THE DEFINITION OF EDUCATIONAL TECHNOLOGY

AECT Task Force
on Definition and Terminology

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A field, as George Gerbner has so often pointed out, is not the same thing as a discipline in the world of the intellect. The audiovisual field, like many other fields including public administration, embraces portions of concepts, skills, and procedures from a number of academic disciplines and also from other applied fields and welds them into new applications. In this process, other elements—notably, the beginnings of one or more new disciplines and a great deal of art—are created. Thus, civil engineering is more than the strength of materials, more than theories of molecular resonance; though it must use these, it must also create elements of its own if real bridges of lasting beauty are to be made to cross real rivers.

In the academic disciplines—chemistry, literary criticism, or urban sociology—definition and terminology is a difficult enough problem. These days, all academic disciplines are in a great struggle to become sciences with physics as the model. Without commenting on the possible inadvisability of this drive by all fields of knowledge to emulate a system for study of the physical universe, the fact still remains that in any science an agreed upon universe of discourse is the sine qua non. The ideal science or academic discipline is one in which all workers understand perfectly all of the terms in the special language of the science or discipline—a language in which all neophytes or apprentices must be inducted until they, too, reach full understanding. Because models created of the real world rarely, if ever, precisely resemble that world, even the utmost reaches of the “hardest” sciences have never really attained this ideal of a totally agreed-upon universe of discourse.

The problem of an applied field with reference to definition and terminology is infinitely more difficult than the same problem in a narrow and precise discipline. An applied field, by its very nature, draws upon so many sources for its sustenance that the problem of definition and terminology is compounded many times. If the biophysicists do not totally agree in their field, what about the public health people who must apply findings from varied disciplines?

Further, it can be argued that an applied field is subject to the winds of change that may mount to hurricane force and speed. The explosion of knowledge causes the narrowest discipline to change with great rapidity. A human profession making use of several disciplines thus has to live with multiplying change.

At bottom, the problem is even more complicated. Writers on science and even eminent scientists in recent years have created and maintained a myth that there is a one to one relationship between a science and any applied field depending upon that science. That is, scientists advance new theories or discover new facts or processes about some aspect of the world, and engineers then apply these theories, facts, or processes directly as handed down. In education, for example, there is talk about the science of learning and the art of teaching or the technology of instruction.

It is true that in the last 50 years, as the industrial revolution has given way to the scientific revolution, we have increasingly relied upon the scientist as discoverer and understander and upon the practitioner as direct applier without change or question. Their relationship, however, is still far from one to one. The practitioner—he be doctor, engineer, public administrator, or audiovisual director—still adds much to the revolutionary process: Call it invention, technology, art, or a little of all three.

The professional who has to do something in this world further complicates the problem of language, definition, and terminology because he adds terms, concepts and ideas to those selected from the supporting disciplines (pp. iv-vi).

AECT’s Task Force on Definition and Terminology has the responsibility for giving both structure and sense to the application of technology to education. Applying technology necessarily affects all parts of the educational enterprise. Finn recognized the scope of this impact:

It follows, then, that definition and terminology in the expanded audiovisual field—instructional technology, if you will—is of crucial importance to the educa-
tional community as a whole. Does the school superintendent, for example, know what the language laboratory that he has just asked for bids on really is? Does he use program in its television sense or its teaching machine or computer sense? (p. vii)

How does instructional design relate to instructional development and how do both relate to curriculum planning? Do summative and formative evaluation differ in respect to time or procedures or both? The need for standard terms and definitions has expanded—not diminished—in past years.

This definition is not offered casually. It has been 14 years in the making. It is the product of people—practitioners in educational technology. Recognizing what is encompassed within the field of educational technology, they represent and have drawn from a wide range of educational specialities. As a product of people at a point in time, the definitions and technology will change and evolve as time goes on. Such changes are welcomed, not discouraged. AECT’s Task Force on Definition and Terminology encourages those involved in any phase of educational technology to make themselves heard, to offer comments and ideas, to contribute to an ongoing revision process. Future editions can only be strengthened by the collective input of you, the practitioners in educational technology. Tomorrow is you—become it.

Rochester, New York

Clint Wallington

January 1, 1977
CHAPTER 1

The Definition of Educational Technology: A Summary

A concept as complex as educational technology requires an equally complex definition. The following definition—all 16 parts—are meant to be taken as a whole; none alone constitutes an adequate definition of educational technology.

1. Educational technology is a complex, integrated process involving people, procedures, ideas, devices, and organization, for analyzing problems and devising, implementing, evaluating, and managing solutions to those problems, involved in all aspects of human learning. In educational technology, the solutions to problems take the form of all the Learning Resources that are designed and/or selected and/or utilized to bring about learning; these resources are identified as Messages, People, Materials, Devices, Techniques, and Settings. The processes for analyzing problems, and devising, implementing and evaluating solutions are identified by the Educational Development Functions of Research-Theory, Design, Production, Evaluation-Selection, Logistics, Utilization, and Utilization-Dissemination. The processes of directing or coordinating one or more of these functions are identified by the Educational Management Functions of Organization Management and Personnel Management. The relationships among these elements are shown by the Domain of Educational Technology Model:
Instructional technology is a sub-set of educational technology, based on the concept that instruction is a sub-set of education. Instructional technology is a complex, integrated process involving people, procedures, ideas, devices, and organization, for analyzing problems, and devising, implementing, evaluating and managing solutions to those problems, in situations in which learning is purposive and controlled. In instructional technology, the solutions to problems take the form of Instructional System Components which are prestructured in design or selection, and in utilization, and are combined into complete instructional systems; these components are identified as Messages, People, Materials, Devices, Techniques, and Settings. The processes for analyzing problems and devising, implementing, and evaluating solutions are identified by the Instructional Development Functions of Research-Theory, Design, Production, Evaluation-Selection, Utilization, and Utilization-Dissimination. The process of directing or coordinating one or more of these functions are identified by the Instructional Management Functions of Organization Management and Personnel Management. The relationships among these elements are shown by the Domain of Instructional Technology Model:

Figure 1.1
DOMAIN OF EDUCATIONAL TECHNOLOGY

The definitions of the elements in the Domain of Educational Technology are given in Tables 1.1, 1.2, and 1.3.

Educational technology is a theory about how problems in human learning are identified and solved.

Educational technology is a field involved in applying a complex, integrated process to analyze and solve problems in human learning.

Educational technology is a profession made up of an organized effort to implement the theory, intellectual technique, and practical application of educational technology.

2. Educational technology is often confused with "technology in education."

Technology in education is the application of technology to any of those processes involved in operating the institutions which house the educational enterprise. It includes the application of technology to food, health, finance, scheduling, grade reporting, and other processes which support education within institutions. Technology in education is not the same as educational technology.

3. Educational technology is often confused with "instructional technology."

Figure 1.2
DOMAIN OF INSTRUCTIONAL TECHNOLOGY
The definitions of the elements in the Domain of Instructional Technology are given in Tables 1.1, 1.2, and 1.3.

Thus, all of instructional technology fits within the parameters of educational technology, while all of educational technology does not fit within the parameters of instructional technology. If instructional technology is in operation, then of necessity, so is educational technology; the reverse is not necessarily true. In educational technology, the Development and Management Functions are more inclusive because they apply to more Learning Resources than just Instructional System Components—they include all resources that can be used to facilitate learning.

4. The definition of educational technology constitutes a Theory because it meets the criteria of: existence of a phenomenon, explanation, summarizing, orientation, systematizing, gap identification, generating strategies for research, prediction, and a principle or set of principles.

5. Educational technology has a unique Intellectual Technique—an approach to solving problems. Each development and management function has an individual technique associated with it. However, the intellectual technique of educational technology is more than the sum of these parts. It involves the systematic integration of the individual techniques of these functions, and their interrelationships, into a complex, integrated process to analyze whole problems and create new solutions. It produces a synergistic effect, yielding outcomes not totally predictable based on the individual elements operating in isolation. This indigenous intellectual technique is unique to educational technology; no other existing field uses it.

6. Educational technology has practical applications. The existence of resources for learning, and the performance of the development and management functions, constitute the most basic and explicit evidence of this practical application. In addition, the application of educational technology affects the organizational structure of education because: (1) it moves the impact of educational technology to the curriculum strategy (and perhaps determination) level; (2) it permits four types of educational patterns—people resources alone, other resources used by (and controlled by) people, people in shared responsibility with other resources (combined into educational systems using mediated instruction), other resources (mediated instruction) alone; (3) it makes possible the existence of alternative institutional forms for facilitating learning, and can serve all these types of alternative institutions. These applications have significant impact on the specific processes of education: they change the techniques of doing, and the people who do, content determination (including standardization, choice, quantity, and quality), design, production, and evaluation of instruction, and interaction with, and assessment of, learners. The result leads to a drastic change in the role of school systems and the individual teacher.

7. Educational technology has guidelines for training and certification. There is a competency-based framework for training people who perform tasks in educational technology. The framework is based on groupings of tasks from various functions within the domains of educational and instructional technology. The groupings reflect specialties within the field as well as levels of performance within the specialty area. The specialties are: (1) instructional program development, (2) media product development, and (3) media management. The three levels of task complexity are aide, technician, and specialist. AECT currently has guidelines for training programs for, and certification of, technicians and specialists in each of the three specialty areas, and is developing procedures for the implementation of those guidelines.

8. Educational technology has provisions for the development and implementation of leadership. Leadership within the profession is carried out through various leadership conferences and internship programs. In addition, educational technology fulfills a leadership function in the field of education through participation in joint groups, grants, and publications.

9. Educational technology has an association and professional communications. There is at least one professional association directly concerned with educational technology—the Association for Educational Communications and Technology. In addition to facilitating communication among members through its
annual convention and three periodic publications, it serves to develop and implement the standards and ethics, leadership, and training and certification characteristics of the profession.

10. Educational technology acknowledges itself as a profession through its professional association and the activities it performs.

11. Educational technology operates within the larger context of society. It advocates being a concerned profession—concerned about the uses to which its techniques and applications are being put. Further, as a profession, it has taken stands in favor of intellectual freedom, in favor of affirmative action, against stereotyping in materials, and in favor of enlisting technology in support of humane and life-fulfilling ends.

12. Educational technology operates within the total field of education. In its relationship to other professions also involved in the field it advocates a coequal and cooperative relationship among these professions.

13. Since the definition presented here meets all the criteria for the existence of a theory (preceding items 1-4), educational technology is a theory about how problems in human learning are identified and solved. Since the definition meets all the criteria for the existence of a field (preceding items 1-6), educational technology is a field involved in applying a complex, integrated process to analyze and solve problems in human learning. Since the definition meets all the criteria for the existence of a profession (preceding items 1-12), educational technology is a profession made up of an organized effort to implement the theory, intellectual technique, and practical application of educational technology. The definitions of educational technology as a theory, a field, and a profession are congruent—with each being derived directly from the one which precedes it.

14. Persons are members of the field of educational technology if they perform activities that fall within the Domain of Educational Technology, based on the theoretical framework of, and employing the intellectual technique of, educational technology.

15. Persons are members of the profession of educational technology if they already meet the criteria for operating within the field; spend a majority of their time performing one or more of the Domain of Educational Technology functions; subscribe to the standards and ethics of the profession; and have the training and certification required by the profession; are involved in developing their own leadership abilities; are members of the association and participate in its communications through reading its journals and attending its meetings; acknowledge themselves as members of the profession; are concerned professionals—examining the ends to which their skills are put and accepting those values set forth by the profession; and relate to other professionals on a coequal and cooperative basis. These people may be called "educational technologists."

16. "The concept of instructional or educational technology is totally integrative. It provides a common ground for all professionals, no matter in what aspect of the field they are working. It permits the rational development and integration of new devices, materials, and methods as they come along. The concept is so completely viable that it will not only provide new status for our group, but will, for the first time, threaten the status of others" (Finn, 1965, p. 193).

"The educational future will belong to those who can grasp the significance of [educational and] instructional technology" (Finn, 1964a, p. 26).
Learning Resources/Instructional System Components

<table>
<thead>
<tr>
<th>Resource or Component</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Items (traditionally called media or software) which usually store Messages for transmission by devices; sometimes self-displaying.</td>
<td>Overhead transparency; slide; filmstrip; 16mm motion picture; 8mm motion picture; videotape; record; audiotape; programmed instruction materials; computer-assisted instruction program; book; journal.</td>
</tr>
<tr>
<td>Device</td>
<td>Items (traditionally called hardware) which transmit Messages stored on Materials.</td>
<td>Overhead projector; slide projector; filmstrip projector; 16mm film projector; 8mm film projector; videotape recorder; television set; record player; radio; tape recorder; dial access information retrieval system console; teaching machine; talking typewriter; computer output devices.</td>
</tr>
<tr>
<td>Technique</td>
<td>Routine procedures or precast molds for using Materials, Devices, Settings, and People to transmit Messages.</td>
<td>Computer-assisted instruction; programmed instruction; simulation; gaming; discovery; inquiry; field trip; team teaching; individualized instruction; self-instruction; group instruction; lecture; discussion.</td>
</tr>
<tr>
<td>Setting</td>
<td>The environment in which the Messages are received.</td>
<td>Physical: school building; instructional materials center; library; studio; classroom; auditorium. Environmental: lighting; heating; acoustics.</td>
</tr>
</tbody>
</table>

Learning Resources (for Educational Technology)—all of the resources (data, people, and things) which may be used by the learner in isolation or in combination, usually in an informal manner, to facilitate learning; they include Messages, People, Materials, Devices, Techniques, and Settings. There are two types: (a) resources by design—those resources which have been specifically developed as “instructional system components” in order to facilitate purposive, formal learning, and (b) resources by utilization—those resources which have not specifically been designed for instruction but which can be discovered, applied, and used for learning purposes.

Instructional System Components (ISC) (for Instructional Technology)—those learning resources which are prestructured in design or selection and utilization, and combined into complete instructional systems, to bring about purposive and controlled learning.
### Table 1.2

**Educational/Instructional Development Functions**

Functions which have as their purpose analyzing problems, and devising, implementing, and evaluating the Learning Resources/Instructional System Components solutions to these problems.

<table>
<thead>
<tr>
<th>Function</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research-Theory Purpose:</strong></td>
<td>To generate and test knowledge (theory and research methodology) related to the functions, Learning Resources and Instructional System Components and learners.</td>
<td>To conceptualize theoretical models. To conduct research projects. To analyze research data.</td>
</tr>
<tr>
<td>Outcome</td>
<td>Knowledge which can act as an input to the other functions.</td>
<td>To generate new ideas. To test validity of model. To test hypotheses.</td>
</tr>
<tr>
<td>Activity</td>
<td>Seeking information, reading it, analyzing it, synthesizing it, testing it, analyzing test results.</td>
<td>Reads proposal. Compares model with known data. Formulates specific hypotheses.</td>
</tr>
<tr>
<td>Design Purpose</td>
<td>To translate general theoretical knowledge into specifications for Learning Resources or Instructional System Components.</td>
<td>To design programmed instruction materials. To develop instructional modules for individualized instruction. To design equipment systems.</td>
</tr>
</tbody>
</table>
### Educational/Instructional Development Functions

<table>
<thead>
<tr>
<th>Function</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Evaluation-Selection Purpose:</strong></td>
<td>To assess acceptability of actual produced Learning Resources or Instructional System Components in terms of criteria set by other functions, and to develop models for this assessment.</td>
<td>To pilot test prototype instructional materials. To preview and select instructional materials. To develop evaluation models and techniques.</td>
</tr>
<tr>
<td><strong>Outcomes:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Evaluation for Design: effectiveness of Learning Resources or Instructional System Components in meeting their objectives.</td>
<td>To identify problems with materials. To identify objectives not met. To insure acceptable sound quality.</td>
<td></td>
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<tr>
<td>(b) Evaluation for Production: acceptability of items in meeting production standards.</td>
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<td>(c) Evaluation for Evaluation: evaluation models.</td>
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<tr>
<td>(d) Evaluation for Selection: acceptability of items for acquisition for a specific purpose.</td>
<td></td>
<td></td>
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<tr>
<td>(e) Evaluation for Utilization: acceptability of items for meeting learning objectives in actual use.</td>
<td></td>
<td></td>
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<tr>
<td><strong>Activity:</strong></td>
<td></td>
<td></td>
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<tr>
<td>Analyzing quality in terms of standards.</td>
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<td></td>
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<tr>
<td><strong>Examples</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Logistics Purpose:</strong></td>
<td>To make Learning Resources and Instructional System Components available for other functions.</td>
<td>To have equipment ready as needed. To provide delivery service. To catalog materials.</td>
</tr>
<tr>
<td><strong>Outcome:</strong></td>
<td>Ordered, stored, retrieved, classified, catalogued, assembled, scheduled, distributed, operated, maintained, and repaired Learning Resources and Instructional System Components.</td>
<td>To cross-index materials. To locate materials for delivery. To keep repair history. To repair filmstrip projector.</td>
</tr>
<tr>
<td><strong>Activity:</strong></td>
<td>Ordering, storing, retrieving, classifying, cataloging, assembling, scheduling, distributing, operating, maintaining, repairing Learning Resources and Instructional System Components.</td>
<td>Threads movie projector. Assigns media code from list. Plans new scheduling system.</td>
</tr>
<tr>
<td><strong>Utilization Purpose:</strong></td>
<td>To bring learners into contact with Learning Resources and Instructional System Components.</td>
<td>To help student use learning activity. To monitor individualized and self-instruction. To help student select learning activities and to meet objectives.</td>
</tr>
<tr>
<td><strong>Outcome:</strong></td>
<td>Facilitation and assessment of student learning.</td>
<td>To analyze student learning style. To present information. To encourage interest in learning activity.</td>
</tr>
</tbody>
</table>
### Educational/Instructional Development Functions

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<thead>
<tr>
<th>Function</th>
<th>Definition</th>
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<tbody>
<tr>
<td><strong>Activity:</strong></td>
<td>Assigning, preparing learner for, presenting, assisting, and following up Learning Resources and Instructional System Components; testing learners.</td>
<td>Discusses with student. Compares learning activities with learning style. Compares pre- and post-tests.</td>
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</table>

**Utilization-Dissemination Purpose:**

(A special subfunction of Utilization.) To bring learners into contact with information about educational technology.

<table>
<thead>
<tr>
<th></th>
<th>To consult on materials design and use. To teach photography course. To explain individualized instruction project. To increase use of learning resources center services by teachers.</th>
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<tr>
<th><strong>Outcome:</strong></th>
<th>Dissemination of information about educational technology.</th>
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<tbody>
<tr>
<td></td>
<td>To provide models for designing instruction. To improve use of mediated instruction by teachers. To answer questions about individualized instruction project. To demonstrate projector. To explain learning resources center services to teachers.</td>
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<tr>
<th><strong>Activity:</strong></th>
<th>Taking in and giving out information about educational technology.</th>
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<tbody>
<tr>
<td></td>
<td>Defines learning resources center services available. Writes professional articles. Views microteaching lesson. Role plays teacher using mediated instruction.</td>
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### Educational/Instructional Management Functions

Functions which have as their purpose the directing or controlling of one or more of the Educational/Instructional Development Functions or of other Educational/Instructional Management Functions to ensure their effective operation.

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<thead>
<tr>
<th>Function</th>
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<th>Examples</th>
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</thead>
<tbody>
<tr>
<td><strong>Organization/Management Purpose:</strong></td>
<td>To determine, modify, or execute the objectives, philosophy, policy, structure, budget, internal and external relationships, and administrative procedures of an organization performing one or several of the Development functions or the Management functions.</td>
<td></td>
</tr>
<tr>
<td>To administer/direct project which includes two or more functions. To monitor and change operation of center. To provide secretarial services in an audiovisual center.</td>
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<tr>
<th><strong>Outcome:</strong></th>
<th>Policy, budget, plans, coordinated activities, administrative operations.</th>
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<tr>
<td></td>
<td>To prepare budget. To identify organization needs. To ascertain jobs to be done.</td>
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<tr>
<th><strong>Activity:</strong></th>
<th>Defining, writing, and carrying out procedures leading to the outcomes.</th>
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<tr>
<td></td>
<td>Reviews purchase orders. Designs new organizational model. Analyzes problems in project.</td>
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</table>
### Educational/Instructional Management Functions

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<th>Examples</th>
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</thead>
<tbody>
<tr>
<td>Personnel-Management</td>
<td>To interact with and/or to supervise the people who perform activities in the functions.</td>
<td>To supervise personnel in graphics unit. To improve communications between technicians and artists. To staff projects.</td>
</tr>
<tr>
<td>Purpose:</td>
<td>Interpersonal interaction, discussion, supervision, employment, and personal development.</td>
<td>To evaluate work performed. To encourage discussion. To supervise the repairperson.</td>
</tr>
</tbody>
</table>

CHAPTER II

Educational Technology: Theoretical Construct, Field, Profession

When we think of educational technology, we can think of it in three different ways—as a theoretical construct, as a field, and as a profession. Consequently, when we define educational technology, we can define it in these same three different ways.

Before stating a definition, then, it is prudent to analyze each of these ways of looking at educational technology, to decide which we are to define, and to set forth criteria by which we can evaluate whether our definition actually defines educational technology in the desired ways.

**THREE PERSPECTIVES OF EDUCATIONAL TECHNOLOGY**

The first way we can think of educational technology is as a **theoretical construct**—an abstraction which includes sets of ideas and principles about how education and instruction should be carried out through the use of technology.

Second, we can think of educational technology as a **field of endeavor**—the application of the theoretical ideas and principles to solve actual problems in education and instruction. The field includes the techniques used, the activities performed, the information and resources used, and the clients served by practitioners in the field.
Third, we can think of educational technology as a profession—a special group of practitioners who are organized, who meet certain criteria, who have certain duties, and who combine to structure a particular part of the field.

None of the foregoing perspectives is more correct or better than the others. Each is a different way of thinking about the same thing. Different people have different perspectives and individuals’ perspectives may change, depending upon what they “do” in relation to educational technology.

DEFINING EDUCATIONAL TECHNOLOGY

Which of these three perspectives of educational technology should be used as the basis for the definition?

Thinking of educational technology as a theoretical construct provides the most substantial basis for a definition. We can consider it in the abstract, analyzing, identifying, and defining its elements and interrelationships, then synthesizing them into a cohesive entity. Such a definition would be the most clear and comprehensive definition which could be generated.

Most people, however, think of educational technology as a field, and identify it not by its theory but rather by those tangible elements they can observe. Those who work to apply educational technology generally relate it to the jobs and the activities they perform daily. To them it is not a theory but an entity in which they exist. A definition of the field of educational technology would most closely fit the perceptions of those who work within it.

A still smaller group of people think of educational technology as a profession, and identify it by the special criteria for professions. While these people are concerned with the jobs and activities of the field, they are also concerned with the criteria (such as training, belonging to an organization) which make them “professionals” and which make educational technology their “professional home.” A definition of the profession of educational technology would address itself more to the question of “who is an educational technologist?”

To select any single viewpoint to the exclusion of the others as the basis for the definition would limit both the scope and utility of the definition.

Therefore, the definition of educational technology presented here will define educational technology from all three perspectives. It will define educational technology as a theoretical construct—showing the ideas and principles and how they are synthesized into a cohesive entity; as a field—showing its applications in and implications for the real world; and as a profession—identifying the criteria for this special group within the field.

Defining educational technology from all three perspectives is not enough, however, for an adequate definition. In addition, the definition must directly relate these three viewpoints into a coherent whole. To do this, it must make the definitions of the theoretical construct, the field, and the profession congruent. The definition must clearly show how the field derives from, and relates to, the theoretical construct, and how the profession derives from and relates to the field. Without such congruence, the definition would be unusable.

REQUIREMENTS FOR THE DEFINITION

To achieve this congruence, and subsequent utility, it is necessary to establish the criteria for defining a theoretical construct, a field, and a profession—requirements which ensure that the definitions interrelate. This is best done by beginning with the most extensive list of requirements—those for defining a profession—and then by identifying which of these requirements are necessary for defining the field, and then a theoretical construct.

These requirements are best spelled out in the list of “Characteristics of a Profession” first identified by Finn and later modified by Finn, AECT, and Silber. They are:

- an organized body of intellectual theory, constantly expanding by research;
- an intellectual technique;
- an application of that technique to practical affairs;
- a long period of training and certification;
- a series of standards and a statement of ethics which is enforced (Finn, 1953);
the ability to exercise its own leadership (Finn, 1960a);
an association of members of the profession into a closely
knit group with a high quality of communications among
members (Finn, 1953);
acknowledgement as profession (Silber, 1974);
professional concern for responsible use of its work;
an established relationship with other professions (AECT,
1972).

The characteristics required for defining a theoretical con-
struct, a field, and a profession are identified in the following
sections, along with a more detailed explanation of each charac-
teristic.

DEFINING A THEORETICAL CONSTRUCT

To define educational technology as a theoretical construct,
only the first of the above characteristics is required: an organi-
ized body of intellectual theory, constantly expanding by
research. According to Finn (1953, p. 8):

... the most fundamental and most important characteristic... is
that the skills are founded upon a body of intellectual theory and
research. Furthermore, this systematic theory is constantly being
expanded by research and thinking within the profession. As White-
head says, "... the practice of a profession cannot be disjoined from
its theoretical understanding or vice versa..... The antithesis to a
profession is an avocation based on customary activities and modified
by the trial and error of individual practice. Such an avocation is
a Craft..." (Smith et al., 1951, p. 557)

If the definition of educational technology is to meet this
requirement, it must meet the requirements for a theory.

Definition of Theory. The term "theory," while often used
colloquially as an antonym for the terms "practice" or "practical,"
has a precise meaning:

1. a general principle, supported by considerable data,
proposed as an explanation of a group of phenomena; a
statement of the relations believed to prevail in a com-
prehensive body of facts (English & English, 1958, p. 551),

2. a principle or set of principles that explain a number
of related facts and predict new outcomes based on these
facts (Wheeler et al., 1975, p. 638).

Characteristics of a Theory. Based on these definitions, and
other writings about theories (Klausmeier & Goodwin, 1966;
Heinic, 1970; Arnoult, 1972), the following characteristics of
a theory can be identified:

existence of a phenomenon—there must be some extant
phenomenon not completely understood in terms of current
knowledge;

explanation—a theory provides an explanation of why or how
the phenomenon occurs (as opposed to simple confirmation
of its existence);

summarizing—a theory summarizes what is already known
about relationships among a large body of empirical informa-
tion, concepts, and generalizations;

orientation—defines and narrows the facts to be studied as
well as distinguishing relevant and irrelevant data;

systematizing—provides a scheme by which the relevant
phenomena, postulates, and laws are systematized, classified,
and interrelated;

gap identification—points out areas which are relevant but
which have been ignored or not resolved at the present as
well as identifying areas for future study;

generate strategies for research—provides a basis for formu-
ling new hypotheses and carrying out further research based
on the explanation;

prediction—goes beyond empirical data and what is known
to enable extrapolation and prediction of new facts and
hypotheses that are at present unknown.

If the definition demonstrates the existence of a phenome-
on that is not currently understood; explains, summarizes,
orients, systematizes, identifies gaps related to the phenome-
on; generates strategies for research about it; and makes
predictions about it, then the definition meets the requirements
for being a theory.
DEFINING A FIELD

A field is a sphere of activity which "embraces portions of concepts, skills, and procedures from a number of academic disciplines and also from other applied fields and welds them into new applications." (Finn, 1963, p. iv-v, quoting Gerbner)

In order to meet the requirements for defining a field, the definition of educational technology must meet: the requirements for defining educational technology as a theory; two additional characteristics of a field—intellectual techniques and practical application, and the characteristic of uniqueness.

Intellectual Technique. An intellectual technique is the approach used to solve problems—the manner in which an individual searches for solutions. Gagne and Briggs (1975) would call intellectual technique a cognitive strategy—the process that controls internal thinking processes and brings them to bear in certain ways to solve problems. Intellectual technique serves as the bridge between theory and practical application.

Practical Application. Practical application involves making thoughts, ideas, and processes operational. It results in tangible products. For example, a person actually performing a scientific experiment or carrying out the steps of the instructional development process is making a practical application of intellectual technique.

In addition, practical application indicates how the intellectual technique is to be put into operation in the context of the organizational structures and institutions in which the field operates.

Uniqueness. Since the definition above indicates that a field welds intellectual techniques and practical applications into new applications, the intellectual technique and practical application identified by the definition must be unique to the field. They must be characteristics found in no other field. If the definition leads to a unique intellectual technique and unique practical applications, then the field it defines can be said to be unique.

Thus, the definition of educational technology as a field must first define it as a theoretical construct, then identify an intellectual technique and a practical application, and demonstrate that these are unique to the field of educational technology.

DEFINING A PROFESSION

To define educational technology as a profession, the requirements for defining a theoretical construct and a field must first be met. Then the definition must meet all the other characteristics of a profession.

Training and Certification. Periods of long training are needed to develop specialists and technicians in the profession. There must be some specification of "the nature of the training either through state regulation of some sort or through a system of accrediting training institutions.... [Training includes] The nature and content of professional education... certification standards, admission standards and practices, and placement." (Finn, 1953, pp. 9, 10)

Standards and Ethics. Statements of ethics indicate how members of the profession should behave. Sets of standards specify guidelines for the materials, devices, and facilities used by people in the profession. "However, the publication of codes of ethics and manuals of standards in itself guarantees nothing. Professionalization occurs when enforcement is possible and vigorous." (Finn, 1953, p. 12)

Leadership. Leadership is necessary to "seize the present and bend the future to proper ends." However, to avoid the circumstance that "many of the recent innovations that are giving us headaches today have been forced upon us from the outside," this leadership must come from within the profession. To exercise its own leadership, the profession must "know our own posture... where we want to go and why." (Finn, 1960a, p. 224)

Association and Communication. A strong organization of people in the profession is needed in order to develop and implement the other characteristics—especially standards and ethics, leadership, and training. It is the existence of a strong association which makes possible the "vigorouse enforcement" of practices, standards, and ethics.
It is also needed to facilitate communication among members of the profession, communication which "is carried on by meetings, journals of high quality, consultations, and other means." (Finn, 1953, p. 8)

Acknowledgement as a Profession. The members of a profession must believe that there is a profession and that they are members of it. The existence of a profession cannot be mandated or thrust upon practitioners. They must want the profession to exist and acknowledge that it does so. They must acknowledge that they are members of the profession. This acknowledgment is manifested by the formation or existence of an association, by the presence of the other characteristics of a profession, and by public acknowledgment of practitioners that there is a profession of which they are members.

Professional Concern. It is not sufficient that a profession uses its intellectual technique in practical application. Additionally, the profession must be responsible in its use. The profession must be concerned about the uses to which its work is put in society. It must continuously examine the values for which it stands, and, if appropriate, take positions on societal issues affected by its work. (AECT, 1972)

Relationship to Other Professions. There may be more than one profession operating within the field. Each of these professions is related—either explicitly or implicitly—to other professions operating in the field. These relationships must be acknowledged, identified, and developed. (AECT, 1972)

ORGANIZATION OF THE DEFINITION

Since the characteristics provide, in sequence, the requirements for defining a theoretical construct, a field, and a profession, they will be used as the organizing framework for the definition.

The requirement for defining a theoretical construct will be addressed first. Chapter III, "Expanding Theory—Historical Perspectives," will review the past definitions and theories of educational technology. Chapter IV, "Expanding Theory—The Current Theoretical Framework," will present the current definition and theory of educational technology.

The requirements for defining a field will be analyzed next in Chapter V, "Intellectual Technique—Functions, Systematic Application of a Combination of Technologies, Synergistic Effect," and in Chapter VI, "Practical Application—Resources and Functions, Effects on Organizational Structures; Effects on Processes of Education."

The requirements for defining a profession will be addressed in Chapters VII–IX. Training will be considered in Chapter VII, "Certification and Training." Standards and ethics, leadership, association, communications, and acknowledgment as a profession will be discussed in Chapter VIII, "Professional Associations." Finally, the concerned profession and its relationship to other professions will be examined in Chapter IX, "Societal Context—Concerned Profession, Humanism, Relationship to Other Professions."

The concluding chapter will evaluate the definition presented and present conclusions in terms of how well the requirements for defining a theoretical construct, a field, and a profession are met. It will then address the question of who is in the field and the profession.