

THE GROWING SCHISM BETWEEN THE PRACTICES AND
PURPOSES OF HIGHER EDUCATION

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One of the joys of being invited to keynote a conference on improving university teaching is that the topic is undeniably important, controversial, and inexhaustible. What more can any speaker ask in an assignment? Certainly there are a broad array of issues from which to choose. One can talk about why teaching should be improved, how to improve it, or how to tell when it has been improved. Indeed one can even spend considerable time talking about whether university teaching should be improved since some of the professors that the reformers would most like to reach see nothing very inadequate about university teaching as it is.

The topic also has an advantage from the point of view of conference planners and participants who enjoy spending some time in Europe in delightful surroundings with stimulating colleagues. And that is that in this Fourth Annual Conference, we are quite unlikely to solve all of the problems associated with improving teaching, and thus there can be a fifth, sixth, seventh, and probably even 25th annual conference. At least I note with some satisfaction that the first three annual conferences apparently failed to exhaust the topic, the participants, or the planners. And so here we are at

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the Fourth Annual Conference on improving university teaching, pledged to move beyond the Third Annual Conference but quite unlikely to obviate the need for the fifth.

In kicking off this year's conference, I would like to address myself first to a very basic issue that has not yet been resolved. It can be succinctly, if somewhat belligerently posed as, What's wrong with university teaching the way it is? Just so you will know where I stand, I shall contend that university teaching fails to serve the needs of today's learners, and the probability is extremely high that it will be even less adequate to the needs of tomorrow's learners.

Of all of the institutions of society throughout the world, I can think of none that have been as resistant to change as educational institutions. As Clark Kerr (1976) has quite rightly observed when talking about classroom procedures, "You could go back to the University of Bologna in the 12th century and feel more or less at home." Either education found the answers early, or we haven't yet found any new answers worth implementing, or there is a powerful streak of conservatism in the educational establishment.

Throughout the developed nations of the world, we have expanded greatly the proportion of the population involved in higher education. In the United States we have gone from serving 5% of the population to serving 50% without changing the methods of instruction. We have invented the printing press, television, and the computer without changing the form of instruction. And we have filled libraries, populated the earth with inexpensive copying machines, and tried to cope with the escalating explosion of knowledge by

storing information on microfiche and retrieving it by computer--all without changing the basic formula for teaching. Despite revolutionary change in the knowledge business, the vast majority of college teaching is still conducted in the pre-print format of providing information to students who, with varying degrees of fidelity, transcribe it into their notebooks as did medieval monks thousands of years ago.

It is not my intention to make academic lectures the culprit in the reform of university instruction. I freely admit that some lectures are as beautiful to behold as an ancient cathedral or a castle on the Rhine, and I would not want to do away with great lectures any more than I would want to destroy the timeless architecture or careful craftsmanship of a beautiful cathedral, but 90% of the lectures students are exposed to are not of classic design and even fewer serve the functional needs of the modern learner in the modern world.

I suggest that one reason for the survival of the lecture as the predominant mode of college instruction is not its value to learners but rather its innate capacity to satisfy the needs of teachers. Even if the lecture you are hearing right now were to accomplish my goal of stimulating a majority of you to think in some new ways about the improvement of instruction, it is unarguable, I think, that I have learned more from preparing it than you will learn from listening to it. I thought actively about a problem, organized my thoughts concerning it, marshalled my arguments, and polished my skills of communicating ideas to an audience. These are the intellectual skills we say we want students to develop. My learning in preparation for

this lecture was a rich and rewarding experience--so satisfying that I am about as likely to advocate the abolition of lectures from international conferences as most faculty members are to attack lectures as the predominant mode for college teaching.

Another reason for lack of progress in improving teaching is our failure to be dissatisfied with it. It is a matter of record that at the present time neither students nor teachers are terribly dissatisfied with college teaching. Most teachers get quite generous marks from their students on faculty rating scales (Hildebrand, 1972), and most teachers feel rather pleased with themselves as teachers (Cross, 1977). Apparently students feel no obligation to uphold the teaching standards of colleges by grading their teachers on the curve. Were we to judge the quality of teaching the same way we judge the quality of learning, we would have to conclude that ratings of teaching by students are rather badly inflated, resulting--so the argument would go--in a lowering of teaching standards. I know of no teacher rating scale which is not highly skewed toward the high end of the scale. Yet this statistical departure from the normal curve seems not to result in a universal call from faculty members for better measures of teaching performance--probably because the high ratings from students correspond rather well with the high ratings faculty give themselves as teachers. In my study of faculty attitudes about the improvement of teaching, I found what may as well be labeled smug self-satisfaction. An amazing 94% of the faculty at the University of Nebraska rated themselves above-average teachers, and over two-thirds ranked themselves in the top quarter on teaching performance (Cross, 1977).

Part of the reason for the satisfaction with things the way they are is that the overwhelming majority of teachers and students have never experienced anything other than lecture-discussion methods, and most have never seriously entertained visions of more effective alternatives. The situation is akin to the way people thought about the use of ice boxes in the first half of this century. An ice box was quite satisfactory because people did not know that an electric refrigerator could be invented by those who thought there must be better ways to preserve food. If we would improve the educational process, there must be some dissatisfaction with the way things are, and there must be some visionaries who think in big ways rather than small ways about improving teaching and learning.

Those two basic requirements for reform may now exist in most of the developed nations of the world. Let me make some observations about postsecondary education in the United States, which I suspect are equally appropriate for most countries moving toward mass postsecondary education.

In the first place, it appears that the public has become outspokenly dissatisfied and disillusioned with the fact that Sally and Johnny can't read or write as well as their predecessors. Indeed to add insult to injury, some are saying that one of the reasons Johnny can't write is that his teachers never learned to write.

A second note of rising awareness that all is not well on the teaching-learning scene is that teachers in open-admissions colleges are discovering that when colleges are not free to select only those students who are good at learning what teachers are good at teaching, teaching becomes a challenging

task that makes college teachers painfully aware of how little they know about teaching their subject matter to students who don't learn it easily.

Faculty in the community college system of the United States, which admit virtually anyone who wants to go to college, are suddenly aware that teaching students who really need teachers is not nearly as easy as teaching students who don't need teachers. Students who have been selected for their academic promise by tests and high school grades usually know how to learn and do quite well with a little guidance on what to learn. Many of the students now flooding into open-admissions colleges do not know how to learn, and they must be taught.

In the third place, we are becoming dimly aware that there are better ways to teach and to learn than the conventional methods that have prevailed for centuries. Admittedly, our research would be better supported and better done if there were more dissatisfaction with the way things are or if there were a powerful group of people who stood to profit from implementing programs of better teaching in colleges and universities. As it is, almost all research on teaching and learning is done by university faculty members whose perspective is somewhat limited because of their familiarity with present methods of teaching and learning. More serious, however, is the vested interest of faculty researchers, not always conscious, in preserving the status quo. This is not to say that a faculty member's research on the improvement of teaching is not sincere, but there is a difference, which I shall elaborate later, between research designed to improve teaching and that designed to improve learning.

Perhaps the lack of involvement of a powerful research effort outside of the educational establishment explains why so much of the present research on college teaching is directed more toward tinkering with the machinery than toward drastic reform. In many ways, research on the improvement of teaching can be likened to the efforts of horse breeders and blacksmiths to improve the transportation industry in the early 1900s. Certainly modest improvements could be made by better breeding, better nutrition, and better shoeing of horses, but the real breakthrough for the transportation industry came with the invention of the gasoline engine, which I remind you was not invented by stable owners. For good reason stable owners thought big about the improvement of horses, but they tended to think small about the improvement of transportation. This is not to disparage efforts to improve horses through research; it is only to suggest that there are different end products from thinking about the improvement of horses and thinking about the improvement of transportation.

Perhaps we need to give some attention in a conference such as this to the possible limitations in thinking only about the improvement of teaching. Yes, I know that everyone is encouraged to talk about the teaching/learning process as though it were a unitary system. But I don't think it is. While the measure of good teaching is presumably good learning, it does not follow that improving teaching is the only way to improve learning. Ultimately, I think the revolutionary breakthrough in the improvement of learning will come more from the work of geneticists and physiologists than from the work of educational researchers.

Nevertheless, there is much that can be done to improve teaching. By and large, improvement can be sought on two levels. Most people working on the improvement of teaching today are thinking about how to improve the skills and motivations of faculty members and about how to recognize and reward good teaching. Certainly any advances made in these directions are highly desirable. But I want to turn our thoughts today, not to the low-risk small ways in which teaching can be improved but to the high-risk big ways in which learning can be improved. If we were to adopt a goal of maximizing learning for each student in our colleges, the organizations in which teachers do their teaching would be in for dramatic change.

I have entitled my remarks today, "The Growing Schism Between the Practices and the Purposes of Higher Education" because our old practices are no longer compatible with our new purposes. Moreover, the more advanced the society and the better educated the populace, the wider the gulf between old practices and new purposes. I am assuming that the new purpose of higher education is to maximize the learning of students. It is less and less to select students who will be successful in college and more and more to make successful those who come.

Most educational enterprises throughout the developed nations of the world involve three fundamental practices. Instruction is delivered to groups of students, for a fixed period of time, and learning is evaluated by comparing the performance of students relative to their peers. Those three practices--classes, semesters or terms, and grades--are sacred traditions in education. The educational system is built upon them and organized around

them, and I suggest that all three are counterproductive to maximizing learning for individual students.

I suppose any one of these sacred traditions could be singled out and analyzed for its contribution to learning. They are, of course, interdependent. Grading practices reflect better than anything else our philosophy of education. If you doubt the truth of that statement, try engaging anyone in a discussion of grading practices without learning a great deal about what that person thinks the purpose of education is. Do grades serve as motivators for student learning? As threats to coerce student responsibility? As protectors of academic standards? As indices of promise to graduate schools and future employers? All of the above? If the common practice of grading on the curve has contributions to make to the education of students, how well does it do the job?

The universal practice of grouping students into classes seems to have a simpler rationale than that for grading. It reflects largely economic considerations or what many people think of as fiscal realities. It is assumed that teaching 30 students as a group is cheaper than teaching 30 individuals. Whether it is more cost-effective raises new questions. The increasing diversity of student populations makes class groupings even more questionable today than when colleges were more selective and more homogeneous with respect to academic achievement.

Finally, the rationale for the practice of fixed time boundaries--terms or semesters--is tied to administrative functions such as recordkeeping, counting credits, computing faculty load, and the like.

Ironically, these three educational practices which form the backbone of most systems of education must be defended largely on grounds other than those related to student learning. To put it bluntly, they exist to meet administrative and fiscal requirements, not to enhance student learning. Indeed, I doubt that anyone would undertake to defend grades or semesters or group instruction as practices designed to maximize student learning. It would be hard, for example, to argue that even the most dedicated and skillful teacher could maximize learning for individuals reading at the 6th, 8th and 15th grade levels through treating them as a class of learners who read at the 12th grade level. Similarly, it would be hard to defend grades as motivating devices for learning when it is the students who least need motivating who receive the greatest rewards of As and Bs, while those who most need encouragement and motivation receive negative rewards of Ds and Fs. Finally it is hard to defend the notion that blowing the whistle on learning at the end of the semester maximizes learning for either faster-than-average or slower-than-average learners. In other words, if colleges were to give student learning top priority, dramatic--yea truly revolutionary--change would have to occur in the structure and organization of education.

That restructuring is beginning to occur in the United States where the problem of dealing with diversity in student preparation has reached near-crisis proportions in the community college system. I found in my survey of two-year colleges that the number of colleges deemphasizing fixed time boundaries in order to permit maximum learning for slower students had doubled in four short years--going from one-third of the colleges in 1970 to

two-thirds in 1974 (Cross, 1976). Today it would be hard to find a community college that does not offer some form of self-paced learning.

But today's experimentation with self-pacing reveals only the tip of the iceberg of what is possible with the invention of what Time magazine has called the "miracle of the supercheap microcomputer."

The cover story of the February 28, 1978 issue of Time was entitled "The Computer Society." Its message is that the invention of the incredibly cheap and versatile microelectronic chip will transform society. To me the most vivid picture of the society of the future was contained in this paragraph:

The computer might appear to be a dehumanizing factor, but the opposite is in fact true. It is already leading the consumer society away from the mass-produced homogeneity of the assembly line. The chip will make it possible some day to have shoes and clothes made to order--the production commanded and directed by computer--within minutes. The custom-made object, now restricted to the rich, will be within everyone's reach.

If we can individualize the fit of shoes, surely we can individualize the fit of education. I'm not talking here about any very complicated uses of computers such as those used in instruction, drill, or simulation; rather I'm referring to the use of computers to manage individualization through record keeping, individualizing assignments and the like. The technology already exists to handle this kind of individualization, and of course the lowering cost of computers is the revolution that is occurring right now. What does not yet exist is experience on the part of human beings with a reconceptualization of the organization of education. Faculty members will have to learn how to redistribute their time. Administrators will need to

find new measures which are less dependent on hours spent and more related to learning productivity on the part of both teachers and learners. Government agencies and budget officers will need to invent new funding formulas.

Much remains to be learned, but already our experience with the use of computers to manage individualization is pulling the rug out from under the defense of group instruction and semesters on grounds of fiscal and administrative necessity--which is not necessarily to deny that group instruction may have its own contributions to make to some forms of student learning. But the fact is that it is no longer necessary for economic or administrative reasons to organize education into semester-long courses taught to groups of students. We now have the freedom and the obligation to reassess the usefulness of our organization of education for its contribution to student learning.

There are a variety of experimental approaches taking place now that herald the beginning of a major restructuring of education. Self-paced learning is challenging the fixed-time boundaries of terms or semesters. Competency-based measures of achievement are challenging grading-on-the-curve. And finally, the dominance of on-campus classes is challenged by individualization as concept, the new media as technology, and adult part-time learners as clientele. Put them all together and we have a new model for education in which student learning is the goal and education is structured to that end.

The goal of maximum learning for individuals is probably best captured by the concept of mastery learning. For those of you who are bothered by

the perfectionistic connotations of the term "mastery," you might wish to think of competence-based learning as a rough equivalent. Both mastery learning and competence-based education assume effective individualization, and both use criterion-referenced as opposed to relative evaluation of student performance.

Mastery learning, accompanied by variable credit, is a simple concept in which the number of credits accumulated is a direct reflection of the amount learned. At present everyone who completes a course satisfactorily receives the same amount of academic credit--despite the fact that some students learned a lot and received As while others learned little and received Ds. In other words, we permit achievement to vary from A through D while holding credit constant, at say three hours per semester course. Mastery learning with variable credit would reverse that. Achievement would become constant, and all would study the subject matter until they learned it. Credit, however, would become variable; some people would accumulate more credit in a year than others.

Mastery learning requires every student to demonstrate mastery of the learning task in order to receive credit. Thus if a student earns three credits, we can assume that he or she knows the material well; what we do not know from the transcript is how long it took him or her to learn it. The tradeoff is whether we would rather have students who know what they know well or whether the time it took them to learn it is somehow more important. Actually, the contest between learning something well and learning whatever is possible in the time allotted reflects our value judgment of the importance of the learning. We would not dream of having

a student learn airplane landings as well as possible in a semester; practice would continue until the student knew how to land safely every time. But if the learning task is mathematics or history, then we seem to say that whatever can be learned in a semester is good enough.

Benjamin Bloom (1971), Distinguished Service Professor of Education at the University of Chicago, claims that 95% of the population can learn the school curriculum to mastery if given enough time and appropriate help. He cites research to show that instruction presented under conditions of mastery learning enables about four-fifths of the students to reach a level of mastery attained by less than one-fifth under non-mastery conditions (Bloom, 1976).

The advantages of mastery learning are both cognitive and affective. Moving a D student who has failed to master the fundamentals along at an administratively convenient time such as the end of a semester practically guarantees failure in sequential learning. It is highly unlikely, for example, that a student will ever become proficient in algebra if he or she hasn't mastered arithmetic. Ironically, however, the student who earned an A in arithmetic has more time to devote to learning algebra than the D student who must continue to struggle with arithmetic while trying also to learn the new subject of algebra. Research (Colman, et al., 1966) shows that as children progress through school, poor achievers fall farther and farther behind high achievers--not because they are dumber or even slower than their peers, but because they lack the skills to approach each successive learning task effectively.

Even worse than the cognitive handicaps wrought by traditional education's notion that everyone should move along at administratively convenient times is the affective damage done to young people who are offered no alternative to doing poor work. A school lifetime of doing a job half-way because the student never has the time to master the task must surely take its toll in feelings of frustration and, by the time they get to college, in feelings of indifference and loss of self-confidence. Many of the students entering open-door colleges these days, and many entering selective institutions as well, exhibit little pride in academic accomplishment because, I suspect, they have had little opportunity to experience the satisfaction of doing school work as well as they could do it. That state of affairs is as true for the top third of the class as for the bottom third. Under the prevailing constant-credit, variable-quality methods of traditional education, the bottom third of the class never reach their potential, while the top third stop short of their full capacity for learning. Neither group achieves the satisfaction of maximum accomplishment.

Gearing credit to amount learned rather than the time served is especially important as we move into lifelong learning. Poor or mediocre academic performance, measured in traditional ways is done and cannot be improved. A "C" transcript cannot be turned into an "A" record. But measures geared to units mastered can be accumulated over a lifetime of learning. A young person may have 200 credits to an active older learner's 400. The difference, however, lies not in the quality of the learning but in the amount.

There is little doubt that mastery learning with variable credit helps to establish conditions permitting maximum learning for individuals. But it also has some other advantages. It raises rather than compromises academic standards by insisting that students know what they are certified as knowing. It offers positive rather than negative rewards through permitting all students to reach maximum achievement. And it provides strong motivation through demonstrating to all students that they are capable of good work.

Under the concept of competence-based education, the measure of learning resides, not in what was taught in the classroom, but in what was learned by the student. If it is true that education will move increasingly toward individualization, why aren't educators preparing for an educational revolution that would help students learn and teachers teach?

Ultimately I think we will face up to the idea of revolutionary change in education because we are simply unable to solve some of today's most pressing problems in the framework of an organizational structure that works against learning. But change is complicated, especially conceptual change. Colleges seem to be able to handle procedural change such as changes in electives or modifications in the academic calendar--although goodness knows anyone who has ever lived through either of those changes on a typical campus knows how time-consuming and difficult even inconsequential change can be in academe. But shifting the purpose of education from teaching semester courses to producing student learning is a conceptual change of major proportions. Let me illustrate the complexity of such change through the use of an analogy.

My story is about a furniture company that is organized like a college. Just as education is geared to completing semesters rather than learning tasks, so this company is geared to completing days rather than chairs. It is the day that determines the work cycle of packers, shippers, billers, and all of the administrative officers of the furniture company. Chairs are sent along at the end of each day in states of completion that approximate the normal curve. A few chairs are nicely finished; most chairs have a weak rung or a missing screw here and there; some chairs are missing critical elements such as a leg or a backrest; and a few chairs are nonfunctional because the seat is missing. But the company is organized to produce a large number of average chairs, and its obligation to customers is to label the quality of their chairs--which is an admittedly different goal from producing quality chairs.

Now one fine day a new president comes to the furniture company. It is her notion that the goal of the company is to turn out quality chairs. To do this she realizes that the whole organization will have to be redesigned. Completed chairs will henceforth be the goal, and chairs will be sent to inspectors, packers, and billers when they are completed rather than at the end of each work day.

Well, when the new plans were announced, there were massive complaints throughout the furniture company. The first to complain were the billers, and their complaints were numerous. In the first place, because of the individual differences in the rate of work of the carpenters, chairs would be coming along every 15 minutes instead of 30 at the end of each work day.

Even though it was perfectly possible to post bills as they came along, billers had been batching for so long that they really believed that it was less efficient to maintain a steady pace throughout the day than to cope with their present peaks and valleys of workload. The inspectors were the next to complain. Having 30 chairs all at once, they said, permitted them to make comparisons so that they could tell a good chair from a bad one and thus fulfill their responsibility to the customers to clearly label the relative quality of their chairs. Then too there was the problem that inspectors could not be expected to make a new test for each chair as it came along, but if they used the same test continually, the word would be passed along and soon everyone would discover the criteria for grading chairs. Eventually everyone would be able to produce quality chairs, and that wouldn't be fair. It is a little hard to understand why it would be unfair to make known the test used by inspectors to grade the chairs, but I think it had something to do with straining public credibility by producing too many good chairs. As everyone knows, most chairs produced by any given company must be average--otherwise you have inflationary standards.

The next problem in the reorganization of the furniture company was a policy issue that was presented to the Carpenter's Senate for resolution. Since some chairs required more work than others, either because missing parts had to be individually tailored or because some woods were harder to work with than others, some chairs would cost more to complete. The question was, How could they justify spending different amounts on different chairs, especially when there was no assurance that the most costly chairs would bring the highest prices in the market place? While the subcommittee report pointed

out that in the current market, incomplete chairs were not selling at all well and that in the long run the extra money required to complete chairs would be more than justified because chairs could be used rather than assigned to the scrapheap, the simple fact was that most carpenters didn't like to work with difficult chairs because they usually required more ingenuity and sometimes even longer hours. And so the Carpenter's Senate passed a fine-sounding resolution about the justice and fairness of the old system which gave equal amounts of time to each chair.

And so the fable of the furniture company ends. The public is still unhappy with unfinished chairs, even though the unfinished chairs are clearly labeled and they don't cost as much initially. The innovative president of the furniture company became very controversial. Since so much furor had been raised over the bold experiments, the furniture company had to do something innovative to show that they were not opposed to change per se, so the furniture inspectors decided to raise standards by increasing the number of warning labels on their unfinished chairs. To further demonstrate their concern, they decided to lobby for legislation that would prevent chairs deemed not sound enough to sit on from bearing the seal of the company that produced them.

The moral of the story is that it may be easier to found a new furniture company than to change an existing one.

While some of you may wish to take me to task for implying that students can be turned out of colleges like chairs can be turned out of furniture factories, the fact remains that if the purpose of education is to maximize

the learning of students, present practices are not consistent with that purpose. What we are beginning to discover is that mass education is not the inevitable route to the education of the masses. The very diversity of the masses precludes the use of the old assembly line model of education which seemed to work fairly well when incoming classes were more homogeneous. As student diversity increases and as education continues to expand throughout the world to include previously unserved segments of the population, the schism between old practices and new purposes will continue to deepen.

As we begin this important international conference on the improvement of university teaching, I challenge us to think not only about ways to improve teaching, but also about ways to improve learning.

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