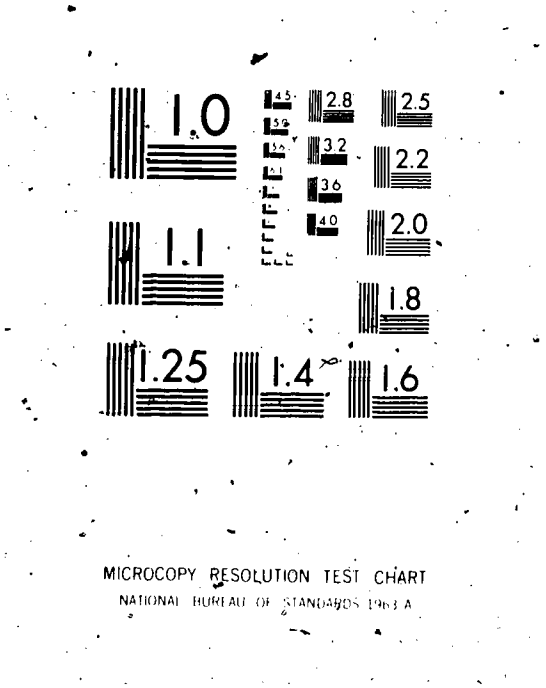
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ABSTRACT

If colleges were to accept the mission of helping each student to learn as much and as well as possible, the organization of education would change. In that the three fundamental practices of education--classes, semesters, and grades--are counterproductive to the goal of maximizing student learning and exist only to meet administrative and fiscal requirements, they would no longer serve as the bases of education. Individualized instruction, such as that currently demonstrated in the computerized systems at Miami-Dade Community College, would free instructors to do those tasks which only humans can do--understanding individual learning problems and offering personal encouragement--and would force administrators to find new measures of learning productivity on the parts of both student and teacher. The goal of maximum learning for individuals is best captured by the concept of mastery learning, which makes achievement a constant, and which has both cognitive and affective advantages. Another issue in this view of educational change is that of the adult, non-traditional student, who is more self-directed, more pragmatic, and more experienced than the younger student. Treating these adult students like adults would involve acknowledging their orientation toward competence improvement, and individualizing instruction and curriculum. (MB)

TOWARD THE FUTURE IN COMMUNITY COLLEGE EDUCATION

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I know that most of you come to this session on the future of community college education with the proper prerequisites on the past and present of community colleges ably presented by professors Bill Moore and John Roueche. I hope that those gentlemen provided a sober and accurate assessment of past and present realities so that I may feel free to speculate, if not wildly then at least imaginatively, about the future.

I believe that the form and organization of education will change substantially as we move into the Third Century. It will change because our practices in higher education are no longer consistent with our purposes. Twenty years ago, the purpose of higher education was to select only the

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most academically promising young people. Colleges accepted the relatively easy task of teaching primarily those who had already demonstrated that they knew how to learn what faculty members knew how to teach. Actually, the academic reputation of a college was more likely to depend on the capabilities of the admissions staff than on the capabilities of the teaching staff. The surest way to graduate a bright class in the 1950s was to admit a bright class.

Today almost anyone can and does go to college. Ninety-nine percent of the community colleges and forty percent of the four-year colleges are open admissions colleges (Roueche & Snow, 1977). The new purpose of higher education is not to select those who will be successful but to make successful those who come.

In the short span of two decades, postsecondary education has replaced a comfortable homogeneity of selected students with an uncomfortable diversity of college students who are 20, 30, and even 70 years of age; black, brown, white, yellow and red; females seriously 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 1960s, society now expects colleges to make access to college something more than a hollow victory. Educators are clearly being challenged to move beyond access for all toward education for each.

But there is a problem. While the purpose of higher education has changed markedly, educational practices--specifically those related to

classroom instruction--have changed very little. As Clark Kerr (1976) has aptly observed, "You could go back to the University of Bologna in the 12th century and feel more or less at home." Even the invention of the printing press did not stay faculty members from their appointed rounds of disseminating information through the pre-print format of academic lectures.

Today I want to take a look at how the organization of education would change if colleges were to accept the mission of helping each student to learn as much and as well as possible.

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 term 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.

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, as does the potential of new technologies and the possible redistribution of faculty time.

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, etc.

Ironically, the three educational practices which 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 student learning were to become the major purpose of colleges, dramatic--yea truly revolutionary--change would have to occur in the traditional practices of education.

There is no doubt in my mind that those changes will occur. They will occur because education cannot accomplish its new purposes with its old practices; and change will occur because the knowledge and the technology now exist to handle administrative and fiscal realities in a manner that is consistent with student learning.

In the past two decades, we have made significant progress in our understanding of the human factors in learning, and we have made revolutionary breakthroughs in the development and cost of computer technology.

Now what I am about to say about the new technology may initially seem at odds with my major premise of wanting to give more, not less, attention to the learning needs of developing human beings, but the

computer is the greatest boon to individualization that has appeared on the scene since Mark Hopkins gazed at the lone student on the other end of the legendary log.

The cover story of the February 28, 1978 issue of Time magazine 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 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. Individualization via computer is already in use at Miami-Dade Community College. Their computer-managed system known as RSVP (Response System with Variable Prescriptions) can identify patterns of errors in student tests. Then, instead of merely informing

students of total test scores or items missed, RSVP generates an individualized letter analyzing concepts misunderstood and prescribing action. It does this with an infallible memory for the student's learning preferences, work schedule, physical handicaps, and anything else that may have a bearing on the student's learning capacity.

Miami-Dade's experience in using RSVP with off-campus students provides convincing evidence that this use of computers is very popular with students and faculty alike (Kelly and Anandam, 1976). So successful in fact that Miami-Dade has extended the use of RSVP into their learning laboratories for students working on basic skills.. Learning specialists at Miami-Dade are enthusiastic about their ability to diagnose learning problems quickly, but even more exciting is their realization that RSVP enables them to use the full range of learning materials. Whereas teachers used to assign one of the two or three resources that they were familiar with and could remember without stopping to check, RSVP will enable them to make maximum use of a variety of learning materials—as many as 3000 individual assignments. It is only necessary for a faculty member to analyze the student's capability, weaknesses, and preferred mode of learning once. RSVP will remember, as most of us cannot, to make the assignment as conditions warrant (see Kelly and Anandam, 1978).

The technology already exists to individualize education, and of course, the lowering cost of computers is the revolution that is occurring right now. Time refers to the "supercheap chip" as the "miracle of the

microcomputer." 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 emphasize those things that only human beings can do--to understand individual learning problems, to offer personal warmth, encouragement, and inspiration. 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. 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.

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 classes 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.

I want to address the issue of change in educational practices as a human issue however rather than a technological one. Clearly, human beings

will make the decisions about educational change; computers will do what they are told. If human beings decide that there are better ways to help students learn, then we can rest assured that technology stands ready to do our bidding. There is no war between technology and human beings. Indeed, the appropriate use of technology is a powerful aid to humanizing learning. It frees human beings from doing mechanistic things and permits us to act fully human.

And now, I would like to return to my original question. How would colleges change if student learning were to determine educational practices?

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. And those are key concepts in the goal to create optimum learning conditions for individuals.

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 A's while others learned little and received D's. 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 English 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 percent 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 t students to reach a level of mastery attained by less than one-fift under non-mastery conditions (Bloom, 1976).

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

Even worse than the cognitive handicaps wrought by traditional education's notion that everyone should move along at administrative convenient times is the affective damage done to young people who are offered no alternative to doing poor work. A school lifetime of doin job half-way because the student never has the time to master the tas surely take its toll in feelings of frustration and, by the time they 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.

In my opinion, learning tasks mastered in learning laboratories should not be considered mere adjuncts to classroom learning. They should be fully creditable, as indeed they are under the concept of competence-based education where 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 around the completion of time units rather than furniture units. Things move in this company at the end of a day rather than upon the completion of a chair. They got started on this rather peculiar and non-functional approach through first determining that the average carpenter could finish a chair in a day. Then they proceeded to organize the entire furniture company around the day as the unit of accomplishment. Packers, shippers, billers, and all of the administrative offices of the company use the day as the basic measure. Chairs are sent along at the end of each day regardless of their state of completion.

Because people are so used to gearing their work to the completion of the day rather than the completion of the chair, they soon cease to notice the inefficiency of having faster-than-average carpenters sitting around doing nothing after their chairs are finished. Anyway fast carpenters usually learn to string out their work, and since they receive greater rewards than slow carpenters, they don't complain too much.

The reason slow carpenters receive lower rewards and fewer benefits is obvious. They don't reflect as well on the company because their chairs are inferior, and it is quite understandable that unfinished chairs, like C and D students, sell only after better chairs are gone. Eventually slow carpenters too adjust to the system. They realize they aren't valued as much by the company, and anyway some who have never completed a chair don't really know how to do the final touches. They aren't very proud of their

chairs; they hate going to work, and they dislike their inferior chairs and their low reward, but what can they do? The goal of the company is to average a chair per carpenter per day. And the responsibility of the company to society is to label and sell inferior products for lower prices.

Now one fine day a new president comes to the furniture company. It is her notion that the new 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 inspectors and graders 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, and that would completely wipe out the peaks and valleys of their workload. It is not unlike what would happen in higher education if staff were prohibited from complaining about how busy they are at the beginning and end of each semester. Furthermore, having 30 chairs all at once permitted inspectors 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. And finally 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 carpenters 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 employees to complain were the fast carpenters. Although the new system still permitted them to receive greater rewards because they were producing more chairs, it also made them work harder, and they no longer had all those leisure hours toward the end of the day. And finally, the slow carpenters complained because they too had to work harder. Most had become accustomed to sending out unfinished chairs at the end of the day and they no longer aspired to high wages for increasing their production.

And so the fable of the furniture company ends. The public is still unhappy with their unfinished chairs, even though the unfinished chairs are clearly labeled and they don't cost as much. The innovative president of the furniture company became very controversial. Among other things, it all goes to show that affirmative action may be asking for trouble when it

brings people into the system who don't understand how or why the old system works. Anyway, the president resigned her position, a sadder but wiser executive. 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.

Despite my tongue-in-cheek analogy, I remain optimistic that new alternatives will prove themselves and that practices in education will become more consistent with our new purposes.

Now I would like to turn to a second question. What would happen if colleges treated adults like adults? College students are becoming older. One third of all degree-credit undergraduate students today are over the age of 21. The average age of community college students is 28 and rising. During the decade of the 1970's, the number of 25 to 34 year olds in the population will increase five times as fast as the number of 18 to 24 year olds. Added to the shift toward an older society is the shift toward a

learning society. The number of adults engaging in learning activities is increasing even faster than their numbers in the population. During the six year period between 1969 and 1975, the number of adults participating in organized learning activities, in or out of the formal school system, increased 31 percent compared to a 13 percent increase of their numbers in the population.

Since colleges were originally designed to serve a primarily adolescent and dependent clientele, it appears that substantial changes are needed if we are to serve the learning needs of adults. What should higher education be thinking about on this eve of the lifelong learning movement?

For starters, we might consider some distinctions between pedagogy (education for children) and andragogy (education for adults) (Knowles, 1969). One important distinction between adult and child learners concerns self-concept. Children perceive themselves as inexperienced people without much responsibility for decisions at home, in school, or in the community. They expect school authorities to make the decisions, and they expect to learn more or less what they are told to learn. Adults, in contrast, see themselves as decision-making members of family and community groups. The school experience that casts students in subservient roles seems incompatible with an image of responsible adulthood.

Many adults are finding college classes an unsettling experience because the school situation carries lingering images of obedience and

dependency. The internal conflict is between images of how students should behave in school and recent experience with how adults are expected to behave in society. Thus colleges will need to learn how to accept into full partnership adults who wish to share in the decisions about what and how they shall learn.

I am a staunch advocate of the learning society, but I confess that I have mixed feelings about the influx of adults into formal learning in colleges and universities. Research indicates that there is an impressive amount of self-directed learning taking place now completely outside of organized learning activities (Tough, 1971; Penland, 1977). Researchers (Touch, 1977) estimate that 90 percent of the adult population design and carry out learning projects each year, locating their own learning resources and deriving considerable joy and satisfaction from learning.

My concern is that in our exuberance for recruiting adults and certifying that their learning projects meet our standards, we will corrupt independent, self-directed learners into learners dependent on someone else to determine where, when, and how people should learn. Visions of a learning society with people of all ages enthusiastically pursuing learning that interests them could so easily turn into a joyless learning society with people grimly fulfilling requirements and seeking legitimacy for every conceivable variety of learning. It is possible, I think, to ruin lifelong learning by turning it into lifelong education. I can only hope that adult learners are more determined to convert education to their needs than education is to convert adult learners to traditional patterns of

school learning.

A second characteristic of adult learners, documented time and again in the research, is their pragmatic approach to learning. Adult learning is motivated primarily by the desire to solve immediate and practical problems. They are interested, not so much in storing knowledge for use at some future time, as in applying knowledge to life goals that seem important to them.

Research on adult learners who were engaged in their own independent learning projects (Tough, 1968) showed that for almost three-fourths of these learners the primary reason for starting their learning project was the desire to use the learning directly in order to do something, produce something, or decide something--in short in order to take action. Ranking quite far down the list on adult reasons for learning was academe's traditional reason for teaching--to aid students in understanding. Fewer than one-third of the adult learners indicated that they were strongly motivated to undertake their learning project in order to understand better what they were reading, hearing, or watching.

The third characteristic of adult learners that differentiates them from children is their reservoir of life experiences. New learning for adults has to be incorporated into an existing framework of learning and experience. Adults don't come to school with a blank slate waiting for it to be filled by teachers. They want to know how new knowledge relates to their own thoughts and experiences. This, of course, has both advantages and disadvantages. It means that there are more pegs on which to hang

learning that is meaningfully related to past knowledge and experience. At the same time, it may mean that some things have to be unlearned because the new learning is not compatible with the old. Unlearning the child-dependent role of subservient student is a good example of past experiences that interfere with learning a new role of self-directed learner. One educational theorist (Ausubel, 1968) puts it this way, "The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly." Easily said, but not very easily done, especially in the case of adults where surprising gaps in learning may exist alongside amazing sophistication.

The research showing that adults are a more diverse collection of individuals than younger college students (Knox, 1977) is easily comprehended when we contemplate the variety of experiences of adults as they move through life. Teaching such diversity as though it were a group with common backgrounds and common expectations is both foolish and wasteful.

And so I return to my question, what would happen if higher education were to treat adults like adults? First, we would take official recognition of the motivation of adults to learn in order to use their knowledge and skills. We would acknowledge the fact that most want to become more competent people in order to do something better or to make more informed and better decisions about the things that matter in their lives--their jobs, their families, and their communities. Our practice of stopping learning at the end of a semester in order to grade the learning accomplishments of adults

is so irrelevant to their needs that the practice simply does not exist in any form of adult education except that done in traditional schools and colleges.

If competence is the goal, then it is essential to start with the learner rather than with the course. The diversity among adults is so great, both with respect to backgrounds and goals, that lockstep education makes no sense. Individualization is every bit as important for adults as for young people--probably more so. Adults needs individualization in curriculum as well as individualization with respect to pace and methods. By individualization, please remember that I mean to make room for people to learn in groups where group interaction is a deliberate strategy designed to promote learning rather than a necessity dictated by administrative or economic considerations.

And now I've come full circle. The answer to my two questions about the future of community college education merge. What would happen if student learning were to become the major purpose of education is not very different from what would happen if colleges were to treat adults like adults.

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