

Instructional Technology: A Challenge to Curriculum Workers

DEVELOPMENTS in instructional technology during the past decade have been phenomenal. Emanating from the modern technological revolution and reflecting the tempo of the times, these developments have burst upon the educational scene with increasing frequency, tremendous impact and far-reaching consequences.

One of the most spectacular and significant is the development of television as a medium of instruction. Ten years ago when the first educational television station was established, only a few schools were pioneering the use of television for classroom instruction. Today more than 65 ETV stations and many commercial stations regularly present instructional programs for use in elementary and secondary schools. State and regional ETV networks have been formed. Others are being planned. Schools in one six-state region in the Midwest are receiving televised instructional programs from an airplane circling overhead at high altitude.

Closed-circuit television has also become increasingly common as an instructional device. In some situations CCTV is merely used to give every pupil in a room a close-up view of objects displayed and demonstrations performed before the class. In other places CCTV is used to teach groups located in several classrooms. One county school system has all

its schools linked together by coaxial cable enabling teachers in central studios to teach children in any school. One state is well along on a project designed to incorporate the schools throughout the state in a closed-circuit ETV network.

At present millions of pupils in elementary and secondary schools receive some instruction by television. Millions more attend schools within range of stations broadcasting instructional programs. Some responsible students of educational television have predicted that in another ten years a majority of students will receive some instruction by television. Certainly, it is quite likely that many more educational television stations will be established and numerous additional closed-circuit television facilities will be installed in the next decade.

A recent study of the educational potentialities of communication satellites indicated that international as well as national educational television programing is possible. The use of videotape offers many other possibilities for utilizing the TV medium in education. ETV facilities exist or can be made available. The big problem is programing. This is the aspect of instructional television that is of major concern to curriculum workers. It is also the aspect on which they are best qualified to work.

Another major development in instructional technology is the language laboratory. These laboratories have been widely accepted and enthusiastically acclaimed by many language teachers and by several authorities in language instruction. Thousands of schools now have language laboratories. Untold quantities of taped materials have been produced by local school systems as well as commercially.

These laboratories were designed originally to make the magnetic sound recorder of optimum usefulness in teaching languages. Such laboratories, however, have been found to be valuable also in providing instruction in other curricular areas. With the incorporation of other types of instructional materials and devices, language laboratories have become what are referred to as learning laboratories.

What Shall Be Taught?

Doubtless these installations are highly effective for teaching certain kinds of subject matter and for providing learners with desirable opportunities to practice skills and demonstrate the acquisition of knowledge. Again, the big questions are not about equipment, but about programing. What shall be taught? How shall the programs be organized and presented? These are questions rightfully directed to curriculum workers.

Among the more recent developments in instructional technology are the teaching machine and programed instruction. The rapidity with which programed instruction has become a major factor in American education can be appreciated when one realizes that it was practically unknown to most educators only four or five years ago. Within the past two years teachers and parents have been

deluged with a confusing array of teaching machines varying in cost from a few dollars to as much as five thousand dollars. These have been advertised with claims that have sometimes bordered on the fantastic. The popular press abounds with features about how men can be taught by machines. The professional literature has been flooded with books and articles about auto-instruction and programed learning.

The use of these devices and materials at all levels of education and in the training of business and industrial personnel has been the focus of much research. Training directors have been especially quick to adopt automated instructional techniques and have often found them highly effective in achieving their objectives. Many well-established and highly respected textbook publishers and educational film producers have embarked on ambitious projects to produce programed instructional materials, some of which are designed for use in machines. Most of these materials, however, are now being produced in formats that make the use of machines unnecessary. The development of programed instruction has been greatly stimulated and supported by the work of scholars in psychology who are advocates of the reinforcement theory of learning.

It is in the program production phase that this development has been slowed down. Educators who have undertaken to do programing have soon learned that the production of a truly effective program is a difficult and demanding task and that considerable pretesting of material with potential users of the program is absolutely essential. This is a painstaking and time-consuming business. So far, very few good programs are available. Once more it is evident that

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remain under scrutiny. So far we have developed some tentative arrangements for the identification and guidance of children through the Learning Laboratory. Once these arrangements are refined and systematized, preserving high flexibility and opportunity for creative applications, we must set about the task of evaluation. It seems feasible to predict that within four years we should have some measurable outcomes, if only of an empirical character.

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Editorial

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curriculum workers have a very important role to play. They have the major leadership responsibility in evaluating and selecting programmed materials and teaching machines and in producing such materials and devices locally.

Other developments in instructional technology that here can only be mentioned are: quick and easy methods for producing transparencies for overhead projection; production of opaque and transparent photographic materials in black and white and in color by means of the Polaroid camera; 8mm sound motion picture film, cameras and lightweight cartridge-load projectors; and cross-media or systems-approach to teaching and learning, including the use of computers. These developments also raise for curriculum workers the familiar questions: What shall be presented by means of these materials and devices? How shall the content be organized? Toward what ends shall the content be used? How shall these devices and materials be employed?

Obviously, instructional technology bears directly on curriculum and on

teaching and learning. These are matters for which curriculum workers have primary responsibility. Consequently, the challenge is clear. Curriculum workers must provide leadership and guidance in deciding whether to use television, language laboratories, programmed materials, overhead projectors, 8mm films or any of the other newer media and devices. They must also advise and assist teachers in the use of these materials and equipment once they are adopted.

Leadership Is Needed

To meet this challenge, curriculum workers need to know the new media and instructional equipment. They need to be informed about the research that has been and is being done to discover the educational effectiveness of these materials and equipment and to determine how best they can be used. Most important, they need to have direct experience with the media and devices.

This is a big order. Even the specialists in the media field find it difficult to keep up with new developments. Nonetheless, much can be learned about instructional technology by reading the professional journals in the field, by attending meetings and visiting exhibits that deal with new media, by participating in workshops and in-service courses, by observing in schools that are using modern instructional technology, and by examining and using a variety of materials and equipment. Readers of this piece can obtain much valuable information and useful commentary about several aspects of the evolving instructional technology by turning to the other articles in this issue of *Educational Leadership*.

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