

Technology: Use and Abuse?

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If a technology of instruction does not improve the quality of life for learners, then the surface goal of efficiency, more technical in nature than humane, may sow seeds of its own destruction.

SOME analysts of technology have characterized the current scene as a race between successful applications of technology to human problems and growing disenchantment with technological influences on human lives. Schools are faced with somewhat the same race, although they have only recently applied more of their resources and attention to the applications of technology to human learning.

Popular terminology in educational circles reflects some aspects of this technology of instruction, for example, accountability, performance-based evaluation, criterion-referenced behavior, systems analysis, behavioral objectives. Each term has a common relationship to the process concept of technology which emphasizes a systematic integration of those components which contribute to efficient and effective learning. In pursuit of this efficiency and effectiveness, however, a gap exists between what has been accomplished to date and an idealized balance

between the control of essential elements for instructional efficiency and a desirable quality of life for all learners. The enhancement of uses or the reduction of abuses of technology in public education will be determined by the degree to which humaneness is also an element of that technology, assuming that educators generally subscribe to humaneness as a fundamental goal of instruction.

A determinant factor in this goal of humaneness is the conception of technology upon which educators base their actions. On the one hand, there is a process definition of technology which calls for the "systematic treatment" of factors relevant to the solution of instructional problems. Another definition equates technology with the use of machines in education, and not much else. The former definition requires the careful examination of relationships among factors which affect the systematic solution of instructional problems. This more comprehensive definition also places tools and equipment of instruction in proper perspective. From this view, the machinery of instruction is one among a variety of categories of learning resources which includes, in addition to machinery, people, materials, processes, and facilities. If one accepts a primary goal of schools as providing learners with the best combination

of learning resources available, then a technology of instruction applied to this goal would mean the systematic development and management of learning resources to provide optimum learning conditions.

Management of Resources

The process concept of technology infers a careful control and management of resources, including humans who perform prescribed functions in the system. Because of this control, there is a potential conflict between the goal of achieving instructional effectiveness and the goal of supporting human options which may be incompatible with the goal of effectiveness. At this point of conflict a technology of instruction may fail to improve the human condition because no provision may have been made for learners or learning processes to be idiosyncratic or because the accomplishment of such a goal proved too difficult to solve. This is most apt to happen where the process concept of technology is applied system-wide, requiring that functions of people be accountable to a master plan which requires demonstrable relationships between input and output.

Whether the principles of systematized instruction are applied to a unit of content in a classroom or to a school-wide learning system, all relevant components are planned to function in their predetermined roles. Decisions concerning deviations from roles must be mutually agreed upon, or the system breaks down. In one sense, slavishly basing behavioral effectiveness on functional analysis of output and on the control of contributing factors may result in instructional systems which are more technical in character than humane. A critical area in the humane use of technology, therefore, concerns the extent to which a technology of instruction, at whatever level of application, can provide adjustments for the vagaries and immediacy of idiosyncratic human needs.

It may be that there are definite limits to which a technology of instruction might extend. For example, when would the quality of service and dedication of professional staff

to improved learning diminish if one were to pursue differentiated staffing to the extent that each staff member were assigned a prescribed niche, with his performance carefully circumscribed by demands of the system? Undoubtedly, the more creative teachers would find their quality of life deteriorated to a point where education as a profession became undesirable.

A probable solution to teacher demoralization, on the other hand, would be a technology of instruction which would enhance the unique functions of teachers and would build flexibility into the system to allow for teacher and learner differences. It is apparent that much more study needs to be directed to the limits of such a system and whether prescribing goal achievement and human functions within such restrictions is irreconcilable with the goal of humaneness in education.

Some students in individualized instruction settings complain about the lack of human contact and their boredom with unchallenging materials and routines. Part of this criticism stems from the student's own lack of independence in learning. Part is unquestionably due to the demands which the system places on the teacher to produce and evaluate materials and methods within time constraints which do not allow adequate contact with students. In a school which contemplates applying the concepts and practices of a technology of instruction, it is critical at the outset that provisions be made to reinforce the unique capabilities of learners and teachers alike.

Abuse of instructional technology sometimes results from built-in conditions which preclude success. One condition is the premature introduction of innovative practices. An example of this would be the adoption of individualized instruction for an entire school without adequate preparation of teachers for the shift in roles and techniques, without adequate materials in readiness, without provision made for those students who are unable to learn from such materials, and with an expectation that the traditional group instruction setting serve as the frame for individualization.

Another abuse arises out of the lack of mutual planning among participants and ignorance about techniques for assuring adoption of innovative practices. While innovators may feel an urgency for early adoption of the newer machinery and techniques of instruction, experience has shown that change with the least traumatic consequences and with the greatest promise for success results from careful groundwork, mutual planning, and enthusiasm for innovation.

Promising Beginnings

This issue of *Educational Leadership* features a range of topics relevant to understanding and introducing a technology of instruction. However, any conclusion as to whether there is appropriate use or abuse of technology must be based on the degree to which technology supports the fulfillment of human values. The use of specific machinery, the preparation of teachers to use technology, the elaborate systems models which project efficiency and effectiveness of instruction, all must aim toward a quality of life for learners and teachers which enhances their humanness. It should be apparent that this goal of humaneness is in no way incompatible with the need for instructional designers, media specialists, systems analysts, learning psychologists, teachers, equipment manufacturers, curriculum specialists, administrators, and others whose business is education. Each of these specialists must simply include humaneness as a desirable quality in the outcomes of his or her work.

There are promising beginnings in the applications of a technology of instruction

in this country. Focusing on the interrelationships of factors affecting instruction has strengthened the move toward a defensible science of instruction. Individualization of instruction has been a motivational device and effective procedure for many learners. Specifying behavioral outcomes has led to more precision in structuring learning experiences. Instruction in a number of areas has improved as a result of demands for accountability for output of an educational system.

To avoid abuses of technology there must be constant attention to those applications which will help to resolve the conflict between human self-realization and subservience of the human to a smoothly operating system of instruction. If a technology of instruction does not improve the quality of life for learners, then the surface goal of efficiency, more technical in nature than humane, may sow seeds of its own destruction.

As applied to computers in education, the term GIGO (garbage in, garbage out) may apply also to a technology of instruction. Perhaps there is some truth to the notion that technology by itself is a neutral factor in the equation of educating for human fulfillment. When the processes and machinery of a technology of instruction are applied to superficial and denigrating human goals, it becomes suspect. When technology makes life better in fundamental ways, it will be accepted more wholeheartedly by learners, educators, and the general public alike.

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1974	March 9-13	Anaheim	Anaheim Convention Center
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