

THE REVIEW FOR THE STUDY OF COLLEGE TEACHING

Spring 2002

Volume 1

Number 1

A Publication of



THE INSTITUTE FOR
THE STUDY OF
COLLEGE TEACHING

THE RICHARD STOCKTON COLLEGE OF NEW JERSEY

The Review for the Study of College Teaching

Published once a year by the Institute for the Study of College Teaching

The Institute for the Study of College Teaching

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Review for the Study of College Teaching
 Volume 1
 ISSN 1540-5516

Periodicals postage paid at Pomona, New Jersey, and at additional mailing offices.

Postmaster

Send all address changes to ISCT, P.O. Box 195, Pomona, NJ 08240-0195.

Subscriptions

For each annual issue, libraries, institutions, and individuals, \$50. Send a check payable to the Institute for the Study of College Teaching at the address shown above.

Change of Address

Send all address changes to ISCT, P.O. Box 195, Pomona, NJ 08240-0195. Send no later than February 1 to receive the upcoming annual spring issue at the proper address.

Claims

Claims for undelivered copies must be received no later than December 1 following the spring release date. The Publisher will supply missing copies when losses have been sustained in transit and when ISCT's reserve stock permits. To secure a replacement copy when transit caused substantive damage, mail the address label and the damaged cover to the Editor at the address shown above. Allow four weeks to receive the replacement issue.

Manuscripts

Spring 2003 deadline: October 1, 2002

Mail manuscripts for publication consideration to the Editor at the address shown above. The manuscript must meet the criteria outlined in the Guidelines for Contributors in the back of this issue.

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Credits

Cover Design: Julie Bowen, Pomona, New Jersey
Editorial Production: Bloom Ink Publishing
 Professionals, Lafayette, Indiana
Book Design: A Bruntlett Design, Lafayette, Indiana

The paper used in this publication meets the minimum requirements of the American National Standard for Information Sciences—Permanence of Paper for Publications and Documents in Libraries and Archives. ANSI/NISO Z39.48-1992 (R1997).

Printed in the United States of America.

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Editorial Mission

The *Review* publishes research that promotes excellence in higher education teaching. Its purposes include:

To Evaluate

The *Review* identifies and evaluates examples of excellent theoretical and empirical approaches to higher education teaching. Through anonymous peer review of articles submitted by Institute members and others, the *Review* gives authority to the Institute itself.

To Create a Culture of Intellectual Criticism

By promoting the discussion of excellence in higher education teaching among members of the profession and their immediate constituents, the *Review* creates a body of changing and expanding knowledge.

To Explain

By demonstrating the best theoretical and empirical approaches to higher education teaching, the *Review* reveals the purposes, objectives, and accomplishments of higher education to a wider public.

To Elevate

By evaluation, criticism, and demonstration of the best empirical and theoretical approaches to higher education teaching, the *Review* raises the level of discussion, taking it beyond the consideration of particular cases to a more substantial level.

Editorial Standards

Articles, which may be theoretical or empirical studies, must make a general and genuine contribution to what we already know about higher education teaching. They must direct readers to the solution of an important intellectual problem in higher education teaching. They must address more than one case or example, and cannot be purely anecdotal. They must meet or surpass the most appropriate technical standards.

Note:

Guidelines for Contributors, which appear at the end of the issue, provide details for preparing a manuscript for submission.



The Institute for the Study of College Teaching

is an independent research center for faculty engaged in the scholarly study of college teaching. It advances an understanding of college and university teaching through careful and intellectually rigorous research. By encouraging more formal research, the Institute identifies and analyzes pedagogical trends and formulates promising approaches for instruction. Its workshops, conferences, and journal, *The Review for the Study of College Teaching*, advance lasting change in higher education.

Message from the Editor

The Richard Stockton College of New Jersey established the Institute for the Study of College Teaching to promote formal research on higher education teaching. Several institutes and journals already assess college and university teaching and promote its improvement. They have, no doubt, done much to better higher education instruction.

The Institute, however, is an independent research center for faculty engaged in the scholarly study of college teaching. It advances an understanding of college and university teaching through careful and intellectually rigorous research. By encouraging more formal research, the Institute identifies and analyzes long-term trends, and formulates promising approaches for instruction. *The Review for the Study of College Teaching* publishes such research.

The articles in this inaugural volume—and in the volumes that follow—raise a number of interesting questions. They deal with form and systematic learning and complex cognitive interactions. They assess the multidimensional aspects of higher education learning: the relation between instructor and classroom; student and classroom; instructor and subject; student and subject; and school and society.

In particular, authors Jean Mercer and Kimberlianne Podlas each raise the critical subject of students' academic achievement and suggest alternative routes faculty can take to better ensure it. Mercer addresses students' cognitive approaches, and Podlas compares the learning styles and temperament types of student-athletes and nonathletes. Diane S. Falk presents evidence that experiential methods have a larger impact on student learning than those faculty use most often in classrooms. Frank A. Cerreto, Ellen L. Clay, and John M. Quinn, along with Melaku Lakew and Rena Iyer, point to the value of emphasizing quantitative content in advancing student learning.

Elizabeth Paul and C. Norfleet Jeffries each discuss student engagement. Both encourage an increased awareness of faculty attitudes toward students in creating a productive learning environment. They suggest we try various teaching approaches when we witness disengaged students in our classes.

Kenneth Borland and Marilyn Lockhart address how higher education administration and faculty might define great teaching, determine teaching excellence within faculty evaluations, and coach and train good teaching faculty to be great.

Because considering the discipline's context is important in judging teaching excellence, the *Review* offers insights in economics education within reports by Lakew and Iyer, and Jeffries.

The Institute for the Study of College Teaching and its *Review* are agents of change. They call attention to some of the clearest ways of looking at higher education teaching, and they promote the transformations that their work develops.

May the *Review* add value to your work.

W.C.L.

William C. Lubenow, PhD

Professor of History

The Richard Stockton College of New Jersey

Contents

Editorial Mission	iii
Editorial Standards	iii
Message from the Editor	iv

Cognitive Development and Academic Achievement 1

Jean Mercer, PhD

The author offers suggestions and speculations about effective classroom practices and student assignments, which can encourage young adult learners to use a more advanced cognitive approach. Students in adolescence and youth may show either of two qualitatively different stages or patterns of cognitive functioning. Educational experience, the mastery of specific knowledge, and vocabulary can all influence the person's cognitive approach.

A Case Study in Cognitively Guided Faculty Development 14

Frank A. Cerreto, PdD

Ellen L. Clay, PhD

John M. Quinn

The authors designed a yearlong faculty development program focused on teaching quantitative reasoning across the disciplines, in which they incorporated the cognitive principles of the constructive, contextual, and social aspects of knowledge. Within their journals and questionnaires, four of the faculty participants documented significant changes in their beliefs about quantitative reasoning and teaching.

Linking the Defining, Evaluating, and Developing of Great Teaching 30

Kenneth Borland, DEd

Marilyn Lockhart, EdD

In this conceptual article, the authors recommend defining great teaching by considering instruction's physical, field/discipline, and curricular contexts; focusing evaluations upon great rather than good teaching; developing valid evaluation instruments; incorporating great teaching into promotion and tenure requirements; developing mentoring and modeling opportunities; constructing and evaluating teaching portfolios; and creating campus dialogues on great teaching.

The Complete Student: Implications of a Three-Dimensional View of Students for College Teaching 38

Elizabeth L. Paul, PhD

Here the author discusses the resulting dilemma when a college instructor holds a one-dimensional view of students. She considers how this view might contribute to or promulgate the challenging learning environment. She compares the one-dimensional with the three-dimensional view of students and discusses how instructors can apply the three-dimensional approach in the classroom and how they can implement it to inspire and challenge students to strive for greater success.

“Dumb Jocks?” Do Learning Style and Temperament Theories Account for Differential Academic Success of Student-Athletes? Kimberlianne Podlas, JD	50
<p>Recognizing doubts about the academic ability of student-athletes, this instant study collects and analyzes data of athlete and nonathlete grades, learning styles, and temperament types. Data showed that athletes possessed the same executive learning style as nonathletes—and in higher proportions. The majority of athletes demonstrated a temperament type associated with flexibility and comfort with lack of structure. More nonathletes were associated with formality and desire for structure and rules.</p>	
Educational Impact on Social Work Study Tour Participants Diane S. Falk, PhD	65
<p>The author discusses the educational impact on two groups of social work students and working professionals who traveled to London/Northern Ireland and Australia to visit social agencies and universities, to meet with social work professionals, and to experience immersion in another culture.</p>	
Integrating Quantitative Skills in Introductory Microeconomics Courses Melaku Lakew, PhD Renga Iyer, PhD	87
<p>Since economics is inherently quantitative in nature, the authors argue that meaningful integration of quantitative skills—in particular, the art of estimation—is vital in introductory courses. Students’ understanding of key economic concepts and their understanding of the connection between basic quantitative skills and economics will increase, resulting in higher student rates of success.</p>	
Teaching the Principles of Economics to Disengaged Students C. Norfleet Jeffries, PhD	99
<p>The author presents some reasons why students are disengaged, which may originate in the student or the professor, and offers techniques and strategies, using introductory economics course examples, that have proven to be successful. He posits that, when students show visible signs that learning is not taking place, the student and the professor both bear responsibility for the shortcoming.</p>	
Guidelines for Contributors	110
Subscription Information	115

Cognitive Development and Academic Achievement

Jean Mercer, PhD

Classroom practices and student assignments can encourage young adult learners to use a more advanced cognitive approach. Students in adolescence and youth may show either of two qualitatively different stages or patterns of cognitive functioning. The concrete pattern that appears more often in younger adolescents involves little abstract or probabilistic reasoning and uses an unsystematic approach to problem solving. Older adolescents and youth are more likely to show a formal pattern, in which a systematic, planful approach enables the thinker to test hypotheses and use abstractions. Age alone does not determine the cognitive pattern, however; educational experience, the mastery of specific knowledge, vocabulary, and the particular problem itself can all influence the person's cognitive approach. The author offers suggestions and speculations about effective classroom practices.

Jean Mercer is Professor of Psychology at Richard Stockton College in Pomona, New Jersey, with a PhD in psychology from Brandeis University. Dr. Mercer has written numerous books and articles on child development and a textbook on childhood and adolescence.

Little girrrls, little girrrls! I am in the business of putting old heads on young shoulders!

Many of us remember the words of British actress Maggie Smith's Miss Jean Brodie with pleasurable acknowledgment of our own professional desires to replace the workings of young students' heads with something more like older ones (i.e., our own). We surely agree that a major goal of a college education is changing ways of thinking, as well as adding content as substance for thinking. But what does the change involve? How are young heads different from old ones? And how does the change come about?

Qualitative Differences Between Old and Young Heads

A "Pogo" character, asked whether a statement was the truth, replied, "No, but it's simpler." When we think about the ways young heads change into older ones, we may look at developmental stages, as long as we recall that the concept of stages simplifies the almost unbearable complexity of the truth about cognition.

A period in people's lives is called a stage if, during that period, individuals do certain things in ways that are *qualitatively* different from the ways they used in earlier or later life periods. In cognitive development, a cognitive stage is a time when the student approaches a problem in a different fashion from how he or she did earlier or later in life. The student does not necessarily solve problems faster or slower or more or less accurately than at other times, but instead uses a different set of assumptions and abilities. *Qualitative differences* is a useful idea that helps us think of changing styles or habits of thinking rather than simple improvement from practice.

A traditional use of the stage concept in cognitive development also assumes that stages occur in a predictable sequence and that each builds on previous development. This idea may imply that a type of thinking, once achieved, remains characteristic of the thinker, until he reaches a higher stage. As we will see later, though, the implication is unwarranted; a single student may show qualitatively different cognitive approaches when doing different kinds of tasks. Circumstances as well as maturation can produce varying degrees of young- or old-headedness. Perhaps it is better advised to say that a student shows a particular *pattern*—rather than a stage—of cognitive functioning.

Stage Concepts of Cognitive Development

Jean Piaget (1970) and many more recent authors (e.g., John Flavell 1963) have described two important stages of cognitive development. "Young heads" have the cognitive characteristics of the *concrete operational* stage of cognitive development, while "old heads" are *formal operational* thinkers. Although Piaget considered concrete operational thought to end at about age 11, giving way to formal operations, we should note that some mentally normal adults seem never to attain formal operational thinking (Philip Cowan

1978), and most adults show some tendency to concrete operational thought under some circumstances. College students have proceeded beyond 11-year-olds but like older adults, are not formal operational all the time.

Concrete operational thought involves the use of symbolic mental representation of concrete experiences, but is less successful with symbolic representation of abstract ideas or hypotheses. Concrete operational thinkers rarely try to find more than one possible solution to a problem, nor do they try to verify a solution by seeking more information (Cowan 1978). Their inability to consider more than one possibility makes it impossible for concrete operational thinkers to deal effectively with probability concepts. Thinkers at this stage often fail to apply known rules correctly or to check their work for mistakes. They find it difficult to decide whether they are uncertain of a solution (Lewis Lieberman 1970). Despite these limitations, however, concrete operational thinkers may know many facts. They can carry out such complicated mental operations as multiple classification of events or decisions as to whether the order of operations matters in a cognitive task. College students who are thinking at a concrete operational level may seem quite bright and competent until they work on hypothetical or probabilistic issues, which require formal operational thinking.

Formal operational thinkers can use the form of a question, as well as facts, to draw a conclusion. They can recognize, for example, that a tautology makes a statement true and an internal contradiction makes it false. This ability to examine the form of a statement is based on the formal thinker's characteristic ability to recognize that different things can be true under different circumstances. Formal operational thought accepts that many things are possible but only some are true at a given time—that "reality is . . . that particular portion of the much wider world of possibility that happens to exist or hold true in a given problem situation" (John Flavell, Patricia Miller, and Scott Miller 1993: 139). The connection between the real and the possible is based on probabilistic thought.

Formal operational thinking has additional qualities that differentiate it from concrete operational thinking. It is:

1. **Hypothetical in nature**—The thinker can generate many possibilities and understand that they are not the same as observable events.
2. **Abstract**—The thinker can work with mental representations of events that may have no concrete reality.
3. **Planful and systematic**—The thinker can imagine a series of problem-solving steps and to correct or alter them before beginning the actual task.

Formal operational thinking also uses combinations or coordinations of two or more factors, as experimental design often requires. Finally, formal operational thinkers use high levels of metacognition, the monitoring of one's own thought processes, which makes it possible to check for logical errors.

Logical Necessity and Causal-Experimental Thought

Piaget's descriptions of concrete and formal operational thinking showed some interesting differences between "old heads" and "young heads," but did not give as complete a picture of cognitive development as we now have. Recently, researchers in this area have attempted to describe some specific types of thought that seem to run parallel with formal operations and that are important for high levels of abstraction and scientific thought. *Logical necessity* is a type of thinking that ignores the accuracy of the facts in a statement and focuses instead on relations between statements. Reasoning about syllogisms is an example of the use of logical necessity. While many adolescents can use logical necessity, they may also confuse this cognitive operation with another operation used in producing many examples of a fact (Anne Morris and Vladimir Sloutsky 1998). College faculty may be familiar with a scenario in which they ask their students what is wrong with a logical conclusion and the students respond with a list of other factors that could cause an outcome; in doing so, they fail to use logical necessity and are answering another question instead. *Causal-experimental* thinking involves reasoning and choosing relevant facts in an attempt to establish causal or other relationships between factors. A student using causal-experimental thought must decide how to isolate variables, whether by removing a factor or by holding it constant while changing other variables.

Adolescents who are beginning causal-experimental thinking have been reported to make characteristic errors (Andreas Demetriou, Anastasia Efklides, Maria Papadaki, Georgia Papantoniou, and Alexandra Economou 1993). These errors will probably seem familiar to those who teach research methods courses in either the social or the natural sciences. The maximization fallacy involves the belief that, if a factor that is known to influence a dependent variable is combined with the independent variable, there will be an increased effect on the dependent variable and the hypothesis will be supported. For instance, if being male slows early language development and lack of language experience is hypothesized to slow language development, a student committing the maximization fallacy would propose to test the hypothesis by limiting boys' language experience but not girls, and then comparing the two groups. In defending this plan, of course, a student would probably not be able to articulate the idea that this is a particularly good design rather than a particularly bad one; an inability to isolate variables effectively makes the student unable to compare the designs point for point.

Beginning causal-experimental thinkers may also get caught in the dependent variable fallacy, another error that interferes with good hypothesis testing. Having hypothesized a causal connection between two variables, the student caught in this fallacy plans to manipulate the dependent variable to see whether it influences the independent variable—not necessarily a bad question but irrelevant to the original hypothesis (Demetriou *et al.* 1993). For example, an older college student who was concerned about her 10-year-old daughter's shyness came across a popular book claiming that certain kinds of handwriting indicated introversion—and the mother at once went to work to

alter the child's handwriting. Difficulties with causal-experimental thought may also involve the matching assumption. The student may feel that she made a good decision in choosing two groups to receive an experimental treatment when one is all male and the other all female, since they are all human beings (Demetriou *et al.* 1993). At the college level, an alternative form of this may be the impractical assumption that every individual in an experimental group must be exactly the same as every other individual, rather than the assumption that the average of members of a group must be the same as the average of members of another group.

The Oldest Heads Make Mistakes, Too

Any reader who has examined his or her own problem solving will admit sheepishly to multiple logical errors, right down to the childish transductive reasoning, i.e., the assumption that makes us think that correlated events must have caused one another. Adolescents are not much less capable cognitively than are older people. College students should be expected to make errors common to all adults, unless they are deliberately taught to avoid them. For example, superficial, unimportant details in a question tend to mislead most people (M. Mitchell Waldrop 1987). This is especially the case when questions about probability contain extraneous information (Amos Tversky and Daniel Kahneman 1974). Adults, like adolescents, pay too much attention to vivid personal experiences and overemphasize them relative to objective evidence (Keith Stanovich 1992). They accept a plausible explanation as if it were genuine evidence (Deanna Kuhn 1993). Like adolescents (see Paul Klaczynski and Gayathri Narasimham 1998), adults frequently think they are testing a hypothesis when they seek only information that will confirm it and avoid information that would falsify it. Adults apparently mentally represent statements about what is true rather than statements about what is false, so they come to mistaken conclusions about the consistency or inconsistency of a set of assertions (P. N. Johnson-Laird, Paolo Legrenzi, Vittorio Girotto, and Maria Legrenzi 2000).

Determining Factors in Problem-Solving Approaches

All other things being equal, old heads operate more effectively than young heads. We acknowledge maturational changes that accompany age in the use of abstract thought and mature problem solving. Of course, other things are rarely equal, so we must examine what those "other things" are and what influence they may have. Most are matters of experience and previous learning, which help or hinder the establishment of "a critical habit of mind" (Daniel Keating 1990: 256).

Maturation and Experience

In her intriguingly titled article, "I Know Why the Caged Bird Cannot Read," the novelist Francine Prose (1999) discussed the critical role of previous

experience and instruction in determining later tastes and abilities. Prose examined reading lists and writing assignments common in U.S. high school English classes and pointed out the relatively simple concepts and obscure writing that characterize many frequently taught novels. She noted the failure of most assignments to require close, line-by-line analysis of novels, and the tendency to ask students questions that stress moral or social implications rather than concrete information about a book's form and content. Prose (1999: 79) cited one teachers' manual that encouraged instructors to conduct a "close reading" of *Huckleberry Finn*, which would show the ways Twain negated the slave Jim's humanity, an approach that seeks to confirm rather than to test a hypothesis about the book. Prose noted also the frequency of assignments that ask the student to identify with a character or to predict what a character might do about something not mentioned in the book. These assignments require a lower level of abstraction than asking the student to compare himself to a character or to draw an abstract conclusion from the book's concrete details. Prose's (1999: 83–84) examination of high school assignments led her to this evaluation:

The new model English-class graduate—the one who has been force-fed . . . gross over-simplifications . . . —values empathy and imagination less than the ability to make quick and irreversible judgments, to entertain and maintain simplistic immovable opinions about guilt and innocence, about the possibilities and limitations of human nature. . . .

—and presumably about possibilities in general. Prose also described English assignments that stressed peripheral issues rather than a play's or novel's actual text—for example, a script for a TV news program announcing the murder of Duncan. One assignment asks students to answer a question about the mental health prognosis of *The Bell Jar's* heroine, an analysis they are far from competent to complete, thus implying that they could derive such an abstraction from the book's incomplete details.

Decontextualized Language. Prose's descriptions of high school writing assignments carry the implication that students receive little practice in the use of decontextualized language, language that is used to convey objectively knowable information from one person to another without the use of such contextual cues as pointing or facial expression (Dolores Norton 1995/1996). We best use decontextualized language when another person can read and understand the information as well as the writer did. This skill presumably develops with feedback from others, who show that they do or do not know what the writer intended. If most of a student's writing is about his opinions or emotional reactions, however, and if no one tries to clarify what those are, no one can tell the student whether the written words convey the underlying reality, and, as a result, his decontextualized language does not improve. Recent suggestions that all of human cognition develops in step with the capacity for communication and understanding what other people know (Marc Hauser 2000) underscores the importance of decontextualized language.

Domain-Specific Knowledge. While Prose's article emphasized a learner's experience with teaching approaches as a factor that helps determine his later thinking patterns, we may also look at experience as supplying both general and specific information relative to a problem. We process familiar material at a higher level than unfamiliar. The existence of a domain-specific knowledge base involves real mastery of the information needed to solve a problem; a student with the correct domain-specific knowledge can put all of her cognitive energy into solving a problem rather than trying to remember details (Flavell, Miller, and Miller 1993). Useful vocabulary is an important part of domain-specific knowledge. Unfortunately, many students in the United States lack mastery of specific knowledge because their early education avoided the rote memorization that can be the most efficient way to learn some kinds of information. John Dewey's idea that memorization was not the culmination of understanding has somehow been converted into the belief that rote memorization is bad for people (see E. D. Hirsch 2000). Discovery learning techniques, however, are very slow in making the student easily deploy number facts or geographical relationships.

Self-Efficacy. An important aspect of knowledge about a topic has to do with knowledge of one's own previous success or failure in dealing with that topic. A student's evaluation of herself as competent to do a particular task is called *self-efficacy* (Albert Bandura 1997). Although a person can have a general sense of self-efficacy, the term is probably more useful when it is applied to beliefs about specific abilities. Self-efficacy is important because it functions as a motivating factor connected with a sense of personal satisfaction and productive engagement with work. Feelings of high or low self-efficacy involve judgments about the self that may or may not be related to actual ability. The motivational effects of different levels of self-efficacy have different outcomes, depending on a student's experience of success or failure at a given task (Bandura 1997). Increased motivation results when a student with high self-efficacy about a type of task actually achieves success in the task.

When self-efficacy beliefs are high but the student does not succeed, however, he is not motivated to work harder at the task, but instead to protest, express grievances, and change the environment. Students who have done well, for example, in the kinds of English classes described by Prose often respond in this way when they receive a poor grade for writing assignments or fail to communicate their knowledge and comprehension on essay exams. Low self-efficacy, unfortunately, gives poor outcomes whether the student fails or succeeds at a relevant task; failure leads to apathy or resignation, and the success that might be expected to help the student instead produces self-devaluation and despondency (Bandura 1997).

Circumstances and Dynamic Systems

Domain-specific knowledge helps a student's problem solving only when the problem is relevant to the same domain. Circumstances—the classroom setting, the type of problem, the necessary knowledge base, the student's self-efficacy with certain topics, the time available, and so on—also affect students'

work, e.g., the interactions between the individual's past experience and the present cognitive task. Perhaps we anticipate that information about a student's maturation and past experience would help us predict how well he would complete a given task. But, like many aspects of human functioning, student performance follows a complex, nonlinear path that makes prediction very difficult.

The many factors that determine student performance work together in a dynamic system, influencing each other and organizing their interactions in a unique way (Marc Lewis 2000). Even when the determining factors do not change, performance shows a natural variability from one occasion to the next. In addition, a factor that changes a great deal may sometimes have very little effect on performance, while on other occasions a small change in a factor may have a large impact on the outcome. We do not understand the rules by which such a dynamic system operates. Although a number of factors discussed here have demonstrable effects on an individual's cognitive functioning, we still have little ability to predict or manipulate cognitive changes. Our best hope for transforming younger heads into functionally older heads seems to rest in exposing the learner to as many appropriate experiences and circumstances as possible.

Improving Cognitive Performance

Are there teaching practices that will help college students bring their most mature cognitive thinking into play? As previously discussed, experiences and present circumstances work together in determining cognitive approaches; we may be able to manipulate both factors as we instruct students in a course's subject matter. The following suggestions are almost entirely speculative; indeed, instructors may not be able to test them objectively because they are unlikely to change one factor of teaching in isolation, without changing other factors as well.

Teaching Students About Their Own Learning

Students often believe that mastery and failure are nonoverlapping categories, and that real mastery always involves speed. We can remind students in our instruction that learning can be a gradual process in which more adaptive techniques gradually take the place of less adaptive (see Robert Siegler 2000: 28). We can also stress the need for reflection in classroom practice by asking students to wait before answering a question or by having two minutes of silent thought before a discussion proceeds.

Encouraging Mastery of Information

In courses such as art history or introductory biology, where recognition of material is an important aspect of mastery, allowing students time to simply look at and explore photographs or preparations may allow them to increase their familiarity with course material. Similarly, in laboratory or other active work, time to explore equipment and make it more familiar can produce more

effective cognitive approaches (Nicholas Burbules and Marcia Linn 1988). In many college-level course curricula, we present material that offers students little possibility of discovery; they must learn it by rote. For example, a student can only think about cause and effect in a historical sequence when she has mastered chronology. She might take many semesters to learn the historical events through ways other than memorization.

Inexperienced memorizers forget to use such tricks as mnemonics, and are unaware of the number of repetitions they must experience before they master a list. They often try to memorize too much material because they cannot decide “what’s important,” even though they have learning aids, such as a time line in a textbook. They run into difficulty with vocabulary as they try to memorize definitions that they do not understand, and wind up with a list of words they can repeat but whose meanings they have not actually mastered. Students may need guidance on all these points.

Helping Practice High-Level Abstract Thought

Instructors can encourage the use of formal reasoning through an emphasis on logical processes. For example, students expect professors to ask them why they gave their answer only when their answer was wrong; indeed, they take “Why?” as the instructor’s indicator that they erred. Asking for explanations of both right and wrong answers communicates that we always need to check our reasoning. Students who have been schooled to seek similarities only or to look for information to confirm a hypothesis may be poor at “compare-and-contrast” tasks. They can benefit from Sesame-Street-style exercises: “Two of these events belong together, two of these events are kinda the same—but one of these events just doesn’t belong here.” In these exercises, students take three people or events, identify the two that are similar and the one that is different, and give reasons for their choices. If this sounds infantile, let me note that I have just finished teaching senior psychology majors a course during which a quarter of the class never succeeded with this exercise about trios of major figures in the history of psychology.

Students who have trouble with this task may need help in establishing categories on which entities could be similar or different. Would instruction in applied logic be helpful to students and encourage high-level reasoning? One quails at the amount of classroom time that such exercises would take, but previously we noted that a little knowledge of logic could help. For instance, we saw previously that students may reply to questions about necessary conditions as if they concern sufficiency. We may be able to prevent this error by demonstrating in instruction that the form of a question can eliminate some possible answers. Thus, if I ask “Does a correlation between a girl’s interest in sexual activity and her peer group’s level of sexual behavior mean that peer pressure causes sexual initiation? The answer cannot be “No, because I don’t think there is a correlation” or “No, because it’s not the only factor that could cause it.” The question, “Is a girl’s interest in sex really correlated with her peer group’s sexual activity?” cannot have the answer, “No, because correlation does not necessarily mean that one factor causes another” or “No, because

it's not the only factor."

Formal operational thought does focus on the form of a question, but it does not necessarily do so dependably without instruction. Unfortunately, students have received careful instruction through media news programs and learned some lessons about the significance of question form that are quite different from the ones we want to teach. Indeed, they have encountered lessons that may be considered "increasingly hostile to a critical habit of mind" (Keating 1990: 256).

Using Appropriate Exam and Homework Assignments:

Assignments that we use to evaluate a student's work have another function as well; they can guide students toward a suitable kind of thinking for the course. Although really good multiple-choice questions can evaluate work on complex topics, they fail to equal essay questions in two ways:

1. A well-written essay question elicits an answer that reveals the student's reasoning as well as his or her factual knowledge.
2. The nature of the question tells the student that reasoning is an important part of the task and one the instructor sufficiently values that he or she will go to the trouble of grading essays in order to emphasize it.

When students are learning new cognitive operations (mathematical skills, for example), exams and assignments must take into account the tendency of extraneous information to interfere with reasoning. Problems we present at the beginning of a topic should contain less extraneous information than those problems we present later. Making the problem into a little story may appear to be student-friendly, but it is not. When an assignment involves a narrative description of a situation or events (a lab report, for example), students may need both instruction and feedback about their efforts at decontextualized language. Initially, scaffolding, such as a checklist of points we want them to include, may be useful—even though the student is writing a description of something she only did a few minutes ago.

Finally, we might speculate that students need some guidance in choosing when a task involves formal operations and when a more concrete approach is sufficient. Some students seem to want to leap directly to an abstract statement when they should still be examining the concrete details from which they must draw a conclusion. Having reached their abstraction, they forget to check back against the data to see whether they made an error. They want to use important-sounding words like "prove," and when they do so, they believe they have completed their task. (And perhaps our earlier discussion of Francine Prose's comments can tell us why this is.) In courses on research methods in the natural or social sciences, this tendency wreaks havoc with students' statements of hypotheses, which are often so abstract that it is impossible to know what concrete facts they could use to test them. We can sometimes counter this problem with specific instructions: to slow down, to make a simple general statement about the topic that interests the student, to make a list of facts related to the topic, to make a prediction about what might happen if you manipulated some of those facts, and so on. It may be helpful to

demonstrate the type of reasoning by analogy that we often use in scientific and mathematical problem solving as well as in literary criticism—analogies are confirmed as useful, or disconfirmed, as a result of systematic, point-by-point comparisons. We may also set standards for the use of information in our instruction; in one study of adult learners, participants who improved following instruction used more information about the problem than those who did not (Michelle Perry and Anastasia Elder 1997).

Other forms of direct instruction may also be valuable, although, on the whole, they have been tested only with younger children. For example, researchers working with elementary-school children have reported success in teaching how to control variables and make valid inferences in scientific reasoning (Zhe Chen and David Klahr 2000). Explicit instruction about the control of specific variables produced successful problem solving that transferred to other problems as well. The technique Chen and Klahr used first allowed children to explore the materials; they were later given explicit instructions about how to design an experiment, including examples of both good (unconfounded) and bad (confounded) designs. They then judged good and bad designs and explained why they made their judgments as they did. This instructional technique is in contrast to many college-level research-design lectures because it asks students to attend to specific details in an example and to explain their reasoning.

Motivation

How nice it would be if we could figure out how to motivate students to study more and to think more effectively! Unfortunately, it is easier to say what does not work in this area than what works. Except for rewards such as grades that we can manipulate, most of a student's motivational factors are established long before he arrives at college. Self-efficacy and its motivating powers are already in place and determine how students respond to success and failure. Telling students that they are competent when they believe they are not is more likely to affect their evaluations of us than of themselves. When students are interested in a topic, they may have long-term goals that affect their efforts, but their short-term goals are more likely to influence their motivation at any given time. The long-term goal, however, organizes a set of relevant short-term goals (Bandura 1997). Many students may lack understanding of how short-term goals are related to long-term goals; for example, an advisee with a 2.1 average may express a desire to apply to a Ph.D. program and be quite shocked to learn that she is not likely to be admitted. Information and counseling on the precursors to long-term goals may have an important motivational influence.

Older Heads, at Least More Often

Although instructors cannot make students more effective thinkers if they have not already matured to a certain point, it appears that specific types of instruction and other classroom practices can make students capable of doing their highest level of thinking more frequently than they do under some other

circumstances. It is difficult to know to what extent instruction about reasoning is valuable enough to take up much classroom time, but some such instruction may be helpful in the understanding of course material. It may be less useful to try to point out how formal operational thought works, because students who are functioning at the concrete level at the time have great difficulty understanding the concept.

Because many students have little experience in the practice of rote memory, specific instruction about memorization and such memory strategies as mnemonics can help them master domain-specific knowledge that they can use in problem solving. Allowing students time to explore and familiarize themselves with materials helps raise the cognitive level at which they approach associated tasks. Assignments that guide students in practicing point-by-point comparisons and categorization can help improve work on problems that require abstract thought. Tasks that require explanations of reasoning provide practice with metacognitive monitoring and also communicate the instructor's emphasis on abstract thought. Writing our assignments so that they are free of extraneous information can also help students whose application of formal reasoning is still shaky.

Indeed, we can make a list of instructional practices that help support "old-headedness." However, it is important to remember that these practices interact in complex ways with a student's past experience and with such complex motivational factors as self-efficacy. Simply adding a good practice to the work of a course cannot guarantee that all students will handle the subject at an advanced level of abstraction. It is probably salutary to recall that instructors do only part of the work of the classroom; working harder and doing more of the right things do not guarantee that we will achieve all our instructional goals, or even make the students enjoy the course. We would prefer to think that our efforts would yield some results that can be documented in the ways traditional to education and the social sciences, but this may not work out in any obvious or even immediate way. The results of what we do in a given course may not be evident for several semesters or even for some years. Some of us have received letters from students whom we have not seen for five years, telling us that they really hated our courses, but now they see what we were trying to do. College courses do not necessarily come equipped with easily measured outcome criteria beyond simple facts and vocabulary—and most of us would like to teach ways of thinking that will stay with the student long after she forgets the simple facts. One of the greatest challenges for our old heads may be to decide when our teaching methods have been successful and when they have not.

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A Case Study in Cognitively Guided Faculty Development

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The authors designed a yearlong faculty development program focused on teaching quantitative reasoning across the disciplines, in which they incorporated the cognitive principles of the constructive, contextual, and social aspects of knowledge. Within their journals and questionnaires, four of the faculty participants documented significant changes in their beliefs about quantitative reasoning and teaching.

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We cannot overstate the importance of effective faculty development programs on college campuses. Faculty development is the *sine qua non* of significant curricular change (Judith Ramaley 1997; Frank Rothman and Jeanne Narum 1999). Moreover, successful faculty development can result in changes in pedagogy (Rebecca Reumann-Moore, Tabatha Abu El-Haj, and Eva Gold 1997), renewed enthusiasm for teaching (Nancy Shapiro and Jody Levine 1999), and improved instruction (Kenneth Eble and Wilbert McKeachie 1985).

In turn, these changes in teaching affect college students. Alexander Astin (1993), for example, linked teaching expertise with student development and academic achievement, and John Braxton, Nathaniel Bray, and Joseph Berger (2000) observed more persistence in learning among students whose professors were highly skilled instructors.

Despite the fact that educators know much about the characteristics of effective faculty development programs, especially for K–12 teachers (e.g., Richard Elmore and Deanna Burney 1999), most faculty training fails to utilize what learning theory researchers have uncovered about how learners learn.

The authors contend here that institutions must base their faculty development design on what we now know about learning (Ralph Putnam and Hilda Borko 2000).

Guidance from Cognitive Principles

The authors and other faculty members at a public, four-year college participated in an intensive, cognitively guided faculty development program. The educators who designed the program integrated principles of knowledge acquisition and retrieval and the constructive, context-dependent, and social nature of knowledge into the program's structure. A brief review of these principles follows.

Knowledge Is Constructed

Educators widely accept that learners construct knowledge through their reflective interaction with the environment (e.g., Ernst von Glasersfeld 1987). That is, they are not empty receptacles into which instructors pour knowledge; rather they are active builders of understandings (Carole Greene 1995). Instructors can enable learners to engage in constructive activities (Carl Bereiter and Marlene Scardamalia 1992; Carolyn Maher and Robert Davis 1990). By now, cognitive scientists generally agree that learners integrate any new knowledge into cognitive structures they already have (Roger Bruning, Gregory Schraw, and Royce Ronning 1995; Robert Davis 1984). Therefore, the ways learners recall and apply knowledge depend in part on the ways they store the knowledge they have (Bruning, Schraw, and Ronning 1995).

The constructive nature of knowledge implies that an individual's knowledge acquisition is idiosyncratic and based on his or her existing knowledge base (Dale Schunk 1998). Prior knowledge, by providing a framework for the assimilation or accommodation of new ideas, is an important determinant of learning (Filip Dochy and Patricia Alexander 1995).

Knowledge Is Situated

John Seely Brown, Allen Collins, and Paul Duguid (1989: 36) challenged the assumed separation between knowing and doing in their influential exposition on situated cognition, in which they posited that knowledge is situated both in context and intention. They argued, "Different activities produce different indexicalized representations, not equivalent, universal ones." The environment influences each indexicalized representation, which, in turn, influences future action.

Given the situated nature of knowledge, an individual learner's transfer of knowledge from one situation to another is not automatic and must be supported by practice (James Hiebert and Thomas Carpenter 1992). For example, Jean Lave, Michael Murtaugh, and Olivia de La Rocha (1984) demonstrated that adults who are quite adept at solving arithmetic problems in a real-world context perform more poorly when they must complete analogous tasks in paper-and-pencil, classroom form.

Knowledge Is Social

Twenty-five years ago, Lev Vygotsky (1978) described how knowledge acquisition is a social process that is embedded in cultural settings. In a rapidly growing body of work, (Brown, Collins, and Duguid, 1989; Allen Collins, John Seely Brown, and Steven Newman 1989; Jean Lave, Sanderson Smith, and Margaret Butler 1989), researchers have postulated that learning has a social, as well as a purely cognitive, dimension.

Rather than simply providing support for the learning of individuals, social interaction influences what a learner learns (Lauren Resnick 1991). In fact, several researchers believe that learning is an enculturation process. For example, in the area of mathematics learning, Lauren Resnick (1989: 58) claimed that:

Becoming a good problem solver—becoming a good thinker in any domain—may be as much a matter of acquiring the habits and dispositions of interpretations and sense-making as of acquiring any particular set of skills, strategies or knowledge. If this is so, we may do well to conceive of mathematics education less as an instructional process (in the traditional sense of teaching specific, well-defined skills or items of knowledge), than as a socialization process.

Implications for Faculty Development Programs

Many student-oriented educational reforms instituted in K–12 and college classrooms are grounded in the theoretical work described above. How might these findings guide the design and implementation of higher education's faculty development programs?

First, if learners construct knowledge, then faculty members as learners need an environment that engages them in rich activities and promotes reflection on these activities. According to Elmore and Burney (1999), success-

ful teacher development programs allow participants to observe and reflect on teaching episodes, not just descriptions of teaching.

Second, given the situated nature of knowledge, faculty should participate in development activities within a setting apart from everyday routines. Intensive summer institutes, for example, free teachers from their typical classroom situations and provide them with opportunities to explore new ideas and content (Putnam and Borko 2000).

Although there is value in removing faculty members from their daily habits for intensive training, learners must engage in authentic, complex activities pertaining to classroom practice; otherwise, these activities will fail to promote transfer of knowledge (Brown, Collins, and Duguid 1989). Therefore, faculty development programs must provide participants with ample opportunities to make connections to their classroom practices and to actual classroom teaching.

The context-laden character of knowledge acquisition also calls for a wide variety of experiences in a number of different contexts. According to Collins, Brown and Newman (1989: 485), referring to classroom learning:

As students learn to apply skills to more diverse problems and problem situations, their strategies become freed from their contextual bindings (or perhaps more accurately, acquire a richer net of contextual associations) and thus are more readily available for use with unfamiliar or novel problems.

These comments apply equally to faculty development. In order to assist faculty members in developing robust understandings about teaching that transcend specific situations, the programs must present knowledge and skills from different perspectives and apply them to different situations.

Third, inherent in the social perspective of knowledge is the important role that experts play in the learning environment (Vygotsky, 1978). In a cognitive apprenticeship (Collins, Brown, and Newman 1989), the expert models the cognitive behavior, coaches the learners as they practice the intellectual craft, and fades any assistance), as appropriate.

Collaboration in faculty development programs is essential. Prefacing their statement of eight design principles for effective professional development for teachers, Willis Hawley and Linda Valli (1999) reported that effective programs provide opportunities for continuous learning in the context of collaborative problem solving. Research on cognition also provides insight into the ideal composition of faculty development gatherings. Diverse groups with different types of knowledge can create new insights (Putnam and Borko 2000).

Therefore, good models of faculty development engage a diverse set of faculty members in multiple contexts, including summer institutes and ongoing support. Putnam and Borko (2000: 7), referring to K–12 teachers, provided a useful summary:

It may be that a combination of approaches, situated in a variety of contexts, holds the best promise for fostering powerful, multidimensional changes in teachers' thinking and practices.

The Case Study

In 1995 the Richard Stockton College of New Jersey (RSC), a public, four-year college, instituted a Quantitative-Reasoning-Across-the-Disciplines (QUAD) program (Barbara Bryne, Frank Cerreto, Charles Herlands, Alan Mattlage, Joy Moll, and Yitzhak Sharon 1997; Frank Cerreto, Renganathan Iyer, Melaku Lakew, Lance Olsen, and John Quinn 1997). Forming an integral part of this initiative, faculty members identified certain courses as, and developed others to be, either Q1 (quantitative-reasoning-intensive) or Q2 (quantitative-reasoning-across-the-disciplines) courses.

In a Q1 course, the primary focus was on mathematical thinking, and students learned to apply quantitative reasoning and mathematical concepts and principles to a variety of situations. In a Q2 course, the primary focus was on a discipline other than mathematics (e.g., psychology, economics, or visual art); however, the course instructor agreed to emphasize the relevance of quantitative reasoning within that disciplinary content.

The Grant Initiative

The following year, RSC received a grant from the National Science Foundation (NSF): 96-52095—Infusing Quantitative Reasoning Across the Disciplines: An Integrated Approach to Numeracy. The NSF awarded the grant so RSC faculty could implement and expand the QUAD program.

The grant had the following three objectives for the RSC faculty (Frank Cerreto 1997: 3):

- *Faculty members from all disciplines should gain familiarity with current research related to teaching mathematical ideas and their applications. They should develop/use classroom materials and approaches, based on this research, which promote student construction of meaningful mathematics.*
- *Faculty members teaching courses outside of mathematics should enrich their own backgrounds in mathematics and deepen their understanding of the connections between quantitative reasoning and their own disciplines. As a result, they should place greater emphasis on quantitative reasoning in these courses.*
- *Faculty members teaching mathematics courses should become better prepared to communicate the utility of mathematical thinking and quantitative reasoning throughout the disciplines to students in their courses.*

Training. The grant activities included an extensive, fifteen-month faculty development program. Based on the assumptions that knowledge is constructed, situated, and social in nature, the program offered a diverse set of experiences designed to facilitate the development of a faculty learning community (Jodi Levine 1998). Shapiro and Levine (1999) noted that similar programs result in changes in pedagogy or philosophy of teaching, improved interactions with students, and a renewed sense of enthusiasm for teaching

In the summer of 1996, twenty-four faculty members from a variety of academic disciplines, along with the project director, participated in an intensive, seven-day workshop series (four sessions in May and three in August). These meetings encouraged the exchange of ideas on research and pedagogy in mathematics.

During the first two plenary sessions, the project director gave background information regarding the grant. In addition, faculty members discussed preliminary plans for integrating quantitative reasoning into their teaching and identified research projects they might carry out in connection with these plans. Next, the participants formed working groups, each associated with one of four academic divisions of the College—Arts and Humanities (ARHU), Natural and Mathematical Sciences (NAMS), Professional Studies (PROS), and Social and Behavioral Sciences (SOBL). A senior grant associate convened each group. The project director and senior associates ensured that at least one mathematician served on each group. These groups met for two days to discuss discipline-specific issues. Members identified quantitative connections in their disciplines, as well as ways that mathematical thinking might augment disciplinary understanding. At the end of the second day, each group shared its findings with the entire assemblage.

Faculty members worked independently during June and July, finalizing their plans for the upcoming academic year. The project director and senior associates were available for one-on-one consultations during this period.

During the first of the three August sessions, participants discussed important research in the teaching and learning of mathematical ideas and its implications for the classroom. Next, mathematics faculty members discussed the goals of their courses and what teaching methods they used to achieve them. At the final meeting, all participants shared their reactions to the summer workshop series and planned their activities for the subsequent academic year.

Implementation. During the 1996–7 academic year, faculty members implemented the new pedagogical approaches and course activities they had developed over the summer. In addition, several faculty members carried out small-scale, classroom-based research projects. In September, a senior associate convened each of the four groups to discuss the progress of their courses and research studies. The groups met regularly, typically biweekly, throughout the year. Joining each working group, a student research assistant, selected from upper-level students majoring in programs in each division, assisted with the research projects and contributed a student perspective. The project director met with the senior associates regularly to review progress. These meetings provided a formal channel for sharing information among the groups.

The groups' activities varied widely. In many cases, participants developed and piloted course materials. A few faculty members conducted small-scale, classroom-based experiments. The PROS group carried out a comprehensive survey of all division faculty members of the quantitative needs of their students and the articulation of the existing curriculum vis-à-vis these needs. Despite this variation, however, all groups spent time discussing their students'

quantitative experiences in specific classroom episodes.

Closing Activities. When the academic year ended, the project director convened a two-day workshop for all participants. Faculty members discussed the successes they had achieved and the difficulties they had encountered during the year. Those who had conducted research projects prepared their work for possible presentation or publication. In August the program culminated with a regional conference on the connections of quantitative reasoning across the disciplines, which was attended by more than 100 faculty members and students. Most of the participants gave presentations of their projects at this conference.

The Research Method

The authors collected information from participants on the impact of this professional development program through two sources, faculty journals for the year and a self-assessment of changes in attitudes, which the director administered at the end of the program.

Data. Each participant kept an informal journal during the yearlong program. Participants recorded changes in attitudes, stumbling blocks encountered, solutions found, emerging strategies, and frank assessments of relative successes and failures. They also reported in a questionnaire any changes in themselves and their courses as a result of participating in the program.

Participants. Excluding the authors, twenty-four faculty members from the other four academic divisions participated in the program. Five of the participants were from ARHU, six each from NAMS and PROS, and seven from SOBL. These faculty members were compensated through the grant.

Of the twenty-four participants, thirteen were eliminated from this report for a variety of reasons:

- They no longer teach at Stockton, and the authors could not obtain final consent.
- Their files were incomplete.
- Their journals contained brief summaries of weekly activities, with little or no commentary on the personal impact of these activities.
- They taught Q1 courses and would not have noted interdisciplinary findings.
- They had previously published reports of their transformations, and, therefore, might bias this report.

A total of eleven participants (three from ARHU, one from NAMS, three from PROS, and four from SOBL) remained in the pool. Due to space constraints, the authors selected one participant from each division for inclusion in this report.

Data Analysis. The authors analyzed the journals and surveys utilizing a multistep process. First, they noted two areas of focus: (1) changes in beliefs about quantitative reasoning and (2) changes in beliefs about teaching. They decomposed each area into four claims concerning the participants. The two areas of focus and the eight claims appear in Figure 1.

Authors Clay and Quinn read the journals and survey responses and noted excerpts that seemed to support or refute any of the eight claims within the two areas of focus. Following this step, six other faculty members at RSC, not connected with the grant project, read some of the same material in order to validate these findings. Readers followed a brief set of written instructions, including two examples of fictitious excerpts that were coded as supporting or refuting claims. The readers then replicated the analysis done previously by the two authors. Therefore, two authors and two other readers, independently, coded each document included in this report. The authors' and readers' coded responses were recorded and analyzed. Only those excerpts identified by at least three of the four readers were selected as representative of participant beliefs and included in this report.

Focus	Claims
Changes in Beliefs about Quantitative Reasoning	<ul style="list-style-type: none"> A. My knowledge of quantitative reasoning/math has increased. B. My attitude toward quantitative reasoning/math has improved. C. I see a deeper connection between quantitative reasoning/math and my discipline. D. Quantitative reasoning/math has enhanced my understanding of my discipline.
Changes in Beliefs about Teaching	<ul style="list-style-type: none"> E. My ability to teach the quantitative reasoning/math aspects of my discipline has increased. F. My ability to use quantitative reasoning/math to teach my discipline has increased. G. My comfort level with teaching quantitative reasoning/math has risen. H. My expectations of students have increased.

Figure 1

Results

Here we describe the observed changes in beliefs of four faculty members who participated in the program, each referred to as female to preserve anonymity. We inserted transitions between their journal and survey excerpts, whenever necessary, to clarify the context. We present the individuals in alphabetical order by division, and their journal excerpts appear in chronological order to preserve the essence of the transitions.

Arts and Humanities. This participant, a historian, altered two courses during the project. The first set of excerpts pertains to her experience in a general education course on the history of science, in which the participant

restructured an entire course. The second set is from her work the following semester in an advanced research course with a Q2 designation for history majors. These excerpts denote the ongoing nature of the transformation.

The first excerpts suggest a significant change in the historian's knowledge of the connections between quantitative reasoning and the history of science. They also show increased ability to use quantitative reasoning to teach the history of science. In addition, they demonstrate increased expectations of students by asking them to actually *do* the mathematics.

Here is an excerpt describing the changes she made:

In teaching History of Science as a Q2 course in Fall 1996, I incorporated new "quantitative" aspects of the material into the course in two ways: I increased the mathematical rigor of the topics I presented in lecture, and I included assignments to allow students to work out some mathematical issues on their own and thus get a feel for the mathematical problems confronting scientists in the past.

In particular, she described two revised classroom activities:

*This time, I drew a detailed diagram showing the motions of the sun, moon, and celestial sphere, and went over it until it seemed to make sense to students. In my lecture on Kepler (Oct. 12), I had previously just said that one reason that Kepler accepted Copernicus' theory was that it gave a specific order for the inferior planets (Mercury and Venus). This time, I included a table and explanation that showed the mathematical reasons for that order. In my lecture on 20th-century genetics (Nov. 25), I had previously lectured on the work of T. H. Morgan and A. H. Sturtevant in working out gene maps for *Drosophila*. This time I handed out Sturtevant's article first, describing the technique of gene mapping, and we worked through the material in class.*

During the semester, she realized:

I could streamline the survey part of my course to present primarily lectures on Mondays and Wednesdays. I could then use the Friday sessions to intensively explore both the experiential and mathematical aspects of certain selected topics in science.

Therefore, this professor demonstrated a significant alteration to the course format. She continued by describing an example of the first of three series of Friday lab sessions. The readers were consistent in judging that this passage supported both the faculty member's deeper connections between quantitative reasoning and her field and her increased expectations of students.

In describing the type of course she wanted, the participant wrote:

The result would be almost like a history of science course with a lab requirement, but in this case, the purpose of the "lab" would be to recreate for students, as much as possible, the intellectual world—including mathematics and its experiential base—of selected scientists.

Later, reflecting back over the semester, she wrote:

I am delighted with the results I have achieved so far.

The next several excerpts suggest the level of comfort and ability the historian had developed with the quantitative aspect of the course, moving from:

I have even questioned whether the course should be a Q2 course at all

to

My first solution to this problem was to design specific Q assignments . . . though I was not very satisfied with this solution

to

The three special topics I have devised are much better solutions. Each of them takes a point in the history of science when phenomena that had been understood in largely qualitative ways began to be formulated in quantitative terms. Each starts the student at the point at which the phenomena was understood qualitatively and lets him/her explore what happened in the process of quantification.

Finally, in her reflection, she stated that quantification is a “mode of knowing,” one of the strongest statements supporting her understanding of the quantitative aspects of the field. The last cited comment from her journal suggests that she expected the same of her students:

For the final written assignment, students will be asked to put themselves in the position of astronomical expert, ca. 1609, and evaluate Sidereus Nuncius. Could they see what Galileo saw? Did they find the work persuasive? Why do they think Galileo wrote it? And can they derive from it his view of the physical geometry of space, embodied in his famous phrase, “the universe writ in number.”

In her advanced research course for history majors, her transition was more difficult, as documented in the following excerpts.

Students also came to the course apprehensive about the level of math they would need, and this aspect of the course did not go well. I went over basic mathematical concepts, like “average” and “percentage”; I also tried to explain the difference between “statistically significant” and “historically significant.” Though most of the students seemed to understand and use the first, I am not sure they all did. And I am very sure that they did not all understand the second. In particular, the course did not do a good job of giving them a feel for numbers in making historical arguments.

By the end of the course, the participant:

remained puzzled about what level of mathematical knowledge is appropriate for the course: should I be content if they get percentages straight, or should I push for significance tests and chi-squares?

About not providing enough examples of quantitative research done by

historians, she wrote:

and it seems to me that one reason why some students had difficulty with the final research prospectus is that they did not have enough models for what they were trying to do. Next time I teach the course I will be sure to do more integration of historical methods into the course.

And in the conclusion, the participant wrote:

It thus has turned students from generally computer-disinterested, if not computer-phobic, into competent, and in some cases, enthusiastic users. I don't think it has been successful in addressing either the quantitative or historical issues implied by the nature of the Q2 and DRP status, but since this course will be offered every spring from now on, I will have many opportunities to try, try again.

This course created more questions for the instructor than answers. Although there was not much written about change that occurred during the course, it is clear that the instructor was beginning to understand the connections and was learning ways to increase the effectiveness of using quantitative reasoning in teaching the course.

Natural and Mathematical Sciences. The second participant, a biologist, focused on a genetics course and lab, both intermediate-level requirements for biology majors. Her journal consists of a before-and-after comparison on her thoughts on the course and lab. In addition, the journal documents a program-wide change that took place in response to her participation in the program.

In the latter section of her journal, the participant wrote about her change in understanding the connections between the quantitative reasoning skills and genetics in the course. It also demonstrates her understanding of the need to have students do the mathematics themselves:

I am demanding a bit more of students' performance. As a corollary of the QUAD project, it motivated me to finally get the Genetics faculty as a group to write our own lab manual, and we are revising it a bit each semester. The molecular genetics lab procedures require basic computational skills, including logs and log plot graphing vs. linear plots—we are asking the students to do this work, not just telling them the answers.

Near the end of the year, she wrote about her personal discomfort with the quantitative aspects of the field. However, her comment on the year-end survey demonstrates a transition that took place during the project:

I have a much better understanding of the role and value of math skills and instruction in teaching genetics.

The readers of her work cited this passage most often as evidence of change in understanding the subject as well as in how to teach it.

Professional Studies. The third participant, an accounting professor, taught two sections of an intermediate-level financial management course required of all business studies majors. She taught one section using a traditional lecture format and the other using an innovative case-study approach.

Again, the participant experienced change not only on the quantitative content of the course, but on the methodology of teaching it also.

The first excerpt from her journal demonstrates change in both her own knowledge of the quantitative aspect of her field and in the way she teaches it.

Preparing my syllabi for the Spring 1997 semester, I found I was much more conscious of the need to evaluate homework problems carefully, not only to achieve the author's objectives, but also to bridge the gap between quantitative skills and practical applications. I found myself really trying to step into the students' shoes and imagine how the links appear to them. In the past I think I have been too rigidly focused on just trying to interpret the text author's formulas for the students without really challenging the students to try to develop formulas or formats for solving problems using their existing base of knowledge. Because I feel my own quantitative skills are weak, I have feared straying too far from the author's solutions for fear I might misinform students. Through the group discussions in QUAD, I've recognized the need to encourage students to try a solution and to give them credit for rational approaches to problems, even if the answer turns out to be wrong.

The following excerpt describes this participant's changing expectations of the students during the semester:

Last week was somewhat frustrating with my Sec. 001 (lecture format) class. I tried to get them to see the logic of dissecting ratio formulas through mathematical thinking and didn't seem to be making much progress. So I let them work in groups to solve chapter-end problems, and they seemed to be more receptive to the process. Perhaps that is a key to getting them into successful QR routines!

After participating in a case presentation, one student further questioned the participant regarding a quantitative aspect of the case. A portion of the participant's report of the conversation follows:

So I told him to think about the assumptions used in each solution. I had to walk him through the timing differences, but in short order, he got it. And he said to me: "Why would you do it 2 different ways? And which one is right?" I told him both were right and asked him to think about how and why that could be true.

The conversation continued until both were satisfied, then the professor wrote, "It was a moment of enlightenment for him and a supreme triumph for me!"

On another occasion, demonstrating an increase in her/his expectations of students, the same accounting professor wrote: "How do we get them to think?"

The following scenario demonstrates the accounting professor's continuing increase in comfort level and ability to use quantitative reasoning in the classroom:

After the disappointment of the midterm exam results, I approached the final week of classes and final exams with as much trepidation as my students. I think we were all very pleasantly surprised. Students in both sections did reasonably well. . . . And students were sufficiently creative in solving problems, that I felt very good about the QR progress made.

Perhaps the best reward this semester came in the "cases" (case study) section. As a wrap-up on the cases, we did a role play on a case, with groups taking the parts of the company, bankers, and creditors and having a discussion on financing negotiations of forced bankruptcy for the company. Students had really done their homework and were able to do a remarkably astute evaluation of pro forma statements and financial ratios.

Best of all, the exam results suggest that students in the cases section made excellent learning achievements. I had been concerned that they might not get it as well, since we didn't do a lot of examples (homework and lectures) in that class. However, their progress was at least equal to the other class and possibly greater.

Overall, it was a highly satisfying semester for my Q2 courses.

On the year-end survey, she reported being:

much more comfortable teaching quantitative concepts and am willing to admit to my students when I don't understand something or when I have made a mistake. I believe this makes it more comfortable for the students to attempt the work than if I appeared to be infallible. Also I am much more flexible in my grading, giving partial credit for correct concepts even when math errors occur. I am more interested in getting students to apply rational thinking and problem-solving skills than I am in merely getting correct answers.

Her transition during the semester was as substantive as any other. She moved from fear to comfort and from one teaching style to another.

Social and Behavioral Sciences. The fourth participant, a criminal justice professor, taught both an introductory course and an advanced research methods course, both requirements of the major, and an intermediate-level policy course the following semester. By then, she began to understand how innately quantitative her field is. The journal includes monthly entries about the ideas that she was forming from a combination of participating in the program and teaching these courses.

In February, the participant enthusiastically described her realization of a deepening understanding of the connections between quantitative reasoning and criminal justice:

Mathematics and quantitative reasoning are at the heart of much criminal justice policy. Many of the questions are numerical. How many, how much, what change are central. Criminal justice is just the study of trends and the system's response to them.

Next, the participant enumerated a list of twenty criminal justice topics paired with related quantitative issues. Then continued:

Numbers, numbers everywhere. Quite amazing. I never realized before how much of the subject matter has quantitative dimension. The arithmetic of criminal justice is everywhere.

The criminal justice participant, who was so enthusiastic about seeing the connections, demonstrated her level of ability and comfort teaching the quantitative reasoning aspects of the field the following month: "The best way to bring quantitative reasoning into this course is with the case-study method."

By the end of the term, on the year-end survey, her reflections also suggested that the participant understood the connections between quantitative reasoning in a much deeper way. As with the historian, she began to see quantitative reasoning as a different way of thinking about things:

My field is all about numbers. Quantitative aspects and features to virtually every issue. Stunningly, this never occurred to me before.

Regarding quantitative reasoning as a way of knowing, the participant then went on to say:

Quantitative reasoning offers another important way of thinking about things, which can be demonstrated and preached in class. I don't mean formal research skills here, but a way of looking at an issue, asking certain questions about it, assessing it.

Conclusion

A common thread woven throughout the participant reports is the notion that quantitative reasoning represents an important tool for understanding their disciplines. In addition, the participants apparently came to value quantitative reasoning as embodying a useful epistemological perspective in these diverse fields.

With regard to pedagogy, the participants seemed to discover (or rediscover) the importance of several teaching strategies:

- providing students with opportunities to engage in meaningful, problem-based classroom activities;
- setting appropriate student expectations; and
- providing useful models of how to use quantitative reasoning to understand other disciplines.

Most significantly, the participants engaged in critical reflection on both their teaching and their students' learning.

Although not included in this report due to space constraints, preliminary analysis of the journals and survey responses suggested that many of the remaining eleven participants who were not included in this report had also undergone significant change. Specifically, faculty members in ARHU and SOBL were nearly unanimous in their belief that integrating a quantitative perspective into their courses had the potential to increase students' understanding of their individual fields.

However, any general conclusions one might draw about the influence of cognitively guided faculty development on changes in teacher beliefs are speculative. First, the participants were selected from among a group of individuals who had already expressed an interest in exploring quantitative connections. Therefore, they may have been predisposed to change. Second, the self-reported changes in beliefs may be artifacts of the instruments or analysis. Finally, even if the reported changes are genuine, this study has not demonstrated any cause-and-effect relationship between the fact that the program was based on cognitive principles and the reported faculty transformations. It is possible, for instance, that any program that brings together faculty members to discuss teaching techniques will eventuate in changes in beliefs about teaching.

Future experimental studies can investigate the relative influence of cognitively guided faculty development on faculty change. This report has provided a glimpse at the kinds of changes in faculty beliefs that can occur in the context of one particular implementation of cognitively guided faculty development.

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Linking the Defining, Evaluating, and Developing of Great Teaching

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We often hear teaching defined and evaluated through its scientific elements—its mechanics—rather than its artistic ones. To become great teachers, we must learn to define, evaluate, and develop the humanistic and artistic elements of teaching. In this conceptual article, the authors recommend defining great teaching by considering instruction’s physical, field/discipline, and curricular contexts; focusing evaluations upon great rather than good teaching; developing valid evaluation instruments; incorporating great teaching into promotion and tenure requirements; developing mentoring and modeling opportunities; constructing and evaluating teaching portfolios; and creating campus dialogues on great teaching.

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Those among us in higher education who strive toward great teaching must reach beyond the status quo and act in ways closer to our ideals. We authors forward an idealistic challenge to the reader—consider our definitions of great teaching; the means by which we evaluate our progress toward that ideal; the strategies we believe will move us from being good to great teachers; and, most powerfully, how we link these three processes.

We contend that higher education administration does not base most approaches in the evaluation of faculty teaching upon definitions of great teaching. Typically, it bases its instruments upon (1) definitions of teaching that fall short of great teaching, (2) student satisfaction, or (3) measurements of other factors that are not directly related to great teaching. If great teaching is the highest level of performance that faculty who teach can achieve, and the administration does not base teaching evaluation instruments upon definitions of great teaching, then we conclude that those kinds of teaching evaluation instruments cannot be valid. They do not measure the presence of great teaching nor do they provide information to faculty members that helps them advance into becoming a great teacher.

We believe that more faculty members would be great teachers if the college or university administration more formally linked the defining, evaluating, and developing of great teaching. We contend that higher education infrequently observes this logical link. As a result, because we witness inadequate definitions of great teaching and therefore, cannot know the degree to which faculty members on our campuses achieve it, higher education cannot design and conduct faculty development that encourages and generates great teaching.

In Pursuit of Great Teaching

To further great teaching on college and university campuses everywhere, we must first define great teaching and then integrate our definitions within valid processes that develop and evaluate our progress toward that ideal. In delivering these processes, we can improve our teaching to the level of greatness.

We must answer four questions to progress toward achieving this concept on our campuses.

How do you *define* great teaching?

How do you *evaluate* great teaching?

How do you *develop* great teaching?

How do you *link* these three processes?

How Do You Define Great Teaching?

According to teaching evaluation reports used on campuses, most college faculty members are defined as “good teachers.” In statistical terminology, the curve representing the distribution of the collective teaching quality on most campuses is negatively skewed, which, for nonstatistically oriented readers, is good news. However, the “good” qualifier suggests that a higher level of

teaching exists, one toward which the majority of good teachers can aspire and at which a smaller number have arrived.

Yet, what really distinguishes good teachers from great teachers? We contend that we must root a definition of great teaching in the contexts of teaching and the art, rather than the science, of pedagogy.

Contexts. Certainly, we must define great teaching within the context of each campus, but we must also consider other contexts. Each campus must consider three critical, specific contexts—the physical, the field/discipline/profession, and the curricular framework.

Consider the *physical context* when defining great teaching. Faculty members teach differently in a lab, seminar, lecture, studio, shop, clinic, the field, or any other physical context. A great studio teacher may not be a great lecture-hall teacher, and a great lecturer may not be successful in a lab. In the physical context, are there many or few students? active or passive students? Is the physical context designed or intended for creating or informing? Are there stations and apparatuses or lecterns and conference tables? The physical context informs or even shapes the teaching of good and great teachers. So, in part, we must define a teacher's greatness within the physical context in which he or she teaches.

Consider the *field/discipline/profession context* when defining great teaching. Each field/discipline/profession has its traditional form(s) of teaching. Consider how teaching has typically and successfully been done in the arts, sciences, technologies, professions, humanities, and social sciences (theoretical and applied), for instance. Great teaching within the campus's field/discipline/profession contexts is often, and rightly so, informally defined by peers/colleagues within each of the faculty's academic homes. Their definitions often reflect the way(s) in which they were themselves taught by the previous generation of faculty. Consider, as well, the educational literature of the field/discipline/profession. For example, in the last decade or so, a number of science, engineering, math, and technology faculty have proposed reforms of teaching in their fields. This generation of faculty on your campus may have to debate "what *is* great teaching vs. what *was* great teaching within their field/discipline/profession context.

A third context useful for defining great teaching is the *curricular framework context*. Is the course part of general education or part of a major? Is it an elective or a requirement? Is it math-, writing-, or research-intensive? Given student ranges of disdain or desire for courses in certain curricular frameworks, each campus might find it necessary to define great teaching differently based on how students respond to each discipline's curricular demands. Do the curricular requirements stir hostile or friendly reactions from students? Those who teach research, mathematics, English composition, and the like may collectively report that they teach students who display high levels of anxiety or low levels of motivation, who are enrolled only because the course is required or who disbelieve the course's career utility. Such faculty teach in curricular frameworks that require definitions of great teaching different from those definitions if they taught courses (1) in which students chose to enroll, (2) at upper division levels, or (3) that students accepted as furthering their career

preparation.

The Art of Teaching. Across all campuses, we are wise to define great teaching through the *art* of teaching, for *pedagogy* means “the science and art of teaching.”

The *science of teaching* refers to faculty behaviors associated with the mechanics or “how-to” aspects of the teacher’s work. Among the how-tos are lesson organization and structure, presentation clarity, communication skills, class interaction, stimulation, elocution, and feedback (Raymond P. Perry, Verna H. Menec, and C. Ward Struthers 1996: 89).

Every evaluation form that students complete in judging their instructors deal with the science of teaching. Was the professor organized? clear? give feedback? While the operationalization of these how-to components can be difficult, good teachers typically have high scores on teaching mechanics, and new teachers and those who need to improve in the mechanics are more apt to learn versatile how-to strategies.

The *art of teaching* is very difficult to define and, therefore, even more difficult to operationalize for evaluation and faculty development purposes. The art of teaching may be closely linked to factors akin to the human spirit, intellect, emotion, volition, authenticity, wholeness, self-renewal, philosophy, and personal goals. Administration can observe these internal humanistic and artistic factors through a teacher’s passion, style, creativity, timing, and self-expression, for example. The art of teaching builds upon the soundness of content and methodology. Artistic teaching is beautiful, inspired, coherent, and somehow reaches beyond an intellect-to-intellect connection of content. It reaches toward a holistic level wherein learning involves more than the intellect but the entire student.

In its use to define and evaluate great teaching, the art of teaching frustrates us: Like great art, we claim to “know great teaching when we see it,” but the art of teaching is not easily operationalized. More frustrating is that what one has difficulty defining will be difficult to evaluate and, consequently, will be difficult to develop. Yet, according to Kenneth E. Eble (1976, 1983) and Louis J. Rubin (1985), over time, good teachers can become great teachers. Once a teacher has developed the mechanics, he or she can develop the art of teaching—just as the painter, chef, musician, and wine connoisseur develop their art forms—through strategies that focus on such aspects. The difference between good teaching and great teaching is not its science, but rather its art.

In addition to content mastery, we must include the contexts of teaching, the science of teaching, and, even more so, the art of teaching in our definitions of great teaching. The mastery of content, contexts, and the how-tos of teaching form the foundation upon which great teachers conduct their art.

How Do You Evaluate Great Teaching?

When you cannot measure it, when you cannot express it, your knowledge is of a meager and unsatisfactory kind.

—Lord William Thomson Kelvin, 1824–1907
British physicist and mathematician

When you can measure it, when you can express it in numbers, your knowledge is still of a meager and unsatisfactory kind.

—Jacob Viner, 1892–1970

Canadian economist and historian of economic thought

Evaluating teaching in general is not without its difficulties and, as expressed by Kelvin and Viner above, the evaluation of great teaching—“we know it when we see it”—is even more difficult.

Observations. Typically, most evaluation instruments are not based upon a desired outcome of great teaching but rather on those components of teaching that every good teacher should demonstrate. It is as if “good” is the desired outcome. Second, most evaluation instruments do not measure teaching in any of the specific contexts previously mentioned. Rather, the evaluation is based on the assumption that teaching is commonly understood and conducted, a “one-size-fits-all” approach, across all contexts. Third, most evaluation instruments measure the scientific components of good teaching rather than the art associated with great teaching. Those who create these instruments do not attempt to gain any measure of that which constitutes the art of teaching. So, how can we formatively evaluate for the art of teaching to generate great teachers?

Improvements. Other than following the best practices of any applied research effort (which assessment happens to be), which includes checking for validity and reliability, using multiple data points, couching numeric data within a narrative context, and so on, the authors recommend the following in improving teaching evaluations. *Note:* With each suggestion, pay particular attention to the art of teaching as well as the science of teaching.

1. Assessment intends to improve teaching, but it cannot be accomplished without a stated definition of the desired outcome (great teaching) and measures related to that value. Design the evaluation by anchoring it in the desire to measure the presence of great teaching.

2. Consider the three contexts (physical, field/discipline/profession, curricular) as key components in the definition of great teaching. For any measure to be meaningful, it must be set within one or all of the contexts that define the teaching experience.

3. Focus the evaluation on the art of teaching as the hallmark of great teaching.

4. Develop valid evaluation instruments relative to the definition of great teaching. This may mean that administration must spend more time in defining great teaching and that the campus has more than one definition of great teaching, which will necessitate the creation of several instruments to ensure validity.

5. Analyze the existing promotion and tenure statements and criteria regarding teaching greatness. Then, revise the evaluation strategies to be consistent with these documents.

6. Analyze the existing student evaluation forms for a balance of art and science of teaching items. “Salvage” from these forms what is valid, reliable,

and supports what you wish to know, but replace problematic and noncontributing items with others addressing the art of teaching.

How Do You Develop Great Teaching?

Once we craft a definition of great teaching and we establish appropriate evaluation designs, then we can use the findings from the evaluations to follow-up with plans and activities focused on the improvement of the art of teaching. However, most faculty development efforts focus on improving the science of teaching rather than its art. So what can we do to assist good teaching faculty members who have already mastered the science of teaching to develop the artistry of teaching indicative of great teachers?

If the art of teaching (and therefore great teaching) is linked to a teacher's passion, style, creativity, timing, self-expression and such human factors as the human spirit, intellect, emotion, volition, authenticity, wholeness, self-renewal, philosophy, personal goals, then we must orient development strategies interpersonally and their content must focus on the interpersonal aspects of teaching. The development efforts focused on great teaching must themselves be like our statement concerning artistic teaching: *beautiful, inspired, coherent, and reaches beyond an intellect-to-intellect connection concerning content toward a holistic level wherein learning involves more than the intellect but the entire student*. Consider, in this light, the following suggestions for how to develop great teaching:

1. Establish *mentoring programs* to improve the art of teaching. Pair the artists of teaching, the recognized, great teachers on your campus, with good teachers to regularly meet over the period of several months (or more) to discuss the art of teaching. These dialogues can be based in readings about teaching and/or some of the recent literature on "faculty spirituality" and can be supplemented with the sharing of passions about and experiences with teaching. The mentor may even observe the good teacher and provide feedback. Mentors may be from the same discipline or perhaps outside of one's discipline to expand viewpoints.

2. Set up *modeling situations* on campus so that good teachers can occasionally observe great teachers performing their art. Publish a list of when and where the great teachers are teaching, reserve a number of seats for good teachers, and provide a setting where the great teacher can address questions after the class session ends. Recordings of these teaching and the question-answer sessions will add to the long-term productivity of this development strategy.

3. Construct and evaluate *teaching portfolios* of good teachers. This portfolio strategy can be purely descriptive, but it is most powerful when it is also reflective. The portfolio can include in-depth assessments of teaching, using such materials as student interviews; student work samples; peer reviews of teaching; course syllabi and exams; course innovations; faculty reflective statements of teaching philosophy, goals, strategies, and practices; and student reflective statements of course learning and faculty teaching. However, they should also include peer and self-assessments concerning the art of teaching.

The good teacher should provide written analysis of her or his passions, styles, creativity, timing, self-expressions, and human factors, as listed above.

4. Establish, staff, and equip *faculty development centers* to offer good teachers resources and reading materials focused on great teaching, as well as opportunities for nonthreatening reviews and critiques of teaching. Such centers must not only address the contexts of teaching, the science of teaching, and the evaluation of good teaching, but must establish, as their highest purpose, the understanding, evaluation, and improvement of teaching toward the desired outcomes of great teaching across the campus.

5. Encourage *campus dialogues on great teaching* that are context specific (see above) and institution-wide. Persons who teach in similar physical, field/discipline/profession, and curricular framework contexts will have much to gain from conversations about great teaching in those shared contexts. The same is true when everyone from the teaching community on the campus can enjoy a conversation regarding great teaching, its evaluation, and its development. It may be necessary to formally create time and physical spaces for these dialogues. It may mean introducing a common “great teaching” theme to the faculty, but it can be a focal point for the dialogue. It may take a while for a formal dialogue to span the campus, and the culture of the campus may not initially seem oriented in this way.

6. Create *campus-sponsored grants* that provide faculty with some of the resources needed to develop their own great teaching. These grants may provide relief from some teaching responsibilities so faculty members have time to focus on developing their potential. Such grants may provide resources for faculty to attend conferences or visit other universities where they can explore the practices of great teaching.

How Do You Link These Three Processes?

While having a definition of great teaching is valuable, as is knowing how to evaluate and develop great teaching, as independent parts of the campus’s teaching mission, they are not as powerful as possible. The most powerful way to achieve more great teaching on campus is to link the defining, evaluating, and developing of great teaching. How can we link these three processes and therefore provide a great teaching synergy on the campus?

The answer is more easily said than accomplished due to the political nature of higher education institutions. However, four words capture much of what must be accomplished.

Plan. Work across campus units, including academic and fiscal administration and faculty, to develop a coherent model and a plan for the coordination of these three processes as one program.

Empower. Give responsibility and authority to faculty groups representing the various contexts on campus to work at defining great teaching for each of those contexts and designing appropriate great teaching evaluation instruments.

Provide. Set aside financial resources to provide budgets for creating the faculty development efforts, to sustain those efforts, and to reward great

teachers and those who work toward becoming great teachers.

Prioritize. The rhetoric of campus leaders, those faculty and those in academic affairs, the policies and procedures established and reviewed, budgets, and purpose statements all should reflect a commitment to great teaching across the campus.

One component that is almost always required for change to be considered, charted, and carried into reality is a champion. That person could be an academic administrator or it could be a great faculty member heralding the need to address the issues related to great teaching. However, more times than not, it is neither a top-down nor a bottom-up approach that is successful. Rather, an effort to link the defining, evaluating, and developing of great teaching should be a collaborative effort of champions within the academic administration and the faculty.

Great Teaching Realized

Be the champion. Take up our idealistic challenge: consider our definitions of great teaching; the means by which we evaluate our progress toward that ideal; the strategies to improve ourselves from being good to great teachers; and, most powerfully, how to link these three processes through a campuswide faculty development program.

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The Complete Student: Implications of a Three-Dimensional View of Students for College Teaching

Elizabeth L. Paul, PhD

In the wake of sweeping societal and technological changes during the last decade, students' attitudes toward higher education have changed to become more consumer-oriented and vocational in nature. Ways in which today's student resists learning have also changed. Here the author discusses the resulting dilemma when a college instructor holds a one-dimensional view of students. She considers how this view might contribute to or promulgate the challenging learning environment. She compares the one-dimensional with the three-dimensional view of students and discusses how instructors can apply the three-dimensional approach in the classroom and how they can implement it to inspire and challenge students to strive for greater success.

Stockton College invited Dr. Paul to present this paper to the Faculty Forum on College Teaching on April 12, 2000.

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Since the 1990s, the efficacy of higher education has been challenged from all corners. Faculty and administrators lament students' lagging motivation and their shortsighted consumer mentality. Students complain of boredom and irrelevance in the college curriculum. Business leaders alert us to the chasm between college curricular goals and workforce needs. The information technology explosion has prompted some individuals to question the need for college and university physical campuses altogether, purporting that virtual institutions would be more efficient. Demographic projections render multiculturalism an educational imperative, yet racial tension remains a most pressing campus concern.

A One-Dimensional View of Students

In this era of educational alarm, most faculty members have a one-dimensional view of the student, and judge him or her a poorer learner than past generations of students. They complain about student deficiencies and increased need for remediation. Virtual colleges are premised on a one-dimensional view of student as learner. They omit cocurricular and other out-of-class experiences, typically characteristic of the college experience, focusing solely on the *virtual* delivery of instruction to *virtual* student learners. Common approaches to outcomes assessment focus on the results of in-class learning, usually overlooking the impact of out-of-class experiences. In viewing the student as one-dimensional, as deficient learner, faculty members render contemporary students more and more inadequate and even invisible.

Frances K. Stage, Lemuel W. Watson, and Melvin Terrell (1999) posed this challenge to the discussion about higher education reform: "Do we know enough about students in order to create opportunities to motivate them to become involved and committed to their educational experience?" Bringing students back to the heart of the matter of higher education requires beholding students as three-dimensional individuals. The *complete student* brings to the classroom lived experience, a sociocultural context, and a generational identity. Thus, the learner is neither one-dimensional nor acontextual, but rather three-dimensional.

Shifting from a One-Dimensional to a Three-Dimensional View

In contrast to a one-dimensional view of contemporary college students as learners, consider the following description of twenty-one students in the research methods course I recently taught. All are full-time students taking five to six courses, and all are gainfully employed working from five to thirty-five hours each week. Six students have more than one job. Sixty percent work primarily for spending money; forty percent work primarily to pay their tuition. Four students are mourning the recent death of a parent. Two are battling anxiety disorders and experience frequent panic attacks. One young woman, an only child of a single mother, is caring for her mother following heart surgery and weathers the storm of her mother's bipolar disorder, which

has been uncontrollable since her surgery. Another student is fighting a severe depression and literally works to stay alive from day to day. Two students are attending college while raising children and working thirty or more hours a week. One of these women also cares for her ailing mother. One student sought a restraining order to gain protection from her ex-boyfriend who was stalking her. Six students are supported by the Educational Opportunity Fund and struggle to bridge their lives as college students and members of families who live in, or near, poverty. One young man who recently lost his father is faced with caring for his younger siblings, because the loss has debilitated his mother. One student has fallen twice on campus and now requires a wheelchair and an assistant to travel around campus. Two students were the targets of racial slurs while walking to class last week.

I do not offer this description to stir pity or sympathy or to set an expectation for the extent of knowledge professors collect about their students. I offer this information to remind us that our students are complex and bring to the classroom the richness of past and present experience and challenging life circumstances. The complete student is not an empty vessel waiting to be filled with knowledge. To engage today's students fully in a dynamic learning process, it is necessary to respect and invoke their three-dimensionality.

It is instructive to examine the possible causes of resistance to learning today. Does the one-dimensional view of today's student contribute to these barriers to effective learning? Can a change to regarding students as three-dimensional learners create a positive change in the learning environment? How could we accomplish this change, or is it even possible to effect such a change?

Manifestations of Resistance Behavior

A three-dimensional view of contemporary students also examines how dramatic sociocultural change in the last quarter of the 20th century has affected students. Consider, for example, a three-dimensional view of the faculty complaint of student resistance to learning.

For decades, members of the faculty have been troubled by the ways students avoid or resist learning, manifesting diverse emotions, cognition, and behaviors:

- **Emotional** manifestations include feelings of anger and fear.
- **Cognitive** forms include the defensive persistence of concrete conformist thought and unproductive attitudes toward learning.
- **Behavioral** resistance includes verbal expressions of rejection and nonverbal indicators such as apathetic body posture, dismissive facial expressions, and physical aggression.

Resistance behaviors are sometimes positive (politeness, emphasizing neat appearance of work versus content) and sometimes negative (hostility and aggression); sometimes passive (not attending class, not completing assigned reading, silent disagreement, conformity) and sometimes active (aggressively questioning the premise of a course). The focus has been predominantly on

student resistance to learning, but teachers can also be resistant to learning (fears of conflict, student debate, and emotion in the classroom).

Resistance to learning is not a new problem. However, manifestations of resistance and the reasons for resistance seem to have shifted over the last several years. While in the 1960s and early 1970s active and aggressive protestation was common, today passive resistance behaviors are more common. Faculty members complain about students' silence in the classroom, "dead eyes," and students "checking out." They observe refusal to ask or answer questions, lack of participation in class discussions and activities, and absence of curiosity and intellectual play. Faculty note students sleeping in class, putting their heads on the desk, coming to class late and leaving early, increased excuses for not completing work at all or on time, and not making use of faculty office hours. Students express resistance to general education, question the relevance and practical utility of course material, and are motivated heavily by grades.

Why do contemporary students resist learning? In contrast to youth in the "protest era" who actively resisted particular perspectives because they were politically and personally engaged and because they wanted to feel passionate, contemporary resistance seems to stem largely from feelings of disengagement and disconnection, wanting to avoid feelings, or wanting to feel numb. Indeed, many students express "future shock" or fear about their world and future. They see little efficacy in investing themselves in an active learning process because they are not optimistic about their ability to make a difference. In a fearful state, students are also less tolerant of challenge and cognitive dissonance.

Historically, higher education has been viewed as a context for identity discomfort, crisis, exploration and formation. However, this is an increasingly difficult task in these times of great and rapid change, and the result is insecurity. The great pressure to become financially solvent and secure leaves little time for personal growth. Indeed, in this context, active learning seems incompatible with students' academic goals—to acquire the skills necessary to obtain a lucrative and/or stable job. In fact, as we clearly saw within my students' life situations, more and more students already have multiple responsibilities (work, family, and school) and feel overwhelmed and exhausted. College is the route to "passing go" and collecting the ticket to gainful employment. An additional hypothesis about resistance to learning is that today's students have limited critical thinking abilities, resulting partly from traditional elementary and secondary education curricula, and partly from the information technological revolution. Some education scholars (e.g., Healy 1998) caution that increased computer and Internet use create numb minds that rely on smaller bits of information and make snap judgments rather than reasoned decisions.

Effects of Societal and Technological Changes

Arthur Levine and Jeanette S. Cureton (1998) cogently argued that, in addition to understanding the sociocultural context of today's students, we must examine their generational identity to better understand their struggles

and resistances. The current generation of traditional-aged college students has experienced no overpowering or galvanizing historical or political events in their lifetime, even though profound societal change has taken place. This void has handicapped students' feelings of connection with their societal and historical context.

In a recent survey of New Jersey college students, when asked what social or political events had impacted their life, typical responses included: "I can't really think of anything right now that has directly impacted my life." "It's hard to think of major social events that impacted me. Most large events in society or politics seemed outside of my daily life. I still went to school the next day, and nothing seemed to change." "It is really sad that I can't think of any that have really had an impact on my life." Instead, students often listed such personal events as parental divorce, family crises, romantic involvements, and personal social events. Certainly some students would now mention the tragedy of September 11, 2001; however, research is needed to determine the extent of the impact this event had on students' attitudes and behaviors.

Paradoxically, this relative void in students' societal and historical reflections is paralleled by profound demographic, economic, global, and technological change. Societal problems, such as economic inequality, racism, crime, environmental problems, and crises of national identity, continue in the absence of solutions. It is a time of rapid technological change, feelings of loss and yearning for the past or the "known," and insecurity about the future.

The Consumer Mentality

Higher education, too, has undergone a sea change, from being elite to broadly available, serving a much larger percentage of high school graduates and even more nontraditional-aged or returning students. The U.S. Department of Education (1999) reported that nearly one-half of college students are over the age of 22, and fewer than one in six students fit the traditional college student stereotype in terms of age, full-time student status, and on-campus residential status. Higher education often is not the uppermost priority for these students, as they face concurrent family and employment pressures. Moreover, given the more universal accessibility of college and "degree inflation," a college education no longer carries the benefit of ensuring the best jobs, and it no longer serves as a sheltered haven, albeit temporary, from social forces. Thus, students desire a different relationship with their college.

In the words of contemporary New Jersey college students, when reflecting on why they are in college:

I'm here to get a better job so I can make more money than I would if I only had a high school education and so I'm not stuck doing some boring job I don't like but I can't get anything better.

If I didn't need college to get a "good job" (i.e., corporate/business work not manual labor), I probably wouldn't be here.

To graduate and receive the piece of paper that tells the world I'm an intelligent and productive member of society, whether or not that

is the case.

To get an education which will allow me to get a good job. It's expected that I go to college; not going was NOT an option.

Basically, it's what students do after high school.

To get a degree, good job, earn respect, because almost everyone goes to college nowadays.

To learn how to do a job.

I want to learn about stuff I like, and I want to make money.

These students reflect the consumer mentality described by Levine and Cureton (1998). They have consumer expectations of their colleges—convenience, quality, service, and low cost—to which colleges are responding with more business-like administrative and legalistic roles. Students' academic goals are becoming more practical, material, and vocational as they seek job security and financial success in an ever-changing world. Attending college has become the vehicle for preparing for a career, mastering a specific field, and training for an occupation.

Critical Elements for Success

Unfortunately, not only are these vocationally oriented and confident students found by their professors to need more remediation in basic skills and knowledge, they also are found by prospective employers to be deficient in the skills necessary for future productivity and success in the changing work world. The Business-Higher Education Forum (BHEF 1999), in partnership with the American Council on Education and the National Alliance of Business, described the ways global economic transformation has changed the world of work and survival skills for workers. In the past, employers prized job-specific skills, seniority earned job security, and homogeneity and integration characterized the workplace. Today, the markers of success in a high-stakes, global economy are broad skills, flexibility, tolerance of ambiguity, analytical skills, creativity, interpersonal communication skills (oral, written, and electronic), a collaborative approach to problem solving, a strong work ethic to meet higher performance expectations, and an ability to work with diverse peoples. Diana G. Oblinger and Anne-Lee Verville (1998) added the imperative of lifelong learning to this list. Indeed, their book and the BHEF report alert us not only to the chasm that exists between the challenges posed by rapid global transformation and the pedagogical goals and strategies still common in institutions of higher education, but also, I believe, to a chasm between the actual demands of today's workplace and student perceptions of those workplace expectations and their recipe for personal success.

Critical elements of today's high-performance workplace and beyond are heterogeneity and multiculturalism. Our population is becoming more and more racially and ethnically complex and diverse. According to the U.S. Bureau of the Census (1996), the largest increase in U.S. population is among racial

and ethnic minorities (especially Asian and Hispanic Americans). And, at some time between 2030 and 2050, white Americans will constitute a numerical minority (albeit large class differences in this ratio) (Richard L. Zweigenhaft and G. William Domhoff 1999). Moreover, growing globalization of the economy further increases the heterogeneity of our reality.

Still, multiculturalism is an unresolved issue on campuses. In an era of political correctness, great tensions over issues of diversity remain, yet students and faculty are reluctant to talk about multiculturalism. In a nationwide survey of "Generation 2001," the first college graduating class of the new millennium, David Krane and Amy Cottreau (1998) reported that 52 percent of Caucasian students, 71 percent of Black students, and 60 percent of Hispanic students rated the current state of race relations in the United States as negative. Victimization, including hate incidents, riddles college campuses. Racial and ethnic groups are segregated socially and organizationally. Student groups defined by increasingly specific social identities proliferate on college campuses. Isolation of individuals in one group from those in another further exacerbates in-group/out-group dynamics and the promulgation of rigid stereotypes, yet may provide needed support for individuals who feel disenfranchised and oppressed. The complex emotions kept smoldering in the underground of campus include rejection, guilt, confusion, fear, uncertainty, hate, and loneliness. Campuses nationwide have tried to "talk the talk" of inclusion and multiculturalism; "walking the walk" has proven to be a formidable challenge. Not only minority students suffer as a result; we all suffer, even though many of us may not recognize our loss.

Classroom and Campus Innovations

A three-dimensional perspective on contemporary college students must be central in the ongoing conversation about creating a system of higher education that inspires students to new heights of learning and growth and also prepares them for a complex and ever-changing world. At the same time, this three-dimensional perspective can be a powerful tool for faculty to inspire change in the classroom. For example, I maintain that a central obstacle to creating classrooms and campuses that celebrate difference (rather than homogenize, and even fear, difference) is the denial of students as three-dimensional. Derald Wing Sue (1997) asserted that achieving multiculturalism requires two conditions: (1) honestly examining unpleasant racial realities such as racism, prejudice, stereotyping and the personal consequences thereof, and (2) accepting responsibility for change. It is important that this process start at the personal level, and to be most effective, inclusive pedagogy must engage the complete student and the teacher.

Multiculturalism has often been taught by presenting students with a smattering of examples, rituals, and customs from disparate parts of the world, or by listing defining characteristics of categories of people that set them apart from others. In contrast, engaging the complete student recognizes the primary importance of in-depth critical study of one's own origins as a basis for comparative excursions into other cultures rather than overfocusing on the

impersonal analysis of others. Moreover, such cultural identities as race are seen not as boxes or categories but as lived experience and as interpersonal relations. For example, M. Jacqui Alexander (2000) defined *race* as construction, fabrication, and absurdity and asked us to examine how we live through racial scripts. In this spirit, Alexander urged educators to be willing “to be unrelenting in the desire to ask difficult questions about who we are.” We must ask questions regarding the ways our students have constructed their identities. We must consider “what it means to be young in a fraught, racialized America.”

Paula Rothenberg (2000) noted that this approach requires that we resist the popular push to simplify and streamline, which is so seductive to contemporary students. Rather, we must make things *more* complicated. Cynthia Enloe (2000) echoed that, “We must help our students be part of a world that is not easily graspable, in which histories are barely visible, and that is full of complexities that are very difficult to comprehend.” Being a teacher in this context is risky, exciting, and unpredictable. We can serve as important role models to learners for whom the classroom experience, and life experience, is just as intense.

Viewed from a three-dimensional perspective, student resistance to learning and conflict in the classroom can be a powerful opportunity for learning rather than an obstacle. Periodically shifting students’ attention from the content of a course to pedagogical processes can empower them to take charge of their learning environment and collectively and individually define learning goals. The key to this process is to acknowledge students’ fears, anger, and stresses, perceiving them as complete people rather than solely as learners. Past strategies were focused on creating a classroom climate that encouraged students to express their perspectives. To help overcome the disconnection between academe and real life, we must augment those strategies by helping students identify and explore their own perspectives first. Moreover, we should explicitly demonstrate the relevance of course material to their everyday lives and to future personal fulfillment.

With a three-dimensional view, I recognize the value of active pedagogical strategies and contemporary education trends, such as community-engaged learning and interdisciplinary study. Contemporary students often receive mixed messages from educators. Faculty complain that students are not engaging themselves actively in learning. Yet faculty who use passive pedagogical approaches do not engage the students’ senses and selves in learning. Faculty must model the kind of engaged learning we desire. Active learning strategies include:

- Engaging students in active discussion, debate, and reflexive thought;
- Guiding students in conducting ethnographic studies of diverse contexts and groups of people;
- Challenging students to work collectively through problems with practical relevance;
- Encouraging students to apply course content to their past and present experience;

- Drawing on students' context and experience to generate ideas for research projects;
- Directing students to converse with someone similar and someone different from themselves and to consider who teaches them more about themselves;
- Involving students in action-oriented projects; and
- Requiring students to participate in an online discussion (provided that all students have access to technological resources) with student colleagues from another college or context.

The very nature of these approaches will increase students' opportunities to involve themselves in their learning and will improve classroom dynamics. Focusing on process, as well as content, is a strength of active learning, which is necessary to actualize the recommendations made in the BHEF report (1999). That report recommends that the core curriculum include development of "flexible and cross-functional skills" (e.g., leadership, teamwork, problem solving, analytical thinking, communication, and time management), as well as personal traits or orientations (e.g., adaptability, positive work ethic, self-management, global consciousness, and a passion for lifelong learning).

For decades, many faculty considered broadening the horizons of their students as a key educational goal. To accomplish this, we crafted in-class presentations about different peoples. Community-engaged learning, defined as active learning through contributing to community good, translates this one-dimensional implementation into a three-dimensional mechanism for deepening students' understanding of humanity. Community-engaged learning prompts students to engage themselves in a real-world setting and to perceive and experience a different part of their community. Most importantly, students interact with three-dimensional people and come face to face with different life circumstances and experiences. In this environment, considering the complete person (including themselves) is more explicit than in the classroom. Integrating in-class discussion about students' personal experiences with community-engaged learning is a powerful way to infuse a complete student perspective. Aspects of themselves that students are socialized to withhold in class are explicitly unleashed in community-engaged learning experiences.

For today's student, catalyzing, leading, and experiencing change in contemporary society requires flexibility, creativity, tolerance of ambiguity, and innovation (many of the same qualities prospective employers count as important for career success). An interdisciplinary focus is an excellent model for the growing complexity and interconnected nature of society. Thus, one of the challenges in curriculum development for higher education, enumerated by Oblinger and Verville (1998: 86) and echoed in the BHEF report (1999), is developing creativity, "making new and unusual connections by bringing together seemingly unrelated ideas, objects, or events in a way that leads to a new conception." This is the very dynamic that often results from connecting to students as complete people in the classroom.

The Complete Teacher

Focusing solely on pedagogical technique, however, we are overlooking important dimensions of faculty as “complete teachers.” As a teacher, I struggle with the three-dimensional view I am advocating. Some of my colleagues vehemently denounce the necessity of a three-dimensional view. Contemporary college students are seen as no different from past generations of college students. Learning is learning; social context is irrelevant. Particularly problematic is the openness to students’ lived experience. A strict *don’t ask, don’t tell* policy is enforced. While I do not require my students to reveal themselves to me, my expressions of interest provide an opening for some students to deepen my perspective of them. I value their complexity; I also struggle with what to do with the three-dimensional perspective.

Consider this all-too-common portrait of a contemporary college student. It is based on data I collected in December 1999, about the daily experiences of New Jersey college students, as well as on recent Department of Education statistics (Laura J. Horn and Jennifer Berkthold 1998) on the typical age and employment status of U.S. college students. A 36-year-old single mother of two, working thirty hours a week, takes an average of five or six courses a semester and spends about sixteen hours a week in class. I appreciate the lived experience of this student. I respect the complexity—and seeming impossibility—of her life. Yet, I hold her to the same high expectations as other students in my class. A three-dimensional view need not lessen academic quality. Indeed, a three-dimensional view potentially increases academic quality as complete students are supported, encouraged, and stimulated in personally meaningful ways.

As we begin to expand our view of students, examining our own attitudes and stereotypes is important. All too often, when students are struggling, we conclude that they are not trying hard enough, that they are “slackers” and don’t have what it takes to succeed. A three-dimensional view prompts us to consider what barriers may stand in the way of the students’ engagement and learning. The answer is usually very different from the “slacker” presumption. I have found that expressing this concern to students is quite empowering. Although some students refuse initially, or altogether, to work with me or another advocate to search for the answer, others accept my care and concern. The teacher’s three-dimensional view might be all that is necessary to turn the student around. Sometimes, as in the case of the student described above, the simple acknowledgement that what they are experiencing is difficult (thereby acknowledging the complete student) gives students increased motivation to involve themselves in learning.

Sometimes the teacher’s understanding leads the student to a needed on- or off-campus resource. Sometimes the answer is not found, and the student does not complete the course successfully. But for those students who gain self-insight and support as a result, their accomplishments are the sweetest of rewards. We sometimes forget that holding students to high expectations and supporting their efforts to reach for them may be a critically important, and all too rare, source of self-esteem and accomplishment. In turn, their intrinsic

motivation to engage actively in learning is fueled.

We must also be sensitive to dynamics of power, class, and privilege in enacting a complete student approach. Some students have had more life experience with asserting themselves and “working the system.” Others have had little opportunity to make themselves visible and to be heard. Our challenge is to even the playing field, inserting humility, bidirectional responsibility, and empowerment, when necessary.

A complete student approach also necessitates an important shift in institutional structure and climate. The different divisions of a college must work together to help students achieve learning and development goals. An important realization is that faculty need not take responsibility for directly serving the personal or extracurricular needs they observe in their students. A faculty member must be knowledgeable about student support services in order to refer students when necessary. They must also communicate with student affairs administrators and staff to share their observations of student life, information that counseling staff can use to plan supportive programming. Moreover, communication must be bidirectional so faculty can learn from the expertise and insight of student affairs staff about the most effective ways to engage students.

I believe it is important to note that a strong, and perhaps even more thoughtful, voice in the national conversation about pedagogical and curricular reform in higher education comes from student affairs personnel. Political dominance hierarchies in higher education have limited the benefits of this quality discourse to faculty, and ultimately to students. In fact, on many campuses there is great contention and competition between student affairs personnel and faculty.

A New Ecology of Academic Life

In conclusion, we must respect the courage necessary to take risks, to cross boundaries, think creatively, and innovate. I am concerned about the cavalier manner in which assertions are made regarding the need for students to engage themselves more actively in learning, and also about the need for faculty to use more active pedagogical techniques. The risk involved in these missions is rarely acknowledged. A complete student approach is more intensive in faculty inputs *and* in student, faculty, and societal outputs. We must consider this intensity in reforming higher education so we can achieve balance between economic and efficiency considerations and the efficacy of a complete student approach. L. Lee Knefelkamp (1990: 11) challenged us to consider what kind of models higher education institutions and faculty present to students. “Are we demonstrating a community that is non-developmental, unresponsive to the complexities of human beings, unwelcoming of fresh and challenging voices, and unwilling to risk the revolutionary nature of change?”

We need a new ecology of academic life, one that acknowledges the three-dimensionality of students, and of all members of the college community. Indeed, respecting and supporting the seasons of our own evolution as

complete teachers promises to optimize our passion for working with complete students.

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Acknowledgments

I gratefully acknowledge William Ball, Timothy Clydesdale, MaryAnn Baenninger, Mary Elaine Perry, and Kelly Grady for their insightful comments on a draft of this manuscript.

I also appreciate the participants of the College Experiences Resource Group of The College of New Jersey and The New Jersey Project for their continued inspiration.

“Dumb Jocks?”

Do Learning Style and Temperament Theories Account for Differential Academic Success of Student-Athletes

Kimberlianne Podlas, JD

Recognizing doubts about the academic ability of student-athletes, this instant study collects and analyzes data of athlete and nonathlete grades, learning styles (as defined by Sternberg’s executive, legislative, and judicial categories), and temperament types. The sample encompassed 125 students (29 athletes, 96 nonathletes), studied in two groups (fall and spring semesters), in a 200-level course.

Data disclosed that, although athlete grades were lower than those of nonathletes on tests #1 and #2, they were higher on test #3. Moreover, athlete grades experienced a mean increase, whereas nonathlete grades decreased on this final assessment. Data also showed that athletes possessed the same executive learning style as nonathletes—and in higher proportions. Finally, however, athletes exhibited a decidedly different temperament type indicator than nonathletes. The majority of athletes demonstrated a type associated with flexibility and comfort with lack of structure, whereas nonathletes demonstrated essentially the opposite temperament type. Nonathletes were a type associated with formality and desire for structure and rules. The author substantially duplicated these results in the second testing.

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The student population of the academy has gradually changed. First generation, nontraditional, and “forgotten half” students now enroll with regularity (Lawrence Gladieux and Watson Swail 2000). Research has suggested that some of these students may be “different” not only in average family income, entering SAT scores, or ethnicity, but also in predominant learning or thinking styles (Chalisa D. Gadt-Johnson and Gary E. Price 1999; Walter F. Heinecke and Hollylynne Stohl Drier 1998). This difference is an important factor in academic success (Gadt-Johnson and Price 1999).

Accordingly, determining and accounting for differences in learning style can offer explanations regarding response to instruction and development of appropriate pedagogical techniques. (Noel Entwistle 1981). Although sometimes evaluated with an eye toward adult or remedial education, the concept of learning styles has also obtained value in graduate and postgraduate education, as witnessed in experiential education, problem-based learning, and web-based classrooms that develop advanced research skills. Hence, integrating learning styles is not simply a mechanism to change the scale of academic measurement, making the “dumb” student feel smart or increasing self-esteem. Rather, it can open the content of higher education venues to a greater number of students, as well as expand their intellectual flexibility and ability to manipulate knowledge in different ways. Pedagogical techniques, however, many of which have been initiated or tested at the K–12 level, have not always been appropriate for the college classroom, responsive to problems unique to the college student population, or met the rigor of university-level research standards (Robert J. Sternberg 1998).

One issue of present concern in the academy is the academic ability (or lack thereof) of student-athletes and their responses to college-level instruction and content. The author’s instant study, which was motivated when student-athlete grades increased, considers whether learning styles and/or temperament type effect such grade differentials—do student-athletes exhibit a style different from nonathletes? This study collects and analyzes data of student-athlete and nonathlete grades, learning styles, and temperament scales, and confirms its hypotheses with a second sampling.

Academic Proficiencies of Student-Athletes

With regard to academics, one of the most vilified student groups is student-athletes. It is not uncommon to hear whispers in university halls questioning their academic ability. (Erik Lords 2000; Welch Suggs 2000, 1999c). Indeed, Suggs (1999c) reported that Amherst College, a Division III institution prohibited from awarding athletic scholarships, has lower admission standards for its athletes than other students. The 1999 decision in *Tae Kwan Cureton v. NCAA* also publicized the academic disparity between the standardized test scores and academic performance of many student-athletes as well as between their academic performance and that of nonathletes.¹ In fact,

1 *Cureton v. NCAA*, 37 F. Supp. 2d 687 (E.D. Pa. 1999), reversed, ___ F.3d ___, No. 99-1222 (3rd Cir. 1999).

the National Collegiate Athletic Association (NCAA) established the freshman eligibility rule, Proposition 16, in large part, to battle perception regarding the hollow education of athletes. (Proposition 16 requires incoming athletes to have an SAT score of at least 820, ACT sum of 68, and GPA of 2.5, scores that the NCAA believes portend graduation rates² [*Cureton v. NCAA*]).

Moreover, *The Chronicle of Higher Education* reported a limited survey that cast suspicion on the academic abilities of athletes at the University of Tennessee (UTN) (Suggs 2000). In 1995 the UTN's Director of Composition began studying the transcripts of twenty-two athletes enrolled in introductory English, suspecting that they had received illegitimate help on papers submitted for class. The transcripts showed that most of the athletes in the survey benefited from frequent changes to their final grades, and spent many semesters on academic probation. Furthermore, the players had a median grade-point average of 2.2, and thirteen of the twenty-two had averages of less than 2.0 (Suggs 2000).

Notwithstanding these suspicions regarding substandard academic performance, student-athletes graduate at higher rates than their nonathlete colleagues. According to the NCAA's annual study of academic performance, 58 percent of Division I athletes who entered college in 1992 graduated, compared with 56 percent of all students. At Division II colleges, 50 percent of athletes graduated, compared with 43 percent of all students. Also, though black athletes graduate at lower rates than their white teammates, they graduate at a higher rate than black students as a whole (Welch Suggs 1999a, 1999b).³ While some believe that this disparity in graduation rates and grades raises questions regarding the quality of the degrees awarded to student-athletes, it also raises questions regarding why such a disparity exists, if it actually exists, and any instructional mechanisms that may account for or decrease performance differentials.

Educational Research Regarding Student-Athletes

There is a continuing need for accurate information regarding the academic achievement and abilities of student-athletes (Lords 2000). Unfortunately, accurate educational practice data has traditionally been in short supply and, often, of questionable quality (Daniel P. Mayer 1999). In fact, the routine collection of educational data in general began only in the 1980s (Mayer 1999) and, commonly, so-called data comes from after-the-fact teacher surveys of perceived classroom occurrences. Moreover, much of this has not been validated through standardized measurement processes (Mayer 1999).

To build and verify coherent explanations regarding student-athlete

- 2 Using the index, a student-athlete could establish athletic eligibility with a GPA as low as 2.000, provided s/he obtains an SAT score of 1010 or an ACT sum of 86; a minimum 820 SAT or 68 ACT sum establishes the floor for students with GPAs of 2.500 or higher. (*Cureton v. NCAA*).
- 3 Only 37 percent of the black students who entered Division I colleges in 1992 earned their degrees within six years, 31 percent men and 41 percent women. (Welch Suggs 1999b).

academic performance and competencies, information should go beyond recording graduation rates and incoming test scores. Rather, researchers should collect data on academic achievement in the college classroom (and assessment instruments) and should contemplate variables including response to instruction, content area and exposition, and academic rigor. Results must be able to be generalized and subjected to retesting (Gerald W. Bracey 1998).

Furthermore, educational research must exert its intended effects on practice (Heinecke and Drier 1998). With regard to student-athletes, research should seek to understand why, as in *Cureton*, students might succeed in high school but fail on standardized tests. Is high school success a result of grade inflation, or do appropriately tailored instructional methodologies better teach to and measure the proficiencies of this group of students (in a way that SATs do not)? Research should inform decision making regarding academic measures and methods applied to student-athletes: Is it worthwhile to refine instructional strategies (because traditional college instruction fails to tap into innate and present, but differently exposed, intelligences), or should we focus on more traditional remedial education? Stated otherwise, are athletes “smart” students who simply do not match the predominant teaching and assessment styles utilized in undergraduate education, or are they only “average” to “below average” students to whom instructors must apply remedial or “special education” precepts? The undertaking reported here attempts to provide testable educational data regarding student-athlete academic success and differential response to the interaction and effect of learning style.

Learning Style Theory

Differential academic success may result in part from different ways of learning or differing levels of intelligence, however defined (Gadt-Johnson and Price 1999; Sternberg 1998). Where different ways of learning influence success, learning style theory is implicated. Though the concept of learning styles has many definitions, generally, it speaks to an individual’s response to instruction. Thus, learning style models concern themselves with the process of learning: how individuals absorb, interpret, and evaluate information. Thinking styles or learning styles also implicate how one uses her abilities, therefore, people may possess almost identical abilities but have different styles. (Sternberg 1998, 1997).

Typically, society does not judge people of equal ability as equal, but rather assesses abilities as highest when people’s abilities best match the abilities taxed in certain situations. A high positive correlation between ability possessed and ability sought, assessed, or used in instruction will beget a more positive assessment or higher grade. Therefore, what may be seen to be lack of intelligence may actually be a mismatch between learning style and teaching or assessment style (Sternberg 1998). Moreover, although style may not account for all of the difference between grades of, for instance, A and C, it may account for some portion of that difference.

Among the most prominent learning style theorists is Robert Sternberg. Sternberg has developed a triarchic theory of human intelligence, which distills

to methods of teaching and assessing students. Within his triarchic theory of mental self-government are three forms of organizing one's thinking. These styles correspond to the functions of government: executive, legislative, and judicial. The executive style favors application of existing facts and theories. Thus, executive students prefer multiple-choice, short-answer, and fill-in-the-blank tests that call for learned facts. The legislative style is the creative style, filled with individuals who like to design problems, formulate hypotheses, and develop new ideas. The judicial style describes individuals who prefer evaluating rules or procedures and comparing and contrasting ideas and outcomes.

According to Sternberg, schools traditionally favor the executive style (Sternberg 1998). Consequently, students possessing the favored executive style learn in classrooms that match their style, thereby creating the best possible learning environment (and, when it comes time for assessment, can best respond to assessment mechanisms). Students possessing the less prevalent judicial and legislative styles will not enjoy the same opportunity to display their competencies or obtain instruction consistent with their leanings. Thus, learning style may account for differential academic success where "intelligence" is equal, or it may falsely increase success of traditionally styled but less gifted learners.

The Study

The instant study sought to develop data on student-athlete academic achievement and learning style differences, and, ultimately, to consider whether the instructor might validly implement models contemplating learning style to address differential success. This study, in fact, responded to an actual educational phenomenon (Elliot W. Eisner 1984). It was motivated by an apparent discrepancy between the grades of nonathletes and student-athletes and a subsequent shift in comparative grades: It appeared that the grades of nonathletes on tests (assessments) #1 and #2 were superior to those earned by student-athletes, but (unexpectedly) that the grades of student-athletes on test #3 were far superior to those of nonathletes.

The instructor structured the course with Sternberg's three (functions) thinking styles in mind. Delivery of instruction, exercises, and assessment mechanisms utilized and flowed from more traditional executive styles to the judicial and then legislative styles. Consequently, the instructor surmised that the change in test score related to variance in instructional and assessment style, specifically, that nonathletes exhibited a style most similar to (or least different from) that demanded of assessments #1 and #2, while student-athletes exhibited the converse.

The Method

The instructor-researcher initially conceived this study as a two-part inquiry, a grade comparison of the three assessments and a learning style assessment and comparison (both, student-athlete versus nonathlete). After the initial hypothesis was not borne out, the instructor added a third phase. Thus, the study, as reported, possesses three main components: (1) a compara-

tive analysis of grades (student-athletes compared to nonathletes) on the tests/assessments; (2) a survey and comparison of learning styles (as defined by Sternberg's "functions" categories of executive, judicial, and legislative styles) of student-athletes and nonathletes; and (3) a survey of personality/temperament indicators as measured by Don Lowry's True Colors (1978).

The Sample

The sample consisted of 125 students studied over two consecutive semesters. Of the 125, 29 were athletes and 96 were nonathletes. Students were mainly freshmen and sophomores in a 200-level legal studies (introduction to law/business law) class, a part of the core curriculum. Each class contained 30 to 34 students, and the same instructor taught each. Two classes of students were assessed in the fall semester, and two classes were assessed in the spring semester. The instructor-researcher omitted the foreign or "study abroad" students from the sample group.

Students in the sample attend a small, four-year business college in New England, a Division II school that graduates 100 percent of its student-athletes (and does not yet award athletic scholarships).

Variables

Students used a different edition (but same author) textbooks in the fall and spring semesters. Additionally, the instructor altered the order of subjects taught in the spring from those taught in the fall, and replaced and reordered some other content, but the primary subjects she taught remained the same and in the same order. Importantly, she maintained the course design in relation to the executive, judicial, and legislative styles, as realized through instructional delivery, exercises, and assessment mechanisms.

The instructor designed the assignments as follows:

- Assessment #1: executive elements, minor judicial elements; highly structured.
- Assessment #2: executive elements, minor judicial elements; structured.
- Assessment #3: executive elements, significant judicial elements; highly unstructured.

Data: Student Grades

To ensure that the apparent shift in grades prompting the study was actual, the instructor-researcher recorded the mean, median, modal, and range of grades for both student-athletes and nonathletes. She further divided them according to semester of enrollment, i.e., fall and spring. She obtained a roster of student-athletes in the courses from the department of athletics. (These records are kept and made available pursuant to NCAA and school requirements).

Each test/ assignment was worth a maximum of 30 points.

Fall Semester 1999

	Student-Athletes	Nonathletes
TEST #1		
mean	21.2	25.4
median	20	24
mode	20	24
range	12–26	16–30
TEST #2		
mean	20.8	26
median	20/22	26
mode	21	24
range	14–26	12–30
TEST #3		
mean	25.52	18
median	26	20
mode	26	19
range	20–29	2–29

Spring Semester 2000

	Student-Athletes	Nonathletes
TEST #1		
mean	22.5	26.2
median	23	24
mode	22	26
range	16–26	12–30
TEST #2		
mean	24	28.6
median	25	28
mode	24	28
range	20–30	22–30
TEST #3		
mean	27	21.6
median	27	22
mode	28	23
range	23–30	16–30

Comparative Analysis of Grades

An analysis of the grades achieved by student-athletes as compared to those of nonathletes disclosed that, just as it had initially appeared, the grades of student-athletes on assessments #1 and #2 were lower than those of nonathletes. On assessment #1, student-athlete scores were an average of 3.95

(4.2 Fall and 3.7 Spring) points lower (13 percent) than nonathletes. On assessment #2, student-athlete scores were an average of 4.9 (5.2 Fall, 4.6 Spring) points lower (16 percent) than nonathletes. Also, over the period from assessment #1 to #2, nonathlete scores had increased slightly, whereas student-athlete scores had declined minimally in the fall semester, but risen slightly in the spring semester. Nevertheless, even within this increase, student-athletes realized only a 1.5 point increase, in contrast to a more significant 2.4 point increase in nonathlete scores.

Assessment #3, however, broke with this trend. On #3, student-athlete scores not only showed a significant increase over their scores on assessments #1 and #2, but also a significant increase over the scores of nonathletes. Indeed, the scores of nonathletes declined on assessment #3. Overall, student-athlete scores were an average of 6.46 points (7.52 Fall, 5.4 Spring) higher (21.5 percent) than those of nonathletes.

Importantly, this trend of student-athletes posting lower grades than nonathletes on tests #1 and #2, but achieving significantly higher grades on test #3, was also witnessed upon retesting (in the second investigation in the spring semester). Moreover, although the overall grades achieved increased slightly in the spring semester, the instructor recorded this rise in the grades of both student-athletes and nonathletes.

Student Learning Styles

The study had hypothesized that the increase in student-athlete performance and, perhaps, the decrease in nonathlete performance (although this was not the focus of the study) could be explained by the connection of learning style with assessment style. More specifically, the study assumed, first, that the student-athletes exhibited a learning style different from their colleagues, and, second, that the style of assessments #1 and #2 favored (or better matched that of) nonathletes, whereas the style of assessment #3 favored (or better matched that of) student-athletes. Indeed, the instructor-researcher assumed that the student-athletes must possess a judicial or legislative learning style, whereas their colleagues possessed an executive style.

Consequently, as Phase II of this study, all students underwent a modified version of Sternberg's Style Assessment Inventory (1997). Although Sternberg's Inventory allows for a high preference in all styles (as well as lack of preference for any style), students who did not exhibit an obvious preference responded to a second inventory. Ultimately, the instructor placed students who did not demonstrate a singular preference in a "no preference" category, and they were not figured into final percentages.

All students, unaware of the categories of the inventory, took the inventory independently, and wrote their "score" atop. The instructor-researcher double-checked these assessments of learning style, separated the student-athletes from the nonathletes, and recorded the learning styles.

Findings Regarding Style

The overwhelming majority (77 percent) of students, student-athletes

and nonathletes alike, exhibited an executive learning style. Data demonstrated, however, that the preference for the executive style was stronger among student-athletes than nonathletes. Indeed, while 74 percent of nonathletes preferred the executive style, 86.2 percent of student-athletes preferred the executive style.

Moreover, this stylistic preference was true, almost without exception, for male athletes. Of the male student-athletes exhibiting a preference (18 of 19), all preferred the executive style (of the 10 male athletes studied in the Fall, all exhibited an executive learning style; of the 9 male athletes studied in the Spring, 9 exhibited an executive style and 1 exhibited no preference).

The executive style was also the predominant style of female student-athletes, although it was not quite as popular. The sample of female student-athletes, however, was half that of male athletes and comprised a mere one-eighth of the entire student sample. (Of the four female athletes in the Fall study, two were executive, one was judicial, and the other showed no preference).

These findings regarding stylistic preference were repeated in both the fall and spring semesters. The fall semester studied a total of 62 students, 47 nonathletes (35 were executive, 7 judicial, 4 legislative, and 1 showed no preference) and 15 student-athletes (13 were executive, 1 was judicial, and 1 showed no preference). In the spring semester, two classes were surveyed, totaling 63 students. Of the 49 nonathlete students, 36 were executive, 5 were judicial, 5 were legislative, and 3 showed no preference. Of the 14 student-athletes, 12 were executive, 1 was legislative, and 1 showed no preference.

Data Regarding Style Preference

	Athletes	Nonathletes
Executive	25	71
Judicial	1	12
Legislative	1	9
No Pref	2	4
total	29	96
total with preference	27	92

Percentage of Style

	Athletes	Nonathletes
Executive	86.2 %	74 %
Judicial	3.7 %	12.5 %
Legislative	3.7 %	9.375 %
No Pref	7.4 %	4.2 %
total	29	96

Athlete Style by Gender

	M	F
Executive	18 (92%)	7 (70%)
Judicial	0	1 (1%)
Legislative	0	1 (1%)
No Pref	1 (5.26%)	1 (1%)
total	19	10

Discussion: Initial Findings

The researcher expected that nonathletes would include a higher distribution of executive learners and a lower distribution of the less prominent judicial and legislative styles than student-athletes. Such a distribution would have explained the superior performance of nonathletes on assessments #1 and #2, which focused on traditionally executive tasks (the style in which the nonathletes would have excelled). Such a style distribution would also have explained their inferior performance on the less executive-styled assessment #3. Conversely, such a distribution would have explained the poorer performance of student-athletes on assessments #1 and #2 (because their learning style would not have matched the method of assessment as well as that of nonathletes), as well as the superior performance on assessment #3.

She could not confirm this hypothesis, however. Rather, as the data demonstrated, not only did student-athletes exhibit an executive style, indeed, a traditional school style, but a higher proportion of student-athletes demonstrated a preference for this style than did their nonathlete peers.

Although this was a surprise to the researcher, it was not a surprise to the student-athletes. In the middle of debriefing one group of student-athletes, a chorus of voices enthusiastically agreed that, of course, they were executive learners. Both a football captain and basketball player explained that the nature of their sports was highly executive, as they must memorize plays and patterns and then implement them. Further questioning disclosed the obvious (but overlooked)—the creation of plays (a legislative function) and analysis or critique of game films (a judicial function) were tasks within the purview of coaches and assistants, not players.

Phase III: Temperament Assessment

Confounded by the findings of Phase II regarding learning style, the researcher sought to account for differences in grades in some other way. Two factors guided further investigation. First, she raised the question of whether certain students were more successful when switching from style to style or working outside their primary style. Second, evidence existed that personality differences can be associated with aptitude-treatment interactions, hence, the interaction between temperament and learning style (Entwistle 1981). Although the latter makes intuitive sense, it had been difficult to find aptitudes

on which differential effects were consistent (Entwistle 1981). The data from Phase I of the instant study, however, suggested a baseline for such measurement.

Consequently, building on the initial outcomes, the final phase of the study sought to explain the differences in academic performance (grades) by reference to personality indicators (i.e., True Colors, a mechanism similar to the more widely known Meyers-Briggs [Katherine C. Briggs and Isabel B. Meyers (1977)]). Personality indicators also speak to styles of learning, though perhaps less directly, as expressed through temperament or collection of personal characteristics. The instructor-researcher hypothesized that student-athletes exhibited a personality temperament different from nonathletes, specifically, that student-athletes possessed a temperament associated with flexibility and/or proficiency or desire for unstructured tasks, while nonathletes had a temperament associated with structure and rules. As previously noted, assessment #3 was an unstructured task permitting different ways of reaching correct answers, whereas assessments #1 and #2 were relatively well-structured, requiring students to proceed through a pattern to reach the correct answer. Thus, superior performance on assessment #3 (and inferior performance on assessments #1 and #2) might be explained by a positive correlation between temperament and assessment flexibility/structure.

Instrument

Students took the True Colors temperament/personality style indicator (Lowry 1978). True Colors, which evolved from Carl Jung's psychological types (1927), Meyers-Briggs 16 often counterintuitively labeled "type indicators" (1977), and David Keirsey's (1998) temperament types, reflects a spectrum of characteristics expressed in a variety of contexts (the classroom, the workplace, and personal relationships). It has been used as both a method to match graduate students with mentors and as a diversity tool in K-12 school systems.

Four colors—orange, green, blue, and gold—each represent a grouping of personality characteristics or temperament types. *Orange* represents variety, stimulation, and adventure. This individual is bored with jobs that are routine and structured, preferring, instead, those that are physical, involve competition, or trouble-shooting. Of all students, the orange student has the most difficulty fitting into academic routine and learns by doing rather than by listening or reading. *Gold* smacks of responsibility, stability, and tradition. This individual is detail-oriented and wants to follow rules and routine. Of all temperaments, the gold student most easily adapts to the traditional educational process, and, according to Lowry, "does best when course content is structured and clearly defined (1978: student card—Gold). *Green* describes the logical, analytical individual. The green student is a conceptual and independent thinker, a natural nonconformist who values intelligence and insight. Finally, *blue* speaks to communication, empathy, idealism, and nurturing. A blue student is a people person, concerned with the feelings and views of others, and adept at motivating and interacting with others. As a student, blue responds to encouragement rather than competition, excels in cooperative

settings, but, due to their imaginations, sometimes find it difficult to fit into the structure of school life.⁴

Data: Student Temperament Types

The researcher's analysis of the temperament scores (i.e., primary color), obtained by comparing the color or temperament type of student-athletes with that of nonathletes, disclosed two very different profiles. This was unlike the analysis of learning style, which showed similar learning styles.

She discovered that, while color or temperament indicator was somewhat distributed (albeit in differing rates) throughout nonathletes, it was not similarly distributed throughout student-athletes. Instead, student-athletes exhibited an overwhelming preference for "orange," the active, unstructured temperament type. Though orange is the most popular color among student-athletes, it was the least popular among nonathletes. Instead, nonathletes were primarily gold (54%) and somewhat blue (25%) with only 10.4 percent falling into the orange and green temperament types.

Temperament Type/Color

	Student-Athletes	Nonathletes
Gold	6 (20%)	52 (54%)
Blue	3 (10%)	24 (25%)
Green	0 (0%)	10 (10.4%)
Orange	20 (69%)	10 (10.4%)
total	29	96

Discussion: Integrating the Findings

In this portion of the study, the hypothesis that student-athletes were different from nonathletes in temperament type, and, in fact, possessed a flexible and less-structured temperament, proved true. Further, the difference between most and least preferred color and the predominance of orange among student-athletes are significant. The orange-gold difference represents a continuum, at one end, of flexibility and desire for lack of structure or opportunity to work without structure (orange) and rules, regimentation, and desire for obvious structure at the other end (gold). Orange is often described as the student most likely to have a difficult time in school, and, according to Lowry (1978), change direction quickly and like competition and activity. Therefore,

4 Moreover, different characteristics may express themselves in what appear to be similar ways. For example, gold would follow a list because it defines the rules or has been memorialized as a list, whereas green might utilize a list or proceed in an A to Z sequential fashion, because it was the most logical choice under the circumstances.

the orange student-athletes would not perform as well as nonathletes under traditional academic assessment tasks. Yet, the flexibility or lack of stringency to rules that comes with orange likely favors these students in unstructured tasks (or assessments that permit students to reach the correct answer in several ways) or disfavors them in structured ones.

Another alternative is that the flexibility of orange may better suit movement between styles, or adaptation to many styles, than the highly regimented gold style, and that this aspect of assessments #1 to #3 accounted for the student-athlete/nonathlete grade differential.

Both conclusions are consistent with empirical research suggesting that “versatile” students may operate in or under learning styles different from their predominant style with greater facility than students not deemed versatile (Entwistle 1981; Gordon Pask 1972). Although research in K–12 classrooms was unable to demonstrate a clear interaction between temperament and teaching style in relation to academic success in most instances (generally, more structure and formality led to greater success), “the least able boys improved more in the informal [less structured setting]” (Entwistle 1981: 148). In a later, duplicative American study, again, greater permissiveness and “a variety of response in activities” characterized the class types that appeared to most benefit children with low initial levels of cognitive skill and motivation (Robert C. Serow and Daniel Solomon 1979: 269, 274). Although that study concluded, as was consistent with the educational movement of the time, that increased success resulted from an increase in self-esteem and expression, the findings may suggest a positive correlation between flexible temperament and a variety of nonpredominant style situations or unstructured tasks (or a negative correlation between an inflexible temperament and nonpredominant style situations or unstructured tasks).

Conclusion

Unexpectedly, the first portion of the study showed that student-athletes possess the same, traditional (Sternberg-defined), executive learning style as their nonathlete colleagues, but obtain noticeably lower and sometimes noticeably higher grades on particular assessment activities. It is unknown, however, whether student-athletes and nonathletes show certain superiorities within this shared style. For instance, student-athletes as executive learners may focus most heavily on application of facts and implementation of plans (such as implementing a play), while nonathletes might focus on learning facts and then depositing them on paper or filling in a test blank, thus explaining success on traditional academic measures.

The final portion of this study, however, showed that student-athletes exhibited a decidedly different temperament-type indicator than nonathletes. Specifically, the majority of student-athletes demonstrated a temperament type known for flexibility, activity, and comfort with lack of structure. Conversely, nonathletes demonstrated essentially the opposite temperament type, known for rigidity, formality, and desire for structure and rules.

In light of these findings, it appears that temperament type may correlate to success on different types of academic assessment mechanisms. It is not certain, however, whether an interaction between learning style and temperament (as defined here) exists, and, if so, what that interaction is. Further research should focus on temperament and control for flexibility/structure. It might also manipulate possible interactions between learning style and temperament type. Future follow-ups notwithstanding, the present findings imply both methods for structuring classroom and assessment methods to best reflect the abilities of student-athletes as well as models for remedial services focused on college athletes.

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Educational Impact on Social Work Study Tour Participants

Diane S. Falk, PhD

The author discusses the educational impact on two groups of social work students and working professionals who traveled to London and Northern Ireland (in 1999) and Australia (in 2000) to visit social agencies and universities, to meet with social work professionals, and to experience immersion in another culture. The focus of both study tours was human rights issues and the role of the social work profession in addressing those issues. Qualitative analysis of responses to open-ended questions revealed that participants' primary reason for joining such a tour was to obtain experiential learning. They developed new perspectives on their profession, appreciated the benefits of group travel, and made discoveries about themselves. Participants found that their emotional responses to the places they visited and the people they met intensified this newfound knowledge. The author conducted an inquiry into the impact of the tours on participants. This paper summarizes the findings of that study, as well as examines the educational rationale for the social work study tour. The author discusses the study's limitations and suggests the need for additional studies on this topic.

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A study tour is a type of experiential education—a way to bring students out of the classroom into real-life situations. An international study tour adds cross-cultural experiences to the lessons. Its duration is longer than a field trip but shorter (and less costly) than a study-abroad program. Its purpose is similar to the latter because it aims to immerse students in another culture while helping them acquire knowledge about a specific topic.

The Stockton-sponsored social work study tour, which included forty-four students and community professionals, including the leaders, introduces participants to social work in another culture, and it helps them make cross-cultural comparisons with social work in their own country. Participants learn about the social problems facing people in different societies, visit the social agencies that address those problems, and talk with the professionals who strive to find solutions. In discussing issues and solutions with practicing professionals, participants gain some understanding of these social workers' values, knowledge base, skills, use of research, opinions on social policy issues, and roles in their society. In the process, students gain clarity about their profession, its role in their own society, and themselves.

Study tours immerse the whole person in another culture, so they offer much broader experiences than learning about one particular topic or discipline. A study tour is also a sensory experience, exposing participants to new sights, sounds, odors, textures, and tastes. It often involves some introduction to local arts, such as theater performances, concerts, art museums, and architecture. As they struggle to understand current issues in the locale they visit, participants begin to acquire a sense of the history of places and peoples. This often enables them to develop a fresh perspective on the history of their own country. They may discover that not all people see the world from the same perspective. They explore the beauty of nature in another country.

As participants are thrown together in the intimacy of travel, they inevitably have a group experience, learning to accommodate to other wills, interests, and limitations. Concomitantly, participants have an experience of self—learning about how they relate to different people and adjust to very new situations, while discovering their responses to the issues they encounter.

Study tours generally involve some activities that prepare people for the experience. These range from lectures, readings, and examinations to videos, guest speakers, and explorations on the Web. During the actual study tour, it is essential that participants have some time to reflect on learning, both in group discussions and privately, as it unfolds. Although experience is the fundamental learning method during a study tour, it is not sufficient. As Rennie Johnston and Robin Usher (1997: 140) explain, reflection provides “the necessary link between experience and knowledge.”

Learning the Profession Firsthand

The feature that distinguishes the social work profession from related professions is its primary attention to the interface between the client system (individual, family, group, or community) and the environment. For a social worker, it is not enough to know the behavior, history, or other characteristics

of a client. The social worker equally must understand the context in which the client is situated—resources, economic conditions, social policies, history of oppression of minority groups, as well as the current climate for persons of the client's culture, gender, race, ethnicity, sexual orientation, and disability status. To understand social work in another country, then, it is essential to understand not only social workers' activities with clients in that country but the social environment in all of its nuances.

A current movement in social work education seeks to conceptualize much of social work theory on a foundation of human rights principles (Yvonne Asamoah, Lynne M. Healy, and Nazneen Mayadas, 1997; Diane S. Falk and Janice Wood Wetzels 2000; Janice Wood Wetzels, 1993, 1998). The social work study tour is a dramatic way of helping students discover how the social work profession has human rights work at its core. Human rights has been one specific focus for the three study tours that I have led, with the social work profession, practice, and policy in cross-cultural perspective as the other major focus.

In May 1998, eight students and community social workers participated in a social work study tour to Hungary and Croatia for nine days. In Hungary tour participants met with the Minister of Ethnic Affairs to learn about the latest legislation on protecting the rights of minority groups within Hungary. They visited social agencies to learn about the effect of Hungary's democratization on social conditions there, and visited a gypsy village to learn of the gypsies' plight in Hungary and the rest of Europe. In Croatia, participants experienced firsthand the after-effects of an ethnic conflict of major proportions—devastation of the villages and countryside and genocide. On a visit to a mass gravesite near Vukovar, participants developed an entirely new consciousness on the conflict's horrors.

In June 1999, sixteen people traveled to London and Northern Ireland for nine days. In Northern Ireland, participants experienced a land torn by sectarian conflict but where people work very hard to maintain the peace settlement. They visited a community development agency that has long worked to resolve community conflicts, toured a government agency that works to educate people about new ways of working and living together, and met with a social work professor to learn about how social workers learn the profession there. In London, participants visited neighborhood centers and learned how local social workers work with immigrants and refugees from Bangladesh and Somalia—people whose human rights had been violated in their own countries and who now struggle against marginalization within their adopted country. Students learned about how social workers, under the framework of government social policies, offer services that seek to ameliorate the effects of social problems on poor and vulnerable people who live in that prosperous city. They discovered that social forces, such as oppression, discrimination, and social exclusion, operate much in the same way as they operate in the United States.

In June 2000, twenty students and community social workers voyaged to Australia for seventeen days. The study tour focused on the reconciliation

movement and its attempt to redress the historic oppression of Aboriginal and Torres Strait Islander peoples. It also explored social welfare approaches, service delivery issues, and the nation's social work education. In visits to Aboriginal-controlled health and child welfare agencies, they learned firsthand about the insidious long-term effects of government policies that dispossessed people of their lands and moved them onto reserves, where they were forcibly stripped of their culture. Participants spoke with people who were committed to self-determination, community control, and empowerment. With social workers from a diversity of backgrounds, study tour members discussed the meaning of reconciliation—how Australians are coping with their past and hoping for their future. Participants learned a great deal about contemporary social issues in Australia, and they developed new insights into the U.S. government's treatment of Native Americans and the plight of other minorities in their own country.

One cannot fully understand one's own culture until one has experienced another. Through learning about human rights issues in another culture, social work study tour participants were forced to compare parallel issues in U.S. society. The values, attitudes, history, politics, and social policies of their own country came into clearer focus. For the first time, they may have understood the assumptions underlying the social service delivery and social work education systems. Many students had a rather parochial perspective on their world prior to the tour. Participating opened their eyes to realities in ways that class attendance never could. This broadened vision and increased clarity about society and the profession make the social work study tour an enlightening experience for students and working professionals alike.

Experiential Learning

In the past decade, a proliferation of scholarly articles and books have examined or advocated for experiential education (Griff Foley, 1999; J. Roy Hopkins, 1999; Johnston and Usher, 1997; David Kolb, 1984; Elizabeth Kamarck Minnich, 1999; Kathleen Maas Weigert, 1990; Susan Warner Weil and Ian McGill, 1989). Experiential learning theories draw on the work of Dewey, Lewin, and Piaget, diverging from rationalist/cognitive and behavioral theories. Experiential theories, as summarized by Kolb (1984: 21) present a "holistic integrative perspective on learning that combines experience, perception, cognition, and behavior." Learning is a process, not a set of outcomes—a process through which learners continuously build a knowledge base as they experience their world, reflect upon their experiences, dialogue with each other, conceptualize, reconceptualize, and act (Kolb, 1984; Paulo Freire, 1974). This view of learning differs from the traditional notion that students learn by passively incorporating concepts and facts, which lecturers or textbooks deliver to them. Experiential learning theory posits an active learner in dialogue with equals, experimenting with ideas, sifting through perceptions, and creating knowledge. Learning is an open process, which a teacher can facilitate but which occurs primarily as a dynamic process of interaction between a learner and a learning environment—which could be anywhere.

In advocating for experiential education, Kolb (1984: 2) argued that the: *learning process must be reimbued with the texture and feeling of human experiences shared and interpreted through dialogue with one another. In the overeager embrace of the rational, scientific, and technological, our concept of the learning process itself was distorted first by rationalism and later by behaviorism. We lost touch with our own experience as the source of personal learning and development.*

More than a decade before Kolb's influential book on experiential education, Malcolm S. Knowles (1970), in his work on adult learners, described the differences between the child and adult learner. Pedagogy, the art and science of teaching children, was compared with andragogy, the art and science of helping adults to learn. Pedagogy is instructor-centered learning, whereas andragogy is learner-centered. In Knowles's approach to adult learning, learners' life experiences serve as resources that instructors use as they facilitate group discussion and problem solving (Knowles, 1970; Kolb, 1984). Foley (1999) has studied informal, incidental learning, particularly that which gradually develops within people as they struggle against oppression. This is closely allied to the development of "critical consciousness" that Freire (1974) described in his writings on emancipatory education. For both writers, the educator's role is not to deliver content but to help people become conscious of and articulate what they learn from experience.

Minnich (1999: 13) summarized experiential education as "purposeful inquiry emphasizing reflection throughout a rounded process of doing and undergoing that finally satisfies genuinely felt, enlivening interests." As Weil and McGill (1989: 3) pointed out, experiential learning refers to "a spectrum of meanings, practices and ideologies which emerge out of the work and commitments of policy makers, educators, trainers, change agents and 'ordinary people' all over the world." In an attempt to make sense of these meanings, practices, and ideologies, the two authors conceptualized "four villages." Village 1, which is concerned with granting university credit for prior life experience, is not of particular interest to this inquiry, but the others are. These encompass experiential learning as innovation in higher education (Village 2), as the basis for consciousness-raising and social change (Village 3), and as a means to personal growth and development (Village 4).

From its inception, social work education has included a hefty dosage of experiential learning—in its insistence on learning in the field. To obtain a baccalaureate degree in social work (BSW), for example, a student must devote at least 400 hours to an internship (Council on Social Work Education [CSWE], 1994a), whereas a master's level student must spend a minimum of 900 hours in the field (CSWE, 1994b). Generally, within a seminar connected with field instruction, students discuss their work in the field and attempt to integrate it with the theoretical approaches they learn in the classroom. Students also meet regularly with an agency-based field instructor, whose role is to help the student to develop practice skills that will work effectively with a diversity of clients.

Unlike rationalist or behavioral-based education critiqued by Kolb, social work education has consistently maintained a focus on personal learning and development. The social work internship includes elements of the rational, scientific, and technological, but even more importantly, it provides an opportunity to gain considerable real-life experience working with clients, as well as time to work on developing the “professional self.” The social work profession posits that an essential component of the helping process is the relationship that the social worker consciously builds with a client system. The social worker learns to use, with discipline, elements of his or her personality and experiences, as well as knowledge and skills, in working with clients. Field instructors and classroom teachers of social work often model the use of the professional self as they guide students in their development.

Although social work has a built-in experiential component, it has not been able to find a way to incorporate a global perspective on the profession into the curriculum, despite a recently adapted accreditation standard that requires this (CSWE, 1994a, b; Lynne M. Healy, 1995). The international social work study tour is a natural way to internationalize social work education, as well as to build on the existing strengths of the experiential portions of the social work curriculum.

The Literature on Study Tours

Formal research and descriptive writings on study tours are sparse. Weigert (1990) described the use of a field trip to the Greenham Common Women’s Peace Camp as a way to immerse university students in peace studies. She concluded that such experiences, which involve the whole person, are potentially effective in educating students about peace and for peace. Hopkins (1995) discussed the study tour as a short-term study-abroad program, which shares the same goals as longer-term alternatives: acceptance of diversity, understanding of other cultures, and exploration of wider opportunities, among others. Julia Marlowe, Teresa Mauldin, Charles Hatcher, Anne Sweaney, Carol Meeks, and Martin Coppack (1998) outlined a number of study tours used to teach consumer issues and policy. They discussed the advantages but apparently have not conducted any studies of the impact on tour participants.

Stephen J. Porth (1997) acknowledged a healthy skepticism about the educational value of international study tours for management students and presented a three-stage model for organizing and leading an effective study tour: (1) predeparture readings, lectures, case analyses, and guest speakers; (2) the actual tour; and (3) feedback, evaluation, and integration. As helpful as his suggestions are for designing a study tour, he does not present any evidence to support his claims. Chauncey A. Alexander and Sally J. Alexander (1979) edited a book in which participants on the first study tour (to China) sponsored by the National Association of Social Workers report descriptively on the content of the tour. The emphasis is on the social situation in China, rather than documenting the educational impact on tour participants. With an apparent lack of research on the impact of study tours, the author presents this report as a beginning step toward documenting outcomes of such tours.

The Study

The author conducted this study during and after the last two social work study tours—to London and Northern Ireland and to Australia.

Method

The most central question of this inquiry is: What is the educational impact of social work study tours on participants? Since study tours involve the whole person in an intense experience, setting narrow educational objectives and then measuring their achievement on a structured scale did not seem appropriate. Such an approach might easily have missed significant impacts that had not been anticipated. This was an exploratory study, which tried to capture the range of participants' responses to experiences during the tours. As such, it lent itself to an approach that would allow them to respond to open-ended questions. They answered such questions in a questionnaire and in focus groups.

Sample and Procedures

The sample included all who were tour participants (excluding the tour leaders). The total sample size was thirty-two (see Figure 1).

Demographics of Tour Participants		TOTAL
GENDER	Male	1
	Female	31
AGE	18–30:	15
	30s:	7
	40s:	4
	Over 50:	6
RACE/ETHNICITY	Black (African American, African, and Caribbean)	7
	Hispanic	3
	White	22
OCCUPATION	Undergraduate social work students	6
	Undergraduate students, other majors	5
	1999/2000 BSW graduates	6
	Graduate students (2 MSW, 1 other)	4
	Employed social workers	11

Figure 1

The researcher obtained responses from participants through a questionnaire administered at the conclusion of the study tour and through focus groups. The questionnaires were voluntary and confidential. Although participants were not asked for their names, it proved fairly easy to identify respondents. Some included their names; others shared information that revealed their identity. Most respondents submitted written responses to the questionnaires. The researcher interviewed a few individuals by telephone or in person, when the participants did not return the questionnaires in a timely manner. The focus groups, which the tour leaders facilitated, occurred during the tours, at the immediate conclusion of the Australia tour, and several weeks after the London/Northern Ireland tour. Facilitators opened the sessions with a very open-ended question, such as, "What has been your response to the trip so far?" In a group composed mainly of social workers and social work students, this was enough to generate a lively discussion that only occasionally had to be refocused. One facilitator took notes and transcribed them soon afterward. The researcher subjected the responses to the questionnaires and during the focus groups to qualitative analysis, using NUD*IST software for analysis of qualitative data.

Measures

The questionnaire posed the following queries:

What were you hoping to get out of this study tour? For example, why did you choose a social work study tour instead of another form of travel?

What did you learn about social problems in London and Northern Ireland (or Australia)? How do you think these compare with the problems that we experience in our society?

What did you learn about the social work profession in London and Northern Ireland (or Australia)? Did you notice any significant differences in the ways that the people we met approached social problems or social service delivery?

How did your understanding of international social work change as a result of this trip?

What impact, if any, do you think that this trip will have on your practice as a social worker (or on your future career in another field)?

What did you learn about the experience of traveling with a group, especially a group of social workers?

What did you learn about yourself?

What was the most meaningful aspect of the study tour for you? Why?

Results

Figure 2 summarizes the return rates for the questionnaires and the focus group participation rates:

Participation Venue	Combined Groups
Questionnaires	21 (66%)
Focus Group 1	32 (100%)
Focus Group 2	22 (69%)

Figure 2

The questionnaire was not an easy one to complete, since it required essay answers. With no participant incentive for completing it, the researcher considered the 66 percent return rate as respectable. The focus groups that were held during the tour had full participation. Participation was lower at focus group 2 for the London and Northern Ireland trip, which was held several weeks after the trip at a get-together for participants.

Data Analysis

Comments during the focus groups tended to cover many of the same topics as the questionnaires, so the researcher merged the group data with the questionnaire responses and analyzed them together. She saw no reason to consider the two study tour samples separately, because this study examined the impact of study tours in general, rather than making comparisons between trips to different locations.

The questions served as a convenient way of organizing the results of the qualitative analysis. In Figure 3 each question precedes the responses, organized into thematic categories and presented in order, from the more frequent type of response to the less frequent. Frequencies reported are the number of respondents mentioning a theme, rather than the number of times participants mentioned the themes. This prevented the more loquacious respondents from having disproportionate influence on the findings. The right-hand column indicates the frequencies of each thematic category.

Limitations of the Study

The subjects studied in this research form a very limited sample of people who have participated in study tours. At present, data is unavailable on how many study tours—social work or other—have taken place in the United States or elsewhere. Based on this study alone, the researcher can make no claims about the educational value of study tours. This inquiry is exploratory; it has aimed to identify the range and intensity of learning during one type of study tour.

Discussion

As Figure 3 shows, the most commonly cited reason for going on a social work study tour was that it was an opportunity to learn experientially. Participants were very interested in learning—but not in the classroom. They wanted

Tour Participation Questionnaire		
	# of persons reporting	% of persons reporting
Hope to get out of study tour?		
<i>R. Experiential learning</i>	20	63%
<i>R. Pleasure</i>	13	41%
<i>R. Concrete benefits</i>	11	34%
<i>R. Personal growth</i>	7	22%
Learned about social problems?		
<i>R. Similarities with problems at home</i>	20	63%
<i>R. Contrasts with problems at home</i>	13	41%
<i>R. Unique aspects</i>	12	38%
Learned about social work profession in the countries visited?		
<i>R. Profession's strengths</i>	16	50%
<i>R. Differences between profession abroad and in USA</i>	13	41%
<i>R. Profession's limitations</i>	10	31%
<i>R. Similarities with social work profession in USA</i>	4	13%
Learned about international social work?		
<i>R. Global nature of social work</i>	12	38%
<i>R. Gained information</i>	6	19%
<i>R. Variations</i>	5	16%
<i>R. Need for culturally relevant approaches</i>	1	3%
Impact on professional practice?		
<i>R. New consciousness, new perspectives</i>	18	56%
<i>R. New interests and behaviors</i>	13	41%
<i>R. New knowledge</i>	4	13%
Learned about traveling with a group?		
<i>R. Benefits</i>	21	66%
<i>R. Difficulties encountered</i>	16	50%
<i>R. Neutral observations</i>	12	38%
<i>R. Coping with difficulties</i>	8	25%
Learned about yourself?		
<i>R. Varied self-discoveries</i>	22	69%
<i>R. Commonalities</i>	3	9%
Most meaningful aspects of study tour?		
<i>R. Appreciating opportunities</i>	20	63%
<i>R. Emotional responses to experiences</i>	20	63%
<i>R. Miscellaneous appreciations</i>	9	28%

Figure 3

to be eyewitnesses to social work—to discover what was happening in the countries visited through interacting with the people who live there. Here are a few quotations:

I was looking to have the sensory experience of being a tourist and simultaneously devoting time to understanding the sociopolitical framework of the culture being studied.

I really hoped to see the country in a new way that was more than just a tourist's viewpoint by seeing how Australia deals with the social problems that exist in the U.S. and all over the world.

I was hoping to get a sense of the social issues in Australia and how social workers deal with the issues.

They hoped to learn from each other, as well as from the group leaders and the professionals they visited. One participant put it this way:

I hoped to learn from a variety of perspectives, from the people who work and live in England, Northern Ireland as social workers, community development workers, etc., and also from the other social work participants on the study tour.

Participants also were interested in more than just academic learning; they wanted personal growth and development. This was as true for the older, employed social workers as it was for the students and recent graduates.

I chose the social work tour because it not only provided pleasure but the opportunity to meet new people, exposure to new cultures, points of reference ... [to help me] become more in tune with who I am and where I come from.

I was hoping to broaden my horizons as a person, scholar, and social worker.

In order to keep energized about social work, you need to have something beyond your day-to-day work—a broader perspective.

Participants wanted to enjoy themselves and to go beyond professional interests. They saw the study tour as a way to combine enjoyment with learning:

I basically wanted to have fun and learn as well.... I also wanted to see the country, the landscape, the water, rain forests.

I love travel and want to meet people.

There can be concrete benefits from a study tour. For example, several people saw it as an affordable way to travel:

I knew a study tour would be far more economical than trying to make such a trip on my own.

Financially I do not think such a trip would have been a possibility without the group rates.

Some saw it as a way to gain academic credit or continuing education

credits (needed to maintain their social work licenses) and as a way to develop the expertise to teach others:

I also hope to get some of the academic work done through the [tour].

Overall I was educated, got CEUs, a tax write-off and the opportunity to continue with relationships initiated during the tour and develop workshops to share my tour experience with others.

Other participants recognized that they needed a guide for such a trip and that there might be benefits associated with going with other social workers:

To me, a study tour with people involved in many phases of social work made more sense than traveling alone to learn.

I have never gone abroad before, so it was helpful to have a structured schedule to go into without having to know the land, people, or places.

I wouldn't have known the first thing about organizing a trip for myself.

What did the participants on these two study tours actually learn? The next three questions explored their learning about social problems, the social work profession in the toured countries, and international social work. Because the planned focus of both study tours was on human rights issues in London, Northern Ireland, and Australia, the leaders hoped that the tour's structured experiences would stimulate thought about human rights issues in those countries and parallel ones at home.

As Figure 3 shows, participants reported that they saw many similarities between the social problems observed on the tour and those in the United States with which they are familiar:

Indigenous people face problems such as discrimination, racism, alcoholism, and poverty. These problems are similar to the ones the indigenous people in the U.S. face. There are also some similarities with other minorities in the U.S.

I learned that, for the most part, social problems are no different halfway across the world than in our backyard. I was amazed at the major correlation between Australian Aboriginals and the U.S.'s Native Americans.

The aged face discrimination [in London] just as they do...[in the USA]; people of color and ethnic backgrounds...need help assimilating to the English culture, and children in both countries need guidance and nurturing to head down the right road.

Participants mentioned, however, a number of differences both in the social problems and in the approaches that social policy and social workers take in trying to solve these problems. They were impressed with some of the social policies and features of the social welfare system:

In terms of large-scale poverty, crime, and disease, Australian culture appears to have set up a liberal welfare system, universalized healthcare, progressive juvenile justice sentencing and a general preventative approach toward maintaining the general populace, at least at the federal...level.

They are progressive in some areas, far more so than the U.S., such as the homeless youth center, with their approach to substance abuse [a harm reduction strategy].

In England, they have a more compassionate attitude in their policy toward immigrants and their absorption than the USA.

They discovered also that other countries have social problems that appear to be more difficult to solve than those in the United States. For example, Australia has vast territories that are very remote from city centers. Providing social work services in remote areas in a country the size of the United States, but with a population that is the same size as New Jersey's, is an enormous problem. The problems in Northern Ireland, although similar to problems between dominant and minority groups in the United States, appeared to participants to be more severe:

Those in Northern Ireland have to constantly worry about their safety.

In Northern Ireland [Belfast], the physical environment...[created an] air of violence.

It was difficult for me to believe that four nights out of ten, I slept in a town where bombs have exploded and shots have rung out, and it could...[have taken] place again when I was sleeping.

Participants had many opportunities to learn about the social work profession in the countries visited, as they talked with social workers at the agencies visited during the tour. They learned about similarities and differences between the profession abroad and that in their own country. As Figure 3 shows, they tended to focus more on the differences than on the similarities in their responses. Similarities included:

It also showed me the similarities in philosophies, such as the strengths perspective, and practices in various countries.

The social work profession in Australia is expected to do more with less as it fights for respect for itself, just as the social work profession does in the U.S.A.

Differences included:

The social work profession in Australia is less rigidly self-defining and exclusionary... [than] it is in the States. There are no generalized expectations of having a college degree to call your work "social work." The profession is not licensed as it is here.

I learned they [Australians] are more laid back when it comes to

clothing, and they don't work a full 40-hour week. They also get a lot of vacation time.

Social work appears less of a profession and more regulated in England—more group- and community-focused and less individually focused.

Participants were quick to notice the limitations that social workers face in the countries they visited. They know that U.S. social workers have not yet achieved full recognition as a profession, despite recent gains, and they readily empathize with their international colleagues about status and role limitations.

I was not surprised that other countries do not consider the social work profession as a recognized and important profession.

As Figure 3 shows, respondents were impressed by the strengths of the social work profession that they observed:

I was impressed by how knowledgeable their social workers were regarding international practice/policy issues.

The social workers we met were upbeat and enthusiastic and similar in many ways to U.S. social workers.

Those called to help seem to have the same motivation, are willing to put work before self-gain and accept non-recognition without affecting their desire to continue helping others to help themselves.

I was impressed with the community-based agencies that combine cultural traditions with education.

Tribal/clan life was such an important part of their history, and with economic difficulties the family unit has changed and broken up. By utilizing community pride and connections, they are trying to heal the main injury and not just put a Band-Aid on the symptoms. I also thought the teen help line was a neat resource that we could use in the U.S.—very creative and novel approach to helping kids.

The social workers I interacted with, however, were quite inspiring and showed great personal strength, courage, and accomplishment.

I was very impressed with the use of the arts with social work education in Northern Ireland.

Even though they had been assigned a reading on international social work as preparation for the study tours, most participants did not have a clear idea of what this term meant:

Well, I had no real clue about international social work before this, but I am now definitely interested in it, and going on this tour really put me in a new frame of mind.

Participants learned that there can be different educational routes to

becoming a social worker and that the role assigned to social work by different societies can vary considerably:

There is a great variation from country to country regarding the roles, education, and wages of a social worker.

I didn't realize that there are different requirements to be a social worker in different countries.

One participant, who is not a social worker, recognized that it is essential for social workers to use culturally relevant approaches:

What is useful or what method is used in one country in handling its social work or problems might be a complete failure in another country, because people in different geographical areas have different needs and values.

This is an insight that escaped many early internationalists in social work, who attempted to export the U.S. or British approach to social work to other countries without taking into account cultural and economic differences.

Despite their lack of prior familiarity with international social work, participants quickly discovered many things about the global nature of social work:

The targets of change, usually elderly, children, people of color, and the mentally ill, are similar. They are, regardless of culture, the most vulnerable. I learned how the globalization of computer access has lent greater access to cross-cultural exchanges of research information.

On an international level, social workers need to be aware of the social problems facing different societies. An awareness of problems and solutions abroad increases, I think the social worker can be more effective in helping clients at home. Learning about the history of social problems and social work in another country causes one to think more critically about the history at home.

We are all connected as human beings, needing the same basic things.

Basically the trip has further sensitized my belief that the boundaries between countries and their social problems are very thin and superficial, and that no social problem in any country is isolated only unto itself.

These discoveries gave participants a sense of solidarity with social workers around the world. Developing the perspective that social work is an international profession and making connections with colleagues abroad appears to have strengthened some participants' commitment to their work:

I feel I'm a part of a larger community of social workers. Connecting and networking with others has made me feel stronger and more committed.

I learned that social work is truly an international profession, that

we are not alone. There is an international sisterhood that shares the same type of passion about issues.

What participants learned about social problems, the social work profession in the countries visited, and international social work is not as important in their professional development as what impact this learning has on their practice as social workers. Although this study cannot validate any long-term effect of such learning, its findings can lend some support to the idea that study tours potentially have impact on professional practice. As Figure 3 shows, participants reported that they gained new knowledge, discovered new interests, committed to new behaviors, and especially developed new perspectives and an enlightened consciousness about their work. Their claims of greater knowledge were more limited than their claims for the other two impacts on practice:

The experience of this tour has given me a broader knowledge base and a better understanding of people both far away and right next door, as well as a much better understanding and interest... [in] culture.

New interests and behavior included:

I am more motivated to get organizationally involved and expand my limits/boundaries beyond the "box."

This trip has also prompted me to study as many indigenous groups as possible...and possibly see about writing an article or book.

This trip has allowed me to share my experience with elderly people who were from England and Ireland, bringing them the opportunity to reminisce and compare notes as to when they were last in their country.

[I have become] more advocacy focused.

[This motivates me] to give more presentations on cultural competence and possibly policy change.

Responses that referred to having new perspectives or raised consciousness include:

I was stimulated by...the organizational leaders of the Aboriginal agencies to "heal thyself"; in other words, the powerful and ample opportunities out there for minority leadership to rise from within that most marginalized culture to speak out, to educate, to change the tide of the status quo.

This trip helped me clarify that social work allows for much of the work I support. Until now I knew what I wanted to fight for—but now I see how I can play an active role in pursuing these ideals.

It has changed my perspective on what I see in my work. For example, when I discovered that young Bangladeshi women self-mutilate as a way of expressing their feelings about their oppression

as women in their culture, I came back with another perspective on what one of our clients, a self-mutilator, is doing.

This trip has had and will continue to have a tremendous impact on my practice as a social worker. When the day starts to get overwhelming and frustrating, I am able to think back to those who we visited and remember the terrific work that they are doing. It's extremely inspirational to know that there are people in a completely different country who think and feel the way that I do about helping people.

It has strengthened me. I feel enriched not only as a professional but as a U.S. citizen and human being.

As participants discovered, traveling as a part of a study tour is an experience that calls for knowledge of group dynamics. The group can serve as a resource for members, or it can be a source of stress. As Figure 3 demonstrates, study tour participants discovered that there are both benefits and difficulties involved in traveling with a group, if those difficulties can be coped with effectively. Although coping abilities varied, participants generally found a way to deal with the difficulties they encountered in the group. Here are some neutral observations respondents noted:

Any time you mix up a group of people, something interesting is going to happen.

Some of us are strong-willed, others of us are passive, but that's what made us a "family," for ten days anyway.

The difficulties mentioned by participants included the following:

Moving a group this size in such a demanding schedule was taxing physically and emotionally.

It's hard being together every day and every night for 17 days.

Without going into detail, I believe that our group experienced some of the same conflicts experienced by our larger society.... Even within the context of our group, while we mostly had pleasant people, we also had a few difficult and inconsiderate ones.

I did learn that with those sixteen different personalities, we all have minds of our own. Not everyone is going to like each other.

Age differences enlivened the groups in some respect, but they also created difficulties for some:

The immaturity level was tough to deal with. I had a low tolerance to that.

Participants shared how they coped with group stresses, and they also had suggestions for the leaders:

I was grateful for the moments in the schedule [when] I could take a break to sleep or read on my own.

[There] should have been more push to process the group experience.

I knew that traveling as one of twenty would be trying at times, and I think I made a conscious effort to be flexible when the group needed us all to bend.

Despite the difficulties, participants were more likely to identify benefits than difficulties, shown in Figure 3. Some of the benefits identified included:

The size and variety of ages, background, and life experience was GREAT.

The group experience was valuable beyond measure. The diversity of the group provided the opportunity to form a community amongst ourselves similar to the one in which we must work and live, leading us to solve the same problems amicably.

The group gave me confidence.

I enjoyed the group experience.... I was worried about it for a bit, but I really had a good experience. I feel the members of this group, as social workers, were more accepting of everyone's differences and limitations. I also enjoyed learning about the different areas of social work that people worked in.

I liked...[group travel]...because I met a lot of interesting people and I saw some great things because people took the time to tell me about what they thought was interesting that I may have missed.

I liked meeting a lot of social workers and learning about their jobs.

I find it to be a terrific experience. Being in a group of social workers was one of the reasons I wanted to participate in the trip. It was wonderful to be around individuals of such different backgrounds. That is what makes the trip so fulfilling because there are sixteen different personalities with sixteen different perspectives.

Being a member of a group is a good way to learn about oneself. When that group is having a variety of educational experiences in a foreign country, the opportunities for self-discovery multiply. Study tour participants reported a number of such discoveries. They found that there are many commonalities among people everywhere:

[I] found commonalities with people across cultures, people having common experiences.... Maybe we human beings are not as different from each other as we think.

As Figure 3 shows, respondents claimed a number of self-discoveries. Some of those include:

I became aware of my own ethnocentrism in terms of thinking, "If WE didn't think of it, it ain't gonna work!" I guess it comes with growing up in the richest country in the world. You think that we are the best at everything.

I think traveling with a group this size taught me about my own tolerances for group stimulation, how I define my boundaries to others, and how I contribute as a team member. It was personally rewarding and altered my self-concept.

I learned about myself if I try I can do anything I set my mind to.

I have discovered me in a different way.

The biggest lesson I'll take from this tour is the need I have to increase my tolerance of the frailties of others.

I learned to hold my ground—but try and clarify other people's meanings in how they relate to me before assuming I know. I confirmed I want to work toward change in the world.

I'm a lot easier to please than some people.

I have a very deep love of social work with a wide variety of interests. This trip made me realize just how versatile my interests are.

I...realized that I could take care of myself and I liked being an independent person.

Respondents reported a variety of learning from the two study tours. The final question on the questionnaire asked participants to identify the most meaningful aspect of the study tour—the most memorable lessons. As Figure 3 indicates, participants mentioned most frequently appreciating the opportunities presented by the study tours. They also reflected on their emotional responses to these opportunities. Several people reported spiritual insights that developed in response to their tour experiences. There was also a collection of miscellaneous appreciations.

The list of miscellaneous meaningful aspects of the study tour is interesting in its variety. Experiences that were especially meaningful for one individual might have escaped notice by others. For instance, respondents mentioned the following:

[I] really liked learning about unimportant differences, such as walking on the other side of the sidewalk.

[I developed an] appreciation of the ways in which immigration enriches society.

Walking through a courtyard and seeing mothers leaning out of their windows, standing on balconies to watch their young sons playing ball. It could have been anywhere. The boys were clearly fitting in, becoming assimilated into living in London. It could have been Camden, where similar scenes are played out.

The first item above reflects a relatively insignificant difference—one that was noticed by everyone, but for this individual it was a memorable piece of experiencing another culture. The experience of seeing mothers leaning out of

windows, watching their sons, was one that all members of the study tour had, but this particular student infused the scene with associations to a New Jersey community that she knew well and to the social processes that she was coming to understand on a deeper level through participation in the study tour.

Opportunities that were seen as especially meaningful included the following:

. . . the hiking; it gave a feeling [of] both personal achievement and group unity.

The most meaningful is the opportunity to have traveled beyond the immediate community in which I've lived all my life. This experience was invaluable to me, both in the exposure to such a beautiful and bountiful landscape and internally as a lesson in humility, (cultural) social responsibility, and the courage to take risks.

. . . the tremendous strengths of [the] indigenous community.

. . . rain forest and reef—they were incredible.

Each agency we visited was so welcoming and informative that I kept having to remind myself how lucky I was to be a part of the tour.

[I] was really touched by how people opened up to us, invited us in, were warm. Kids Help Line—they were strangers, yet they opened themselves.

. . . to see people really fighting for what they believe.

. . . [the opportunity] for immersion in historical events.

The opportunities mentioned by participants stimulated a range of feelings that intensified the learning experience. Here are some examples of learning intensified by study tour experiences:

I was touched by the people in the Riding for the Disabled program.

[The most meaningful aspect of the study tour was] understanding the Australian culture more deeply—the experience involved all my senses.

[The most meaningful aspect of the study tour was] the natural surroundings and its beauty. By appreciating this, I think I was able to connect with a lot of the Australians I met. They all seemed to have the same appreciation/awareness of their surroundings.

In the hostel in Belfast and on the streets around it, I felt the tension . . . the experience of two of us going to meet the group at a local pub, discovering that the streets were deserted, wondering what it meant, becoming very frightened and alert . . . led me to experience what it must be like living with the conflict in Northern Ireland—how they accept the tension and go on with their daily lives.

Derry and Holywell Trust stole my heart—the beauty of the city, landscape, the efforts of Holywell Trust, and the “vibes” of the people.

Participants, by being immersed in a different culture, are deeply involved. Learning that involves all the senses and that stimulates emotional responses is more likely to be memorable and life-changing than classroom learning. The feelings experienced by participants led them to deeper insights. For example:

[The most meaningful aspect of the study tour was coming to] the realization that we are all of one Spirit.

[By listening to the Aboriginals we met discuss their history, I] understood deeply a pain I avoid in my life. [I felt] humbled to be here, blessed to come.

I felt validated as a social worker while in Australia. It reminded me of why I'm in this profession.

Summary and Conclusions

Study tour participants learned that social problems in the toured countries had many similarities with those at home, such as inadequate resources to meet needs, lack of access to existing resources, and the oppression of minority groups. They learned that social problems cross national boundaries—that immigration is a global issue. They discovered that the social work profession in other countries, as in their own, has limitations in its ability to serve clients, its status, role, and turf. They also learned that they have much to learn from what social workers are doing and thinking in other countries. They discovered innovative practice ideas and developed admiration for social workers who were finding ways to work effectively, despite the difficult challenges they faced. They became aware that social work is an international profession and came away comforted by the notion that an international sisterhood exists that shares the same passion that they feel about social issues. Participants resolved to strive harder in their work—to be more conscious of culture, ethnicity, and class, to be more advocacy-focused. In addition, they spoke of feeling rejuvenated and refocused, more hopeful and more globally connected.

The data demonstrates that a social work study tour, whether it lasts nine days or seventeen, appears to have a significant educational and personal impact on participants—at least in the short term. To determine how long-lasting this impact is would require a different kind of study. Given what participants shared about their experiences and their learning, further inquiry into the impact of study tours would be valuable.

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Acknowledgments

I acknowledge my colleague, Sandy Runkle, Chair of the National Association of Social Work—Pennsylvania Chapter's International Committee, who served as an able tour co-leader in 1999 and 2000. I also acknowledge Gèza Nagy of Mid-Sweden University who co-led the 1998 study tour.

Integrating Quantitative Skills in Introductory Economics Courses

Melaku Lakew, PhD
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Many studies have shown that, despite exposure to introductory economics courses, U.S. students do not have a good understanding of basic economic concepts and seldom grasp key economic policy decisions of the federal government. Since economics is inherently quantitative in nature, we argue that meaningful integration of quantitative skills—in particular, the art of estimation—is vital in introductory courses. We strongly believe that one must introduce relevant quantitative concepts in the context of economic ideas. It is also essential to include a wealth of real-life economic data and other resources, including the web, in introductory courses. It is important to include exercises that will foster both individual and group learning. Creatively incorporating quantitative skills will increase students' understanding of key economic concepts, and it will increase students' success in economics as well as their understanding of the connection between basic quantitative skills and economics.

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Several studies conducted with college students reveal a less-than-satisfactory level of economics knowledge. For example, Walstad and Larsen's *National Survey of Economic Literacy* (1992) showed that fewer than 50 percent of college seniors could recognize an example of monetary policy action taken by the Federal Reserve Board. Another study of 12,854 students who took the Major Field Test in Business II (MFTB) (Educational Testing Service 1998) indicated that fewer than 50 percent of college seniors could correctly answer nine or more of the twenty economics items. Students in basic economics class come ill-equipped to interpret empirical evidence, and their understanding of using a quantitative approach to economics is weak (John J. Siegfried 1998: 64).

The quality of textbooks used and the instruction provided affects student learning of basic economics concepts at the college level. Most introductory economics textbooks fail to articulate the connections between quantitative skills and economic ideas. Very few textbooks integrate applied basic quantitative skills in the context of economic concepts and theories. Also, most textbooks do not emphasize real-world examples relevant to students' life experiences.

In contrast to instructors in other disciplines who have moved to a broad teaching repertoire, economics instructors in many institutions continue the traditional lecture as their preferred teaching method. William E. Becker (1997) revealed that more than 80 percent of teaching time in basic economic courses is spent lecturing, the usual "talk-and-chalk" method. The 1996 publication *Test of Understanding of College Economics (TUCE III)* investigated the use of different instructional materials and approaches in principles of economics courses across the nation (Siegfried 1996: 5). Based on a survey of 139 faculty members at 53 colleges and universities across the nation, the study concluded that fewer than 20 percent of instructors used computer-based exercises or television programs, and only about 40 percent assigned nontextbook readings.

Since most introductory economics courses involve passive instructions, notably the lecture, instructors seldom take into account students' different learning styles. Few courses spend time on group work, discussions, case studies, simulations, or other forms of active learning. Instructors limit learning opportunities for their students when they do not take different instructional modalities into account.

Quantitative Skills Building

We strongly believe that a good background in quantitative skills is essential for students' understanding of, and success in, economics. Quantitative skills come in many forms, for example, numerical reasoning, data gathering and analysis, and algebraic reasoning. An important skill often overlooked by many students and instructors is the ability to make good "ballpark" estimates. In economics, one often creates simple models based on assumptions, available data, and data from surveys (from government or private sources), which one then uses to make economic predictions. Estimation skills

are important because they give students the confidence to tackle economics problems essential to their lives. Once students have grappled with many estimation problems, they often find it easier to relate to economic indicators released by government and private agencies. They are better able to interpret and analyze data and to draw meaningful connections and conclusions about economic problems.

Since everyone has a different way of understanding large numbers or quantitative data and concepts, it is important to depict quantitative information in various ways. For example, a billion dollars can be thought of as one billion one-dollar bills, ten million hundred-dollar bills, or hundred-dollar bills stacked to a height of 4,000 feet! It is very useful to have multiple representations of a single quantitative concept, as this leads to a more robust understanding of the concept involved.

Reinforce the Scientific Method in Economics

Theory plays a vital role in basic economics. Estimation problems expose students to the four-step scientific method employed in economics.

Step One. *Identify the question, and define relevant variables.*

The first step is to identify the economic question and define the variables relevant to the problem. In this case, the relevant variables are price and quantity. Students should know that a variable is a measure that can take on different values. The variables of concern become the elements of the theory, so they must be selected with care.

Step Two. *Specify assumptions.*

A student who indulges in several estimation problems will see clearly the relevance of assumptions in solving economic problems.

Step Three. *Formulate a hypothesis.*

Create a theory about how key variables relate to each other. The purpose of this hypothesis is to help make predictions about the real world.

Step Four. *Compare predictions with evidence.*

To test a hypothesis, students in economics must focus attention on the variables in question and validate with real-life data the predictions of the theory.

Illustrate Quantitative Data Concretely

We give four examples to illustrate the idea of representing quantitative data in a multifaceted fashion. The general principles used in these examples are also widely used in solving economic problems and in economic forecasting. Students who learn the techniques of estimation will relate more easily to fundamental economic theories and concepts.

Example 1.

Estimate the total amount in sales (dollars) of all the toothpaste sold in a year in the United States.

There is no single answer for this problem, and this teaches students that

quantitative problems in real life rarely have only one right answer. Depending on the assumptions they make, students will derive different estimates. This problem teaches students the importance of making reasonable assumptions, questioning those assumptions, and finally seeing the connections between their assumptions and their solution.

Let us say there are 100 million U.S. households., with an average of three persons per household. It is reasonable to assume that every household uses toothpaste on a daily basis. Let us also assume each household consumes a tube of toothpaste in a month. (Here students can use their personal experience and, of course, this may provide each with a different assumption.) This means each household consumes 12 tubes in a year, which implies that the total number of tubes of toothpaste used in the United States in a year is 1200 million, or 1.2 billion. Then, to find total sales, we assume the average price of a tube of toothpaste is \$2.50 (again, students can use their personal shopping experience to assume about the price of a tube of toothpaste), we calculate the total sales of toothpaste in a year to be equal to:

$$\$2.5 \times 1.2 \text{ billion} = \$3 \text{ billion.}$$

Since we can change the assumptions, we can model this problem using simple algebra by assigning variables for different information assumed. For example, if

q = the number of tubes (i.e., quantity) of toothpaste consumed per household in a year,

and

p = the average price per tube of toothpaste,

then we can express

the total revenue (TR) as $TR = q \times p \times 100$ million households. We can change the values of price (p) and quantity (q) to see how the total revenue (TR) changes. We can also do this problem by breaking the population into various income categories and estimating the revenue based on each of these income groups to arrive at the total revenue.

This problem can help students understand such concepts as total market demand and total revenue, which are important components in the theory of firm in microeconomics. By using such an illustration, we can easily introduce the notion of markets by which buyers and sellers carry out exchanges (via demand and supply) to determine price and quantity. One can extend the idea to talk about distinctions among the local, regional, and national markets. When we refer to the total household consumption of toothpaste in the United States, students make the connection that the demonstration refers to the national market in which there are many sellers and many buyers.

Example 2.

Estimate the total gasoline sales at all the gas pumps in the United States in a year.

Of course, there are many ways to tackle this problem. We will illustrate one method. First, ask students to guess their answers to this problem and to write it down.

Again, assume there are about 100 million households and that the average household has two cars. Each car is filled with gas once a week on average. (Some families may fill up more or less often, depending upon commute distance, so this may be a good place to talk about the importance of averages.) This means each household fills their cars' gas tanks around 100 times a year. Then suppose each full tank, on an average, costs \$20, so each household spends \$2,000 a year on gas. This means the total sales per year of all the gas stations in the United States is $\$2,000 \times 100 \text{ million} = \200 billion!

Again in this problem, we can introduce variables at different steps, and write a simple algebraic formula to express the total sales of gasoline in a year in the nation and study how the total sales changes when the assumptions are changed.

Now, \$200 billion is a lot of money. We can illustrate this amount of money in several ways. \$200 billion dollars is equivalent to:

208 million square feet of area covered with \$100 bills, or

23 million square yards of \$100 bills, or

4,000 football fields covered with \$100 bills!

A \$100 bill (or any currency denomination, for that matter) is approximately 6 inches long and 2.5 inches wide, so the area of each \$100 bill is about 15 square inches. Therefore:

Total area of \$200 billion = 30 billion square inches = 208 million square feet. (We used 1 foot = 12 inches, hence 1 square foot = $12 \times 12 = 144$ square inches.)

Example 3.

Estimate the number of pizzas consumed in the United States in a year.

Of the many ways of figuring out this problem, we will illustrate one.

Assumptions:

- Approximately 100 million households in the United States
- Each household consumes an average of two pizzas per month.

Therefore, the number of pizzas consumed by a household in a year = $12 \times 2 = 24$, and the total number of pizzas consumed in a year in the United States = $24 \times 100 \text{ million} = 2.4 \text{ billion!}$

The estimate gives a sense of how many pizzas Americans consumed in a year. Initially, the students may have no idea at all, but, after this simple estimation, they have a slightly better sense of what the actual figure might be. Notice they used basic arithmetic to come up with an estimate for this problem.

They could also look at this problem from an economic perspective of the resources (labor, capital, and such raw materials as flour, oil, cheese, etc.) used to produce the pizzas and the revenue generated by selling these pizzas. Can they estimate the amount of labor and material used to produce this number of pizzas?

Sometimes it is hard to get a sense of 2.4 billion pizzas. One can look at this in many ways, as we did in the earlier problem. 2.4 billion pizzas stacked

on top of each other will be:

200,000,000 feet high, or

38,000 miles high or

160,000 times as high as the Empire State Building in New York City!

Can students guess the height of the Empire State Building? How many acres would 2.4 billion pizzas cover? How many football fields will this cover?

The examples discussed above lend themselves to group work, fostering cooperative learning. Students working in groups will:

- Gain insights into diverse ways of thinking about a problem.
- Learn to be a team player, an important skill in the workplace.
- Share their life experiences in the context of economic problems, thus achieving a better understanding of economic concepts.
- Better understand the advantages of division of labor in completing a task efficiently.

Now that students have been exposed to some simple estimation problems in economics, one can challenge them to think about how economists compute more complicated economics estimates, such leading economic indicators as the Consumer Price Index (CPI), unemployment rate, gross domestic product (GDP) and others. For most students these indicators are abstract economic concepts with no relevance to their lives. When students do simple calculations about these leading indicators, they internalize the basic ideas and thus become informed citizens. Below we give a few examples.

Example 4.

Ask students to define the notion of unemployment rate, then guess the current national unemployment figure and the state unemployment figure. As a follow-up, ask them to gather data on their campuses and find the local unemployment figure. The students can then compare their figures to the national rate, and explain the possible differences using economic concepts, such as investment, growth rate, and income.

Example 5.

According to the Monthly Labor Review, March 2000, the U.S. unemployment rate for 1999 was 4.2%. Estimate the actual number of people unemployed.

Clearly, one needs to know the size of the population to come up with an estimate. The U.S. population is approximately 274 million. If we use the entire population as a basis and 4.2 percent are unemployed, this means the number of unemployed is 4.2 % of 274 million = $.042 \times 274 \text{ million} = 11.5 \text{ million}$.

Obviously our estimate is not correct. To arrive at the right figure, we must calculate 4.2 percent of the labor force in 1999 rather than the total U.S. population. The approximate labor force in the United States was 139 million in 1999 (Source: *Monthly Labor Review*, March 2000). Hence, the number of people unemployed in 1999 is calculated as $.042 \times 139 = 5.8 \text{ million!}$

This figure is more than the 1999 populations of Washington, D.C., Nebraska, New Hampshire and Nevada combined. Clearly U.S. society as a whole would be in an uproar if the entire population in three or four states was unemployed, but since the 5.8 million unemployed people were dispersed all across the country, it wasn't noticed as much.

After this exercise, the instructor can share with students the process the federal government uses to generate the unemployment figure. It conducts a household survey of 59,500 people to estimate the unemployment rate based on answers to a number of questions, including, "Are you employed?" and "If you are not employed, are you looking for work?" The unemployment rate is then calculated as the ratio of the number of people unemployed to the total number in the labor force. To be counted in the labor force, you must either have a job or be looking for one.

Explore Economics through Quantitative Models

Economic models are always abstractions, or simplifications of the real world. They take very complicated phenomena such as human behavior and actions of businesses and governments, and simplify them, much like a model of an airplane used by an aerospace engineer is a simplification of the actual plane. Some economics models are very detailed; others are just broad abstractions. Use concrete examples to articulate well the connection between economic ideas and quantitative skills to students.

Quantitative models in many cases can be represented and explored:

Numerically—by looking for patterns in the table of values among the variables involved.

Algebraically—by describing an equation relating the variables.

Geometrically—by plotting values of the variables, looking at the graph, and observing important characteristics of the graph and their implications in economics.

Whenever possible, it is important to represent relevant economic concepts using these three quantitative approaches. We believe this will build a powerful understanding of the concepts involved. Using a variety of representations increases the probability that each student will find meaning in the material presented. We discuss two examples in detail to illustrate our argument.

Example 6.

Given below are approximate GDP figures for the years 1996 to 1999. Using that information, estimate the GDP for the years 2002, 2005, and 2010.

First, one can ask the students to write a few sentences about their understanding of GDP. This exercise might help them get a sense of the different components of the GDP and its relation to the health of the economy.

The students can first look at the data from a numerical perspective only by observing that the GDP had increased by \$351 billion each year from 1996 to 1999. Some may recognize a linear relationship in this table of values.

Year	1996	1997	1998	1999
GDP in billions of dollars	7814	8165	8516	8867

* Source: *Survey of Current Business*, March 2000

Figure 1

Assuming that the same trend in GDP continues, one can calculate the GDP in future years as follows:

In one year the GDP goes up by 351. Hence, the GDP will go up by $3 \times 351 = 1053$, from 1999 to 2002, and the GDP in the year 2002 will be $8867 + 1053 = 9920$. (All figures are in billions of dollars.)

Now the students can calculate the GDP for 2005 and 2010 by following a similar scheme. By looking at the table, one can now create a simple algebraic model (linear model) to study the change in GDP over a period of time. To make things more organized, we introduce variables Y (commonly used in economics textbooks) for the GDP and T for time measured as number of years from 1996; i.e., 1996 corresponds to $T = 0$, 1997 corresponds to $T = 1$, etc. Now we can rewrite the table as follows:

Time (T)	T = 0	T = 1	T = 2	T = 3
GDP (Y)	7814	8165	8516	8867

* Source: *Survey of Current Business*, March 2000

Figure 2

One sees that as T changes by 1, the value of Y changes by 351. Notice the following:

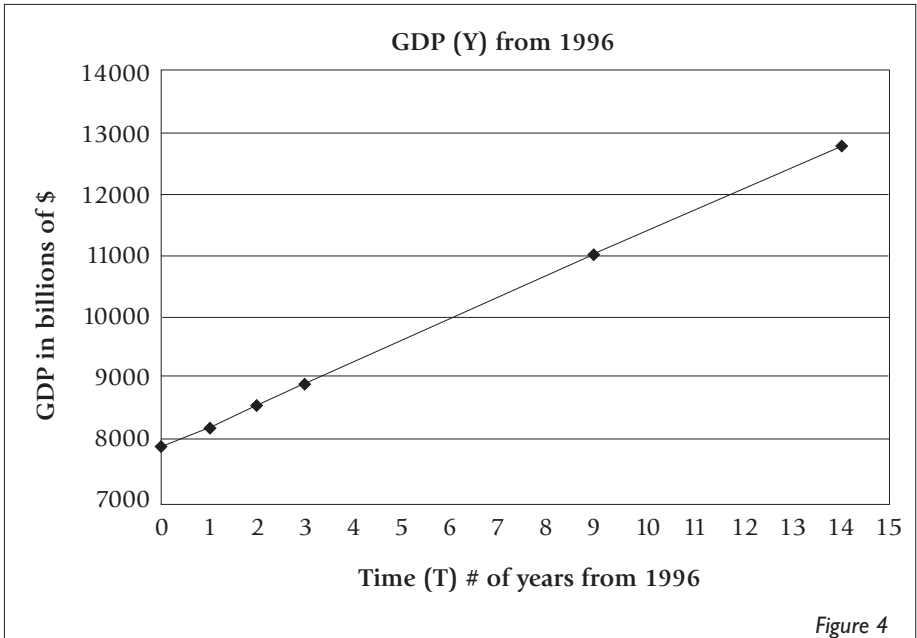
T	Y
0	7814
1	$8165 = 7814 + 351$
2	$8516 = 7814 + 702 = 7814 + 2(351)$
3	$8867 = 7814 + 1053 = 7814 + 3(351)$

Figure 3

It is not hard to see how to continue this further. One can easily see the relationship between T and Y as follows: $Y = 7814 + 351T$.

Notice the equation in T and Y is linear. Now one can compute the GDP in the years 2002, 2005 and 2010 by using this equation. For example, GDP in 2005 is the value of Y when $T = 9$ (2005 is 9 years from 1996): $Y = 7814 + 351(9) = 7814 + 3159 = \10973 billion = \$10.973 trillion.

Because the equation connecting Y and T is linear, the graph of Y versus T is a straight line, as shown below. We can look at the relationship between Y and T through this graph and also use the graph to compute the GDP in 2002, 2005 and 2010.



Example 7.

The following table gives information about consumption (C) and GDP (Y) from 1996 to 1998 in trillions of dollars. Use this data to explore the possible relationship between C and Y, and assuming that the same trend continues, predict the values of C in the years 2002, 2005 and 2010.

Year	1996	1997	1998
GDP (Y)	7.814	8.165	8.516
Consumption (C)	5.238	5.434	5.699

* Source: *Survey of Current Business*, March 2000

Figure 5

Notice that the GDP has gone up by \$351 billion (= \$.351 trillion) each year from 1996 to 1998. Let us see how the consumption (C) has changed each year from 1996 to 1998. In economics, it is customary to denote change in C by ΔC (pronounced *delta C*), and change in Y by ΔY . Let us calculate these changes.

Changes	From 1996	From 1997 to 1998
$\Delta Y =$ change in Y	.351	.351
$\Delta C =$ change in C	.196	.265

* Source: *Survey of Current Business*, March 2000

Figure 6

Notice that the GDP has changed by the same amount, i.e., 351, both from 1996 to 1997 and from 1997 to 1998, but the changes in consumption from 1996 to 1997 and from 1997 to 1998 are different. This change clearly is NOT a linear change (i.e., constant change). How can we predict the future values of consumption in relation to GDP? Well, even though we may not be able to figure out exactly the future consumption values, we still can at least come up with a ballpark estimate for this as follows:

Since the GDP is changing in a linear fashion, one can use the calculations of example 3 to find future values of GDP in 2002, 2005, and 2010 (under the assumption that the same trend continues for the GDP).

The change in consumption from 1996 to 1997 = \$.196 trillion

The change in consumption from 1997 to 1998 = \$.265 trillion

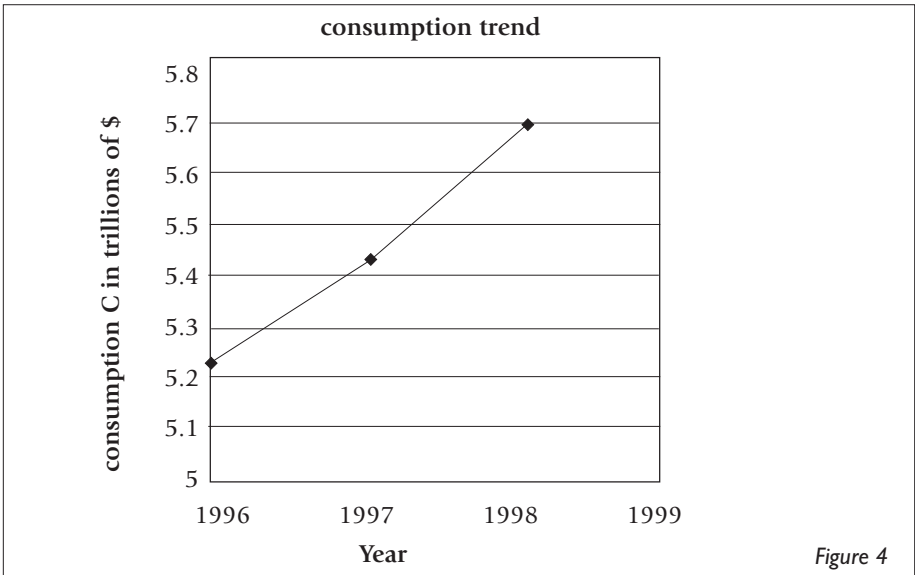
The average of these changes is \$.231. It is not highly unrealistic to predict that the consumption will change by \$.231 for the next few years, so using this rough estimate we can project the consumption levels in 2002, 2005 and 2010.

$$\begin{aligned} \text{Consumption in 2002} &= \text{consumption in 1998} + 4 (.231) \\ &= 5.699 + .924 \\ &= \$6.623 \text{ trillion} \end{aligned}$$

$$\begin{aligned} \text{Consumption in 2005} &= 5.699 + 7 (.231) \\ &= 5.699 + 1.617 \\ &= \$7.316 \text{ trillion} \end{aligned}$$

Similarly, one can calculate the consumption for 2010.

Of course, we have assumed that consumption will increase by the same amount of \$.231 trillion each year from 1998 through 2010. In this example, we made simple assumptions about the consumption and created a model to forecast consumption in future years. Let us now look at this example graphically.



The graph above indicates that the data points (1996, 5.238; 1997, 5.434; and 1998, 5.699) do not lie on a straight line, i.e., the relationship between time and consumption is not linear, although it appears somewhat linear. To build a linear model that will best describe this relationship, we can use linear regression, which is beyond the scope of this paper.

Quantitative Resources and Rewards

The examples discussed above clearly demonstrate the importance of quantitative skills in understanding many of the economics concepts and problems. Instructors can use data sources such as the Bureau of Labor, *Survey of Current Business*, and *Economic Report of the President* to teach introductory economic courses in a more lively and current manner. Instructors can also use a number of government and private websites to create interesting classroom examples and stimulating group projects.

We believe that integrating quantitative tools in meaningful ways in basic economics courses will help students:

- Learn and communicate fundamental economics ideas effectively.
- Create simple economics models.
- Strengthen their quantitative skills and prepare them for future economic courses.
- Understand economic policy decisions that affect their lives.
- Become informed citizens.

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Teaching the Principles of Economics to Disengaged Students

C. Norfleet Jeffries, Ph.D.

The author presents some reasons why students are disengaged, which may originate in the student or the professor, and offers techniques and strategies, using introductory economics course examples, that have proven to be successful. He posits that, when students show visible signs that learning is not taking place, the student and the professor both bear responsibility for the shortcoming.

Dr. Jeffries originally presented aspects of this paper at the Sixth Lilly Conference on College and University Teaching—South at the University of Georgia, held February 11–13, 2000.

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Empirical studies on student performance in economics have followed several different approaches. One emphasizes the characteristics of students, another centers on the qualitative aspects of the economic principles course, and another approach focuses on the characteristics of the professor. Investigators who studied students examined such factors as the importance of academic characteristics, interest, and gender in determining student performance in economics. For example, Barbara Beaudin (1992) reported that course grades have a different impact on male and female students in whether they continued the study of economics. Mary Williams (1992) reported that no significant gender difference exists in performance on economic examinations. This author, C. Norfleet Jeffries (1995a, 1995b), provided a comparison of the performance of male and female students in introductory economics.

Michael K. Saunders and Phillip Walstad (1990) were among those who examined the qualitative aspects of the principles course. These authors provide a comprehensive handbook for teaching the course, which covers such topics as textbooks, learning objectives, course goals, and teaching methods. N. Scott Cardell, Rodney Fort, Wayne Joerding, and Fred Inaba (1996) endorsed the laboratory approach to learning economics and reported on two such formats. Kristeen Bullwinkle (1998) suggested that more integration of textbook, Internet, and websites would enhance the learning of economics. Charles Holt (1999) advocated classroom experiments for learning economics, in part, because students are placed into the environment of an economy.

When considering the characteristics of the professor, Ewuuk Lomo-David and Jack Hulbert (1993) noted that an instructor's classroom behavior is important. This author also examines the behavior of professors, specifically, how professors can involve disengaged students in class lectures and other activities.

Disengaged students are those who are unmotivated, unconcerned, and uninterested in class lectures and other learning activities. These students are not unintelligent but merely mentally disconnected from the learning environment. They show *visible* signs that they are not focused on learning, such as sleeping or nodding in class, staring blankly, continuously looking at a watch or room clock, passing notes, talking, or preparing for class dismissal ten to fifteen minutes before the class will end.

Before I discuss professor behavior, I discuss the reasons for student disengagement, including student-centered reasons, then suggest instructional techniques and strategies that have proven to be successful. In offering these, I assume that the instructor-reader (1) knows his or her discipline; (2) knows his or her students and is committed to their learning success; and (3) is interested in improving his or her instructional delivery.

One additional caveat is in order. I illustrate particular teaching strategies through examples from my 25 years in the higher education teaching of economics. My examples will be more or less readily applicable to other academic disciplines.

Student-Centered Reasons for Student Disengagement

Some reasons for disengagement in the classroom originate in students. Students may have misperceptions of content relevance, lack of interest in economics, misallocate their time, and counterprioritize.

Misperceptions of Content Relevance

Students may be disengaged because they see no relevance between what is taught in class and what they perceive is happening in the real world. Sometimes students will ask for class discussions and other activities that have relevance. For example, they may ask for a practical example rather than listen to a theoretical explanation. They want to know “how people really behave.” In reality, their perceptions of the world may not correspond to actual fact. When such issues surface in class, take time to link the content discussion with examples of actual events and point out relevance with every example.

When I discuss the efficiency of markets and how the price mechanism operates in my introductory economics class, students often want to discuss what they perceive as the gross injustices in society, e.g., the exploitation of women, minorities, and the environment. I take advantage of their initial perceptions to teach course material. Prior to the lecture, I ask students to write about their perceptions of the operation of the economy by posing general questions that correspond to the lecture topic and chapter currently under discussion.

After the lecture, I ask students if any of their perceptions have changed and, if so, to what extent. Usually, after the lecture, readings, and Internet assignments, students do change their opinions or, at least, modify them somewhat. This has proven to be a valuable teaching tool, one that increases student participation in class discussions and forces students to think critically about economic issues.

Lack of Interest in Economics

At the undergraduate level, I (Jeffries, 1995a, 1995b) extensively surveyed more than 400 students enrolled in economic principles classes. The students were from various academic majors throughout my former university. Students provided their personal and academic background, employment situation, and career plans.

In the study, 53 percent of the respondents were female (Figure 1). Seventy-eight percent were less than 23 years old, with 20 years old the most frequently reported age. Almost 40 percent and 34 percent of survey participants are sophomores and juniors, respectively. Forty-eight percent of students were registered in the principles course because it was a general education requirement.

Jeffries reported that nearly 44 percent of respondents indicated having a “substantial interest” in the principles course and 43 percent have an “average interest” in the subject matter (Figure 2). Sixty-four percent of survey partici-

Background Information of Survey Respondents

School	No.	Percentage
Liberal Arts	137	(33.3)
Education	36	(8.8)
Business	174	(42.3)
Science & Technology	63	(15.3)
Other	5	(0.2)
Sex		
Male	194	(46.9)
Female	220	(53.1)
Classification		
Freshmen	1	(1.2)
Sophomores	164	(39.6)
Juniors	141	(34.1)
Seniors	100	(24.2)
Graduates	4	(1.0)
Age		
< 22	322	(78.2)
23 >	92	(21.8)
Place of Birth		
In-State	226	(54.6)
Out of State	188	(45.4)
Why Enrolled		
Elective	15	(3.6)
General Requirement	199	(48.3)
Major Requirement	198	(48.1)
Grade Point Average		
2.0 - 2.4	129	(31.3)
2.5 - 2.9	146	(35.4)
3.0 and Above	137	(33.3)
Plans		
Graduate School	207	(50.6)
Work	163	(39.9)
Other	32	(9.5)

Figure 1

Student Interest in Economics

Interest in Economics	
Substantial Interest	44.0%
Average Interest	43.0%
Little Interest	13.0%

Expect to Learn	
Substantial Amount	64.0%
Average Amount	32.0%
Little	4.0%

Contribution of Economics to Career Goals	
Substantial Amount	50.0%
Average Amount	38.0%
Little	12.0%

Difficulty of Economics versus Other Courses	
More Difficult	49.0%
Same Difficulty	40.0%
Less Difficult	11.0%

If Given the Option, Will Enroll in Another Economics Course	
Yes	42.0%
No	58.0%

Note: Figures are rounded

Figure 2

pants expect to learn a “substantial amount” of economics in the principles course and 32 percent an “average amount.”

Fifty-eight percent of survey respondents, if given the option, indicated that they would not enroll in another economics course. Forty-nine percent of students noted that introductory economics is “more difficult” than their other classes. Forty percent of respondents believe that economics is “equally as difficult” as their other classes, and 11 percent indicate that economics is “less difficult.”

One-half of the survey participants believe that economics will make a “substantial contribution” to their career goals and 38 percent indicate an “average contribution.” Only 12 percent of undergraduates reveal that economics will make “little contribution” to their future goals.

These findings indicated that students come to introductory economics interested in the subject, expecting to learn economics, and believing that it will help them in their careers. Notwithstanding, more than one-half of the survey respondents indicated that they would not enroll in another economics course, if given the option.

Time Misallocation

Some students are disengaged in class because they allocate few hours to their studies. They oftentimes spend too many hours working jobs. This work contributes to physical and mental exhaustion, which negatively affects their preparation and enthusiasm for their courses and class activities. I recognize the need for some students to work for living expenses, but many appear to work to maintain lifestyles, complete with late model cars and cell phones.

Other students spend an inordinate amount of time in athletics, fraternity or sorority activities, and other extracurricular activities, including partying. Because of these primarily social activities, students have less time to study and prepare for class. This lack of preparation facilitates disengagement in the classroom.

If students' job duties or extracurricular activities interfere with their class responsibilities, I speak to them privately about ranking priorities and steer them to readily available materials on time and credit management, which some students find helpful.

My student survey study (Jeffries 1995a, 1995b) revealed that students were not spending a sufficient amount of time studying and preparing for class. More than one-half of the respondents (53.3 percent) acknowledged studying economics three or fewer hours per week. This suggests, in part, that these students are relying heavily on class lectures to successfully pass the course. However, students who indicated that they spent more hours per week studying economics also expected to earn higher grades in the course.

Students who worked less than 15 hours per week expected to earn a higher grade in economics (3.19 on a 4.0 scale) than those working 32 or more hours each week (2.88 on a 4.0 scale). These data imply that students understand that study time and hours spent working will impact the grade they earn in economics.

Counterprioritizing

Some students are disengaged in class because the course is not a priority to them. They have set different priorities, and are more interested in just obtaining a passing grade for the course, not necessarily, learning the content. Indeed, some students say, "I'm only taking the class because it is required." Other students have suggested that what is taught in class is not important because "It is not in my major."

The time of day or the day(s) of the week the class meets can also contribute to the disengagement of students. Some professors have experienced the difficulty of teaching late-afternoon classes during the spring, before a homecoming game, or in competition with other major campus events. Notwithstanding, it may be beyond the control of the individual professor or the student to make a change in this area.

As a consequence of misperceiving the relevance of class content, holding minimal interest in economics, working, and allocating insufficient time devoted to studying, students can become disengaged in class. On the other hand, students who have invested time studying and preparing for class are

more focused during lectures and, as a consequence, more likely to participate in other class activities (i.e., more engaged).

Faculty-Centered Reasons for Students Disengagement

Other reasons for student disengagement in the classroom originate in the instructors. Similar to student-centered reasons, professors may misallocate their teaching time, neglect content relevance, and counterprioritize.

Class Time Misallocation

Some professors spend an inordinate amount of time on their discipline's esoteric jargon, at the expense of more understandable and meatier subject matters. Students can become bogged down with minute details. Hence, students are disengaged because professors spend too much time lecturing on minor points. If analyzed, professors might choose to omit these minor points completely.

With students who are not economics majors, I no longer spend a considerable length of time on minor points. For me, it is less important that students understand that *"the marginal cost curve that lies above the minimum point on the average variable cost curve is the firm's supply curve."* My time is best spent helping students understand the more general application of the firm's supply curve than the finer point of how it is derived. Students are relieved! Equally, there is no substantial disservice to them or the academic discipline.

Neglecting Content Relevance

Because students want real-world relevance, we professors must give more concentrated attention to conveying to them the significance of what we teach. Depending on one's academic discipline, this attention may be more or less urgent.

When I lecture on the price elasticity of demand (i.e., responsiveness of consumers to a change in product price), I provide examples of how and why "real" businesses (e.g., K-Mart, Microsoft, movie theaters, sport teams, etc.) are eager to know the precise sensitivity of consumers to a change in the price(s) they charge. Because many of them attend the university's games, an example using the price of football tickets is more likely to invite responses from students. The demand for "widgets" was the example my instructor used in teaching other students and me the price elasticity of demand. Widgets are mythical goods that have no material counterpart in the real world. Indeed, the use of widgets was confusing and uninspiring.

Counterprioritizing: On Driving Empty Buses

Randy Bartlett (1993) presented a persuasive argument in his "Empty Buses," addressing the challenges many academicians face. Very succinctly, Bartlett told a story of a local bus transportation company that was accused of not stopping to pick up passengers, i.e., driving empty buses. The company's

response was simple. The bus drivers were committed to maintaining their route schedules. If they stopped for passengers, their efforts to complete their routes on time were hindered. Hence, the drivers decided not to stop at all.

Some professors, at times, give a higher priority to completing the course syllabus than focusing on what students are actually learning. For example, professors continue to cover new course material, even when students clearly indicate through test scores that they have not learned previously presented content. Moreover, some professors will lecture on chapter 10, for example, when students are still struggling to understand concepts in chapter 4. If you know such professors, they are driving empty buses with no students on board.

I strongly suggest that the driver (i.e., professor) has control over the steering wheel and brake pedal. Hence, if learning is to take place, it is up to the professor. We professors must assist students in reaching the proper destination, which may be to increase student learning, improve the performance of underachievers, raise the number of students passing the course, or increase graduation rates.

If students are disengaged and unmotivated because professors are driving empty buses, we must make immediate adjustments. We no longer have the luxury of blaming students when learning is not present in our classrooms. Do not hesitate during class lectures to apply the brakes to stop or slow down. Solicit evaluative responses from students about the “driving,” and take careful note of student performance on exams, quizzes, or oral responses to questions.

Stopping may be the appropriate response when we discover that we are chapters ahead of our students. Sometimes, it may even be appropriate to make a U-turn to go back over material taught during a previous lecture, chapter, or week.

Inevitably, professors are involved in trade-offs. We must make the hard decision about the quantity of chapters we cover during a semester versus the quality of our instruction and student learning. Admittedly, there are two schools of thought. One emphasizes the quantity of material presented, a common view among those teaching courses that are prerequisites for others, e.g., Statistics I and Statistics II. Others favor giving more attention to the qualitative aspects of teaching and learning. Of course, no magic formula exists to assist professors in making the decision about what is best for them and their students. I endorse quality teaching for success in learning.

In presenting these faculty-centered reasons, I have made the assumption that the reader does not exhibit behaviors often blamed in the past for student disengagement, such as using ancient and decaying lecture notes, coming to class unprepared, lacking interest in what students learn, and lacking skills in class and time management. If any are applicable, enroll in faculty development programs to improve instructional skills and academic advising.

Other Successful Engagement Strategies

Try other teaching methods when students become disengaged; try using the computer and computer labs, conducting PowerPoint presentations,

assigning individual projects and group presentations during certain points in the course. Below are additional strategies that may help hold students' attention.

Tie in Local Interests. Discussing state, local, and campus events will help to engage students. I often discuss local firms in the community. First, students are aware of such businesses. Thus, during class discussions, I rely on the experiences of students with some of these firms. Second, I establish a linkage clearly showing the relationship between the textbook, the local business community, and class lectures.

Keep Up-to-Date. Professors must be very sensitive to students' age, ethnicity, and gender. For example, I no longer talk about the demand of eight-track tapes or the double-digit rate of inflation during the 1970s. Keeping in touch with the popular culture trends for each age and gender group represented in class will assist in making examples relevant.

When there are older and more mature students in class, I take the opportunity to allow them to discuss their purchasing behavior when they were 18 to 22 years old. This has led to some lively discussions between the younger members of the class and the 'old school' students.

Vary Leadoffs. Changing the way we begin class can be helpful. Depending on one's discipline, a professor can start the class one day with a problem-solving exercise. Begin the next class with a discussion of current national, state, or local events. Launch another with a conceptual or opinion question about topics covered during a previous class lecture, chapter, or week.

Tie in Global Interests. Integrating cultural and diversity issues into class lectures is an excellent way to involve all students in the learning process. For example, I ask international students to volunteer to share their views, examples, or compare differences between the U.S. economy and the economy of their homeland. Because my former university had faculty members and students from more than sixty countries, I had students from several different nations in each class.

Seeking volunteers is critical. Solicit in such a way that international students do not feel you are singling them out or asking them to do more in class than other students. This approach will engage *all* students in the subsequent class discussions. Usually, some U.S. students find the views of their international classmates interesting, even when they disagree with them. Also, involving international students enhances the classroom experience, promotes cross-cultural understanding, and makes transnational students feel more comfortable in the class setting.

Show Your Passion. We can inspire students with our own enthusiasm for the lecture, course, and discipline. It is easier for students to become involved in class activities when they see their professors are motivated and excited. Engaging is difficult when they see their professor seated in front of the class, drinking coffee, and talking in a monotone voice.

I usually provide my students with several reasons for my passion in teaching them economics. These reasons run the gamut from teaching is a blessing to it represents a lifelong commitment. I tell them that I have invested twenty-some years studying and learning the discipline. I also add that eco-

nomics is a vibrant, inspiring, and thought-provoking discipline.

Interject Humor. I do use humor in my courses. I am not a comedian, but I do have about ten jokes that I've practiced. Humor helps to relieve the academic tension from the rigors of class activities. Obviously, keep rein of the frequency and purpose of these lighter moments. I have found that students generally tolerate, or even like, a professor who occasionally shares a lighter moment with them.

Teach the Person. Finally, I teach more than my discipline, economics. I teach students. Hence, I teach whatever is necessary to help my students become successful. If the need arises, I teach math, English, history, credit card and debt management, and job hunting. At the same time, I am very cognizant of the discipline I am required and expected to teach.

Conclusion

Several colleagues in my department and I do well on the Student Instructional Rating Systems (SIRS) evaluations. On the form, students answer: Was the professor prepared to teach class? showed enthusiasm? receptive to students' viewpoints? Did you have the freedom to ask questions? Was the class intellectually challenging?

Students who are engaged and motivated are more likely to give their professors higher marks than those students who are not. When students are engaged, the word quickly spreads to other students. As a result, future enrollment in a professor's class may increase. Also, student enrollment in the academic major or school may increase if its professors stimulate students' interest.

Motivated students, as a result of engaging class learning, will study, attend class, and do the other tasks necessary to do well in a course—any course. Engaged students, more often than not, will earn higher grades than disengaged ones.

When students are actively engaged and professors are prepared and enthusiastic, more learning takes place. Otherwise, students will show visible signs that something is wrong. When this occurs, the student and the professor both bear responsibility for the shortcoming.

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- **Initial capitalization.** Please keep capitalization to a minimum. Where possible, use lowercase for government, church, state, party, volume number, etc.; North, South, e.g., are only capitalized if used as part of a recognized region. Otherwise, use, e.g., eastern France, southwest of Berlin.
- **Italics.** Indicate italics by underlining, in preference to the italic font. Underline titles of books, journals, newspapers, plays, films, long poems, paintings, and ships. Avoid extensive use of italics for emphasis.
- **Quotations.** Use double quotation marks for quoted material within the text; single quotation marks only if there are quotes within quotes. Quotations of over forty words should be extracted, indented, and underlined. Do not add leader dots at the beginning or end of a quotation unless the sense absolutely demands it.
- **Ellipsis.** Within a quotation, use three leader dots for a midsentence break; four if the break is followed by a new sentence.
- **Numerals.** In general, spell out numbers under 100; but use numerals for measurements (e.g., 12 in.) and ages (e.g., 10 years old). Use numerals in data sections where numbers under and over 100 are intermixed. Insert a comma for both thousands and tens of thousands, with no space following (e.g., 1,000 and 20,000). Always use the minimum number of digits for ranges and dates, e.g., 105–6, 1966–77, 212–313, and 1901–18. Use the percentage sign only in figures; spell out “percent” in text, using a digit for the number (e.g., 84 percent).
- **Dates.** Set out as follows: July 8, 1990, on July 8, or on the 8th; 1990s (not spelled out, no apostrophe); nineteenth century (not 19th century). Insert a hyphen when used adjectivally (e.g. nineteenth-century art).
- **Dashes.** If no em dash (long —) is available through keystrokes on your keyboard, use a double hyphen (e.g., “the potential for exploitation is still present—depending on how . . .”). If no en-dash (medium –) is available, use a hyphen to link number spans (e.g., 124–38) and dates (e.g., 2000–2). Use an en dash to connect two proper names when used adjectivally, e.g., Republican–Democratic alliance; Rome–Berlin axis; Temple–Hardcasde project.

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