

Education must teach youngsters to live in an option-expanding world—and to control their own lives by selective choice among these options.

“Technology” and the Classroom

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RECENTLY, guards had to be placed around some school buildings being torn down in one of our larger cities because vandals were waiting to pilfer the classroom clocks which were bringing about \$100 apiece as antiques. So much for the value of obsolete technology in the classroom.

That city will soon be investing in shiny new clocks that will look down on bright new classrooms in equally bright new buildings, but the time they keep will more than likely continue to be punctuated by the same hourly bells, marking the same familiar “periods,” for the same time-honored classes of students who have been loosely grouped together or “graded” in much the same way that students were first graded into classes for the purposes of standardized mass education more than 100 years ago. Would that we might say also “so much for the obsolete technology of the classroom and the standardized instruction it sustains!”

In these days of growing concern with educational problems, we are told that at least a partial solution to our problems can be found by applying

“new educational technology” to the classroom. However, those who look to this new educational technology as a solution are frequently so blinded by their enthusiasm that they fail to realize that the educational-social problems they are trying to solve have been, to a great extent, technologically generated themselves.

Technology as Process

To talk about our present educational system being built upon 19th century technological concepts (or upon any technology at all) may seem to some an unjustifiable stretching of the concept of technology. However, in its most fundamental sense, the concept of technology includes a good deal more than devices, machines, or machine processes. To the Greeks, “technology” was used to describe the process whereby an accomplishment of human artistry (whether action or artifact) was systematically organized so that others might use it to achieve the same ends more efficiently. Today, such processes range from the technique of logically rotating fields so as to maintain the soil

and produce more dependable crop yield (i.e., agricultural technology) to the technique of logically arranging electronic impulses so as to control machines (i.e., computer technology).

If we are willing to accept this definition of technology (if only for the sake of argument), then we are in a position to examine the difficulties inherent in applying the new educational technologies—from television and teaching machines to team teaching and the ungraded school—to our traditional technique of logically organizing for learning via the classroom.

The fact that our system of mass education developed hard on the heels of the developing techniques of mass production in industry is by no means simple coincidence. The similarities between the factory and the school throughout the past century are striking. The grading or classifying of resources (human and otherwise) for the purpose of more efficient production was a significant example. There were other examples as well—all of which were as apparent in the earliest 19th century schools as they were at the turn of the 20th century when Peirce, Dewey, and their followers were urging educators to adopt the progressive methods they hoped would take them beyond the factory-like 19th century school. In fact, the presence of the factory may be found in the very first popular school directly designed for the instruction of the children of the new industrial class. This was the famous Lancastrian School of London (1801) which grew out of an instructional system aimed at achieving limited educational objectives created by Joseph Lancaster.

It is some such idea of efficiency that

we still too frequently honor in schools today. And it is important that we recognize that our respect for it began long before the rise of what Raymond Callahan has labeled "the cult of efficiency in education." It is also important that we recognize that the concept of efficiency via standardized educational practices is more deeply seated in American educational tradition than Callahan, for instance, would have us believe.

If we fail to realize how long and how pervasively our educational form and practice are influenced by outmoded technological concepts, we may fail to see the extent to which our present educational system must be restructured if it is to serve *all* educable individuals as individuals. But then what assurance do we have that this goal can be achieved by a technologically restructured educational system? Perhaps truly individualized education is simply a chimera, or more prosaically, the carrot we dangle before ourselves. I would maintain that the performance of industrial technology in supplying our individual *material* needs indicates that our educational dream can be made a reality. Whether the reality can be prevented from turning into a nightmare is yet another question.

Let us look for a moment at the basically different ways industrial technology has approached the problem of fulfilling the material needs of individuals as that technology moved from the 19th into the 20th century. At one and the same time the great achievement and outstanding characteristic of the production of consumer goods in the 19th century was the standard product that everyone could afford.

Concepts of Technology

While the technological concepts of standardization, economy, and efficiency in American industry have undergone a transformation since they were introduced into American industry over a century ago, outmoded versions of them are still deeply embedded in some aspects of our educational enterprise.

Today, uniform statewide adoptions of textbooks still are the rule in the majority of our fifty states. Although in most cases this does not mean adoption of a single text per subject, it does indicate the extent to which present educational practice accepts an essentially outmoded concept of organizing resources for learning.

Indeed we "talk a good fight" about our struggle to individualize instruction. We idealize this as a goal in much the same way as we idealize teachers as educational professionals, while realistically we compel them to become mass producers of education to whom we frequently pay less money than non-professional industrial workers earn. In doing these things, most American communities unwittingly maintain educational systems built upon an outmoded conception of technology which continues to standardize the modes and means of mass instruction in an effort to economize on the cost of education at the expense of student, teacher, and society alike.

Many communities which believe that the "new educational technology" offers at least a partial solution to this pressing problem are going about it the wrong way. They are mistakenly trying to superimpose new practices upon our

traditional technology of education with which the new practices are incompatible.

Use of Television

For example, television as lived with and used by youngsters at home, is a window through which many escape from the humdrum of their environment. There is ample evidence that the more deprived a child's life is, the more he looks at television. He sees in television some of the things which he feels are lacking in his real life. Maybe these are not the things he really needs. Maybe they are not "safe," in good taste, of long lasting value—but they *are* options (he even has the option of changing the channel or of turning the set off).

Yet, television has usually been applied to our present educational system with its essentially immature, 19th century, efficiency-through-standardization concept of technology. Thus television, so applied as an educational medium, is a far cry from that which the child has learned to expect from television at home. In school, television is, all too frequently, a single channel experience which reproduces an essentially inanimate object, a teacher (usually severely restricted in movement) who communicates, not through the almost mesmerizing, multi-faceted, audio-visual medium the child has come to know at home, but (in most cases) through the all-too-familiar medium of the "talking face." And no channel changing is allowed—although in some schools students have been known to devise ways of turning sets off—permanently!

The most common explanation for our unimaginative use of one of man's

most imaginative communication technologies is that education does not have the money to provide either creative multi-channel programming or the individual sets that would give children something comparable to the options they have in home viewing. No matter how true this may be, it does not lessen the fact that we are tolerating wasted time and human potential by clinging to outmoded conceptions of technology in education.

An educational system in a modern technological society teaches youngsters who live in a world of expanding, not lessening, options. Such a system must, of necessity, teach young people to live in that option-expanding world—and to control their own lives by selectively choosing among those options.

American schools' first round of experience with teaching machines and programmed instruction presents an even more striking example of the problems resulting from the perseverance of our outmoded educational structuring. Unlike television sets, teaching machines and programmed instruction were designed especially for educational use and specifically for the purpose of individualizing the educational process by letting each learner proceed at his own pace. However, most classrooms into which this technology is introduced try to do this through a period in which old classroom group-paced learning is restructured and during which students begin to spread apart (and in some cases take separate learning paths). All too frequently, in the end, the traditional class structure, its group logistics, and its time schedules win out over the new requirements of the new technology.

Hazards in Technology

What do these two examples say about the use of new technologies in education today? Certainly not that they will not be used—they *are* being used, *will* be used, of course, if only because they are new and because they exist. Yet these examples do say something about the tolerance within our communities for wasted human resources, and about our failure to grasp the profound incompatibility between old and new technologies in education.

There are many potential hazards of modern educational technology even at its best. Yet we will not avoid these hazards by maintaining an outmoded concept of technology in an environment in which standardization no longer means a one-color automobile, or the employment of labor at the lowest possible wage. A modern technological society presents other options. And our task in an option-producing educational technology, as in the option-producing world of consumer goods, is to selectively discriminate among our growing choices. This we must do both with a sense of what is immediately useful, and with a sense of what may possess lasting value as well. We must, therefore, create educational systems that make full use of our new 20th century option-producing technologies, and which are manned by teachers who know how to guide the young toward discriminating among these options both in and out of school.

Steps To Be Taken

How can we do this fast enough to avoid continued human wastage and the inappropriate, unproductive appli-

cation of technology to education? The answer is we cannot act fast enough to avoid much that should be avoided, for the steps that must be taken are not going to be easy, nor will they be taken quickly by most communities. And some communities will not choose to make them at all, but will be pushed or pulled along the way by forces around them. Yet some steps can be taken.

The first step is the raising of teachers' salaries. Why raise the salaries of people when you have no proof that it will make them more productive? The fact is that teachers *are* getting less than they deserve, and we *must* pay them more whether we think we can afford to or not.

A second step is to give teachers some proof of the worth of the new tools available to them and pay them to learn how to use and *criticize* these tools as knowledgeable professionals. Too few of our new technological options are being shaped by informed professional users.

The third is to give them ample op-

portunity to increase their knowledge about *all* their options and about how students learn.

Finally, we must make a central aim of education the discriminating use of these increasing options for creating people capable of dealing with the complex world around them. This is an agenda that obviously cannot be treated in a hurry. Yet it is one that we must begin now with the first step first. For given on the one hand, the current dissatisfied mood of teachers throughout this country and, on the other, the increasing number of corporations readying to provide "the new technology" to communities that feel dissatisfied with their present educational system, the ensuing struggle for dollars to pay for "things or people" will only cause further educational wastage.

The changeover in education from the 19th century technology to a technology that will ready us for life in the 21st century will not be easy, and it will entail more than putting new clocks in new classrooms. ☞

THE NEW ELEMENTARY SCHOOL

ALEXANDER FRAZIER, EDITOR

Papers from the Roundtable on New Knowledge about Children sponsored by the Elementary Education Advisory Council of the Association for Supervision and Curriculum Development (1966) and from the Conference on the New Elementary School sponsored by the Council in cooperation with the Department of Elementary School Principals (1967).

Price: \$2.50

Pages: 128

Association for Supervision and Curriculum Development, NEA
1201 Sixteenth Street, N.W., Washington, D.C. 20036

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