male students' self–assessment (data not shown because of low number of participants). Older (more than 30 years old) male students' self–assessment was low, and they actually were not successful at completing specific tasks or setup in the lab.

In contrast to young males, both groups of females (older and younger) had lower self–assessment of lab abilities than faculty evaluation of their actual lab performance. In the pre–lab survey, twenty percent of young female students said that they were able to do the specific set up and tasks, but, surprisingly, forty five percent of them were able to do that lab work successfully without any faculty help (**Figure 2**). In the

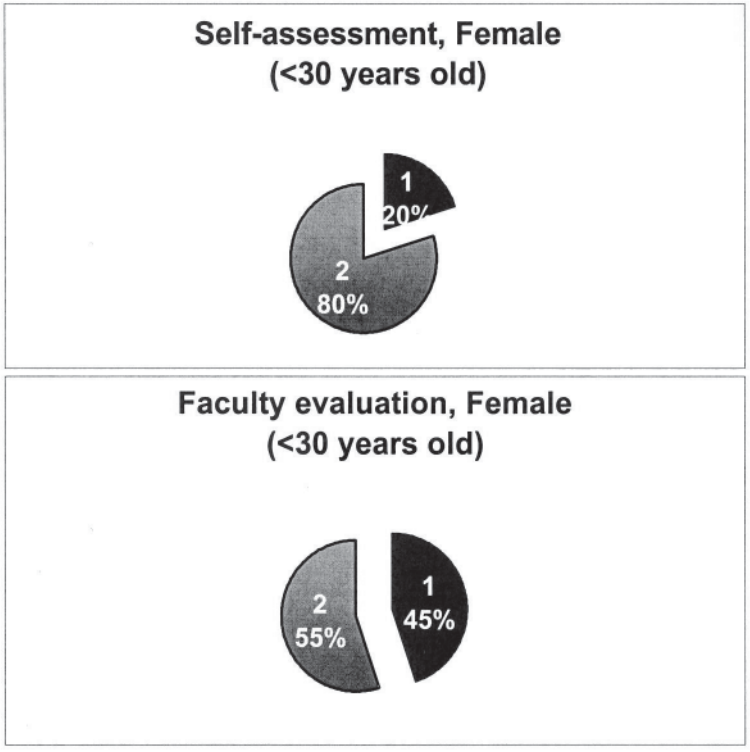

Figure 2

older female group, thirty–eight percent of students said that they were able to do the specific set ups and tasks and sixty–two percent of them completed the lab work successfully without faculty help (**Figure 3**). There may be many reasons why gender might influence certain

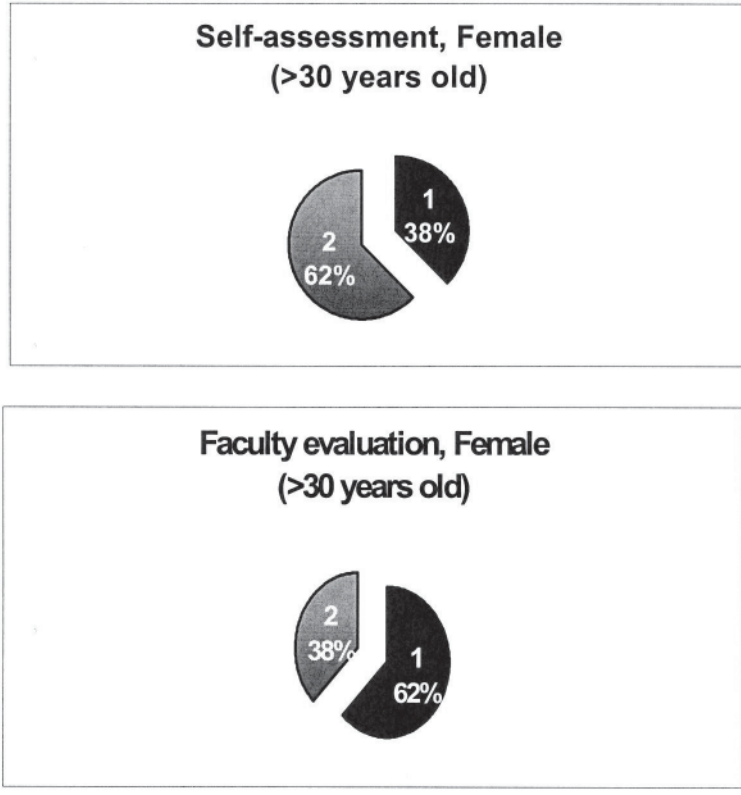

Figure 3

students to rate their knowledge higher or lower than their actual performance indicates.

In a study of student self–evaluation in surgery rotation, Lind et al. note that women, although they statistically do better than men, underrated their work in comparison to teacher evaluation, both summative and formative. Men, on the other hand, tended to rate themselves higher than teachers did. They also found that grade point averages prior to the learning experience did not influence student self–

evaluation. The researchers speculate that this could be "a result of gender differences in socialization" (Lind et al., 31).

Conclusions

If our classroom assessment includes using self–assessment as a major method for improving teaching and learning, we need to understand factors effecting self–evaluations. Students' confidence, past experience, and belief about their ability to perform specific tasks play an important role in self–assessment outcomes. In most cases, self–assessment can be more positive than other evaluations measuring actual knowledge or ability.

In our study, we found that differences in accuracy of self–assessment related to gender and age. Considering these two factors within our data, we found five central outcomes, as follows: first, older students exhibit lower self–perception compared to younger students; second, males exhibit higher self–perception than females; third, older females exhibit very low self–perception compared to all students; fourth, younger males exhibit higher self–perception than faculty evaluation; fifth, females exhibit lower self–perception than faculty evaluation.

Future research might give further attention to these factors to confirm whether our results can be generalized to other areas. Also, our review of the literature indicates that attention should be given to how questions are formulated. Instead of asking how well the students believe they can perform something, asking how often or whether they perform specific tasks may elicit more accurate information. In the same manner, questions about computer usage should ask for a record of what programs are used rather than asking students to estimate levels of expertise.

When instructors are using self–assessment to improve teaching and learning, we need to be more aware of the factors involved in overestimation and underestimation of skills and knowledge. Overestimation is not necessarily a sign of a healthy self–esteem (Colvin). In fact, it may interfere with learning. Wolski and Jackson found that students often have beliefs about themselves that interfere with their learning: one such belief is that they have more expertise because of past experience than they actually have. In addition, Forsterling and Morgenstern (2002) note that although unrealistic self–evaluation affects

motivation and lower results, more realistic self–evaluation leads to better performance.

Our findings indicate that there is a need to develop better self–assessment skills in students. Parikh et al. (2001) noted that students are usually not taught self–assessment skills. However, they state, and we agree, that "self–assessment skills are crucial for the development of lifelong learning habits" (635).

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Conference Presentations

Six Generations Of Students In Regional Campus Classrooms

E. Ted Bunn
Wright State University—Lake

Fifty–three years and two months ago, I walked into a classroom at the University of Pittsburgh—Johnstown to begin my first day as a college teacher. Since 1950, I've spent nearly thirty years, off and on, in regional campus classrooms, the last sixteen of those years at Wright State University—Lake Campus.

1890 to 1980

People born in every decade from the 1890s to the 1980s have been among my students. They have been an interesting group. There was a delightful woman born in Poland in 1891. Her sons were doctors, and she decided to get more education to keep up. There were registered nurses who came to class right from the hospital, still dressed in their starched white uniforms. In 1950, most Pennsylvania elementary school teachers had two–year degrees from the state teachers' colleges. The state Department of Education was requiring those women to obtain a bachelor degree. Imagine teaching for twenty–five years and being forced to return to college or risk destroying a career. How about that as a source of stress? And I've graded papers for veterans of every U.S. war from World War II to Desert Storm.

I believe my experience provides a unique retrospect of the regional campus concept. Where did it come from? How long has it been around? What has it accomplished? How has it changed? Let's go back to the beginning using information provided by the University of Pittsburgh.

The Beginnings At Pittsburgh

In 1924, the University of Pittsburgh had a new chancellor, Dr. John G. Bowman. Bowman came to Pitt from the University of Iowa in Iowa City with its clear skies and open prairie surroundings.

Pittsburgh was the center of the steel industry. Day and night the mills and coke ovens belched thick, dark haze into the sky. The atmosphere was so dense that the street lights were on at 10:00 in the morning. Bowman certainly knew he wasn't in Iowa anymore. Pittsburgh's young men left public school to work in the mills and mines. Women who needed to work could clerk in stores or take menial jobs in offices, while the lucky ones might become nurses or teachers. Bowman believed his university should provide options to the young people's life choices. His first innovation was Pitt's "Late Afternoon, Evening and Saturday Division" to give people with full–time jobs access to post–secondary education. His second idea was radical: If students couldn't come to the university, the university would go to them.

Pitt would establish an off–campus operation in a middle–sized city that would offer a full freshman and sophomore program. Bowman's plan was deceptively simple: find a public school district with unused classroom space and located on one of the railroads providing passenger service to Pittsburgh.

Johnstown, sixty miles east of Pittsburgh, had a new high school building with available space. The city was located on the main line of the Pennsylvania Railroad, with six trains a day both ways. Bowman planned a small resident faculty for Johnstown, with selected Pittsburgh faculty commuting to Johnstown by train. Students would live at home, dramatically reducing college costs. Bowman's Late Afternoon, Evening and Saturday program would be extended to Johnstown for employed people.

The agreement between Pitt and the Johnstown school board created the first satellite campus (regional campus if you prefer) in the United States. Informally named Junior Pitt by the locals, the new institution offered its first classes in the fall of 1927, with this mission statement: "A chance for a good and useful life." Tuition was $10.00 a credit or about $80.00 to $90.00 after adjusting for inflation since 1927. The first freshmen to register numbered 166, most of them the first ones of their families to attend college. There were three men for every woman in the class, a ratio that would remain much the same for decades.

For this gathering of regional campus faculty, this brief biography of our institutions' great grandfather should be of interest. Pennsylvania State College's first satellite campus didn't appear until 1946, almost

twenty years after Pitt Johnstown. But Penn State's effort was not the result of a vision or plan. It was an urgent improvisation to meet an emergency, the only way the college could handle the flood of applicants waving G.I. Bill benefits. In 1945, Penn State's enrollment was about 5,000. State College, Pennsylvania, was a town of 12,000 or so. There was no way Penn State could provide classroom space or housing for several thousand additional students until a crash–building program took place. The answer emerged: find space in school districts around the state and farm out the freshmen.

As an undergraduate, I did my freshman, sophomore, and junior years at Pitt—Johnstown, not transferring to the Pittsburgh campus until my senior year. When I graduated in February 1950, Johnstown needed an English instructor for late afternoon, evening, and Saturday classes. Chairs of English departments in Pittsburgh and Johnstown agreed that I would do, and I was offered an appointment to teach freshman English and a course for students who hadn't done well in the placement tests. I enjoyed the work and made friends with several of my colleagues. Most of my students were serious nontraditionals with a sprinkling of eighteen–year old "true freshmen." At the end of the first semester of the 1954–55 academic year, I left Pitt for the advertising and marketing world and moved with my family to Lima.

Development Of Ohio's Regional Campuses

When Governor James Rhodes announced his program to put every Ohio resident within forty miles of a state university campus, he caught my attention. During the discussions about and the planning for the Ohio State–Lima campus, I read every news story carefully. I'm ashamed to admit it, but I even considered calling the committee and offering help as someone who knew a good deal about such a campus. In hindsight, it's probably a good thing my wife talked me out of it.

However, it was Ohio State which put me back in the classroom. My daughter–in–law was director of continuing education at OSU–Lima. She asked me to teach a series of one–month programs in advertising and other marketing–related subjects. The programs must have been well accepted because Gloria said her peers at Mansfield, Newark, and Marion wanted me to do similar programs at their

campuses. I made the circle of the OSU campuses for three or four years. That led to an appointment to teach advertising at Lima Technical College. In 1987, the Lake Campus needed someone to teach marketing, and I've been there ever since. I'm retiring July 1, which is why I have been thinking about my years in classrooms and the students who passed through them.

Evolution: Facilities And Students

What has changed during the last fifty-three years? What has remained the same? From the information I've uncovered, most of Ohio's regional classrooms had beginnings much like that at the University of Pittsburgh at Johnstown. Some of them even were launched in borrowed public school classrooms. At first, the course offerings covered the basic freshman and sophomore subjects. As the regional centers matured, additional programs were added, until now they are conferring some bachelor degrees and graduate programs. Facilities have grown from single buildings into substantial campuses. Technology is everywhere. In the early 1950s, high–tech consisted on a 16–millimeter motion–picture projector and a 3M overhead projector. Now there are more computers in a single classroom than were owned by a major university. TV monitors and VCRs equip almost every room. Projectors are linked to computers so instructors can use *PowerPoint* presentations. One thing that hasn't changed in many cases are those uncomfortable, impractical desk–chairs. An article in a recent issue of the *Chronicle* deals with that subject.

What about the students? The comments that follow are based on personal observation, not research. They are still mostly day–trippers, coming to class from home or work, just as they were in 1927. They dress differently now. In the 1950s, 70s and 80s, I never found myself staring at a bejeweled female navel in the front row. Nor did I teach a male athlete with a diamond stud in his ear lobe. Students all seem to own cars or at least have ready access to one. Among my four best friends when I was an undergraduate, only my roommate owned a car. He bought a 1948 Ford with $2,500 he won shooting crap on the troop ship coming back from Europe in early 1946. Radio, the pay telephones on campus, and daily newspapers were our connections to

the world. Even at Ohio State—Lima in 1979 that was largely true, although television had mostly replaced radio. Another big change since 1950 is the ratio of women to male students; nationally the ratio is now three women to every two males. My economic students are asked to complete an audit of their time and money resources and write a paper comparing their findings to basic economic principles. When I read papers by women with children, husbands and jobs, I can hardly imagine how they manage. The dedication to their courses is astounding. Incidentally, most of us have probably caused real stresses in the marriages of the women. Now we often have 16–, 17–, and 18–year old students as high school juniors and seniors taking advantage of Ohio's program to begin college–level work before they graduate. With on–line offerings, some students never enter a classroom for a course.

In a survey I've been taking, within thirty seconds after leaving the room, most of the students whip out their cell phones and make a call. Who are they calling? And why? What has changed since the hour before when last they called? Of course, from time to time a student will forget to turn off the telephone; then half way through the class the phone rings. During last quarter, a young woman's phone rang. Muttering "I'm sorry," she left the room. When she returned, she said she'd told him to call back later. Within five minutes, her phone rang again. She left. As she came back, she told me, "He wanted to know how much later."

Basic Knowledge

While I'm not one of the gloomy critics of the public schools, there does seem to be a lower level of basic general knowledge than students possessed in the past. Many have weak language skills. There's over–dependence on the computer's spell checker instead of proofreading. They use *loose* when they mean lose; they don't seem to know the difference between *they're*, *their*, and *there*. If the spell checker doesn't underline a word, it's the right word, even if they wrote *weather* when they meant whether. Also, I'm afraid students don't read anything if they don't have to, which leads to scanty knowledge of current events and the world they live in. That is a big change from the 1950s, 70s, and 80s.

Math problems also exist. A student who can do algebra or even calculus may not be very good at basic arithmetic like calculating percentages. While everyone who enrolls may not have the best preparation or be really suited to college work, we have issued an open invitation to come spend time with us, and we will help you gain skills that will serve you well. For many who accept the invitation, results are exciting.

Students' Comments

Here are a few comments from regional campus students who did find the results exciting:

> Ed Kane, UPJ and former editor of a Pittsburgh newspaper, notes: "Sure it wasn't Harvard, Duke, Columbia, or Notre Dame, but it gave us a shot at climbing a ladder instead of crawling into the coal pits or facing the flames and heat of a blast furnace."

> Carol Jones, WSU–Lake, now campus faculty secretary, who believed she had no marketable skills when her assembly–line job vanished, comments: "I know in my own situation, without the Lake Campus I wouldn't have been able to attend college."

In September, 2001, through an unlikely series of coincidences, I crossed paths with two women who had been in my English classes at the University of Pittsburgh at Johnstown in 1952–53. I met Joanne Litzinger and her husband in a hotel elevator. In the casual conversation, I mentioned my name, and she gasped and said she had been one of my students. Not only that but a close friend, Shirley Boardman, also had been in that class. The next morning, Mrs. Litzinger rang my hotel room to tell me she had called her friend in New Jersey. Mrs. Boardman wanted to write to me to thank me for putting her on the road to a satisfying profession as writer and editor. I provided my e–mail address and was assured I would hear from Shirley Boardman.

That was all very flattering, but I really did not expect a former student would cross forty-nine years to write a thank you. A week after

I arrived home, I received a four–page e–mail from Shirley Boardman. The following is a quotation from her letter:

> "Why do I remember so many details from that twice–a–week class almost fifty years ago? I really don't know. . . I had no inclination on my part to work, or even play, with words. I dreaded writing the assigned themes and book reviews as much as the next person. I could never think of a subject for the themes, and I probably never got the point of any of the books I read. But part of the impact, I think, was the result of living in Summerhill [a coal mining town] for sixteen years and then going to Catholic high school, so my whole experience at Pitt that first year was like seeing sunshine for the first time after living in a windowless room illuminated by a forty–watt bulb. And your class was especially memorable because you encouraged us to read and think critically. You fostered exploration of diverse ideas and maybe philosophies that had never been mentioned to me before. I can't begin to guess how many times over the years I've thought of you and one of your suggestions or directions, not only when I was writing something but also when I was editing something someone else had written."

Conclusion: A Career And An Observation

Regional campuses certainly provide an immensely valuable service for adults who decide or need to return to the classroom. Our institutions also serve as an economic resource for the areas they serve. And keep in mind there is something we do much better than our parent campuses. For recent high school graduates, we make the transition to the opportunities, challenges, and stress of post–secondary work more suitable, satisfying, and, I believe, more effective. At the Lake Campus, the enrollment limit for an introductory–level biology class is twenty. A comparable biology class at Wright State's Dayton campus will have 300 students. Just consider the difference in possible interaction between instructor and student and the odds of doing well in a large lecture class as opposed to the immediacy of a class at a regional campus with a

limitation of twenty students.

In 1927, Pitt Chancellor John Bowman set in motion a plan meant to give people excluded from traditional academic opportunities their "chance for a good and rewarding life." As this academic year winds down and I retire from the experience of teaching, I'm grateful several institutions gave me a chance to help deliver on the promise.

Biography

Since Ted Bunn's days as an undergraduate at the University of Pittsburgh—Johnstown, he has spent much of his adult life on various regional campuses. For five years in the 1950s, he taught English at Pitt—Johnstown before leaving academics for the harum–scarum world of advertising, marketing, and public relations. In 1977, Lima Technical College appointed him to teach advertising. While doing this, he toured Ohio State's regional campuses twice a year conducting special seminars for business managers. In 1987, he began teaching marketing at Wright State University—Lake. After retiring as an insurance executive in 1993, he took on other business–related courses Wright State University—Lake. Bunn retired from Wright State University—Lake on July 1, 2003.[1] He may be reached by e–mail at ebunn@wcoil.com.

[1][Editor's note—we are not sure if Bunn will ever retire.]

Regional Campuses

Wright State University

Since its inception, the Lake Campus has initiated new programs to both meet area educational needs and to offer its students timely opportunities. For example, a program in the early nineteen-eighties offered a two-year degree in water well drilling in response to a request from the National Water Well Association. Students came from Mexico, Saudi Arabia, Canada and the United States to learn the techniques of locating water and drilling for it in order to supply potable water to areas in need of water.

The program was phased out as demand dwindled and other educational needs became more pressing. Similarly, Manufacturing Technology, Electronic Technology and Engineering Technology have become part of the campus' history while Natural Science programs, Information Technology, and Computer-Aided Drafting and Design are new and evolving programs.

As a branch campus of Wright State University, the Lake Campus offers general education courses with nearly seamless transitions to the Dayton Campus and dozens of majors. On site, students may pursue certificate programs, associate and prebaccalaureate degree programs, as well as a limited number of upper division and graduate courses, including a Bachelor of Science in Early Childhood Education, a Bachelor of Science in Organizational Leadership, a Bachelor of Science in Nursing completion program, and Master's degrees in Education, Educational Leadership, and Business Administration. As a full-service branch campus of Wright State University, students are offered career and placement testing, financial aid and scholarships, and tutoring and other instructional services.

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