THE DEVELOPMENT OF EDUCATIONAL TECHNOLOGY — ITS IMPACT ON EDUCATION IN TRINIDAD & TOBAGO

Victor Look Loy

For centuries, teachers have been using Audio-visual aids to improve the effectiveness of their teaching. They have relied on such aids as the teacher’s voice, the blackboard, pictures, charts, maps and texts material to elucidate, illustrate and clarify ideas and concepts, which by their very nature might have presented some difficulty in terms of students’ perception of them.

Such aids have been, and are still being used to supplement and reinforce the communicative efforts of the teacher. As the name audio-visual aids implies they are merely aids and not expected to do the whole job of teaching.

It happened however, that with developments in the physical sciences, audio-visual aids took on new dimensions and education was found, as a result, to be gradually invaded by a variety of electrical teaching devices such as tape recorders, record players and projectors.

These new aids gave added impetus to teachers, and by the mid 1950’s the whole spectrum of teaching aids began to be subsumed under the general concept of educational technology which was created to meet the exigencies of the times.

It was a time that witnessed a series of explosions such as pupil explosion, resources explosion and knowledge
explosion. It was also a time when conventional methods of teaching could not cope with the unprecedented demands for training of both military and civilian populations. Finally it was a time when there were complaints from many quarters that education was missing the mark and that the educated person had not been coming up to anticipated standards. That movement held out great promise of a more comprehensive approach to effective classroom teaching.

However, for decades to follow, people suffered delusions about the true meaning of this movement called educational technology. The term conjured up in the minds of many educators a Utopian situation in which sophisticated machines with magic powers, solved by the mere flicking of their switches, most, if not all the problems of day-to-day classroom teaching.

On the other hand, educational technology has been perceived by others as a cataclysm and a catastrophe with severe dehumanizing effects on the essentially human process of teaching and learning. They saw an ever growing spectrum of mechanical, electrical and electronic gadgets that were helping to destroy the initiative and imagination of learners. Both these views however, are inaccurate and exaggerated since they reflect an obsession with only one aspect of technology, namely the hardware aspect. What is disconcerting about this misconception of educational technology, is that in the minds of many people involved in education, it still continues to exist.

According to Lumsdaleine (1964), there are two elements to educational technology. One aspect he describes as Hardware component involving teaching aids, which “transmit, amplify, distribute, record and reproduce stimuli materials with a consequent increase in teacher impact.” The other is described as the software or intellectual element involving the “application of learning principles to the direct and deliberate shaping of behaviour.” It is the element of educational technology
that relates to such things as task analysis, precise behav-
ioral objectives, stimulus variation, teacher-pupil inter-
action, learning skills, reinforcement, cumulative learning
and evaluation. In short, it may be looked upon as a
process by means of which we apply the research findings
of the behavioral sciences to the problems of instruction.

It seems therefore, that if educational technology is to
fulfil effectively its role in teaching and learning, its full
connotation must be grasped by those concerned with
education. It must be clearly understood that educational
technology is neither hardware nor software taken exclu-
sively. It is an integration of both.

Chadwick (1979) explains that there has been, and still
is the problem of arriving at a suitable definition of Edu-
cational Technology. It should have been resolved between
1968 and 1969 when according to him, various authors
such as Gagne, Komski, Tosti, and Ball were classifying
the issue as one of technology in and of education, and
not technology for education.

The National Council for Educational Technology, NCET,
issued a booklet entitled News from NCET which defines
educational technology as "... the development of sys-
tems, techniques and aids to improve the process of
human learning."

According to Sakamato (1980) there are three major
concepts in terms of a definition of educational tech-
nology. The first is to pursue the maximum combination
of the components of teaching and learning and educa-
tional support systems. The second is to develop and use
technological devices and systems necessary for the
implementation of the optimal combinations. The third
is to organize the technologies into a systematic science
of instruction and learning.

Sakamato explains that Japan, between 1960 and recent
times has experimented with each individual concept,
although at present, educational technology is understood
to mean the integration of all three concepts.
Unwin (1968) has gone even further to add a third dimension — that of the control of the learning environment. In his view, Educational Technology is concerned with the application of modern skills and techniques to requirements of Education and training. It includes, he thinks, the facilitation of learning by manipulation of media and methods and the control of environment in so far as this reflects on learning.

On this question of environmental influence on learning, Carl Wernstein (1981) expressed the view that while classroom design may play second fiddle to instructional methods and curriculum, there is growing evidence that the physical setting of a classroom is capable of influencing the behaviour patterns of the pupils within. He holds the view that furniture arrangements, seating position and the aesthetics of the surrounding walls, are three physical dimensions under a teacher’s control that appear to make an impact on pupils’ attitude. In other words, it is being advanced that technological considerations include even the physical features of the classroom.

Unfortunately though, many educators are still of the view that educational technology is associated exclusively with instrumentation. Their persistent outlook is due partly to the fact that commercial and manufacturing worlds have been devoting much time and effort to penetrating the educational market with the sale of technological hardware, while educational theorists have been doing much less by the way of disseminating knowledge concerning educational theory and practice. This imbalance between the intellectual and the mechanical aspects of the technology, constitutes the inevitable distortion of the concept.

Most teachers for example are aware, even minimally of such instructional aids as the flannelgraph, the magnetic board, the tape recorders, the overhead projector, the super 8 and 16 mm projectors, the opaque projector, the computer, radio, video and television. These all fall within the hardware category and to varying degrees are found,
though not always used, in a number of schools and other educational institutions even in developing countries such as those of the Caribbean region.

Regrettably though this phenomenon of awareness does not exist to the same degree with respect to the intellectual aspect of the technology. In fact, not many teachers are equally aware of the contributions to learning theory made by Neil Miller, Skinner, Gagne, Lumsdaine, Ausubel, Mager and Richardson just to name a few. Not many are equipped with the psychological foundations of Educational technology upon which they could base the many professional decisions they have to make.

Regrettably, the work of Educational Psychologists and Educational Theorists remains at the level of academic study and do not filter down to the practitioner in the classroom causing the intellectual component of Educational technology to be almost non-existent.

In the mean time the hardware component of the technology continues to make its individual contribution. For instance it has been accepted that audio-visual aids as a component of the technology help to improve the effectiveness of teaching while increasing and maintaining interest on the part of pupils; it has also been argued that audio-visual aids help pupils to form richer and deeper concepts while at the same time contributing to permanence in learning as well as to swifter and more accurate recall.

Dawyer (1972) in what he calls the Realism Theory says in effect that the more realistic the aid, the more effective it will be as instructional support and Dale's cone of experience (1969) is in fact, based on this hypothesis. It represents a range of experience from the very concrete to the very abstract in ascending order as illu-
Dale further divides his cone of experience into three levels starting at the base. These are (a) Participation (b) observation (c) symbolization. The participation level consists of direct purposeful experiences, contrived experiences, and dramatized experiences. The observation level consists of demonstrations, school journeys, exhibits, television, motion pictures, sound recordings, radio and still pictures. The symbolization level consists of visual symbols and verbal symbols.

There is the further argument that audio-visual aids are able to overcome such barriers to effective teacher-pupil communication as verbalism, referent confusion, restricted perception, day dreaming and physical discomfort, Wittich and Schuller (1963). At the same time, Audio-visual aids especially those of either an electrical or electronic nature, provide the classroom counterpart of the attractiveness of out-of-school entertainment media which are creating a difficult situation for non-Visually attuned teachers.
who find themselves having to teach visually adept pupils by the traditional talk and chalk method.

The concept of Audio-visual aids is continuing to exist in itself. It is independently making an invaluable contribution to teaching and learning; and while it will continue to do so for years to come, one cannot help but feel that as a component of educational technology its effectiveness can only be maximized if there is a greater degree of integration with the software or intellectual component.

The question of course, that needs to be brought into focus for the benefit of teachers, teacher-trainers and administrators is — how does one effect this integration between the hardware component of the technology and the intellectual component?

There are those who feel that the answer to this question may rightly lie in the establishment of a structure that could maximize the use of a systematic approach to teaching and learning. Gerluch and Ely (1971), provides the teacher with a structure for the design of instruction, that offers a more suitable configuration of the elements in the teaching process. See Fig. II

Figure II illustrates that the systems approach suggests that lesson design (whether of an individual lesson or unit of lessons) must be conceived with specific requirements in mind and arranged in sequence as follows:—

(a) Specification of objectives
(b) Selection of content
(c) Assessment of entering behaviour
(d) Determination of teaching strategies
(e) Organization of groups
(f) Allocation of time
(g) Allocation of space
(h) Selection of resource (teaching aids)
(i) Elevation of performance
But does this systems approach really solve the problems of integration? It certainly does not, for while there is some agreement that Educational Technology is considerably more than the use of audiovisual aids and mass communication media, its thirty years of development has not produced such refinement in its characteristics as would make it an easily definable field of educational activity.

There have been a considerable amount of discussion and an overwhelming number of presentations concerning its true nature, but, what it really encompasses and
how it can as a system, integrate with the other systems in its environment is still unclear.

It is a technology whose slow rate of development has not been consistent with anticipated progress, yet it engages the attention of education authorities in many developed and some developing countries.

In Trinidad and Tobago it is making almost the same initial impact it has made in some of the more developed countries of the world. It is bringing about changes, but not substantial ones. They are simply ad hoc changes that are in no way substantial enough to cause a re-structuring of the traditional system of the educational environment of the country.

In 1960 Trinidad and Tobago embarked upon a pilot project through which it endeavoured to implement educational radio broadcasting. The project has been successful and it exists today as an addition, superimposed upon the traditional situation but with little evidence, even hope, of any serious integration into the system.

This country is now considering the introduction of Educational Television Broadcasting and there is nothing so far to indicate that it will form an integrative part of the existing super-structure. Like Educational Radio Broadcasting it will remain on the periphery although the chances of it being more deeply entrenched into the system through its direct penetration of the school curricula, are quite good.

But, even if one turns from an examination of the educational use of the mass media such as Radio and Television to that of conventional teaching aids like tape recorders, record players, movie and slide projectors, the flannelgraph, maps, charts and diagrams one would find that the vision of integration is equally faint.

There is evidence of inefficiency and insufficiency, constraints and restraints in the use of conventional teaching aids. An infinitely small number of schools has been
supplied with modern teaching aids and there are few teachers in those schools who are capable of using the aids at their disposal, intelligently and appropriately.

At the same time, teachers' colleges where very effective work could be done to improve the professionalism of teachers by increasing their competence in technological matters will all in a short while, become non-existent. Even as a last resort one might have attempted to turn to the "Continuing Education" programme for teachers and school principals, but that attempt would be futile, since the programme has, so far, done little to improve the technological proficiency of teachers. Yes; Educational Technology has made an impact on the formal education system of Trinidad and Tobago but the impact is feeble.

REFERENCES


Dale, E. Audio visual Methods in teaching. The Ohio State University. 1969.


