

THE NEED FOR NEW MODELS

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The task of thinking about the role of general education is a challenging one. It raises the profoundly fundamental question of whether there are learning experiences that should be common for every educated person, and if so, what is the nature of those experiences? Should general education be thought of as a set of skills, a body of content, or patterns of values? Should the measure of education be taken in terms of what students can do, what they know, or their view of the world and their place in it? These are not simple questions, but they lie at the heart of any decisions about the nature of educational offerings and educational requirements.

Since I have the honor of appearing early in your consideration of these issues, I have the happy assignment of thinking broadly about the future of higher education. What will higher education look like in the 21st century? No one knows, of course. Some hope that it will look very different from today's models, whereas others hope that recent trends will slow down or reverse themselves and we can recapture the golden days of the past.

As I think about the future, I am increasingly convinced that we need totally new models for thinking about change.

Predictions for the future for higher education have usually been based on extrapolations from the past. Except for

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occasional surprises, this linear prediction model has served us well. For the past one hundred years it has been fairly safe to predict the continued growth of almost everything in higher education -- more students, more colleges, larger campuses, expanded curricula, larger budgets, more faculty. But strange things are happening in the formerly predictable world of education. Recently, the forecasters of college enrollment had to return to their charts when the percentage of male high school graduates entering college dropped off sharply instead of continuing its steady climb. That new "trend," combined with the rather sudden appearance of a declining birth rate, led to what almost everyone regarded as a somber warning of a no-growth future for higher education. But no sooner had the phrase "steady state" worked its way into the language than enrollment forecasters began snatching back their gloomy statistics to incorporate the "unpredictable" rise of adult college enrollments into their forecasts. Who at this hour can guess the future of adult education in Florida or any other state? What happens when the desire of people for education out runs the willingness to pay? Seemingly the world of higher education has become less easily predictable.

It is my conviction that education has outgrown the two dimensional charts that handle change that moves up, down, or sideways. Extrapolations have reached the asymptote in some cases and the point of practical absurdity in others. It is hard, for example, to think of any segment of the population that has not

now been considered in the trend toward the democratization of higher education. It is hardly prophetic to suggest that by the year 2000, colleges will be serving ethnic minorities, poor people, women, senior citizens, part-time learners, prisoners, low achievers, and anyone else who wants to go to college. We will simply run out of groups to include in the egalitarian thrust that has been the major force for change throughout the history of higher education in this country.

Historically the great pressures for change have always come through revising higher education to serve broader segments of the population. The land-grant colleges moved higher education toward industrial progress through their emphasis on applied technology and research. The G. I. Bill introduced the ~~notion~~ notion of the democratization of higher education. The community colleges carried democratization further, and also modified the curriculum to serve the needs of the people. The non-traditional movement builds on the community concept and once again introduces pressures for change. But it is clear now that we are running out of the egalitarian pressures that have been responsible, directly or indirectly, for change. Higher education is quite unlikely to continue its emphasis on change to serve new segments of the population. Not only are we running out of historical pressures for change, but it looks as though we shall do so without solving some of the problems that we thought we were addressing. Although universal education has certainly raised the floor of learning in this country, it is difficult to demonstrate that we are making substantial progress in bringing about

equality of opportunity through education. Indeed, there is some evidence that the disparity between the "haves" and "have nots" has not grown appreciably less with the achievement of near-universal secondary education and the rapid approach of universal access to college.

Nevertheless, the problems facing a democratic society are far from solved, and the drive for equality through education will no doubt continue to be a compelling force for change in higher education. But by the year 2000, the problems can no longer be addressed through quantitative changes -- more degrees for more people -- they will have to be approached through changes in the kind of education offered. We shall need new models to deal with new kinds of change. I shall return later to the shape of these things-to-come, but first let me parallel this example of the exhaustion of the trend toward democratization with an example of an extension of a trend that is theoretically infinite but that has reached the point of practical absurdity.

The expansion of the curriculum has followed essentially the same pattern as the growth of enrollments. Just as enrollments grew by including new segments of the population, so curricula expanded by adding new fields of study. The land-grant movement expanded the classical curriculum to include applied subjects, and the community colleges expanded the interpretation of "applied" to include vocational subjects. Now people are debating the virtues and expenses of expanding the curriculum to include avocational subjects that are of interest to people with increasing amounts of leisure time.

The problems of the bloated college curriculum have been exacerbated by the explosion of knowledge within each course of study. Instead of academic disciplines fragmented only to the point where experimental psychologists have no common vocabulary with which to converse with clinical psychologists, we are rapidly approaching the point where the sub-branches of clinical psychology have almost nothing in common. Libraries are moving from shelving bulky books to storing microfilm, to pondering a new technological version of the old philosophical question, How many books can be stored on the head of a pin?

The ultimate extrapolation of an educational model that aims to pass along the "heritage of human knowledge" in the form of subject matter content is rapidly reaching the point of practical absurdity. It may be impossible to identify the "common core" of subject matter that should be known by the college graduate, and it is increasingly difficult even to agree upon a common core within disciplines. In much the same way that we seem to have reached the end of groups of people that can be included in higher education, so we seem to have reached the practical end of the content that can be added to the curriculum. Furthermore, the trend toward curricular expansion, like the egalitarian trend, has left unsolved educational problems in its wake. There is no indication that the easy availability of knowledge has resulted in generations of young people who "know" more than those of the past. In fact, if nationally standardized tests are a measure of knowledge, then all indications are that recent high school graduates know less than those of a decade ago.

These examples of trends for the two major components of higher education -- students and subject matter -- illustrate the need for new models that are less dependent on extrapolation to provide a glimpse of the future. I suggest that reliance on trends and prediction formulae cranked out by computers and technicians will be of limited usefulness in 21st century education. We will need models that can handle qualitative, as well as quantitative, change.

The planning models for the future will be bolder, involving relatively more emphasis on direction by educational statesmen and somewhat less reliance on prediction by technicians. Instead of permitting what has happened or is happening to predict the future, 21st century educators will give more attention to problem-solving models that ask what should happen. What should happen in the 21st century to implement the ideal of quality education for all people? And what should we teach in our colleges?

The deepest problems of egalitarian ideals are not addressed by simple growth formulae. Equality is a relative concept, and the "haves" always seem to have a running head start on the "have nots." I doubt that we will narrow the opportunity gap by continuing to provide the "have nots" with what the "haves" had two generations ago. They will just never catch up because the "haves" will move at the same, or more likely, a faster rate. To cite but one example, when the "have nots" from poor rural areas got to the "good Life" of the cities, the "haves" had fled to the "good life" of the suburbs. Likewise, now that the "have nots" are finally getting college degrees, the commercial value

of the certificate is becoming deflated, and people are questioning the ability of the nation to support large numbers of college graduates in the style to which they have become accustomed. In short, the old growth model has outlived its usefulness. Equality will not be attained through simple numerical approaches, nor will educated people be produced by stuffing minds with curricular content.

I suggest that the model that will gradually replace the growth model during the remaining years of this century is a pedagogical model that concerns itself with how education can maximize the potential of the individual. Education for all was a 20th century goal; education for each will be the major goal for the 21st century. The components of the new model are already in place -- individualized instruction through self-pacing, individually designed learning contracts, personalized systems of instruction, personal growth groups, internships, competency based education, developmental programs. Such programs are concerned with pedagogy and individual development through learning, and they are different in kind from the issues of access to college that dominate today's equal opportunity programs. The shift is from the simple emphasis on attaining minimal educational rights for all people to concern about maximizing learning for each individual.

The provision of quality education that makes a difference to individuals is the task that lies ahead, and educators are already beginning to meet that challenge. The new surge of interest in a variety of techniques and methods known collectively

as the individualization of instruction is a movement of sufficient magnitude that it is not inappropriate to call this totally new model the beginning of an Instructional Revolution (Cross, 1975). The movement is broad in its influence, deep in its demands for change, and relatively sudden in its acceptance by educators. And breadth, depth, and speed of change are characteristics of educational as well as political revolutions.

Self-paced learning, and its conceptual companion, mastery learning, lie at the heart of the Instructional Revolution. The speed with which they have been introduced into a great variety of educational institutions is almost beyond belief. In my recent survey of two-year colleges (Cross, 1975), I discovered that in the short span of three years, the use of self-paced learning modules had spread from 31 percent of the colleges in 1971 to 68 percent by 1974. The Personalized System of Instruction (also known as PSI or the Keller Plan) uses the self-paced learning module as its basic component, and it has made an astounding sweep through university classes, especially in disciplines such as psychology, engineering, and physics.

More interesting than speed and breadth of adoption of self-pacing is its revolutionary potential for upsetting conventional ways of thinking about education. The simple formula for mastery learning is that the student must learn a unit to mastery, regardless of how long it takes. This is quite the reverse of traditional education which insists that all students spend equal amounts of time in the classroom but permits them to learn to varying levels of achievement. In traditional education we turn

out students who are well educated and those who are not, but we certify that all have spent the same amount of time at the task -- surely a meaningless measure of learning. The conventional grading system does not solve the problem; it just acknowledges that some students learned a lot in the time specified and received A's, while others learned little and received D's and F's. If Bloom, Bruner, and other scholars are correct in their assertion that anyone can learn a subject to mastery if given adequate time and appropriate help, then we have a breakthrough that permits us to provide for individual differences through holding achievement constant (mastery for everyone) and letting time vary.

The concept of mastery learning raises havoc with habitual ways of thinking about learning, but it makes much better sense educationally than the traditional measuring system. If what we teach is important, then presumably whether students learn it is more important than how long it takes them. Furthermore, if what we teach is related to what a person is able to do with knowledge, then we should certify knowledge by the number of learning units mastered rather than by how much the student learned in a semester relative to his classmates.

Mastery learning has special significance for the education of the non-traditional learners that I have called New Students -- those with poor records of past academic performance (Cross, 1971). Its advantages to New Students are both cognitive and affective. It lays the cognitive foundation for future learning by insisting that one unit must be mastered before the student may proceed to subsequent learning. And it carries an affective message through

demonstration to low-achieving students that they too are capable of doing good work. To most New Students, those two critically important experiences are missing from most of traditional education. New Students are perpetually at a cognitive disadvantage in school because they are rushed along to advanced learning without laying the foundation of the more elementary concepts. It is almost impossible to gain anything from a study of algebra without knowing the multiplication tables, and it is difficult to grasp the significance of history in the absence of an adequate reading vocabulary. To the extent that knowledge is cumulative and sequential, efficiency in learning depends upon mastering each step in turn. Research demonstrates that as children proceed through school, the bright get brighter and the dull get duller as the gap between achievers and non-achievers increases (Coleman and others, 1966). The widening gap is probably due to the efficiency factor in learning. Whereas achievers have the tools and the background to make good use of further education, the future learning of non-achievers is perpetually thwarted by their failure to master fundamentals.

Perhaps the question to be addressed by those concerned about general education is, What are the fundamentals that must be mastered in order for the doors to future learning to remain open? That is one question, but as anyone who has worked with low-achievers knows, emotional blocks to continued learning are just as serious as cognitive deficiencies.

Our old models of education contended that everyone should move along with the group. This simple group formula for

education has wrought extensive affective damage in young people who are offered no alternative to doing poor work because their rate of learning is slower than average. Rarely do New Students experience the satisfaction of doing school work in which they can take pride. Mastery learning permits New Students, for perhaps the first time in their lives, to do well -- as well as anyone in the class -- at school learning tasks.

While mastery learning has undeniable merit for individual learners, it also has some unsung advantages for the educational system. Mastery learning is the only educational concept that I know of right now that offers a solution to the concern about the erosion of academic standards. If all students master the subject matter, then the charge of lower academic standards for New Students cannot be leveled at egalitarian higher education.

In short, I am suggesting that the old model of education for all will give way to the new model of education for each. Ironically, we have discovered that mass education is not the inevitable route to education of the masses. The very diversity of the masses calls for the abandonment of the mass methods that seemed to work fairly well when we had more homogeneous student bodies.

Paralleling the need for new models to deal with the new constituencies of higher education is the need for new models to deal with the knowledge explosion. I suggest that curricular emphases will move away from the proliferation of subject matter content to less easily quantifiable concerns -- from how much is known to how well students are prepared to cope with a continually

changing world. The old aims of providing an education that can last a lifetime are gone forever. Any type of vocational or professional knowledge is quickly outdated, and even education that is pursued for personal satisfaction and the enrichment of life changes with the times and with the developing individual. A well-known architect wrote recently that "...almost nothing that we were taught by our betters in or out of the architecture schools of the mid-century has stood the test of time. Nothing -- or almost nothing -- turns out to have been true."¹ Speaking less bluntly, but conveying the same message, the president of the academically prestigious American Psychological Association recently urged his colleagues to teach so as to remove "any arrogant scientific certainty that psychology's current beliefs are the final truth...."² The new humility that is making its appearance in some academic disciplines is giving impetus to the search for models of teaching that move away from the teacher as purveyor of subject matter.

The teacher of the 21st century will be concerned with the development of the intellectual resources of students. The move will be away from teaching content as an end, toward using it as a means to the cultivation of intellectual skills such as the capacity to express ideas, the creative use of knowledge,

¹Blake, P. The Fallacies of Modern Architecture, Atlantic Monthly, September, 1974.

²Donald Campbell quoted in TIME, September 15, 1975, p. 94.

the ability to analyze and to synthesize -- in short, the desire and the capacity to use the mind in working with ever-changing information about the world and its people.

This new model for curricular emphasis has profound implications for general education requirements. Should everyone take a course in community problems, for example, or should everyone be required to learn the intellectual skills of problem-solving? Or should the course in community problems concentrate on solving real-life problems?

One of the great myths of education is that students should practice thinking on abstract problems, free of implications for real living. So ingrained is this myth that the word academic is defined in the dictionary as something "having no practical or useful significance." To say that a question is academic is to dismiss it as having no practical value. We don't seem to have moved much beyond the sort of reasoning that had high school students in the 1920's learning Latin to improve their English. With a little common sense and a lot of research, we finally discovered that there is little transfer of training and that studying English is the best way to learn English. But Latin did not disappear as a requirement without loud protests and considerable wringing-of-hands over the erosion of academic standards in the high schools.

I can think of no reason why students should not practice thinking by thinking about real problems. They are not only every bit as intellectually challenging as academic problems, they are frequently more appealing and motivating to students,

calling forth more and better efforts. Why shouldn't our colleges be requiring students to present articulate arguments for and against such major and meaty issues as the graduated income tax, police review boards, automation, unionism, guaranteed income, egocentric hedonism, pollution, the death penalty? Indeed, the topic of education itself presents ample scope for exercising those skills that we say we most want students to develop -- marshalling of evidence, analysis of facts, logic of argument, synthesis of information, communication of convictions.

Although there is evidence that educators recognize the problems inherent in the traditional curriculum (Cross, 1973), making changes in curricular content is surely the most difficult of all innovations. Few graduate schools turn out faculty members prepared to think with sophistication about the teaching of undergraduates; there is no reward structure to recognize the extensive effort that goes into preparing current and challenging materials; and innovators and their innovations are usually imposed upon a system that is ill-prepared to accommodate them.

Nevertheless, I suggest that curricular innovation requires a totally new model. We can no longer add a course or a new major every time we are presented with needs for specific kinds of new information. The new models for curricular change will have to deal squarely with the temporary state of knowledge. The task of education is not to pump students full of our information, but to prepare them to live in a world of change. This I suggest is the task that you have set for yourselves in opening the Pandora's Box of what should be the common core of the educational experience.