

Improving Education and Work Linkages

“Education could well learn much from training
which has learned to deal with accountability”

Harold Hodgkinson

Educators as a group are sort of interesting people When I first got into higher education, which was about 15-18 years ago, I remember people snickering whenever the word *training* was mentioned. Indeed, if you wanted to get a laugh in a faculty room you could usually say that so-and-so was going off to some kind of a training program, and everybody snickered. Let me tell you that they're not snickering now . . . and there's a good reason why they're not. Colleges and universities have suddenly discovered *accountability* and when that happens the first thing that is a necessity is that people begin looking more seriously and more analytically at their own practices than ever before!

As a result you find on a number



“Training and development has been getting increased respect from the traditional educational community.”

of college and university campuses today faculty development programs that are so primitive in terms of the way they use the procedures and knowledge about human development that they often-times are, I think, scandalous.

We are now in a situation where for the first time in many years, colleges and universities need YOU. They are reluctant to admit it, as one naturally would be after having snickered in the faculty room at you for 20 years. It's not easy to come and admit the fact that you know things that we would like to know. My hope is that we can in the next few years begin to forge more useful links across the areas of *education* and *work*. One of the ways we're trying to do that is a grants announcement that was recently re-

leased, which is a series of new research projects coming out of the National Institute of Education (NIE) dealing with education and work. If you write to NIE we will send you this grants announcement if you are interested in doing that kind of thing. (HEW, Brown Bldg., Room 722, 19th and M, N.W., Washington, D.C. 20208.)

In addition there's one other comment I'd like to make about education. And that is, I would like to mention to you the best book in education that has appeared in the last decade. It's a book that you've never heard of. The book, *The Enduring Effects of Education*, was published by three distinguished researchers at the University of Chicago (University of Chicago Press) in 1975, and has all but disappeared from the bookstores.

This book is the largest single study of education since the Coleman study; it has 80,000 adults in it, age 25-72, who participated in various surveys about what they knew. Indeed there were 250 different knowledge items that were used as a measure of the effects of education. In comparison after comparison, the authors found that the evidence demonstrated overwhelmingly that "There is an increment of every kind of knowledge with each step of the educational ladder that is preserved, no matter how old the individuals." That means that the system in some funny way, works.

If you look at the way in which the declining test-score phenomena has been reported in the press . . . if you look at the way in which the National Assessment Data has been reported . . . it's quite clear that the general impression the American people have been given is that the educational system is a complete failure in this country. This is an almost complete distortion of the evidence.

For every score decline that you find, you can find another indicator that suggests that the scores are

remaining the same or even going higher. Indeed 17-year-olds today read better than 17-year-olds did a decade ago. All you have to do is look it up in the *National Assessment Data*. Unfortunately, few reporters and fewer headline writers took the time to look into the material and make their own conclusions. I saw in a paper in Iowa, I believe it was, a month ago a "scare" headline which read as follows: "Half of the Students in Iowa are Below Average." There's one headline writer who could use a little competency-based instruction. We want to get closer together with all of you, and we want to find out more about what's going on in the whole area of training.

Education — "Big Business"

Educational research and development is becoming big business in this country. The federal government is putting about \$500 million into educational research, development, dissemination and evaluation. We at NIE, the flagship agency, have a \$70 million budget this year, and will have \$90 million in the President's budget for 1977, so that's a pretty small flagship for that total amount. States put in about \$49 million, locals put in about \$4 million, foundations put about \$57 million in, but again a

small number provide most of that. If you add it up, it means that nationally we're spending about \$617 million on finding out what works in education, what doesn't work, and why. That may sound like a lot of money, but remember we spend about \$115 billion on education this year!

Given that fact, we're spending less than one-half of one per cent of that total investment on trying to find out what worked and why it did. Agriculture, on the other hand, spends between 3.8 and 4.2 per cent on research, medicine spends anywhere between four to eight per cent, depending on whose numbers you count. So educational research is now a large and growing endeavor. More than 500 agencies are listed in the *Contracts and Grants Dictionary* as working in the area of education, and well over 2,000 groups in the country are involved in educational research, development and dissemination. That, of course, includes training.

At NIE, we have a fairly large program in finance and productivity . . . We fund the HES-6 satellite system, which is the largest educational satellite delivery system; we're supporting the University of Mid-America, which is the

FIGURE I.

Estimates - National Funding of Educational RDD&E, 1975

1. Governmental:	
A. Federal	\$511 million
(8 Agencies Provide 87%)	
B. State	\$40 million
C. Local	\$4 million
2. Private:	
A. Foundations	\$57 million
(11 Provide 85%)	
B. Independent (?)	\$5 million
TOTAL, ALL SOURCES	\$617 million

Estimate Range: Low - \$500 million
High - \$790 million

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university that crosses state lines; and we're very interested in new studies of the financing of public schools, and of colleges and universities. We have a large program in education and work, a major part of which we inherited from OEO.

We've been doing a lot of work on sex bias on the career-interest inventories and have a series of television films that you'll be seeing next year which try to show young children how the total range of careers may be opened for them. This includes particular work on getting little girls to think about careers in a broader sense than they normally are led to do . . . and little boys to do the same thing.

In addition, we have a large dissemination and resources program that has virtually doubled in the last couple of years from nine to 16 million dollars, and with that we're working particularly through states to develop state dissemination capacity building. That seems to us to be the logical place to go.

Basic Skills Program

The *basic skills program* is doing a lot of work on the teaching of reading, the teaching of mathematics and the teaching of writing. We have learned some things about reading that we think are quite significant. Most of the major problems in grades one through three have been solved. We know how to teach kids phonics, and we do that fairly well. That's one reason why the reading scores go up in those early grades. The problem now is to translate that kind of skill into the reading of complex message units that we call sentences. When that happens, we hope that grades four through six will increase in performance, too.

Our education equity group has been responsible for developing research and bilingualism which is, as you know, a major new area of importance in the country. We have a women's studies group, a law and education group. I think

the law studies are going to be some of the most profitable and useful ones that we have. And we have the school-capacity building for problem-solving group. Their thesis is that you don't need outside experts . . . that the whole trick is to get the enormous wealth of talent that exists within almost every school and school building in the country out so that it can be useful. We're emphasizing teacher centers, teacher networks, and other ways of finding competence in the field and making use of it.

There is one absolutely important court decision that has drawn us together, and that seems to me to be one that you all know about. It's called *Griggs vs. Duke Power* and, in my opinion, is a landmark case because, for the first time, the court said to the educational system that your credential — your degree — may not be used in an employment situation as a way of discriminating against certain people unless you can demonstrate that that credential produces *better performance* in the work place. If you can't do that, you are not allowed under the law to use the credential as a way of systematically rejecting people. Mr. Griggs happened to want to sweep floors for the Duke Power Co. and was told that he could not qualify for the job because he did not possess the proper educational credential, nor did he get a high enough score on the personality inventory. Mr. Griggs, who happened to be black, had the feeling that there might be some other reasons why the job was denied him, and took the case all the way to the Supreme Court.

Most of my academic friends in universities at that time felt very good about that decision. They have a certain anticorporate mentality, as you probably know, and there were all kinds of feelings: "Right on, Supreme Court, sock it to 'em." The thought was that the Duke Power Co. was the

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FIGURE II.

SUPREME COURT IN GRIGGS VS DUKE POWER (On Tests Used For Job Selection, As Well As Degrees)

"What Congress has forbidden is giving these devices and mechanism **controlling force** unless they are Demonstrably a reasonable measure of job performance"

- Can't measure job performance of those who are only applying.
- Can (1) Develop predictive (proxy) measures.
(2) Sample actual job tasks.

QUESTION: Does the Ph.D. Degree satisfy the criterion of Predicting success in college teaching, as in (1)?

- If not, is it a **legal** device for rejecting applicants for teaching positions?
- What **would** predict college teaching success?
- Can we legally use tests like S.A.T. for admissions purposes? What do such tests predict?

real villain. Well, unfortunately, *Griggs vs. Duke Power* has come home to roost. This year there are three cases of college faculty members who have been denied tenure because they did not have a Ph.D. degree who have sued their colleges ala Griggs on the ground that it is up to the college to prove that people with Ph.D. degrees teach better than people without them. And let me tell you, that's a very tough case.

A similar case in the public school area is *Armstead vs. Starkville* District, involving an elementary-school teacher who was denied tenure because she did not possess a master's degree. She sued the city on the grounds that the city had to prove that people with master's degrees teach better than teachers without master's degrees. Again, that's a tough case to justify. So, *Griggs vs. Duke Power* has opened up a whole range of accountability, opportunities and problems for higher education. It is in that sense that I think we really need better contact with you. The accountability issue is one that almost every business

deals with every day. "If you ain't accountable, you ain't profitable. If you ain't profitable, you go out of business!"

Adult Education

Why are colleges and universities so suddenly interested in adult education? The answer is relatively simple: We're about to run out of 18-year-olds. I am always amazed when I go to educational conferences at the sudden renewed dedication presidents and deans have to the concept of lifelong learning, having ignored adults for about 15 years. Most of them still have requirements that if you're over 40, you can't get in because presumably you have become apathetic and you can't learn anything. This trend is an unusual one, in that it has gone through the elementary schools of this country, decimating about half of them. Enrollments have gone from 900 students in one year to 100 the next. Nobody knows how to finance that kind of a system, nobody knows how to deal with the fluctuating teaching staff, nobody knows how you mothball a school building (although we're beginning

to find out a few things about it). But here again is an area where we could learn a great deal from industry. We could learn how to deal with declining interest and declining shifts in demand. We don't know much about that.

This trend will hit the high schools next fall. There has been no contact between the high schools that will have to deal with the problem and the elementary schools that have dealt with it. Four years from now it will hit the colleges, and the colleges will have made no contact with the elementary or the secondary people who had to deal with the problem. Each educational level deals with the problem as if it hit them alone for the first time.

Population Shift

The population shift, as you know, is not much of a prediction. I mean, those people are there right now, and we're not going to change those numbers unless the human gestation period changes considerably, which it's not likely to do. Some demographers are arguing that there is now evidence for a slight upturn, but I find that evidence just a little bit thin thus far. In California, for example, 4,000 births was the rate of increase last year, and I'm not sure that's enough to indicate what's going to happen.

There is, then, a population shift in amazing proportions — we've never seen anything quite like this in this country. And that is going to have a major impact on colleges and universities. They will have to seek new markets — they're not used to doing that. They will have to find out better ways of advertising themselves and they're not used to doing that. And they will have to ably demonstrate the quality of their product, and those very words are an anathema to any academics. The notion that there is a product — that people buy something called education is very, very hard for most academics to come to

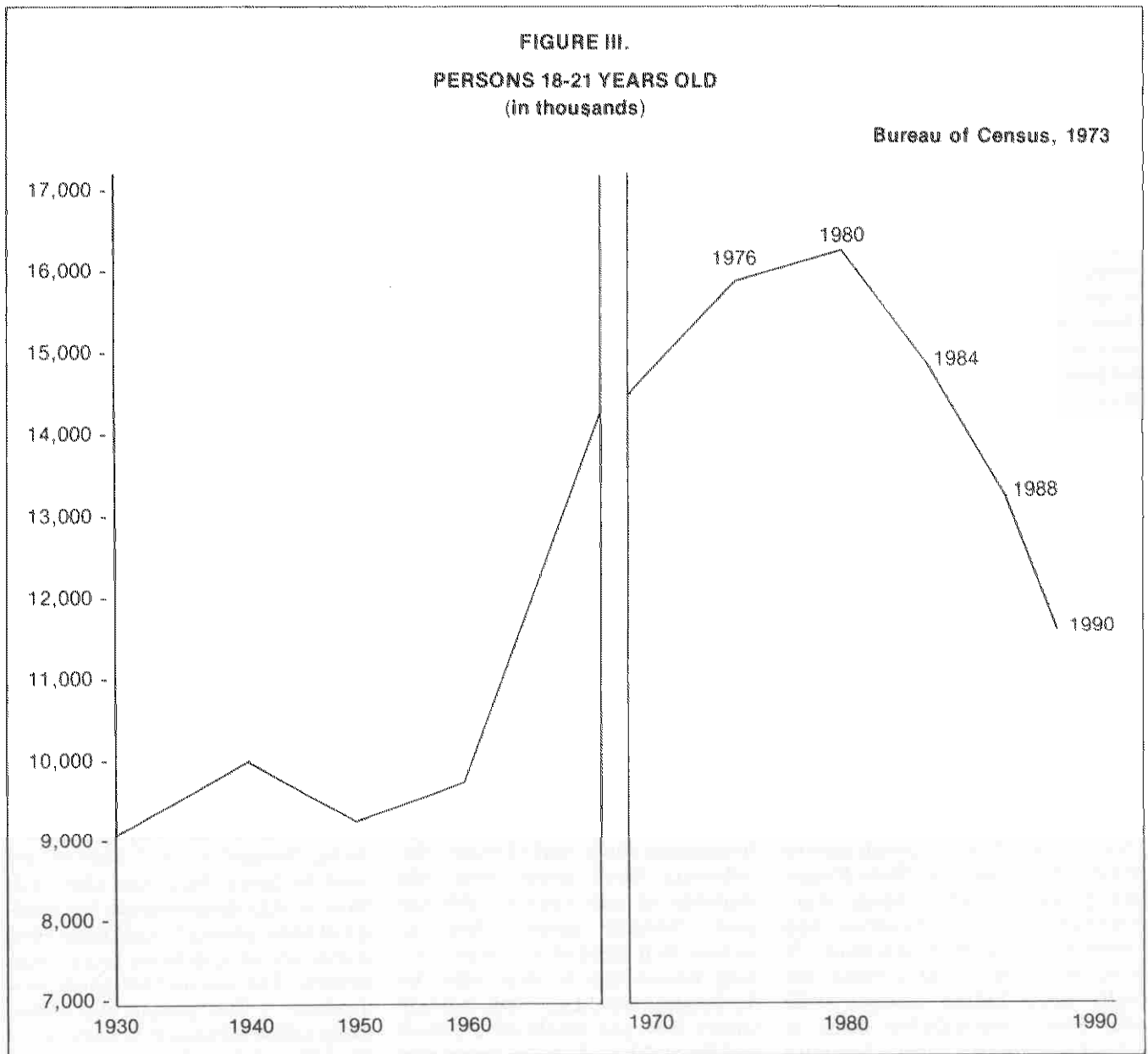
understand. So this population shift in many ways can be one of the most productive things that can happen to higher education. Some institutions may go out of business, but some will become much more flexible, much more adaptable, and much more interested in the needs and wishes of the students that come there.

In addition to the population decline, however, we have another problem, and this is one that isn't talked about very much, and it's one that should interest you, too.

The decline in population thus far has occurred primarily in the Caucasian section of the society, and in the upper and middle classes. If you look at minority-group birth rates over this period, from 1960 to 1972, you would find the birth rate holding remarkably constant. That means that, in 1972, the proportion of individuals who were born, coming from minority-group backgrounds, has gone up to 20 per cent. So, we have a smaller birth cohort, and a higher percentage of that cohort is coming from a mi-

nority-group background.

In 1985, if you add up all the minority groups — that we consider to be minorities leaving out the white ethnics — we find that about 30 per cent of the 18-year-olds will be from minority-group backgrounds. That has important implication for schools, particularly those who had hoped the problem would go away or who had felt that minority education was somebody else's responsibility, because clearly there will be more people who have not done well in the edu-



cational system, who will be coming through that system and then later will be going on into the occupational world. It seems to me that if we do anything, it means that we should redouble our efforts to find useful ways of educating people from minority-group backgrounds, and indeed from all sectors of society, who have characteristically not done well in the educational system.

New Era of Education

One of the reasons it's important to think about today is that we are moving into a new era of education . . . and I suspect this has a lot to do with the way you operate. There was an *Aristocratic phase* in the educational system — 1860 to 1910, let's say — During this time the only thing that mattered was who your parents were. And that's how far you got in the system. If your parents were of the right birth order, you generally did all right. About two per cent of the age cohort was in college at that time.

We move from there with World War II into a *Meritocratic period*. This was a time when large numbers of people sought access to higher education as the means of success. Now higher education had to find a cheap, easily scored, apparently understandable way of keeping people out. And during the 50s, if you went to a college and asked the dean how good the college was, he would usually tell you how many people they rejected . . . hardly a performance measure. You don't find people doing that quite so much today. This was the time of the National Merit Scholarships, the National Talent Search; it was the time when almost everybody felt that education ought to be the sieve through which the most able people would come out on the bottom. There seemed to be, during that period, an enormous interest and concern with aptitude testing as opposed to special skills testing, and indeed

many of the aptitude tests that were developed during that period are not particularly applicable when it comes to specific skills.

The best example I can think of is the Scholastic Aptitude Test, which as you know has a verbal and a mathematical section in the aptitude part of it, and if you look at the verbal scores that one gets, and then look at the colleges that have developed competency-based measures of verbal skills which includes speaking and writing — two relatively, unexceptional kinds of communication — you find that in most of the colleges that have collated SAT scores with their actual demonstrated competencies in speaking and writing, there is a slightly negative correlation.

Now if you have a verbal aptitude measure which doesn't correlate with speech and doesn't correlate with writing, then you can say to yourself, what DOES the darned thing correlate with? And why have we rejected so many people from colleges and universities almost solely on the basis of that particular set of tests?

So, as we move into the *Egalitarian era*, it seems to me that there is a decline in the numbers to be educated and there is a greater belief in educating everybody to the fullest limits possible. There is also a belief in competency testing of direct skills and a feeling generally that people should move as far in the system as they can in the most flexible way. So given that, I think you will find that most faculty members, at least in colleges and universities, are still at phase two . . . They still think there is a Meritocracy going on and that they are the ones to decide who has the merit. And as a matter of fact, the system is going around colleges and universities, in my opinion, to develop a whole new set of criteria for who has merit, and those are based far more on performance than they are on how many years you spent

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sitting on a chair in a college or a university. Educational institutions, then, are very hard to change.

Conception to Application

Before we get overly pleased with how stodgy our friends are in academe, I might bring to your attention some other little items. I asked my staff to put together a few things about how long it takes to get an idea into the real world. And the first thing they looked at was about the first idea to the first working model. Hybrid-seed corn, which is sort of our ideal — we all wish we could do that in education — took 25 years to develop. The heart pacemaker was 32 years from the conception of the first working model, and even the ubiquitous zipper took 27 years to become unstuck.

And then if you look at how long it took to get from the first working model to widespread use: Hybrid-seed corn took 13 years. That gives us 38 years for hybrid-seed corn from the first conception to widespread use. Kindergartens took 40, only two years behind. The new math — so-called — took five years, and interestingly enough, the cotton picker 53 years. So when we think about the educational system as being unwilling to change, it might be good to look at some of the other dimensions of society that also have a little time problem.

Another reason why people in academe are getting more and more concerned is the fact that college grades have usually been interpreted as being the way in which we ultimately sift the truly meritorious. The aptitude tests get you into college. Then your performance in college is what determines the genetic quality of your being. As a matter of fact, there have been about 55 carefully controlled studies of grades in college compared with success in later life and there are about 12 commonly used definitions of suc-

cess in later life, ranging all the way from finance to philanthropic activity to travel, commitment to the arts, social services . . . things of that sort.

Whatever your measure of success in life, it is not predicted by grades. It is not the straight A student in medical school who goes on to become the most distinguished or creative physician or surgeon or doctor, and it is not the straight A student in law school who goes on to become the most distinguished or important jurist or barrister. This has been a real shock to the educational system. Aptitude tests predict grades . . . grades in undergraduate college, grades in graduate school. But, once you leave that whole sheltered arena and enter what some students refer to as the afterlife, the world of work and home, you find that the predictability of that whole system drops to near zero.

I hear people saying through the insistence of state legislatures on minimal competency requirements for the high-school diploma: *"Look, we don't understand the way you've been measuring people, but whatever it is we don't like it, and what we want are measurements of human abilities that we can understand and that are in the public domain, and that make sense in terms of what American society needs in the way of functioning."* It's very important that we all realize that a number of trades . . . and I can mention just a few that are systematically left out . . . are given short shrift in the academic evaluation.

If you look at people, for example, who have high grades and high aptitude scores in academic life, you will find they tend to be low on creativity, on communicating, on forecasting, on planning, and on decision-making! Indeed, the decision-making one always struck me, because in my experience you only have to chair one faculty meeting in a college before

that truth bursts upon you. If you put in a room 200 people who are trained to see dichotomies and ambiguities, where everybody else sees simple truth, and ask them to make a decision, you have problems. In my view, we need creativity, we need people who can communicate well, we need people who can look ahead and make some good forecasts and plan, people who are good decision-makers. The educational system at the present time is systematically avoiding these criteria. Those things are going to change.

Learning and Forgetting

In addition, we've been doing a lot of thinking about some other matters that relate to learning and forgetting. There are about 4,000 studies in literature dealing with learning, and only about eight that deal with forgetting. I have always been more fascinated with forgetting than with learning. I know about 400 items in the bibliography of sociology that I can rattle off at the drop of a hat. On the other hand I have forgotten my anniversary for the last four years and I can't remember the dates on which my children were born. All of that suggests that forgetting is a very, very complex and interesting problem.

For example, a learning curve on walking tends to continue. That is, once one learns to walk, one isn't usually punished for it, one sort of tends to keep on — it's sort of fun. Talking is the same kind of thing — when one learns to talk, one continues. Indeed I have two friends whose curve would be exponential, and go right up off the top of the chart.

Reading is a similar phenomenon: when one learns to read, one keeps on. But consider for just a minute the geography of Brazil. When you were 10 years old, you were an expert on the geography of Brazil. You knew the rivers, the tributaries, the imports, the exports, the capital city, the cli-

mate . . . you knew it all. By the time you were 11 most of that knowledge had disappeared, leaving one with a new kind of question, and that is, given the investment of public tax dollars and getting that knowledge into your head, what was the net gain?

A similar course taught at the university level — Introduction To Natural Science — indicated that during the first semester the learning curve went up about as quickly as the geography of Brazil did, and in the second semester when they were no longer taking the course but were still being given weekly measures to see how long it took them, the slope of the forgetting curve was roughly similar. That course was taken by over 2,000 students and the faculty loved it because it provided enough course registrations for them to teach the upper-class seminars that they really loved to do. When asked why this course was necessary, the faculty said, "Well, every American citizen will have to make decisions on matters of scientific policy as a voter, and therefore this course is a real necessity." And of course if that was true, all national elections would have to be held between semesters, because that's the only time we knew it. So, similarly with division of fractions, we find that that's the thing that's learned quickly and forgotten just about as fast.

I made a bet with one dean of a medical school when I first presented this kind of data, and he said "I think that's hogwash. Medical students don't do that." And he bet me a drink, which for him was high, that if we retested his first-year students a month after the end of his first-year exams, they would have recalled 85 per cent of what they had learned on the exams. That sounded like a good free drink for me, so we did it. And, after the end of the first year, they had a month and then

took their first-year exams all over again. They had forgotten 45 per cent of the material! You might think of that the next time you drop in on your friendly local physician.

I became so interested in this problem that I asked some of the medical students why this was. And they all said, well, it's very simple . . . "I've gotta make room for this next load that they're pouring in right now." So you have this image of a hollow vessel, being poured into at the top and it's going right out through the bottom.

That enables us to raise a whole lot of questions that are new for education — they're probably not new for you — but they have to do with *retention*. How long should people be expected to retain certain kinds of skills or certain kinds of values? These are new questions for us, and they relate to the social investment in education. We're beginning to think pretty seriously about how we can get some better ways of finding those things out. We do know that people forget, and we know something about why.

In addition, we know something about people's attitudes regarding school. This is a project talent data-base test . . . I think the best sample of adults in the country right now . . . a thousand of these carefully selected people were given four-hour interviews and asked a lot of questions about their lives. Most of them, incidentally, were quite happy. Most of these 30-year-olds felt good about themselves, about their family, about their work (even though Jim O'Toole says most Americans hate their work). There is good evidence from this study that most Americans find their work enjoyable and fulfilling.

No Vocational Guidance

But, on the issue of their intellectual development, only 50 per cent said that they were anywhere

near satisfied with how far they had gotten. When asked what went wrong in school, they replied that the most important thing, the most frequently mentioned thing, was *vocational guidance*. Eighty-eight per cent of the males said that the vocational guidance was not only late, but it was hard to get their counselor and the information was false. They were told that there were jobs in a given field and those jobs didn't exist. They were told that "college A" had a marvelous department of Psycholinguistics when "college A" had never even heard of Psycholinguistics. So the complaints they made were not access only — it wasn't "I can't get in to see my counselor" — it's "the system is bankrupt, it's giving me false information." That I found unusual and something we simply have to do something about. Seventy-five per cent of the women had the same kind of complaints. As far as quality of teaching is concerned, it turned out that every time somebody mentioned the good thing about a teacher in an interview, somebody else mentioned a bad thing. So teaching styles and characteristics were canceled out.

Interestingly, too, was the expressed interest in need for personal counseling. About 33 per cent of the sample said sometime during their educational career they had a real need to be able to talk intimately and personally with another human being, hopefully an adult, and the opportunity simply was not there.

That, then, suggests that we have two major jobs to do in higher education, and that has to do with the quality of occupational advice and information we provide students which right now I think is very bad, and it suggests that students, unbelievably, are human beings. Perhaps there are times in their lives when they need the same kind of things that other human beings need. As a result of all

this criticism, higher, elementary and secondary education have begun to move. There is a lot more interest today in *evaluation*, particularly around three questions: the criterion question, the standards question and the technique question. Criteria are simply the things you want people to do. Those are the ultimate outputs — the things that you are trying to achieve. I think in terms of the educational system, we are getting better. We're not as good as you are, but we're getting better. We can specify to a greater degree what we want people to learn, at what levels, and why. So the criterion question I think in the last five years has made enormous strides.

Similarly, with techniques, as you well know, if you know what you want to measure, there is probably a technique available to measure it. On the standards question, however, we still have not gone very far. Nobody knows how much is enough. What should be a good cutting score for an institution to give you credit on the CLEP exam? We find institutions ranging fairly consistently on that question because nobody knows. A CLEP score is a magic number and each institution has to decide for itself. Similarly, more and more faculty members are saying, "Okay, I give a 68 a passing and I give a 65 a fail . . . why do I do that?" What does 100 represent in terms of a final examination in my course? It certainly doesn't represent all of the material — only a small chunk of it, so 100 is 100 of what? And, similarly, with 68. So the issue of standards, how much is enough, is an issue that is very much before the educational system and I suspect it is one of the issues on which you can help us a great deal. Because performance standards, I suspect, are somewhat easier in some of the areas that you work in, than they are, let's say, in deciding who's compe-

tent in introductory philosophy.

Time Terms

Basically, when we think of standards in American education, we think in time terms. If you change a tire in 10 minutes, you're competent . . . in 12 minutes, you're not. Now the range here is quite finite. A pit crew at Indianapolis takes about two seconds to change a tire; a weekender, if there's no coronary involved, would take about 35 minutes. Somewhere between that range, a committee tried to decide how much time it took a competent tire-changer to change a tire. They argued and argued . . . They quoted Thomas Paine, Jefferson, the Bible . . . And they found that they simply couldn't answer the question. So when we think about competency in education, we are still thinking basically about time-bound units, even when those time-bound units are not particularly effective.

We have learned, however, that there are interesting ways of thinking about competency itself, including the ability to work with data, the ability to work with people, and the ability to work with things. You find, beginning to emerge in some American colleges, the belief that people ought to have some competency in each of these areas and that we should try to build a multiple-reward system so that students can feel good about some of the things they were able to achieve at a high level. And indeed, as you know from the *Dictionary of Occupational Titles*, each one of these things has its own little operational definition, and they are relatively easy to find.

So we are beginning to use that kind of data, as I suspect you are too. And we're beginning to find that it may be that the educational system is not as devoid of skilled training as we once thought. Indeed, if you want to teach people how to be mentors and negotiat-

ors, if you want to teach people how to analyze problems — those are skills — and they involve poetry as much as music theory, as much as they do a problem in advertising. And we're beginning to realize that, that there may be more commonalities than we once thought.

In addition, we are developing a lot of new devices — at least new for us — including the use of games and simulation, portfolio techniques, which are quite widely used now, learning contracts whereby the student writes his or her own contract, the evaluation is written in, and then that becomes the student's four-year program, the use of jury panels to make decisions about student competency, and a variety of things of that sort.

Also, we have discovered a number of interesting things about what predicts success in the job. We have found, for example, that on-the-job training, such as the experienced-based career-education program that we have supported at NIE, had an enormous ability to predict success on the job. Job training is better, job simulation isn't quite as good, specific jobs, knowledge and skills, is not quite as good again, general job knowledge of skills such as typing is a little less good. I know that the prediction of success as a secretary based on typing skill is not very good. One of the best predictors of success is a 15-minute test of patience. Indeed, I suspect that test has a large future in a number of different kinds of jobs.

So we are beginning to develop some ways of linking better with the occupational system. The worst predictions that you can make about job content are tests of verbal ability and figural relations . . . the SAT and the Miller Analogies. Those are the tests still most frequently used in higher education, and they have the least to do with the world of work. So clearly our job is cut out for us.

Adult Development

I do want to spend just a minute on some new work that I think is quite exciting and that I think will be exciting to you, and that has to do with the stages of adult development. I think you've probably read something about this in the paper and some of the magazines. To my mind it's one of the most exciting aspects of research now available. We do know that, for example, getting into the adult work is a task that is characterized by most people as a time of some pain. It occurs after leaving the family, which is 16-24. We have two institutions in this country that help people to leave the family . . . one is called the Army, the other is called college. Some people, of course, never do leave the family, and you find this odd confusion in phase I and II as characterized by Archie Bunker's funny relationship of having his daughter's husband living with him at the same time. So some people break out of their own families in particularly funny ways.

Entering the adult world has two dimensions. One is to *dream*, when you think about how your life is going to be at 40; and the other is the *mentor*, and mentors exist everywhere. Mentors are older people who take an affinity for a younger person and help them through. Very, very interesting how mentorship is developed.

The next stage, and the most complex of all in some ways, is the settling down and moving up stage, age 30-38. This is when you have young children, usually, and you want geographic stability, you want them to have a home, a place, and so forth. But you want to move ahead in the firm and that means being ready to move in a moment's notice to some new town. So the primary conflict that happens there is over job mobility versus personal stability in the family. Knowing that, you can find a lot of

ways of helping people who are going through that particular set of problems.

Then comes midlife transition, or as I call it, *midolence* — age 39 to 43, the period when drug addiction, alcoholism and suicide rates all go up rather astonishingly. Something happens in this country between 39 and 43. Nobody knows quite what it is, but one of the things that happens is that you have to redefine that dream that you had for yourself in the early 20s, and for most of us we find ourselves waning. It is a revisionist time, it is a time of high divorce rates, it is a time when people begin thinking through what they want to become, just the way they did when they were adolescents. They fantasize a lot, they dream, they ask those "what would have happened if" kinds of questions just the way adolescents do.

For those who survive there is this next phase called *restabilization*. For most people it's the best time of their lives. The late 40s — this is a time when you have energy, you have autonomy, you know what you want to do, you're clear in terms of personal goals, if you've survived your marriage to that period, your marriage gets much more stable and much more youthful, and generally people find that to be a useful time. A final stage is called *finishing up*, which is listed here as 50-65 but ought to be revised to 50-75 or 80 because people are around for longer periods of time. Indeed, I heard the other day at a geriatrics conference that 55-year-olds are now being referred to as the pre-elderly.

So if you know something about this set of developmental tasks of adulthood, it seems to me that you could work a lot more effectively with people if you have a better idea of the problems they are likely to be going through. If you ask adults what they would like out of any kind of educational experi-

ence, 41 per cent want to take a course that's predictable; 31 per cent, however, want some assessment of their personal goals and potential (see Figure IV). I found that quite interesting . . . not to get back into college, but to find out what they're good at, where they ought to put their time, where they ought to put their investment. They somehow want to be better people. And most interesting of all in this chart, 20 per cent of the adults, in a face-to-face interview, admitted that they felt a need for personal counseling. Again I suggest that the large numbers of adults feel the need to consult with somebody — some skillful adult — about the problems of adulthood.

That suggests then, that most of those needs, outside of taking a course, cannot be met by the institutions we now have and it may be

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FIGURE IV.

Potential Learners Interested in Noninstructional Services:

Take a course	41%
Assess personal competences - personal growth, potential	31%
Test strengths and weaknesses in skills and subjects	28%
Obtain information about educational opportunities in region	22%
Need for personal counseling	20%
Testing for advanced standing in a program of studies	18%
Discuss education-career plans with staff member	17%
Compile record of all job and educational experience	16%
Training in basic skills - Math, Reading, Writing	12%

that we'll have to invent some new ones. There are all kinds of places where adults congregate where they have time on their hands (see Figure V). Those are listed in the left-hand column: hospital waiting rooms, DMV, all kinds of places. These are places where with literature and some skilled human beings, you can work on people and try to get them to commit themselves to some things that they would like to do that they are not now doing. They then could move into some diagnostic centers where they could be helped to achieve those things that they want to do, and where necessary they could be

referred out to those kinds of agencies which could give them the experiences they need. No college that I can think of, with the possible exception of Thomas Edison, could do all those things for adults. Here is a major agenda in which business and industry, I think, must cooperate in terms of how we deal with the new adult.

In Conclusion

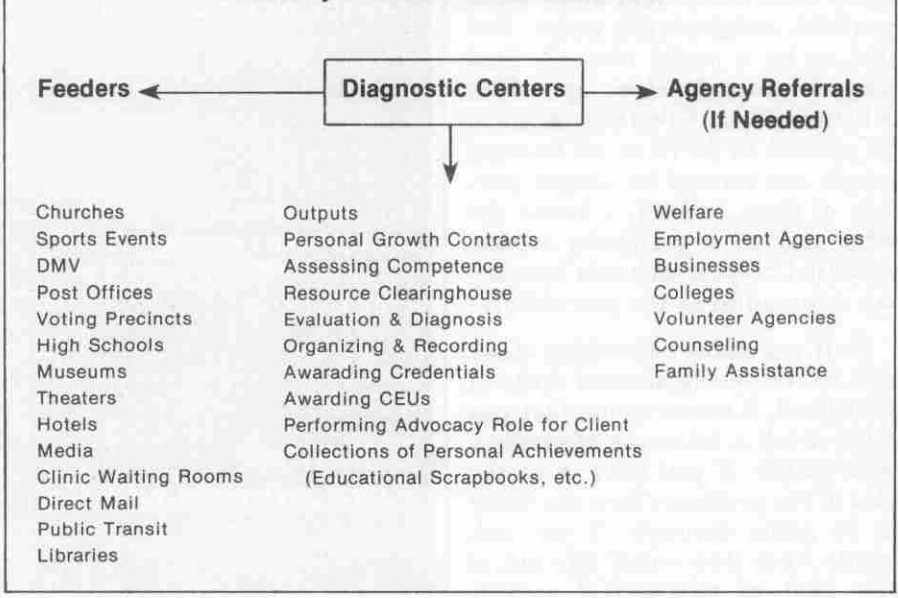
How do we do it? I'll close on a metaphor because I think it's one that's appropriate If you will visualize the typical cafeteria, which is a series of food stations arranged in a linear fashion . . .

you come in at the left, you select what you want and you go out at the right. Now that looks easy enough, but that to a systems person is a linear one-way rounded system. It means that you have one decision about bread, and that's all. If you go past bread and then decide you want some, it's pretty tough to get back in line. So, the system has its own drive, its own imperatives, and it suggests snack shop decision-making. That is, you've got one shot at the vegetables, and that's, as we used to say in New York, "If you don't like that, it's tough nuggie."

Now, think about the new kind of cafeterias . . . usually called scrambled-access cafeterias. The first time you go in one, you're scared to death, because people are coming at you from all directions, going from each of the separate food stations to another, and each of those stations is designed to push out large quantities of one kind of food, and that's all, and they do it very well. You are allowed the freedom, then, of building the kind of meal you want in the order that you want, and I suspect that the sequence is as important as the items you choose.

Surprisingly, the new cafeterias are a little bit more efficient — I've been told about 15 per cent more efficient — than the old kind of cafeteria, although the start-up costs may be a little higher for the second type. When the new kind was presented to a group of cafeteria managers, their response was that the new one was "immoral." That puzzled me, so I asked why. And they said, "Well, it's very simple. What you don't realize about the old one is that desserts are at the end of the line. People are forced to fill their trays with things that are good for them, and by the time they get to desserts they've only got room for one." And they said of the new one, "If you give people that much freedom, they'll take nothing but

FIGURE V.
Delivery of Noninstructional Services



desserts." Which of course people don't. I thought to myself, "My God. How do people like that manage to keep the jobs they have?"

Then I thought about every registrar that I have ever dealt with on the college campus. It occurred to me they are English 101, 201, 301, 401 people. They believe in freshman, sophomore, junior, senior. If you take a semester off, you're obviously on drugs or your girl friend is pregnant, or something worse. Indeed, I was in a registrar's office earlier this year, and a girl came in and said that she had talked to her instructor about getting out of her required sophomore course; he had tested her; she had the requisite knowledge, and she wanted to take a junior seminar. She was kind of excited about it. The registrar looked at her with that steely glance that

registrars have, and said, "Why don't you like it at our school?"

To violate the straight-line system then, is to commit an immoral act. It seems that we are beginning to learn that human beings, when given greater amounts of freedom, do not take just desserts. They take the things that at that particular time are the things they need. There is, then, a model here, I think, not only for cafeterias, and not only for education, but for lifelong learning. People will be moving through occupations in somewhat the same way. They will be moving from job, to leisure, to education, back to jobs, and they will be doing this far more often than they have done in the past.

All of us have a great deal to learn about how people can most effectively make these changes. In the process of doing this, there will

be a number of crises, and there will be a number of problems, and we will have to work more closely together than we have worked before. But let me just mention to you, in closing, the Japanese define crisis as a threatening opportunity

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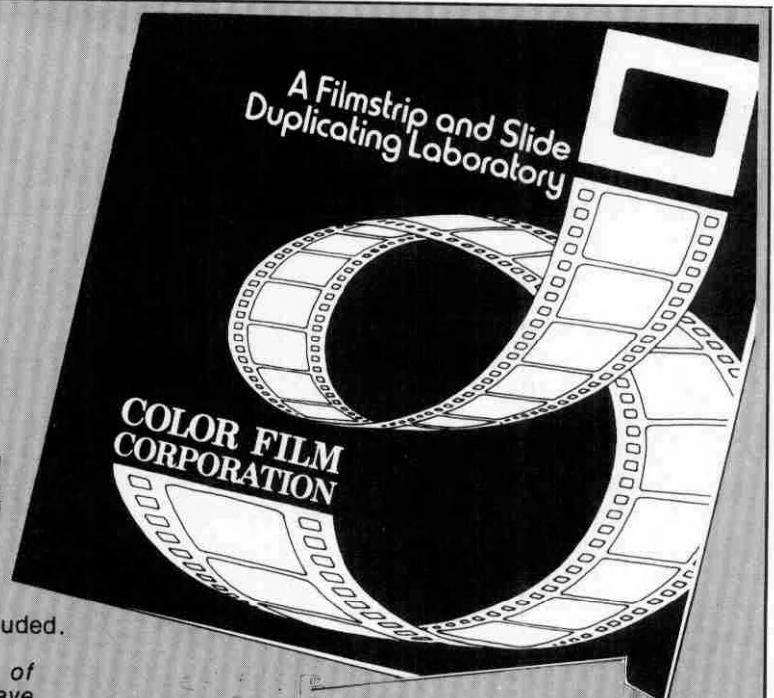
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