

WHAT WOULD HAPPEN IF...?

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The 1970s is a strange decade for American higher education. It seems to separate two vastly different moods. We look back at the 1950s and 60s and see a period of high optimism, exuberance, and self-confidence in colleges across the nation. The final report of the Carnegie Commission (1973) called these years the Golden Age of higher education. Looking ahead to the 1980s and 90s, many educators, if not downright pessimistic, are at least not optimistic about the future. The years immediately ahead have been referred to as Time of Troubles by the Carnegie Commission, and they do indeed seem to be full of problems--with steady-state enrollments, taxpayers' revolts, faculty retrenchment, the search for meaning in the curriculum, and new demands for setting priorities and making hard choices.

I don't wish to be a Pollyanna about some of the troubles that lie ahead for higher education in California and throughout the nation. But a few decades of limited growth is not an altogether unwelcome respite from the expansionist activities that characterized the Golden Age. Perhaps the nation as a whole, but educators in particular, need to take some time to reflect on the purposes and priorities of higher education.

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One of the things that I think we will discover is that the practices of higher education are increasingly incompatible with our purposes. The purposes of higher education have changed substantially over the last couple of decades, but our practices, especially those related to instruction, have remained essentially unchanged for centuries. Clark Kerr (1976) has quite rightly observed that, "You could go back to the University of Bologna in the 12th century and feel more or less at home."

As recently as the 1940s and 50s, the purpose of higher education in the United States was to select and educate young people who had already demonstrated their ability to learn what colleges were prepared to teach. Today, society has charged higher education with the responsibility of educating those who are walking through the opening doors.

When most of us were in college, a majority of colleges in this nation were encouraged to select carefully the students whom they would teach. Ironically the most selective colleges had the easiest task and the greatest prestige. They took on the rather delightful assignment of choosing from a generous surplus of applicants those who would be easiest to teach and most likely to succeed. College prestige was measured in terms of entering admissions test scores, the number of National Merit Scholars on campus, and the selectivity ratio of numbers accepted to numbers rejected for college admission. Academic excellence was the slogan, but in the 1950s version, the academic reputation of a college depended more on the ability of the admissions office to select an outstanding class than on the ability of the teaching faculty to create one.

Emerging in the 1950s, but making itself felt in the 1960s, was the dramatic change in social priorities that was to affect higher education so profoundly. There was a none-too-subtle shift in society's assignment for higher education. The task was no longer to educate an elite few for positions of leadership, but rather to educate the masses to their full humanity.

Today almost anyone can and does go to college. Ninety-nine percent of the community colleges and nearly half of the four-year institutions in this country are open admissions colleges (Roueche & Snow, 1977). There is relatively little selectivity left in higher education. Over the short time span of two decades, postsecondary education has replaced a comfortable homogeneity of selected students with an uncomfortable heterogeneity. Students today enter colleges from the ghetto, the barrio, the reservation, and the suburbs; they are 20, 30, and even 70 years of age; women preparing for lifetime careers; faltering students unsure of their academic skills; hopeful students, the first in their families ever to attend college. Having waged a vigorous campaign for equal access throughout the 1950s and 60s, the society of the 1980s expects colleges to go beyond mere access to make college for the masses something more than a hollow victory. Educators are clearly being challenged now to move beyond access for all toward education for each.

There are those who hope that the 1980s will bring moderation to what they perceive as the excessive egalitarianism of the 1960s. But the so-called new conservatism is not, I think, a return to anything. These are new times

with a new student clientele and a new mission for higher education. Students who are hard to teach will not disappear simply because there is a rising concern about academic standards. Raising standards in the 1950s meant raising entrance requirements, but raising standards in the 1980s means raising exit standards. And that places the burden squarely in the laps of the teaching faculty and of all administrators and legislators who have the power and the responsibility to enhance the effectiveness of teaching and learning.

I doubt that the challenge facing education in the 1980s can be met by tinkering with the educational machinery set in place in different times for different purposes. Significant improvement in education will take major reform, and that reform will have to be directed toward making the daily practices of education more compatible with our new purposes.

As I see it, whether colleges are selective or not, the national purpose of postsecondary education is to help any student who wants to learn learn as much and as well as possible. I have entitled my remarks today "What would happen if...?" because I want to take a look at what would happen if colleges were to teach so as to maximize learning for each student. To consider that possibility, we need to take a hard look at how today's practices impede or enhance that goal.

Our educational system is based on three fundamental practices. Most instruction is delivered to groups of students for a fixed time period such as a quarter or a semester, and students are evaluated by comparing

their performance with that of their classmates. Those three practices--classes, semesters, and grades--are sacred traditions in education. Our system is built upon them and organized around them, and I suggest that all three are counterproductive to the goal of maximizing student learning.

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 student learning, 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. What are the real efficiencies and inefficiencies of group instruction? And what is the potential impact of new technologies on the cost-effectiveness of group instruction?

Finally, the rationale for the practice of fixed time boundaries or the semester is tied to what might be called administrative realities-- record keeping, counting credits, computing faculty load, and the like.

Ironically, the three educational practices that form the backbone of our system 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 improving student learning were to become the major mission of colleges, dramatic--yea truly revolutionary--change would have to occur in the traditional practices of education.

Such a revolution would affect not only the practices of classroom teachers, but also the practices of administrators, fiscal agents, and

legislators. The major change, I think, must be in the direction of greater individualization of learning. What we are discovering is that mass education is not the inevitable route to the education of the masses. Indeed the very diversity of the masses calls for the abandonment of mass approaches to education.

Individual faculty members have already made substantial progress in individualizing the process of instruction. Carnegie studies (1977) show that in 1975, 37 percent of the nation's undergraduates had had some experience with self-paced instruction. By now, I suspect that a majority of students in traditional and non-traditional programs of education have had experience with some form of individualized instruction. But the kind of progress that is necessary if we are to make a really significant impact on the quality of student learning awaits the restructuring of education.

The technology to manage the individualization of education already exists. 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--to spend less time presenting information and more time understanding how individuals absorb and utilize information. Administrators will need to find new measures of learning which are less dependent on hours spent and more related to productivity on the part of both teachers and learners. State legislators and budget officers will need to invent new funding formulas that reflect more accurately the new mission of higher education, which is quite simply to help students learn.

I believe that our present organization of education is, in large measure, responsible for the problems we are having with student mastery of the basic academic skills. The basic skills are the tools for learning. We have no more right to expect a student without reading skills to be an effective learner than we have to expect a carpenter without a hammer to be effective at pounding nails. To carry the analogy further, what we are seeing at the college level are students with good hammers making effective progress, students with bent or broken hammers doing some things well and either struggling with other tasks despite poor tools, or giving up because they know that their tools are inadequate to the task. And then I'm afraid we even see some students making little or no progress, demoralizing themselves and everyone else, because their tools are the primitive equivalents of hammers, consisting largely of sticks and stones.

College teachers can, of course, hope that in the future appropriate tools for learning will be provided at the earliest possible age. But in the meantime, there are students in virtually all colleges and universities without the tools to do the work. And there is no escaping the responsibility of colleges to provide this generation of college students with the best learning tools possible. Personally, I doubt that effective remediation can be done at the college level without considerable individualization of both diagnosis and prescription. For adults 18 years of age and over, learning problems tend to be too individualistic to lend themselves easily to group solutions.

And now, I would like to return to my original question. What would happen if student learning were to become the major purpose of educational institutions? How might education be restructured to accomplish that task?

The goal of maximum learning for individuals is probably best captured by the concept underlying 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. And those are key concepts in the goal to create optimum learning conditions for individuals. They are also key concepts in any effective teaching of the basic skills at the college level.

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 of study 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 English or mathematics then we seem to say that whatever can be learned in a semester is good enough.

Benjamin Bloom (1971), Professor of Education at the University of Chicago, claims that 95 percent of the population can learn the basic skills 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. Not surprisingly, research (Coleman, et al., 1966) demonstrates that as children progress through school, poor achievers fall farther and farther behind high achievers--not necessarily 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 that 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 earned at age 17 cannot be turned into an "A" record when the student reaches greater maturity. But measures geared to units mastered can be accumulated over a lifetime of learning. A young person may have 100 credits to an active older learner's 200. 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 their maximum achievement. And it provides strong motivation through demonstrating to all students that they are capable of doing good work.

All rational arguments support the contention that we would have better education for more people if we restructured education so that our measures

of learning were geared, not to what was taught in the classroom in a semester, but rather to what was learned by the student.

I am prepared to admit that a major obstacle to individualization of education up to the 1970s has been the problem and expense of managing the process. But that problem is well on the way to solution. In its cover story of February 28, 1978, Time Magazine predicted that 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 sophisticated use of the computer for interactive instructional purposes. Rather I'm referring to the quite simple use of the computer to remember the learning capabilities and preferences of individuals and to keep records on progress.

Some institutions already have an economical computer program in use, and the technology is becoming better and cheaper with each passing year. Indeed the technological revolution has preceded the educational revolution.

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. 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. 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 for the billers to post bills as they came along, they 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 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 for management. 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 marketplace? While the independent consultant's 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 the public was still so enamored with the efficiency of Henry Ford's assembly line that they had a lot of trouble understanding new concepts of cost-effectiveness. While it was clear that a finished chair was more useful than an unfinished one, there lurked the sneaking suspicion that a chair that went together quickly and easily was somehow basically superior to one that took more skill and time.

The moral of the story is that changing the institutions of society affects just about everyone. It requires dedicated leadership on the part of the committed, flexibility on the part of those who must change their habits, and the desire of just about everyone to continue the search for better ways of doing things.

I have devoted the major portion of my allotted time this morning to one person's analysis of what colleges ought to be thinking about for the 1980s.

Basically, it boils down to society's charge to postsecondary education to maintain or improve academic standards while dealing with an unprecedented diversity in student populations. If we are to move beyond access for all toward education for each, we are going to have to redesign education so that individuals are offered maximum opportunities for growth and learning.

Now I have both a promise and an apology to make. The apology is to those who were lured to this lecture by the statement in the brochure that I was also going to talk about adult learners this morning. However, the promise is that I'm not going to talk much longer because I should like for you and me to finish our respective tasks this morning at roughly the same time. One of the problems with the ubiquitous lecture is that all too often the audience finishes listening before the speaker finishes talking. I hope that you can delay the completion of your task for just about five more minutes, which is what I think I need to add just a footnote about the impact of adult learners on Bay Area colleges in the 1980s.

In July, I received a two-year Carnegie research grant to enable me to write a book about lifelong learning. Since I have spent much of the summer reading all of the research I could find about adult learners, there is a real and present danger that I could tell you more about what research says about adult learners than you want to know. The consistent finding, however, that is beginning to overwhelm me, as I attempt to synthesize the literature, is the impossibility of describing in any useful way the diversity of learning needs and interests in adults. If we think we are struggling with

diversity now, just wait until the realities of the lifelong learning movement make their impact on educational institutions.

When colleges were dealing primarily with 18-24 year olds, there was at least a certain kind of homogeneity present in a population that had spent most of its life in school, learning to a greater or lesser extent, what was put before them. But the learning backgrounds of adults span the spectrum from grade school to grad school in the formal school system while also presenting an incredible array of out-of-school learning experiences. Similarly interests are so varied as to defy any simple classification scheme. In the recent study of adult learning interests done for the California State Legislature, researchers reported 167 first-choice subjects running the gamut from art with 42 first-choice nominations to Greek, Jewish history, and cake decorating with one choice each (Hefferlin, Peterson, and Roelfs, 1975). Describing learners in terms of demographic characteristics doesn't seem to work very well either. Talking about the learning needs of adult women isn't very meaningful when you realize the vastly different learning goals of career women, re-entry women, and full-time housewives. Even a nice concise category like "re-entry women" doesn't constitute a homogeneous grouping that can be neatly described as a target audience for educational programming. The re-entry woman of 35, whose youngest child is off to school, has different learning needs from the re-entry woman of 55 who is a recent widow. And the poor re-entry widow who needs to make a living may have different learning needs from the rich widow who needs something to occupy her time.

The simple point is that for the foreseeable future in higher education, there is no retreat from increasing diversity. That does not mean that higher education has any obligation to cater to every ideosyncratic learning need that comes along. What it does mean, I think, is that colleges, individually and collectively, need to be clear about their priorities. If the priority is to provide the best possible learning experiences, whether for gifted students, average students, or the entire spectrum of students, then there is no better time than October 1978 to begin a systematic examination of the relationship between educational practices and educational purposes.

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