The Shame of American Education

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ABSTRACT: Recent analyses of American schools and proposals for school reform have missed an essential point: Most current problems could be solved if students learned twice as much in the same time and with the same effort. It has been shown that they can do so (a) when the goals of education are clarified, (b) when each student is permitted to advance at his or her own pace, and (c) when the problem of motivation is solved with programmed instructional materials, so designed that students are very often right and learn at once that they are. The theories of human behavior most often taught in schools of education stand in the way of this solution to the problem of American education, but the proposal that schools of education simply be disbanded is a step in the wrong direction. Teachers need to be taught how to teach, and a technology is now available that will permit them to teach much more effectively.

On a morning in October 1957, Americans were awakened by the beeping of a satellite. It was a Russian satellite, Sputnik. Why was it not American? Was something wrong with American education? Evidently so, and money was quickly voted to improve American schools. Now we are being awakened by the beepings of Japanese cars, Japanese radios, phonographs, and television sets, and Japanese wristwatch alarms, and again questions are being asked about American education, especially in science and mathematics.

Something does seem to be wrong. According to a recent report of the National Commission on Excellence in Education (1983), for example, the average achievement of our high-school students on standardized tests is now lower than it was a quarter of a century ago, and students in American schools compare poorly with those in other nations in many fields. As the commission put it, America is threatened by "a rising tide of mediocrity."

The first wave of reform is usually rhetorical. To improve education we are said to need "imaginative innovations," a "broad national effort" leading to a "deep and lasting change," and a "commitment to excellence." More specific suggestions have been made, however. To get better teachers we should pay them more, possibly according to merit. They should be certified to teach the subjects they teach. To get better students, scholarship standards should be raised. The school day should be extended from 6 to 7 hours, more time should be spent on homework, and the school year should be lengthened from 180 to 200, or even 220, days. We should change what we are teaching. Social studies are all very well, but they should not take time away from basics, especially mathematics.

As many of us have learned to expect, there is a curious omission in that list: It contains no suggestion that teaching be improved. There is a conspiracy of silence about teaching as a skill. The *New York Times* publishes a quarterly survey of education. Three recent issues (Fisk, 1982, 1983a, 1983b) contained 18 articles about the kinds of things being taught in schools; 11 articles about the financial problems of students and schools; 10 articles about the needs of special students, from the gifted to the disadvantaged; and smaller numbers of articles about the selection of students, professional problems of teachers, and sports and other extracurricular activities. Of about 70 articles, only 2 had anything to do with how students are taught or how they could be taught better. Pedagogy is a dirty word.

In January 1981, Frederick Mosteller, president of the American Association for the Advancement of Science, gave an address called "Innovation and Evaluation" (Mosteller, 1981). He began with an example of the time which can pass between a scientific discovery and its practical use. The fact that lemon juice cures scurvy was discovered in 1601, but more than 190 years passed before the British navy began to use citrus juice on a regular basis and another 70 before scurvy was wiped out in the mercantile marine—a lag of 264 years. Lags have grown shorter but, as Mosteller pointed out, are often still too long. Perhaps unwittingly he gave another example. He called for initiatives in science and engineering education and said that a major theme of the 1982 meeting of the association would be a "national commitment to educational excellence in science and engineering for all Americans" (p. 886).

When Mosteller's address was published in *Science*, I wrote a letter to the editor (Skinner, 1981) calling attention to an experiment in teaching algebra in a school in Roanoke, Virginia (Rushton, 1965). In this experiment an eighth-grade class using simple teaching machines and hastily composed instructional programs went through *all* of ninth-grade

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algebra in *half* a year. Their grades met ninth-grade norms, and when tested a year later the students remembered rather more than usual. Had American educators decided that that was the way to teach algebra? They had not. The experiment was done in 1960, but education had not yet made any use of it. The lag was already 21 years long.

A month or so later I ran into Mosteller. "Did you see my letter in *Science* about teaching machines?" I asked. "Teaching machines?" he said, puzzled. "Oh, you mean *computers*—teaching machines to *you*." And, of course, he was right. Computer is the current word. But is it the right one? Computers are now badly misnamed. They were designed to compute, but they are not computing when they are processing words, or displaying Pac-Man, or aiding instruction (unless the instruction is in computing). "Computer" has all the respectability of the white-collar executive, whereas "machine" is definitely blue-collar, but let us call things by their right names. Instruction may be "computer aided," and all good instruction must be "interactive," but machines that teach are teaching machines.

I liked the Roanoke experiment because it confirmed something I had said a few years earlier to the effect that with teaching machines and programmed instruction one could teach what is now taught in American schools in half the time with half the effort. I shall not review other evidence that that is true. Instead I shall demonstrate my faith in a technology of teaching by going out on a limb. I claim that the school system of any large American city could be so redesigned, at little or no additional cost, that students would come to school and apply themselves to their work with a minimum of punitive coercion and, with very rare exceptions, learn to read with reasonable ease, express themselves well in speech and writing, and solve a fair range of mathematical problems. I want to talk about why this has not been done.

The teaching machines of 25 years ago were crude, of course, but that is scarcely an explanation. The calculating machines were crude, too, yet they were used until they could be replaced by something better. The hardware problem has now been solved, but resistance to a technology of teaching survives. The rank commercialism which quickly engulfed the field of teaching machines is another possible explanation. Too many people rushed in to write bad programs and make promises that could not be kept. But that should not have concealed the value of programmed instruction for so many years. There is more than that to be said for the marketplace in the selection of a better mousetrap.

Psychological Roadblocks

I shall argue that educators have not seized this chance to solve their problems because the solution conflicts with deeply entrenched views of human behavior, and that these views are too strongly supported by current psychology. Humanistic psychologists, for example, tend to feel threatened by any kind of scientific analysis of human behavior, particularly if it leads to a "technology" that can be used to intervene in people's lives. A technology of teaching is especially threatening. Carl Rogers has said that teaching is vastly overrated, and Ivan Illich has called for the de-schooling of society. I dealt with the problem in *Beyond Freedom and Dignity* (Skinner, 1971). To give a single example, we do not like to be told something we already know, for we can then no longer claim credit for having known it.

To solve that problem, Plato tried to show that students already possess knowledge and have only to be shown that they possess it. But the famous scene in Plato's *Meno* in which Socrates shows that the slaveboy already knows Pythagoras's theorem for doubling the square is one of the great intellectual hoaxes of all time. The slaveboy agrees with everything Socrates says, but there is no evidence whatsoever that he could then go through the proof by himself. Indeed, Socrates says that the boy would need to be taken through it many times before he could do so.

Cognitive psychology is causing much more trouble, but in a different way. It is hard to be precise because the field is usually presented in what we may call a cognitive style. For example, a pamphlet of the National Institute of Education (1980) quotes with approval the contention that "at the present time, modern cognitive psychology is the dominant theoretical force in psychological science as opposed to the first half of the century when behavioristic, anti-mentalistic stimulus-response theories of learning were in the ascendance" (p. 391). (The writer means "ascendant.") The pamphlet tells us that cognitive science studies learning, but not in quite those words. Instead, cognitive science is said to be "characterized by a concern with understanding the mechanisms by which human beings carry out complex intellectual activities including learning" (p. 391). The pamphlet also says that cognitive science can help construct tests that will tell us more about what a student has learned and hence how to teach better, but here is the way it says this: "Attention will be placed on two specific topics: Applications

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of cognitive models of the knowledge structure of various subject matters and of learning and problem solving to construction of tests that identify processes underlying test answers, analyze errors, and provide information about what students know and don't know, and strategies for integrating testing information with instructional decisions" (p. 393). Notice especially the cognitive style in the last phrase—the question is not "whether test results can suggest better ways of teaching" but "whether there are strategies for integrating testing information with instructional decisions."

The Commission on Behavioral and Social Sciences and Education of the National Research Council (1984) provides a more recent example in its announcement of a biennial program plan covering the period 1 May 1983 to 30 April 1985. The commission will take advantage of "significant advances . . . in the cognitive sciences" (p. 41). Will it study learning? Well, not exactly. The members will "direct their attention to studies of fundamental processes underlying the nature and development of learning" (p. 41). Why do cognitive psychologists not tell us frankly what they are up to? Is it possible that they themselves do not really know?

Cognitive psychology is certainly in the ascendant. The word *cognitive* is sprinkled through the psychological literature like salt—and, like salt, not so much for any flavor of its own but to bring out the flavor of other things, things which a quarter of a century ago would have been called by other names. The heading of an article in a recent issue of the APA *Monitor* (Turkington, 1983) tells us that "cognitive deficits" are important in understanding alcoholism. In the text we learn simply that alcoholics show losses in perception and motor skills. Perception and motor skills used to be fields of psychology; now they are fields of cognitive science. Nothing has been changed except the name, and the change has been made for suspicious reasons. There is a sense of profundity about "cognitive deficits," but it does not take us any deeper into the subject.

Much of the vogue of cognitive science is due to advances in computer technology. The computer offers an appealing simplification of some old psychological problems. Sensation and perception are reduced to input; learning and memory to the processing, storage, and retrieval of information; and action to output. It is very much like the old stimulus–response formula patched up with intervening variables. To say that students process information is to use a doubtful metaphor, and how they process information is still the old question of how they learn.

Cognitive psychology also gains prestige from its alignment with brain research. Interesting things are certainly being discovered about the biochemistry and circuitry of the brain, but we are still a long way from knowing what is happening in the brain as behavior is shaped and maintained by contingencies of reinforcement, and that means that we are a long way from help in designing useful instructional practices.

Cognitive science is also said to be supported by modern linguistics, a topic to which I am particularly sensitive. Programmed instruction emerged from my analysis of verbal behavior (Skinner, 1957), which linguists, particularly generative grammarians, have, of course, attacked. So far as I know they have offered no equally effective practices. One might expect them to have improved the teaching of languages, but almost all language laboratories still work in particularly outmoded ways, and language instruction is one of the principal failures of precollege education.

Psycholinguistics moves in essentially the same direction in its hopeless commitment to development. Behavior is said to change in ways determined by its structure. The change may be a function of age, but age is not a variable that one can manipulate. The extent to which developmentalism has encouraged a neglect of more useful ways of changing behavior is shown by a recent report (Siegler, 1983) in which the number of studies concerned with the development of behavior in children was found to have skyrocketed, whereas the number concerned with how children learn has dropped to a point at which the researcher could scarcely find any examples at all.

There are many fine cognitive psychologists who are doing fine research, but they are not the cognitive psychologists who for 25 years have been promising great advances in education. A short paper published in *Science* last April (Resnick, 1983) asserts that "recent findings in cognitive science suggest new approaches to teaching in science and mathematics" (p. 477), but the examples given, when expressed in noncognitive style, are simply these: (a) Students learn about the world in "naive" ways before they study science; (b) naive theories interfere with learning scientific theories; (c) we should therefore teach science as early as possible; (d) many problems are not solved exclusively with mathematics; qualitative experience is important; (e) students learn more than isolated facts; they learn how facts are related to each other; and (f) students relate what they are learning to what they already know. If these are *recent* findings, where has cognitive science been?

Cognitive psychology is frequently presented as a revolt against behaviorism, but it is not a revolt; it is a retreat. Everyday English is full of terms derived from ancient explanations of human behavior. We spoke that language when we were young.

When we went out into the world and became psychologists, we learned to speak in other ways but made mistakes for which we were punished. But now we can relax. Cognitive psychology is Old Home Week. We are back among friends speaking the language we spoke when we were growing up. We can talk about love and will and ideas and memories and feelings and states of mind, and no one will ask us what we mean; no one will raise an eyebrow.

Schools of Education

Psychological theories come into the hands of teachers through schools of education and teachers' colleges, and it is there, I think, that we must lay the major blame for what is happening in American education. In a recent article in the *New York Times* (Botstein, 1983), President Leon Botstein of Bard College proposed that schools of education, teachers' colleges, and departments of education simply be disbanded. But he gave a different reason. He said that schools of that sort "placed too great an emphasis on pedagogical techniques and psychological studies" (p. 64), when they should be teaching the subjects the teachers will eventually teach. But disbanding such schools is certainly a move in the wrong direction. It has long been said that college teaching is the only profession for which there is no professional training. Would-be doctors go to medical schools, would-be lawyers go to law schools, and would-be engineers go to institutes of technology, but would-be college teachers just start teaching. Fortunately it is recognized that grade- and high-school teachers need to learn to teach. The trouble is, they are not being taught in effective ways. The commitment to humanistic and cognitive psychology is only part of the problem.

Equally damaging is the assumption that teaching can be adequately discussed in everyday English. The appeal to laymanship is attractive. At the "Convocation on Science and Mathematics, in the Schools" called by the National Academies of Sciences and Engineering, one member said that "what we need are bright, energetic, dedicated young people, trained in mathematics . . . science . . . or technology, mixing it up with 6- to 13-year-old kids in the classroom" (Raizen, 1983, p. 19). The problem is too grave to be solved in any such way. The first page of the report notes with approval that "if there is one American enterprise that is local in its design and control it is education" (p. 1). That is held to be a virtue. But certainly the commission would not approve similar statements about medicine, law, or science and technology. Why should the community decide how children are to be taught? The commission is actually pointing to one explanation of why education is failing.

We must beware of the fallacy of the good teacher and the good student. There are many good teachers who have not needed to learn to teach. They would be good at almost anything they tried. There are many good students who scarcely need to be taught. Put a good teacher and a good student together and you have what seems to be an ideal instructional setting. But it is disastrous to take it as a model to be followed in our schools, where hundreds of thousands of teachers must teach millions of students. Teachers must learn how to teach, and they must be taught by schools of education. They need only to be taught more effective ways of teaching.

A Solution

We could solve our major problems in education if students learned more during each day in school. That does not mean a longer day or year or more homework. It simply means using time more efficiently. Such a solution is not considered in any of the reports I have mentioned—whether from the National Institute of Education, the American Association for the Advancement of Science, the National Research Council, or the National Academies of Sciences and Engineering. Nevertheless, it is within easy reach. Here is all that needs to be done.

1. Be clear about what is to be taught. When I once explained to a group of grade-school teachers how I would teach children to spell words, one of them said, "Yes, but can you teach spelling?" For him, students spelled words correctly not because they had learned to do so but because they had acquired a special ability. When I told a physicist colleague about the Roanoke experiment in teaching algebra, he said, "Yes, but did they learn algebra?" For him, algebra was more than solving certain kinds of problems; it was a mental faculty. No doubt the more words you learn to spell the easier it is to spell new words, and the more problems you solve in algebra the easier it is to solve new problems. What eventually emerges is often called *intuition.* We do not know what it is, but we can certainly say that no teacher has ever taught it directly, nor has any student ever displayed it without first learning to do the kinds of things it supposedly replaces.

2. Teach first things first. It is tempting to move too quickly to final products. I once asked a leader of the "new math" what he wanted students to be able to do. He was rather puzzled and then said, "I suppose I just want them to be able to follow a logical line of reasoning." That does not tell a teacher where to start or, indeed, how to proceed at any point. I once asked a colleague what he wanted his students to do as a result of having taken his introductory course in physics. "Well," he

said, "I guess I've never thought about it that way." I'm afraid he spoke for most of the profession.

Among the ultimate but useless goals of education is "excellence." A candidate for president recently said that he would let local communities decide what that meant. "I am not going to try to define excellence for them," he said, and wisely so. Another useless ultimate goal is "creativity." It is said that students should do more than what they have been taught to do. They should be creative. But does it help to say that they must acquire creativity? More than 300 years ago, Molière wrote a famous line: "I am asked by the learned doctors for the cause and reason why opium puts one to sleep, to which I reply that there is in it a soporific virtue, the nature of which is to lull the senses." Two or three years ago an article in *Science* pointed out that 90% of scientific innovations were accomplished by fewer than 10% of scientists. The explanation, it was said, was that only a few scientists possess creativity. Molière's audiences laughed. Eventually some students behave in creative ways, but they must have something to be creative with and that must be taught first. Then they can be taught to multiply the variations which give rise to new and interesting forms of behavior. (Creativity, incidentally, is often said to be beyond a science of behavior, and it would be if that science were a matter of stimulus and response. By emphasizing the selective action of consequences, however, the experimental analysis of behavior deals with the creation of behavior precisely as Darwin dealt with the creation of species.)

3. Stop making all students advance at essentially the same rate. The phalanx was a great military invention, but it has long been out of date, and it should be out of date in American schools. Students are still expected to move from kindergarten through high school in 12 years, and we all know what is wrong: Those who could move faster are held back, and those who need more time fall farther and farther behind. We could double the efficiency of education with one change alone—by letting each student move at his or her own pace. (I wish I could blame this costly mistake on developmental psychology, because it is such a beautiful example of its major principle, but the timing is out of joint.)

No teacher can teach a class of 30 or 40 students and allow each to progress at an optimal speed. Tracking is too feeble a remedy. We must turn to individual instruments for part of the school curriculum. The report of the convocation held by the National Academies of Sciences and Engineering refers to "new technologies" which "can be used to extend the educational process, to supplement the teacher's role in new and imaginative ways" (Raizen, 1983, p. 15), but no great enthusiasm is shown. Thirty years ago educational television was promising, but the promise has not been kept. The report alludes to "computer-aided instruction" but calls it the latest "rage of education" and insists that "the primary use of the computer is for drill" (p. 15). (Properly programmed instruction is *never* drill if that means going over material again and again until it is learned.) The report also contains a timid allusion to "low-cost teaching stations that can be controlled by the learner" (p. 15), but evidently these stations are merely to give the student access to video material rather than to programs.

4. Program the subject matter. The heart of the teaching machine, call it what you will, is the programming of instruction—an advance not mentioned in any of the reports I have cited. Standard texts are designed to be read by the student, who will then discuss what they say with a teacher or take a test to see how much has been learned. Material prepared for individual study is different. It first induces students to say or do the things they are to learn to say or do. Their behavior is thus "primed" in the sense of being brought out for the first time. Until the behavior has acquired more strength, it may need to be prompted. Primes and prompts must then be carefully "vanished" until the behavior occurs without help. At that point the reinforcing consequences of being right are most effective in building and sustaining an enduring repertoire.

Working through a program is really a process of discovery, but not in the sense in which that word is currently used in education. We discover many things in the world around us, and that is usually better than being told about them, but as individuals we can discover only a very small part of the world. Mathematics has been discovered very slowly and painfully over thousands of years. Students discover it as they go through a program, but not in the sense of doing something for the first time in history. Trying to teach mathematics or science as if the students themselves were discovering things for the first time is not an efficient way of teaching the very skills with which, in the long run, a student may, with luck, actually make a genuine discovery.

When students move through well-constructed programs at their own pace, the so-called problem of motivation is automatically solved. For thousands of years students have studied to avoid the consequences of not studying. Punitive sanctions still survive, disguised in various ways, but the world is changing, and they are no longer easily imposed. The great mistake of progressive education was to try to replace them with natural curiosity. Teachers were to bring the real world into the classroom to arouse the students' interest. The inevitable result was a neglect of subjects in which children were

seldom naturally interested—in particular, the so-called basics. One solution is to make some of the natural reinforcers—goods or privileges—artificially contingent upon basic behavior, as in a token economy. Such contingencies can be justified if they correct a lethargic or disordered classroom, but there should be no lethargy or disorder. It is characteristic of the human species that successful action is automatically reinforced. The fascination of video games is adequate proof. What would industrialists not give to see their workers as absorbed in their work as young people in a video arcade? What would teachers not give to see their students applying themselves with the same eagerness? (For that matter, what would any of us not give to see ourselves as much in love with our work?) But there is no mystery; it is all a matter of the scheduling of reinforcements.

A good program of instruction guarantees a great deal of successful action. Students do not need to have a natural interest in what they are doing, and subject matters do not need to be dressed up to attract attention. No one really cares whether Pac-Man gobbles up all those little spots on the screen. Indeed, as soon as the screen is cleared, the player covers it again with little spots to be gobbled up. What is reinforcing is successful play, and in a well-designed instructional program students gobble up their assignments. I saw them doing that when I visited the project in Roanoke with its director, Allen Calvin. We entered a room in which 30 or 40 eighth-grade students were at their desks working on rather crude teaching machines. When I said I was surprised that they paid no attention to us, Calvin proposed a better demonstration. He asked me to keep my eye on the students and then went up on the teacher's platform. He jumped in the air and came down with a loud bang. Not a single student looked up. Students do not have to be made to study. Abundant reinforcement is enough, and good programming provides it.

The Teacher

Individually programmed instruction has much to offer teachers. It makes very few demands upon them. Paraprofessionals may take over some of their chores. That is not a reflection on teachers or a threat to their profession. There is much that only teachers can do, and they can do it as soon as they have been freed of unnecessary tasks.

Some things they can do are to talk to and listen to students and read what students write. A recent study (Goodlad, 1983) found that teachers are responding to things that students say during only 5% of the school day. If that is so, it is not surprising that one of the strongest complaints against our schools is that students do not learn to express themselves.

If given a chance, teachers can also be interesting and sympathetic companions. It is a difficult assignment in a classroom in which order is maintained by punitive sanctions. The word *discipline* has come a long way from its association with *disciple* as one who understands.

Success and progress are the very stuff on which programmed instruction feeds. They should also be the stuff that makes teaching worthwhile as a profession. Just as students must not only learn but know that they are learning, so teachers must not only teach but know that they are teaching. Burnout is usually regarded as the result of abusive treatment by students, but it can be as much the result of looking back upon a day in the classroom and wondering what one has accomplished. Along with a sense of satisfaction goes a place in the community. One proposed remedy for American education is to give teachers greater respect, but that is putting it the wrong way around. Let them teach twice as much in the same time and with the same effort, and they will be held in greater respect.

The Establishment

The effect on the educational establishment may be much more disturbing. Almost 60 years ago Sidney Pressey invented a simple teaching machine and predicted the coming "industrial revolution" in education. In 1960 he wrote to me, "Before long the question will need to be faced as to what the student is to do with the time which automation will save him. More education in the same place or earlier completion of full-time education?" (Sidney Pressey, personal communication, 1960). Earlier completion is a problem. If what is now taught in the first and second grades can be taught in the first (and I am sure that it can), what will the second-grade teacher do? What is now done by the third- or fourth-grade teacher? At what age will the average student reach high school, and at what age will he or she graduate? Certainly a better solution is to teach what is now taught more effectively and to teach many other things as well. Even so, students will probably reach college younger in years, but they will be far more mature. That change will more than pay for the inconvenience of making sweeping administrative changes.

The report of the National Commission on Excellence in Education (1983) repeatedly mistakes causes for effects. It says that "the educational foundations of our society are being eroded by a rising tide of mediocrity," but is the mediocrity causing the erosion? Should we say that the foundations of our automobile industry are being eroded

by a rising tide of mediocre cars? Mediocrity is an effect, not a cause. Our educational foundations are being eroded by a commitment to laymanship and to theories of human behavior which simply do not lead to effective teaching. The report of the Convocation on Science and Mathematics in the Schools quotes President Reagan as saying that "this country was built on American respect for education. . . . Our challenge now is to create a resurgence of that thirst for education that typifies our nation's history" (Raizen, 1983, p. 1). But is education in trouble because it is no longer held in respect, or is it not held in respect because it is in trouble? Is it in trouble because people do not thirst for education, or do they not thirst for what is being offered?

Everyone is unhappy about education, but what is wrong? Let us look at a series of questions and answers rather like the series of propositions that logicians call a *sorites:*

1. Are students at fault when they do not learn? No, they have not been well taught.

2. Are teachers then at fault? No, they have not been properly taught to teach.

3. Are schools of education and teachers' colleges then at fault? No, they have not been given a theory of behavior that leads to effective teaching.

4. Are behavioral scientists then at fault? No, a culture too strongly committed to the view that a technology of behavior is a threat to freedom and dignity is not supporting the right behavioral science.

5. Is our culture then at fault? But what is the next step?

Let us review the sorites again and ask what can be done. Shall we:

1. Punish students who do not learn by flunking them?

2. Punish teachers who do not teach well by discharging them?

3. Punish schools of education which do not teach teaching well by disbanding them?

4. Punish behavioral science by refusing to support it?

5. Punish the culture that refuses to support behavioral science?

But you cannot punish a culture. A culture is punished by its failure or by other cultures which take its place in a continually evolving process. There could scarcely be a better example of the point of my book *Beyond Freedom and Dignity.* A culture that is not willing to accept scientific advances in the understanding of human behavior, together with the technology which emerges from these advances, will eventually be replaced by a culture that is.

When the National Commission on Excellence in Education (1983) said that "the essential raw materials needed to reform our educational system are waiting to be mobilized" it spoke more truly than it knew, but to mobilize them the commission called for "leadership." That is as vague a word as excellence. Who, indeed, will make the changes that must be made if education is to play its proper role in American life? It is reasonable to turn to those who suffer most from the present situation.

1. Those who pay for education—primarily taxpayers and the parents of children in private schools—can simply demand their money's worth.

2. Those who use the products of grade- and high-school education—colleges and universities on the one hand and business and industry on the other—cannot refuse to buy, but they can be more discriminating.

3. Those who teach may simply withdraw from the profession, and too many are already exercising their right to do so. The organized withdrawal of a strike is usually a demand for higher wages, but it could also be a demand for better instructional facilities and administrative changes that would improve classroom practices.

But why must we always speak of higher standards for students, merit pay for teachers, and other versions of punitive sanctions? These are the things one thinks of first, and they will no doubt make teachers and students work harder, but they will not necessarily have a better effect. They are more likely to lead to further defection. There is a better way: Give students and teachers better reasons for learning and teaching. That is where the behavioral sciences can make a contribution. They can develop instructional practices so effective and so attractive in other ways that no one—student, teacher, or administrator—will need to be coerced into using them.

Young people are by far the most important natural resource of a nation, and the development of that resource is assigned to education. Each of us is born needing to learn what others have learned before us, and much of it needs to be taught. We would all be better off if education played a far more important part in transmitting our culture. Not only would that make for a stronger America (remember Sputnik), but we might also look forward to the day when the same issues could be discussed about the world as a whole—when, for example, all peoples produce the goods they consume and behave well toward each other, not because they are forced to do so but because they have been taught something of the ultimate advantages of a rich and peaceful world.

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