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ABSTRACT

Four of the most important issues currently facing higher education are the need to make students the central focus, to restore public trust and demonstrate accountability, to manage limited resources more efficiently and effectively, and to utilize the power of technology. The driving forces behind these directions are public disaffection, financial constraints, the power and promise of new technology, and a growing enthusiasm for change, especially among faculty of community colleges. One example of this enthusiasm for improving the profession of teaching is a 1990 Carnegie Foundation report calling for the recognition of the distinct scholarships of discovery, integration, application, and teaching. In addition, the concept and practices of Classroom Assessment and Classroom Research developed at the University of California, Berkeley attempt to involve college teachers in these multiple scholarships. The project has put together 50 Classroom Assessment Techniques (CATs) to give teachers immediate feedback on how well students are learning. One simple assessment technique is the "Minute Paper," where before the end of the class period students write about the most important thing they learned and their main unanswered question. Faculty involvement in Classroom Assessment helps complement and strengthen the renewed emphasis on excellence in teaching, helps faculty understand the relevance of institutional assessment to their own work, and can help prepare faculty for a leadership role in the restructuring of teaching and learning. (Contains 12 references.) (KP)

Educating for the 21st Century

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EDUCATING FOR THE 21ST CENTURY*

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Six months ago in the darkness of mid-winter, when Terry asked for a title for my remarks today, I didn't have a clue about what I might want to talk about by midsummer or what you might want to hear about. So I gave him a serviceable 1995 title that combines two of the hot topics in higher education today -- improving instruction and assessment. I do plan to address those topics, but I would like to do so in the broader context of community college leadership. Thus I have retitled these remarks, "Educating for the 21st Century."

There is certainly no shortage of advice from legislators, the public, the media, and a wide variety of experts within our own ranks on what we should be doing to get higher education on the right track for entrance into the 21st Century. Amazingly, for an enterprise as diverse and often contrary as higher education, there is unusually high agreement on the directions in which higher education should move. Although there are variations on the theme and considerable discussion about what actions to take and how fast to take them, every conference I attend and every campus I visit is working on -- or at least talking about -- these four issues:

1. The need to make students the central focus of our work.

2. The need to restore the public trust and to demonstrate through assessment our acceptance of accountability for student learning.

3. The need to manage limited resources more efficiently and effectively.

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4. The need to utilize the power of technology to educate in and for the 21st century.

Community colleges are closer to accomplishing these four goals than any other type of institution of higher education. Nevertheless, legislators, the media, and the public are pressing hard for improvements throughout all of higher education. Fortunately, the four dominant themes are interrelated. They move in a common direction, and improvement in any one of them is likely to bring about improvement in the others. Improvement in assessment, for example, should help us to improve student learning without raising costs, which should help in regaining the public trust, and so it goes.

I don't think many people, in or out of the educational enterprise, would argue very forcefully against those imperatives -- not even the staunch defenders of the research university which must bear some of the burden for leading higher education away from the mission of educating undergraduates. But if Donald Kennedy, President Emeritus of Stanford University, is right, the research universities are going to lead higher education into a renewed emphasis on students and their learning. Writing in the latest issue of Change, Kennedy claims that because the research universities train the faculties for all other institutions of higher education, graduate students will soon be entering upon their academic careers as faculty members with a new set of values. He tells this story as evidence of the change that is already taking place among the emerging generation of faculty members:

At a symposium at Stanford late in 1994, about 500 graduate students in the sciences gathered to discuss their future careers. Following a panel in which teaching received a lot of attention, a distinguished senior scientist rose to say that in his view there is little point in trying to teach people how to teach; if one knows the subject matter, he said, the rest simply follows. "That is not the good

news," says Kennedy, "The good news is that the audience actually booed." (Kennedy, 1995, p. 15) Kennedy sees the changing emphasis in the research universities this way. He writes,

> "Now reform is in the air, and I think it will result in a new kind of institution. Its features will include a balanced respect for teaching, including teaching as scholarship; a sense of responsibility for undergraduate students that includes more than just their intellectual development; and a special understanding that in training their own graduate students, research universities are preparing people for careers full of complex challenges in a variety of places." (p. 15)

That "new kind of institution" may not sound very revolutionary to you who work in community colleges, but remember Kennedy is talking about revolutionary change in the research university -- an institution that many of us have learned to think of as relatively impervious to change. There is high significance in Kennedy's forecasts about change in the training of future faculty members because one of the more common complaints among those pressing for change is that it is hard to get faculty members committed to the kinds of changes that we are talking about today. But if the goal is improved student learning, then faculty involvement is not only desirable but necessary.

We need not wait for a new generation of faculty members, of course. Indeed, the pressures for change are so strong today that we cannot wait. But today's pressures for change are largely external; they come from forces in the broader society. It doesn't take much reading to pull together a list of what are sometimes called the "driving forces" for change in education. My list, aided and abetted by researchers and scholars in higher education, looks like this:

First, we must respond to the public disaffection with education. There was amazing strength in the public response to the harsh criticism of the public

schools in A Nation at Risk, (National Commission on Excellence in Education, 1983) which kicked off the educational reform movement a decade ago. Higher education, while not the target of as much hostility as the public schools, has come in for considerable criticism, and the criticism seems to be building rather than abating. Derek Bok, former president of Harvard, commented to his Board of Overseers that, "critics in this country have attacked [higher education] more savagely during the past 10 years than at any time in my memory." Now, almost everyone with any responsibility for education, including governors, legislators, accrediting agencies, and the Federal government, has jumped on the bandwagon of disaffection, with promises to do something about the rising costs and declining quality of education.

A recent poll in California, commissioned by the California Higher Education Policy Center, suggests that there is a gap between the perceptions of the general public and those holding positions of leadership in the state. The general public believe that a college degree is necessary as a ticket to a good job, and thus they are greatly concerned about cost and access. But they are not convinced that a college education is necessary in order to perform well in a good job. Actually, according to the survey, a majority of the general public feel that society has made college seem more important than it really is. Leaders in the state, however, are convinced that the quality of learning at least as important as the certificate, and they are raising questions about accountability, efficient use of resources, and "restructuring" comparable to what is going on in other segments of society.

The implications of these attitudes by our publics are already apparent in the funding of higher education. Quoting from an analysis of the California study -- and I have no reason to think that surveys in other states would show markedly different results -- "We find no sympathy among leaders or the public

for higher education's problems. Instead, we do find a belief [among leaders] that colleges and universities could do more with less, and a readiness to support or at least condone cutbacks that don't reduce access . . .The public -- valuing the college diploma, but not convinced the substance behind it is all that important -- have no reason to protest such cuts." (Wadsworth, 1995, p. 16).

This leads us directly to the second driving force for change, and that is financial constraint. I suspect that there is no one in this room who is not faced with the tightening of resources. Many feel that there is no place left to cut. Budget cuts have gone right to the bone in many states, but the cuts that have been made by institutions of higher education have been, for the most part, short-term emergency measures, such as personnel layoffs, early retirement, combining of administrative functions, and the like. They preserve the general structures of higher education, enabling us to continue to do pretty much what we have always done, but with reduced resources and fewer personnel. The radical restructuring that has been called for has not really taken place, but going back to the old ways of doing things is no longer an option. No one is predicting that higher education will ever return to the glory days of seemingly unlimited growth.

The third driving force for change is the power and promise of the new technology. Technology has been trumpeted before as a major force for change, but this time there is little doubt that the arrival of the Information Age will call for radical restructuring and a rethinking of the way we conduct our teaching/learning business.

There is an interesting parallel between the role technology has played in the transportation industry over the years and the role that it is destined to play in education. Technological advances in transportation occurred in quantum

leaps that resulted not in just "more" or "better" but in radically "different" ways of doing things.

For centuries, people walked from place to place. With the taming of the horse, the distance traveled and the loads transported became a different order of magnitude. With the invention of trains and cars, another quantum leap occurred. Then air travel increased the speed of travel, not just from 20 to 80 miles per hour, as improvements in the car had done, but from 80 to 800 miles per hour. Astronauts now move through space, not just10 times faster than airplanes, but at the rate of 25,000 miles per hour.

These quantum leaps result in more than improvements in the old ways of doing things. No amount of careful breeding, attention to diet, or training can make the greatest horse even approach in efficiency the "transportation work" done by the most mediocre car. Technological advance in the transportation industry has resulted not just in greater speed, but in a fundamentally different mode of transportation. Moreover, the time elapsing between inventions has grown shorter and shorter. Walking, as a means of transportation, served generation after generation; jet airplanes and space travel occurred within the time span of a single generation.

Quantum leaps are now occurring in the communications industry. Just within a decade or so, the speed of written communication has gone from airmail, to overnight delivery, to fax, to e-mail -- from a lag time of a week to a lag time of a minute.

Now think for a moment about how education has responded to technology. How different is the educational experience of your students from your experience -- or from that of your parents or grandparents for that matter? While there have been major changes in the content of education and in who has access to a college education, education has kept its basic structure in place for

centuries. Were a visitor from the 14th century to visit a modern American classroom, he would feel pretty much at home. A visit to a modern hospital or corporation, in contrast, would leave our visitor completely baffled.

It is a bit speculative to try to identify the parallels between technology's quantum leaps in transportation and in education. But the printing press may have done for education what the car did for transportation. It reached into every home and made reading necessary for the general public, much as the automobile reaches into every home and makes driving a car necessary for virtually everyone. The printing press and the easy availability of books and mass communication changed everything about lifestyles, much as cars have changed everything about lifestyles today -- from where people live, to what they do for a living and how they do it.

Computers now reach into most businesses and an amazing number of homes. They are changing what people do, where and how they do it. To be sure, they are making an impact in schools and colleges, but for the most part, computers have not made a quantum leap in education. A study by the Pew Higher Education Research program concluded that technology has not been used to bring about the radical restructuring that is called for and now seems within reach. Rather, say those who have studied the changes, "It appears that . . . technology has been used almost exclusively to automate existing practices." (Guskin, 1994, p. 27).

In enough ways to be eerie, higher education stands now where the railroads stood in the 1920s -- which is at the end of a golden era of expansion, but facing unprecedented change in the external environment. Seventy-five years ago, the railroads found themselves in trouble as the automobile, buslines, and finally airplanes offered new alternatives to travelers. At the same time, trucking, inland water routes, and pipelines offered faster, more convenient, and

cheaper service for the movement of freight. What the railroad operators failed to perceive was that the demand for transportation was growing, and that new ways of moving people and goods were rushing in to fill the need. Ironically, in the midst of great demand for transportation, the railroad operators turned inward and concentrated on "running the railroad" through striving for greater efficiency and more attention to doing better what they were already doing.

Today's heavy emphasis on improved efficiency and better management is certainly necessary, as indeed it was for the railroads, but it is hardly sufficient -- no more so than it was for the railroads.

There is another lesson from the transportation industry that has relevance for higher education. In his book, The Decline and Fall of the American Automobile Industry, Brock Yates observed that, "by the middle 1960s . . . emphasis at all the American auto makers had shifted away from engineering toward marketing and finance" (Yates, 1984, p. 29). He goes on to tell the story about an old-line engineer who cared passionately about cars who was asked to give a newly-hired executive a tour of the manufacturing operation. When they got to the engine plant, the new executive nudged the engineer and said, "Excuse me, I wonder if you'd explain how these things work. The thing he wanted me to explain," the engineer exploded, 'was an engine!' He had just been hired as an engineer by the world's largest automobile company and he didn't have the vaguest notion about how an internal combustion engine worked!" (Yates, 1983, p. 89).

There are managers in education today who know how to market and manage their product, but they don't know how "the thing" works. They don't know how students learn or how teachers teach, or how the curriculum is constructed, or how to visualize new roles for technology in our business of teaching and learning. I believe there is a driving force for change for all of the

actors in our business of education -- trustees, administrators, faculty, and students. Restructuring is not a management matter; it is an educational matter. Anyone setting out to restructure education, through technology or any other means, needs to know how this thing we call education works.

Finally, there is a fourth pressure for change, which is promising if true. Donald Kennedy sees "a growing enthusiasm for change that comes from within" the universities (p. 11). As examples of this openness to change, he cites the expanding literature on reform, the increasing number of comments by leaders about the need for change, and the serious attention being given to fundamental change by foundations. Well, OK. There is no denying the emphasis on change in the literature and among the leadership of higher education. But when all is said and done, more is being said than done. I have not seen much enthusiasm among my faculty colleagues at Berkeley for major change in the way they teach their classes, nor for the most part, have I spotted such enthusiasm among the rank and file faculty of community colleges. For some of my colleagues, their quantum leap consists of a timid hop into the use of customized textbooks that are a by-product of the invention of the printing press. I'd like to think that Kennedy is right in identifying a "growing enthusiasm for change," and I must admit that I do see pockets of great enthusiasm and energy, especially among faculty of community colleges.

But my message today is to argue for the preparation of faculty to take the leadership in developing the profession of teaching. At present, most faculty are at best followers rather than leaders in the restructuring of teaching and learning. We offer fairly modest programs of "professional development" to bring faculty the latest information from technology, cognitive psychology, and learning theory in the hope that they will apply new and informed practices to their teaching. Professional development programs are both good and necessary, but

they are not sufficient to prepare faculty for assuming leadership in the development of teaching as a profession.

Lee Shulman has pointed out that teaching is one of the few professions that lacks a "wisdom of practice" (Shulman, 1987). Most professions -- at least the most esteemed professions -- build on the knowledge of previous generations. Architects leave behind buildings; law has its cases; medicine has internships and "rounds;" engineering has bridges and roads. All of this accumulated "wisdom of practice" can be preserved and studied by future generations. We learn something when bridges and buildings collapse in an earthquake, and we build them better the next time around. But the wisdom of practice in teaching ends with the career of the individual teacher.

That may change with the introduction of technology-- which can be preserved and studied and improved by successive generations of teachers -- but classroom teaching today is a very personal and private profession. It is learned in private, and for the most part, it is practiced in private, without much input from any external source. Thus, there is little "community" among teachers who presumably share the knowledge and skills common to the teaching profession.

If education is to catch up with the other professions in preparing for major change, then faculty members will have to develop a profession of teaching. For higher education, that means going beyond the present calls for the recognition and reward of good teaching to engage teachers actively in constructing and pursuing the knowledge and skills of their profession. To date, the community colleges cannot be accused of fostering an ambiguity of the appropriate balance between research and teaching, but many community college faculty, emerging from training in research universities, have absorbed a culture there that regards publication as the ultimate form of scholarship. I continually run into community college faculty who want to know how they can

publish something -- anything -- in order to launch them into the work that graduate studies have prepared them for. If Donald Kennedy is right, then the graduate school culture is changing to reflect a broader base of scholarship that is more appropriate for the future careers of the majority of graduate students.

In the meantime, the Carnegie Foundation for the Advancement of Teaching has launched what appears to be a very promising nationwide movement to combat the overemphasis on research as the singular form of scholarship in academe (Boyer, 1990). The Carnegie report calls for the recognition of four separate, but overlapping functions of scholarship -- the scholarship of discovery; the scholarship of integration; the scholarship of application; and the scholarship of teaching.

The message of the Carnegie report is that teaching should be recognized as one of the four forms of scholarship. I want to go beyond that proposal to suggest that teaching, if it is to be real profession, should involve **all four** forms of scholarship.

"The scholarship of **discovery**, at its best, says the report, "contributes not only to the stock of human knowledge but also to the intellectual climate of a college or university. . . The advancement of knowledge can generate an almost palpable excitement in the life of an educational institution." (p. 17). Community colleges have not had a research mission, and for years, they have been accused of lacking an intellectual life. When I did my study of the priorities of community colleges in the 1980's, the lack of intellectual orientation and the lack of "community" were the points of highest dissatisfaction among faculty (Cross, 1981). It appeared that community colleges were suffering from the Rodney Dangerfield syndrome. As a community of educators, they got no respect from others -- or from themselves -- for their intellectual concerns.

My experience recently has been different. One of the most rewarding outcomes of my work with community college teachers engaged in Classroom Assessment and Classroom Research is the sense of excitement and community that has been generated as teachers join together to study their profession. In just a minute I will address specifically how community college teachers, with their already overburdened teaching schedules, can engage in Classroom Research, but for now, it is sufficient to recognize that dedicated community college teachers, teaching in the most challenging of all institutions of higher education, have much to gain and much to contribute to the advancement of teaching as a profession through the scholarship of discovery in teaching and learning.

The scholarship of **integration**, according to the Carnegie definitions, involves making connections across the disciplines and making interpretations to fit research into larger intellectual patterns. Community colleges, because they do not confine their faculties to narrow disciplinary boxes, are in an excellent position to work across the disciplines for the advancement of teaching as a profession. Writing Across the Curriculum is an example of an innovation that is based more in pedagogy than in a discipline. It involves the integrative form of scholarship since its goal is to engage teachers across the disciplines in teaching students how to learn through writing.

The scholarship of **application**, according to Carnegie, addresses the question, "How can knowledge be responsibly applied to consequential problems?" Many institutions of higher education, but most specifically land grant universities and community colleges, were founded on the principle that higher education should apply knowledge to serve the best interests of the community. Law, business, medicine, engineering, and all the vocational programs of the community colleges are committed to the application of

knowledge. But teaching, for the most part, has not applied what is known about teaching and learning to improve the profession. Most teachers teach as they were taught. If teaching is to become a true profession, then teachers must apply what is known about learning to the teaching/learning process.

Finally, there is the scholarship of **teaching**. Teaching, says the Carnegie report, is "a dynamic endeavor involving all the analogies, metaphors, and images that build bridges between a teacher's understanding and the students' learning. Pedagogical procedures must be carefully planned, continuously examined, and relate directly to the subject taught.. . . teaching, at its best, means not only transmitting knowledge, but **transforming** and **extending** it as well" (pp. 23-24, emphases in original).

It is encouraging that the Carnegie report has been so well received. Many colleges and universities are scrambling to build into their promotion and tenure procedures a broader definition of scholarship. That is fine, as far as it goes, but I believe that there are broader and deeper implications of the report that have not been addressed.

I see the Carnegie recommendations as important for community colleges, not as a **correction** for an existing problem, but as an **opportunity** to take the leadership in the advancement of teaching as a profession by encouraging their faculties to get involved in the multiple scholarships of teaching.

As some of you know, my colleague, Tom Angelo, and I have been trying to involve college teachers in the multiple scholarships of teaching through Classroom Assessment and Classroom Research. In order to help teachers observe the learning that was occurring in their own classrooms, we put together 50 Classroom Assessment Techniques (CATs) that can be used by any college teacher of any subject to get immediate feedback on how well students are learning what the teacher is trying to teach (Angelo & Cross, 1993).

For those of you not familiar with Classroom Assessment, let me give the briefest of examples. Classroom Assessment's most famous CAT is the Minute Paper. The Minute Paper is a simple device, that does precisely what Classroom Assessment is supposed to do. It provides immediate feedback to students and instructors on what students are learning while there is still time in the semester to make corrections, and it incorporates pedagogical principles that are important to students' learning. It works like this: Shortly before the end of a class period, the instructor asks students to write brief answers to two questions: (1) What is the most important thing that you learned in class today? and (2) What is the main, unanswered question you leave class with today?

Notice that the Minute Paper is as much a teaching device as it is an assessment technique. It incorporates pedagogical principles by requiring every student in the class to reflect on what they have learned, to synthesize and articulate it in a few brief sentences, to express that learning in writing, and to think actively about what they did not understand. If students are told that the Minute Paper is going to be requested at the end of a given class session, they tend to ask themselves along the way what they are learning, and they tend to be more involved and more active in sorting out the major message. Thus, even if the instructor failed to learn something important about students' responses to the teaching of that class session, the Minute Paper would still be worthwhile as a pedagogical technique.

But teachers do learn a great deal from Minute Papers. Dick Light, Director of the Harvard Assessment Seminars, comments in his first annual report that "This extraordinarily simple idea is catching on throughout Harvard. Some experienced professors comment that it is the best example of high payoff for a tiny investment they have ever seen." (Light, 1990, p. 36). The same productivity is apparent among community college teachers. In her survey of

community college teachers Mimi Steadman found that 88 percent of those using Classroom Assessment said that they had changed teaching behaviors or class activities as a result of the feedback that they received through Classroom Assessment (Steadman, 1994).

My original reason for proposing Classroom Assessment was to address two problems in implementing educational reform: One was the development of procedures that would complement and strengthen the renewed emphasis on excellence in teaching. I thought we needed some practical ways for teachers to learn more about their own teaching. Getting feedback on how well they are accomplishing their teaching goals is certainly a step toward recognizing the obligation of college teachers to self-assess, evaluate, and improve their own work.

My second motive became apparent as colleges everywhere became involved in institutional assessment under mandates from state offices and the accrediting agencies. Many, if not most, institutions assigned the responsibility for assessment to an office skilled in data collection and analysis, and hoped for the best. It was hard to get faculty involved in assessment when it was seen as just one more bureaucratic requirement that would have little relevance for their work. Few people, whether administrators or faculty, who had assessment crammed down their throats, saw how assessment could be used for self-improvement as well as for the accountability demanded by external agencies. I figured that Classroom Assessment was a way to get faculty to see assessment as relevant to their own work and to the educational missions of their departments and colleges.

Now I have a third reason for wanting to promote faculty involvement in Classroom Assessment and Classroom Research. And that is to prepare faculty for a leadership role in the restructuring of teaching and learning. Community

college teachers today know at one level "how the thing works," but they are more like assembly line workers than like design engineers. Through experience alone, they have figured out --sorta -- what works in their own classrooms, but they have very little understanding of why it works. For that, faculty need a knowledge base for their profession. And one of the ways for teachers to gain knowledge, without adding to their already very heavy teaching loads, is to use their classrooms as laboratories for the study of teaching and learning. Classroom Research, a close cousin of Classroom Assessment, is designed for discipline-oriented teachers without extensive background in either traditional research methods or in cognitive learning theory. It involves all four Carnegie functions of scholarship-- discovery, integration, application, and teaching.

When we first started our work, we used the terms Classroom Assessment and Classroom Research interchangeably, but we are now beginning to stress important distinctions between Classroom Assessment and Classroom Research. Classroom Assessment usually addresses the status quo or "what" questions of teaching and learning. What is going on in this class today? What did students find interesting or memorable? What did they learn from that day's lesson? What did they fail to understand or what did they have further questions about? Classroom Research attempts to answer questions having to do with understandings -- the "why" and "how" questions. Why did students respond as they did? Why did they confuse two concepts that the teacher worked especially hard to distinguish? How do students learn to contrast two different points of view?

The questions for Classroom Research frequently arise out of a teacher's work with Classroom Assessment. Data collected via the simple CAT of the Minute Paper, for example, might raise any of these questions: Are the topics mentioned as important more likely to come from the end than from the

beginning of the class period, that is, does recency play a more important than weariness at the end of a 50-minute class period? What happens if the Minute Paper is held over and administered at the beginning of the next class, i.e. how much do students remember from one class period to the next? Are poor students especially likely to fail to differentiate important from peripheral information? If so, are there ways to label the big ideas? Does repetition of major themes throughout the class period enhance students grasp of the big picture? Do good students have more questions or fewer than poor students at the end of the class period? Do students of color select different topics as important than Anglo students? If so, why? Are there cultural interpretations embedded in student priorities? If so, can they be used to enhance multicultural appreciations? These are questions that can occur to teachers who have trained themselves to be careful and systematic observers of students in the act of learning. And all teachers can learn to raise interesting questions about the teaching and learning that goes on in their own classrooms every day.

Some of you, I suspect, are familiar with the questions raised by Mina Shaughnessy about how students learn to write. Perhaps no book ever written on teaching and learning has had as much influence as Mina Shaughnessy's Errors and Expectations, written in 1977. Her book grew out of a careful and systematic analysis of students' writing errors. I would call the methods used in her book "Classroom Research." Shaughnessy was, by profession and by disposition, a teacher. She had no training as a researcher, and certainly would not have viewed herself as such. Her abiding interest was in understanding why the open-admissions students who flooded the gates of New York's City University when they swung wide in the 1970s wrote so badly that their writing essays, "...stunned the teachers who read them." (Shaughnessy, 1977, p.3). Shaughnessy 's task as Director of City University's Instructional Resource

Center was to help teachers understand how these students interpreted the alien writing tasks that faced them. Because at the time, there were no guides, textbooks, or research studies to turn to, Shaughnessy embarked upon her own study in a very pragmatic way. She describes her research methods as follows:

> "I have drawn from three resources: my students and the explanations they have given me, directly and indirectly, of their difficulties with written English; my colleagues, who have shared their insights with me over the years in many different settings, both formal and informal; and my own experience as someone who writes and therefore understands the pressures and peculiarities of that behavior.
>
> From these resources, I have reached the persuasion that underlies this book -- namely, that BW (Basic Writing) students write the way they do, not because they are slow or non-verbal, indifferent to or incapable of academic excellence, but because they are beginners and must, like all beginners, learn by making mistakes. These they make aplenty and for such a variety of reasons that the inexperienced teacher is almost certain to see nothing but a chaos of error when he first encounters their papers. Yet a closer look will reveal very little that is random or 'illogical' in what they have written. And the keys to their development as writers often lie hidden in the very features of their writing that English teachers have been trained to brush aside with a marginal code letter or a scribbled injunction to 'Proofread!' Such strategies ram at the doors of their incompetence while the keys that would open them lie in view." (p. 5).

One cannot help observing that Shaughnessy's beautiful and lucid writing style sets her apart from most educational researchers. But beyond that, her work is likely to be read and heeded by writing teachers who perceive that she knows intimately the problems they face in teaching remedial writing. The point I want to make is that her research involves methods that are available to any

classroom teacher -- sensitive observation, careful listening, a sincere desire to understand, and experience (her own as well as that of her colleagues) in teaching remedial writing. Those research methods, honed to excellence by Shaughnessy, have proved more powerful in influencing the teaching of remedial writing than most controlled experiments and statistical analyses conducted by traditional educational researchers. This type of educational research is in very short supply and it is especially appropriate for classroom teachers who have good opportunities to watch a wide diversity of students in the process of learning. College teachers can make a substantial contribution here -- to their own development as teachers, but also to the profession of teaching.

Classroom Research is different from traditional educational research, and if it is to be practical for classroom teachers, we need to be clear about the assumptions and procedures of Classroom Research. Most traditional educational researchers assume that there is an underlying order to the world, and that through the rational and objective methods of science, they can discover how this world of ours is put together. Questions are now being raised about the application of this sort of science to the vagaries of human behavior. Donald Schön of MIT observes that the problems for research in the hard sciences are usually clearly identified. Not so in the world of professional practice. ". . . problems do not present themselves to the practitioner as givens," he writes. "They must be constructed from the materials of problematic situations which are puzzling, troubling and uncertain" (Schön, 1983, p.40)

Schön contends that there is a choice to be made between the "rigor" of science and the "relevance" of practice in the social sciences. In professional practice, he writes,

> ". . . there is a high, hard ground where practitioners can make effective use of research-based theory and technique, and there is a swampy lowland where situations are confusing 'messes' incapable of technical solution. The difficulty is that the problems of the high ground, however great their technical interest, are often relatively unimportant to clients or to the larger society, while in the swamp are the problems of greatest human concern. Shall the practitioner stay on the high, hard ground where he can practice rigorously, as he understands rigor, but where he is constrained to deal with problems of relatively little social importance? Or shall he descend to the swamp where he can engage the most important and challenging problems if he is willing to forsake technical rigor? . . .
>
> There are those who chose the swampy lowlands. They deliberately involve themselves in messy but crucially important problems and, when asked to describe their methods of inquiry, they speak of experience, trail and error, intuition, and muddling through. (p. 42-3).

Many beginning teachers do a lot of muddling through, and eventually their insights improve their own teaching, but because teaching is such a private profession, not much talked about with colleagues and not much shared through publication, there is no systematic way of advancing teaching as a profession. If faculty are to provide the leadership for restructuring teaching and learning, they need to be systematically observant about how students learn their particular subject matter. They need to share their insights with colleagues, and they need to engage in the sensitive and purposeful observation of students in the act of learning .

Classroom Research isn't the only way to do this, of course. Almost anything that raises the intellectual curiosity of teachers and engages them actively in the communal pursuit of knowledge about learning will address two

problems in community college education: One is the seemingly perennial problem of teachers feeling that their work in the community college lacks intellectual engagement and that they are isolated in their own classrooms. The other is that there is now no place in higher education that is fully prepared to lead us into the 21st century with a restructuring of teaching and learning. Educational researchers can't do it alone because they lack access to the variables that are most important in the advancement of teaching as a profession. They lack continuous access to the natural setting of real classrooms; they usually lack an intimate knowledge of the subject matter content that students are attempting to learn; and they lack a continuing relationship with the student and the opportunity to see the triumphs as well as the struggles of individual learners. These are the variables that classroom teachers possess in abundance. But teaching as a profession remains an amateur's profession because faculty have not been challenged to assume the role of leaders in the restructuring of teaching and learning.

It will not be enough, I think, to appoint a faculty committee to give their attention to restructuring the way we deliver and process education. Most discipline-oriented faculty members do not have the professional knowledge that is required to improve the quality and reduce the costs of education. They can learn by engaging actively in the four scholarships recommended in the Carnegie report -- the scholarship of discovery, the scholarship of integration, the scholarship of application, and the scholarship of teaching. But if we are to meet the challenges of the 21st century, colleges must charge their faculties with the task of developing the profession of teaching. That means actively engaging faculties in study seminars on what is known about learning. It would be well worthwhile, I should think, to turn some faculty meetings into study seminars. It means supporting and encouraging faculty in the sensitive observation and

collection of data about what students in their own classes are learning, and in discussing their findings with their peers.

The pedagogical colloquium is an exciting idea whose time has come (Shulman, 1995). It is already used in community colleges more than elsewhere, but not always used to its full advantage. It might be used to the advantage of everyone, for example, in interviewing potential faculty for jobs. Instead of asking job candidates to describe their "philosophy of education" in grand abstractions such as "I am in favor of active learning," they might be asked to talk about or demonstrate how they would handle the teaching of a particularly difficult concept in their discipline, or about perennially problematic issues, such as the right balance between breadth and depth in introductory courses, or about their experience with Classroom Assessment or Classroom Research -- how they formulated the question, how they collected the appropriate data, and what they did about it. These are issues in which everyone -- even students -- can get involved. After a series of such job interviews, the department should have engaged some interesting issues and have some fresh ideas about teaching in their discipline. Thus, job interviews become occasions for stimulating discussions rather than a chore that takes time away from faculty's work.

There are many such activities; you will be relieved to know that I am not going to present them all. My message is simply this: if we are to meet the demands for a restructuring of teaching and learning, faculty must be actively engaged in the development of their profession. This means establishing an intellectual community on every campus with the shared responsibility for developing a profession of teaching that is up to the demands of the 21st century.

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