# Educational Technology in Transition: A Study of the Years 1968 - 1989

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**Abstract:** It is consldered that the professional field of educational technology (henceforth called ET) is comprised of three interlocking groups of individuals: scholars/professors; practltioners and graduate students In the process of enterlng the profession. For many, graduate study is the mechanism through which they develop thelr professional knowledge and skills. This article examines the interrelationshlpof the professional literature, Concordla University's curriculum in ET and the vlews of 408 of its enterlng graduate students. It looks at the similarities and dlfferences in these data sources from a hlstorlcal perspective from 1968 to 1989. These years span from the end of the audlovlsual movement to the era of computerized multi-media. A synthesls of the separate sources of lnformatlon is provided in an attempt to delineate the major trends and thelr possible effects on future developments in the field.

**Résumé:** Il est admis que le domaine professionnel de la technologie educatlve est constituée d'un emboitement de trols groupes d'individues: érudits/professeurs. praticiens professionnels et étudlant(e)s diplomé(e)s a la veille d'entrer dans la profession. Pour ces derniers. les études supérieures leur permettent d'affiner connaissances et competences. Cet article examlne, dans ce domalne, les connections existantes entre la littérature spéclalisée, le programme d'études de l'Universlté Concordla et les points de vue de 408 de ses étudiant(e)s diplomé(e)s. Il décrit les ressemblances et les différences entre ces sources d'lnformatlons dans un perspective historique entre 1968 et 1989. Ces années couvrent la fin du mouvement audlovlsuel pour s'étendre a l'ère des multl-média informatisés. Une synthese de ses données est présentee afin de faire ressortir les tendances majeurs et leur effet posslble sur les deéveloppements futurs du domaine.

## INTRODUCTION

Some have characterized ET as having the potential to revolutionize educational practice (e.g., Beckwith, 1988), and others have said that it's best application is industrial training (e.g., Derryberry & Rossett, 1986). There is a tendency to think of ET as a subset ofeducation, but it has been argued that technology is the proper focal point for its study (Heinich, 1990). Whatever perspective one takes on these issues, it is clear that ET has changed

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dramatically in both practice and conceptualization over its 25+ year history. It will be shown that changes to the field go far beyond the popular impression that "fascination with medium X gave way to zealous attention to medium Y", and that one of its primary struggles has been to achieve an identity other than the one just mentioned.

This paper examines the major changes that have occurred during the years 1968 to 1989 from three perspectives: a) the professional literature; b) the curriculum of Concordia University's Graduate Programs in ET; and c) the graduate student body While ET as a field existed prior to 1968, this year was chosen because it marks the beginning of Concordia's Graduate Program in ET.

This paper is organized in three main sections. The *Method* section lays out the plan that was devised and used for selecting and reporting the professional literature, the way the Concordia curriculum was examined and the means for investigating student information. The *Results* section begins with a description of the evolution of the concept of ET. It goes on to describe major events, ideas and innovations that have influenced ET in three time periods: 1968-1974; 1975-1981; and 1982-1989. Also reported in each periodarechanges that occurred to the Concordia curriculum and to the reasons expressed by graduate students for entering the program. The Discussion section is a synthesis of these data sources depicting major shifts and trends.

## METHOD

### *Professional Literature*

*Coverage.* Eight sources of literature were used to examine the history of the field. These were: a) articles published in refereed and non-refereed ET journals; b) articles published in journals related to the field of ET; c) related books published in or around the relevant period; d) *Aspects of Educational Technology* (British, Educational Technology International Conference) and other published proceedings from major conferences; e) unpublished conference papers; f) the *Encyclopedia of Educational Technology* and; *Educational Technolology: Definitions and Glossary of Terms* (AECT, 1977); g) reports of committees or task forces empowered by professional organizations; and h) ERIC documents. In all, approximately 120 separate documents were examined.

*Selection.* Documents were sorted into the three time periods and main ideas were extracted from each. Selection of primary issues for inclusion in the description that follows was based on the degree of redundancy, the circulation or coverage of the publication source (a rough measure of importance) and the occurrence or non-occurrence of these issues in the formal accounts of the history and development of the field. The selection of references for inclusion in this description, when several sources were available, was based on the importance of the publication source.

*Program Data*

*Data source.* Changes to the curriculum of the Graduate Programs in ET were taken from the calendar of the *Division of Graduate Studies* (henceforth referred to as Concordia Calendar) for each of the 21 years involved. Information was extracted concerning program and course descriptions, program and course additions and deletions, and changes to the requirements for degree completion.

*Student Sample Data*

*Sample.* Subjects for this study were 408 students who wereaccepted to the M.A. program in ET and subsequently graduated (60% of the total acceptances). The overall demographic characteristics of the subjects are shown in Table l(see page 156) along with the breakdown for each period.

*Materials.* Demographic data were collected from the regular graduate studies admission form that is filled by each applicant to the program. In addition to this, it has been the regular custom in the program to ask prospective students to answer the question: 'What are your reasons for entering the ET program?" (henceforth referred to as REASONS). Responses to this question and information concerning demographics were the raw data for this study

*Procedure.* Subject responses were classified using a keyword technique similar to that used in identifying "idea units" in verbal learning studies (Kulhavy, Schmid & Walker, 1977). First, subjects were randomly ordered. Second, keywords and phrases were extracted from the verbal transcripts and coded numerically Earlier transcripts yielded more keywords than later transcripts (i.e, 50% came from the first 50 transcripts and no new keywords were found in the last 50 transcripts). Third, these categories were scrutinized by two experts in the field who collapsed them into 22 REASONS. The collapsed categories became the basis for the statistical analyses.

Statistical analyses were performed in two steps. First, factor analysis was conducted on the REASONS data to further reduce the keywords to correlated clusters of factors. The factors were named according to the highest loading variables. The 9 highest loaded factors, and their percentage of variance accounted for are shown in Table 2 (see page 157). Factor scores were derived through this process, for each subject, and served as the input to the second step. A factor score is the sum of the weighted (multiplied by) variables (the weight is related to the strength with which each variable loads in factor analysis) for each subject. The distribution of weighted scores for each factor, has a mean of 0 and a standard deviation of 1 .O. and may be read as z-scores.

The second question involved an exploration of changes in REASONS (factors) over the three time periods: 1968 to 1974 ($n$ = 82,20%), 1975 to 1981 ($n$ = 120, 29%) and 1982 to 1989 ($n$ = Discriminant functions analysis was conducted to determine which of the factors identified earlier best predicted (discriminated among) the period of student application.

Table 1
Demographic Characteristics of Students Over the Three Periods

| Level | 1968-1974 | 1975-1981 | 1982-1989 | Total |
|---|---|---|---|---|
| | | *Sex* | | |
| Female | 40% | 55% | 67% | 57 |
| Male | 60 | 45 | 33 | 43 |
| | | *Educational Background* | | |
| Education | 10 | 18 | 17 | 16 |
| Psychology | 12 | 17 | 17 | 16 |
| Linguistics | 24 | 17 | 16 | 18 |
| Business | 7 | 9 | 18 | 8 |
| Natural Science | 7 | 13 | 7 | 14 |
| Communication | 20 | 15 | 13 | 15 |
| Humanities | 20 | 11 | 12 | 13 |
| | | *Professional Background* | | |
| Education | 70 | 61 | 53 | 59 |
| Management | 21 | 21 | 25 | 23 |
| Technological | 9 | 18 | 22 | 18 |
| | | *Origin* | | |
| Quebec | 46 | 47 | 66 | 53 |
| North Amer. Europe | 31 | 25 | 24 | 26 |
| Developing Countries | 23 | 28 | 9 | 23 |

## RESULTS: CHANGES TO THE FIELD, THE PROGRAM AND THE STUDENTS

*Preface*

In a work such as this, it is impossible to do justice to the entire history of a field as diverse as ET. The best we can expect to do is to highlight various people, events and ideas that have helped shape the field. Like any historical account, however, the attached importance is a matter of personal perspective, that may differ with the views of other knowledgeable professionals. More comprehensive histories of the development of the field can be found in Saettler

Table 2
Results of the Factor Analysis and Discriminant Functions Analysis of REASONS Data

| Factor Analysis | | Discriminant Functions Analysis | | | | |
|---|---|---|---|---|---|---|
| Factors (Eigenvalues > 1) | Variance (%)[a] Explained | Category Means (Factor Scores)[b] | | | F-Ratios | |
| | | 1968-74 | 1975-81 | 1982-89 | Univariate | Multivariate |
| 1. Interdisciplinary | 8.9 | -.39 | -.19 | .27 | 16.90 | 21.03* |
| 2. Research-based Design and Development | 8.1 | -.17 | -.17 | .17 | 5.90 | 7.55* |
| 3. Learning Theories (Applied and Research) | 7.4 | .01 | .08 | -.05 | < 1.00 | |
| 4. Mass Communication (Educational Television) | 6.3 | .69 | .02 | -.29 | 32.66 | 37.27* |
| 5. Developing Countries (Interest in and from) | 5.6 | -.21 | .26 | -.07 | 6.32 | 6.42* |
| 6. Training for Profession | 5.4 | .01 | -.01 | .00 | < 1.00 | |
| 7. Alternative Education | 5.0 | .10 | .19 | -.15 | 4.89 | 6.03* |
| 8. Educational Problem Solving | 4.9 | .01 | -.08 | .04 | < 1.00 | |
| 9. Improve Teaching Effectiveness | 4.7 | .18 | .17 | -.17 | 6.00 | 7.69* |

[a] Total Variance Explained = 56% [b] Grand Mean = 0.0; Standard Deviation = 1.0 *$p < .05$ $n = 408$

(1968, 1990), Eraut (1989), Ely, Januszewski and Le Blanc (1988), Ely, LeBlanc and Yancey (1990) and Gagne (1987).

### *Period 1: 1968 to 1974*

Field. One strand of modern ET evolved out of what is commonly referred to as the "audiovisual movement". Names such as James D. Finn, Edgar Dale, and F. Dean McCluskey are commonly associated with the development of audiovisual instruction during the period 1950 to 1965. This aspect of ET is reflected in Lumsdaine's definition of ET (see Table 3 page 159). Television, in particular, seemed to hold great promise as a medium of instruction and as a means for reducing the personnel costs associated with teaching (Saettler, 1968).

Concurrently, there was recognition of the need for a conceptual framework which encompassed both instructional media and other solutions to educational problems (e.g., Davies, 1971; Banathy, 1968). Tickton (1970) promoted the view that the broader conception of ET is a "...systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication and employing a combination of human and non-human resources to bring about more effective instruction" (p. 5).

The primary target for early ET was the public schools and many attempts were made to integrate audiovisual teaching methods and materials into the schools. Libraries became media centres and there were attempts to examine the roles of teachers in light of the newly devised notion of media specialist and instructional designer (e.g., Kerr, 1977).

ET has always tended to import theoretical perspectives from other fields and disciplines. During this period the strongest of these influences were: communication theory, including mass communication (e.g., McLuhan, media influences; Schramm, learning from media); behavioral psychology (e.g., Skinner, teaching machines; Mager, behavioral objectives); media aesthetics and symbol systems (e.g., Arnheim, psychology of art; Goodman, semiotics); and perceptual psychology (e.g., Gibson, picture perception; Deregowski, cross-cultural perception). Systems theory (e.g., Banathy, instructional systems design; Beer, organizational management) began to emerge as a means for linking these disparate pieces into an integrated whole.

Towards the end of the period the National Society for the Study of Education devoted Part I of its 73rd annual yearbook to a study of *Media and Symbols: The Forms of Expression Communication and Education.* The yearbook set the tone for a flurry of studies of the symbolic codes embedded in media and their effects on learning and thinking. About the same time Salomon (1972) published an influential study of the hypothesized effects of one such code (i.e., zooming in on an object) on the development of general thinking skills.

*Program.* Concordia University's Graduate Programs in ET began in 69 when the Centre for Instructional Technology (now AV Services) and the

Table 3
Selected Conceptual and Functional Definitions of Educational Technology

| Author (Date) | Quotation or Descriptive Phrase |
|---|---|
| Lumsdaine (1964) | Two aspects: "hardware or product orientation" and "software or process orientation" to solve educational problems. |
| Davies (1971) | A "conceptual framework able to deal with problems stemming from the needs of an education or training system to survive, grow and develop the capacity to adapt and manage change" (p.16). |
| Mitchell (1975) | The "discernible educational technologist" may perform as a learning consultant, an educational materials producer, a manager of learning resources or a systems developer and planner. |
| AECT (1977) | ET "is a complex, integrated process involving procedures, ideas, devices and organization, for analyzing problems and devising and implementing, evaluating and managing solutions to those problems involved in all aspects of human learning" (p. 1). |
| Davies (1978) | Added "criticism and evaluation within a problem-solving" approach. |
| Hawkridge (1981) & Romiszowski (1981) | Philosophical assumptions that guide research and practice must reside outside of the "hardware" and the "software" components identified by Lumsdaine. |
| Pals & Plomp (1989) | Three interacting dimensions: ET1, ET2 and ET3. ET1 centers around physical media developed to assist in the teaching/learning process. ET2 includes processes, used for developing, designing and evaluating instruction. ET3 is the philosophical and holistic orientation that is sometimes called the systems approach, whereby problems are analyzed and solved in their own context through a consideration of as many facets and their interrelationship as possible. |
| Ely (1989) | Nine ET functions: organizational management; personnel management; research; design; production; evaluation; logistics; utilization (teaching and training); and utilization/ dissemination (teaching about ET). |

then newly formed Department of Education merged. In the early years the Program was a combination of traditional education courses (e.g., philosophy of education, sociology of education) and educational film and television development, production and evaluation. The entry requirement was a B.A. in education with teaching experience recommended. During this period (1968-1974) the Concordia's *Calendar* described the field as "a rapidly changing field of study"..."having a major impact upon education theory, teaching, learning, curriculum design and school organization". Emphasis was placed on teaching, instruction and communication. The early thesis requirement (1968-1971) was "Option A – Research and Development of Educational Media" and "Option B – Production of Educational Television". The title of Option A was soon (1972) changed to 'Research and Development of ET", a move towards broadening the definition of the field. Later Option B was changed to "Production and Evaluation of Educational Materials". A systems analysis and an educational cybernetics course were first offered in 1971.

*Students.* As shown in Table 2, the comparison of the three periods revealed two significant differences which started high in Period 1 and declined in subsequent periods. These were: a) (Factor 2) mass communication (educational television); and b) (Factor 9) improve teaching effectiveness.

Twenty percent of the sample mentioned Mass Communication (educational television) as a reason for entering the program. In addition, forty-four percent of the subjects mentioned Improving Teaching Efficiency and Effectiveness as a reason for applying to the program.

An interesting demographic shift occurred over the periods. Males dominated the first period, whereby females dominated the other two periods.

### *Period 2: 1975 to 1982*

In 1975 the Council of Europe (Steering Group on ET) moved further away from Lumsdaine's hardware/software distinction by stating that ET involves "the optimization of human learning' using "tools, techniques and methods necessary for effectiveness" to meet the "needs and values of learners" (Fleschig, 1975). Several other definitions of the field also emerged during this period (see Table 3).

Continuous and life-long education began to appear in the vocabulary of ET (Leedham, 1975) suggesting that the field's near fixation with public schooling was beginning to soften. Access to education, as well as the technological means of achieving it, became an issue for consideration in the development of media for Third World countries (Hubbard, 1975).

A 1977 task force of the Association for Educational Communication and Technology (U.S.) adopted a definition of the field (see Table 3) that led to a wave of introspection and criticism (e.g., Morgan, 1978; Saettler, 1978; Gagne, 1980; Popham, 1980; Hawkridge, 1981). A common thread running through these analyses was concern for the roots of the field, the definition of ET and its alternative futures. Multi-disciplinarity was considered by some as a dominant feature of the field and most argued that by stressing the problem-

solving and philosophical orientations, the 'hardware stamp" that still persisted from the earlier era could be reduced.

During this period much of what is now accepted practice in instructional design was developed and formalized. Two influential instructional design books emerged. Dick and Carey (1978) provided teachers with an almost algorithmic approach to designing instruction, while Bomiszowski (1981) attempted to represent all of the complexity and subtly in designing systems for education and training. The term "needs analysis" was popularized by Kaufman (1976). More recently, this notion has been further refined into a stepwise approach called performance technology (Rossett, 1987). On the development end, "message design" became a popular euphemism for research-driven design and development (Fleming & Levie, 1978).

There was a shift away from the notion of mass communication in favor of individualization as a model for education. Individual differences became an important element of research studies. In summarizing research and theory developments up to 1977, Torkelson stated that, "...interest in communication was gradually superseded by educational/instructional technology, developing ultimately to a point in recent years where the narrower emphasis. . . was upon instructional development and aptitude-treatment interaction, logical outgrowths of refined analysis of programmed instruction and systems concepts" (p. 327).

Perceptual theory and research flourished, while the influences of the behavioral orientation began to wane. Cognitive science, and in particular information processing approaches (e.g., Anderson, Bower) to understanding learning, became popular. Mental imagery and dual coding (e.g., Paivio) were influential explanatory constructs used both to defend visual learning and to underpin the development of personalized memory techniques. The term "visual literacy" (Levie, 1978) emerged as a rallying point for researchers and teachers alike, whose interest lay in investigating or promoting the effects of visual teaching. Later, this notion was largely debunked (Cassidy & Knowlton, 1983).

In summary, this period was marked by transitions away from some of the ideas that underpinned early ET-educational innovation, mass communication theory, behaviorism and audiovisual instruction. With the decline of television as an instructional medium, came the sobering prospect that no single educational medium represents a panacea. Research questions began to change away from intra-medium questions such as "Is medium Xbetter than traditional classroom instruction?", towards more refined "inter-medium questions" like "Does a change in Y component of medium X produce better instruction?" (Solomon Clark, 1977).

*Program.* The move toward broadening the notion of ET continued by the introduction of 11 concentrations. In addition to the production and evaluation focus of the previous era, systems analysis and planning, information systems, educational innovation, communication theory and the management of learning resources appeared in the Calendar. For the first time, ET in Developing

Nations appeared as an optional course.

*Students.* An examination of Table 2 indicates that for two factors there was a higher mean in Period 2 than in the other two periods. These were: a) (Factor 5) Developing Countries, where a large increase from Period 1 and a large decrease in Period 3 was evident; and b) (Factor 7) Alternative Education, which was relatively high in Periods 1 and 2 (but higher in Period 2) and markedly lower in Period 3.

Eighteen percent of the total sample indicated an interest in ET for Developing Countries, especially in Period 2. Two demographic shifts were evident over the three periods for this factor. Not surprisingly, a large demographic shift involved geographic region. People from within North America showed interest in developing countries, while at the same time students from developing countries diminished in number.

The emphasis for Alternative Education was expressed by 34% of the sample. Alternative education includes references to adult education and continuous education, but it does not include distance education. No demographic trends were evident for this factor.

### *Period 3: 1982 to 1989*

Nisbet (1981), in a keynote address to the Association for Education Training and Technology's annual meeting, argued that theory building and research must precede practice even though results are not immediately applicable. He distinguished between the direct and indirect impact of research. Direct effects might be observed from research on educational materials, while indirect effects could result from the "gradual but steady absorption of the ideas of ET into the fabric of educational practice . . . becoming a part of the established conceptual framework for tackling educational issues" (p. 8) (see Table 3 for other definitions of ET).

One of the key developments of this period was the introduction of the microcomputer in homes, offices and schools. A wave of enthusiasm swept through the ET community over the widespread adoption of LOGO, a computer language developed by Seymore Papert to promote mathematical and critical thinking. ET programs geared up to teach teachers to use computers in the classroom. However, the initial enthusiasm surrounding LOGO waned as research failed to confirm the original hypotheses (Tetenbaum & Mulkeen, 1984). More recent developments, which seem particularly useful in the training domain, involve the marrying of computer assisted learning with video disc to create a hybrid medium called interactive video (e.g., Schwier, 1987). The application of digitized sound and images, stored within random access hypermedia stacks or accessible to students through computer assisted learning lessons created with "authoring languages", looms as the next great advance in this area. Intelligent tutoring and expert systems have appeared on the horizon, but are still largely at the prototype stage Wenger, 1987).

Two largely new applications of ET emerged in the 1980s. Distance educators, heretofore mostly confined to the delivery of print-based

tional materials through the postal system, began to envision the use of communication technologies and computer applications to reach wider student populations. The other major application was in the world of industrial and corporate training where cost/benefit concerns led to consideration of techniques for training design and delivery. Adaptations of long-standing instructional design models began to appear as training design models and training-oriented professional associations, such as the National Society for Performance and Instruction, began to appeal to a large segment of the ET field.

This period is characterized by a shift in research focus, away from teaching improvement and towards an understanding of learning processes. This change in emphasis brought about an even greater adherence to cognitive theoretical orientations, applied both to traditional media such as print-materials (Jonassen, 1985), as well as problems of artificial intelligence and intelligent tutoring systems (e.g., Wenger, 1987). Terminology from the language of psychology, like elaboration theory, subsumption theory, assimilation-encoding theory and mathemagenics permeated the research literature and aptitude-treatment interaction research, big in Period 2, began to diminish, largely as a result of criticisms by Cronbach and Snow (1977).

In spite of Clark's (1983) revolutionary pronouncement that the media have little or no effect on learning performance outcomes, Heinich (1990) comments on a disturbing tendency of the late 1980s. Apparently there is an increasing trend in some quarters to re-equate ET with tools, and one tool in particular — the computer. The reason cited is that "doing so has the political advantage of controlling the pipeline to grant money" (p. 67). Hence, we may be witnessing a reinvention of the previous mistakes made by the television enthusiasts.

*Program*. This period was marked by a further decline in the emphasis placed on teaching, and public school teachers as primary consumers of the M.A. in educational technology. According to the *Calendar* (1981-1985), 'the program qualifies people for careers as learning consultants, producers and evaluators of educational media, designers of instructional materials and systems, managers of learning resources and educational planners". In 1988, "knowledge engineers (who collect human expertise and incorporate it into machine systems)" was added to the list of potential careers supported by the program.

In 1981-1982, a Ph.D. Program was added, featuring a curriculum which combined advanced-level seminars and individual tutorials. In addition to a general core of philosophy, learning theories, systems theory, research methods and statistics, five main study concentrations were listed: instructional design; distance education; research and development of educational media; systems theory and cybernetics; and human resource development.

Another new program, a Diploma in Computer Assisted Learning, was launched in 1983-1984 to support the growing demand for computer-literate teachers. This program attracted a great deal of attention for several years, but

was finally discontinued in 1989 as its clientele diminished to nearly zero.

A number of course changes were made during this period. Educational broadcasting became distance education (1982-1983). Formative Evaluation of Educational Materials (1984-1985) replaced the emphasis previously placed on summative evaluation and measurement. A second course in instructional design was added (1988-1989), while nearly all of the production courses were compressed into a 6-credit general media development course (1988-1989). Several computer-related courses were added: Knowledge Engineering and Intelligent Tutoring Systems, Modelling and Simulation, and Interactive Multi-Media Tutoring Systems.

One of the major changes was the addition of a major internship as an alternative to the thesis/thesis-equivalent requirement that had existed previously This change was largely in response to the growing demand for experienced instructional and training designers for business and industrial settings. This major shift in emphasis was accompanied by a reduction in the M.A. from 90 credits to 60 credits.

*Students.* Two factors, "Interdisciplinarity (Factor 1)" and "Research-Based Design and Development (Factor 2)", are significantly higher in Period three than in the other two periods. Thirty-eight percent of the sample made some mention of the advantage of the interdisciplinary nature of the field. Education as the primary work experience diminished in Period 3, while non-educational media background increased from Period 1 to Period 3. These trends suggest a movement towards students with backgrounds in a variety of disciplinary areas other than education.

Half of the sample was interested in the research orientation of the field and the program, and they expressed an overall tendency towards research in developing instructional materials.

## DISCUSSION

### *Specific Findings and Trends*

From the overall analysis it is not unreasonable to conclude that students view ET as multi-faceted and lacking one dominant central theme, besides its interdisciplinarity. This view also prevails in the literature of the field.

Three of the nine primary loading factors in the student data did not change over the three periods covered here. For Learning Theories (Factor 3), Table 1 shows that the number is divided about equally among the students responding in each of the three time periods, even though in the literature there was a change of emphasis from a behavioral to a cognitive orientation. Training for a Profession (Factor was given as a reason for entering the program by 21% of the entering students and 18% of the students see ET as a field concerned with Educational Problem Solving (Factor 8). This reflects a commonview in the early literature of the field that apparently persists to the present.

The following trends seem reasonably well justified from the literature of the field and the student data:

- There has been a shift in the field away from its roots in public school education towards applications, particularly of instructional design and systems theory, in industrial and military contexts. This conclusion is supported by a significant demographic shift in professional background over the three periods, and by the greater concern in the literature of the field for training design and development. Several authors have attempted to explain this trend. Boyd (1991) claims that lack of funds to support training and development in the public sector is partially responsible for the ineffectiveness of ET. Rossett and Garbosky (1987) point to the move towards defining ET as instructional design as a partial reason for the lack of impact, saying that ". . if we wish to be key players in the schools, we must either cleave to our media/technology roots or expand the way we are perceived in schools" (p. 41). Spitzer (1987) cites increased differentiation between education and training, increased politicization of the public schools, more money for development in the private sector and private sector leadership in educational innovation, as reasons that ET's trend away from the public schooling will continue.
- Related to this is a trend, indicated in the student data, away from an emphasis on teaching effectiveness (Factor 9). Two directions in the literature of ET suggest this. First, there was a change in emphasis from group-based teaching (i. e. audiovisual movement) towards indi vidualization (Elton, 1977), where the needs and characteristics of learners are of primary concern. Second, there is a shift in theoretical perspective from perception and behaviorism towards a consideration of learning processes and skills, meta-cognition and learning strategies.
- ET has moved away from communication theory (Factor 4), especially mass communication, and behavioral psychology and towards cognitive, and in recent years social psychology, The shift from behavioral to cognitive psychology is partially a function of this very trend in psychology itself. It may also be true that psychology provides a richer explanatory environment than communication theory and a better link with current learning technologies, including instructional design.
- There has been movement away from the language of alternative education (Factor 7) (e.g., adult education, continuous education). This may have resulted, not because these areas are no longer fashionable, but because they have developed in their own right. For instance, at Concordiaan Adult Education undergraduate program was instituted in 1980 and has flourished since.

- There has been a general move towards the view, whether correctly or incorrectly held, that research in instructional variables (Factor 2) and message design (from early work in visual design to more recent studies of computer-based learning) will result in better learning products. In part, this view may stem from the tendency over the past several decades to draw both theory and experimental methodology from educational psychology and other related fields.
- There has been a consistent move towards greater interdisciplinarity (Factor 1) in ET, as well as a general tendency away from education as the root discipline. This, Clark (1987) argues, is a step in the right direction, at least as far as training researchers is concerned. In addition to psychology and communication, areas such as management, sociology, computer science, engineering, library studies and information science have become connected with ET In fact, it is not uncommon to find ET-like activities taking place in any of these alternative disciplines, It is certainly true that the boundaries between ET and some of the other areas are becoming more indistinct, particularly when computers are involved.

Several major points can be derived from looking at program information (Concordia's Calendar) over the three periods. First, Concordia's Program led the field in offering systems theory and cybernetics courses in the early years. Except for this, however, Concordia's Program has tended to follow many of the trends that are reported in the general literature of the field. The one obvious exception is that for the most part Concordia has resisted the urge to become very specialized in instructional design, like some of its American counterparts (e.g., Syracuse, Florida State University). Concordia's faculty has chosen to define the field in a manner similar to Winn's (1989) thinking. He argues persuasively against graduate training that favors an algorithmic approach to designing instruction. Hegoeson to say that if instructional design is to become a true profession, ". . .students (must be) taught to reason about the consequences of instructional strategies for learning and not just follow prescribed steps in a design model" (p. 43).

A second point is that Concordia's program was somewhat late (1988-1989) in offering an internship option to the M.A. thesis, whereby the skills of instructional design, media production, etc. could be developed and evaluated rigorously. Many American universities have had this option since the early 70s. This indicates a hesitancy on the part of Concordia's faculty to back away from its long-standing emphasis on research and evaluation.

### *General Reflections*

Perhaps the most interesting aspect of this characterization of the field is its struggle to define itself and particularly its attempts to define itself as something other than the application of technologies (tools view). And yet, paradoxically, the application of tools, broadly defined, is precisely where the

field has achieved a degree of success over the last twenty years. Training design, medical education and distance education (e.g., U.K. Open University), to name only a few areas, have profited greatly from their association with ET (e.g., Hannafin, 1989).

However, Mitchell's (1989) argument that ET has in large measure failed to achieve the level of potential envisioned for it is probably true, if one examines only the results of what Nisbet (1981) calls the "direct effects" of the field. These are the dramatic improvements to educational practice at all levels, that educational television, systems theory and more recently computers were predicted to evoke. The "indirect effects" of ET are more difficult to assess because they occur incrementally through the accumulation of knowledge acquired through research and the formalization and testing of development practices. More patience and a wider perspective may be required to evaluate the indirect achievements of the field.

Throughout the decades of rhetoric there is a cry consistently heard for something more; something which allows us to see the big picture, anticipate the future and make the right decisions. For many this is the systems approach, for some it is a philosophical framework and for a few it is cybernetic modeling. However, can the assiduous application of these thinking tools produce the direct effects that Nisbet describes? Probably not, but it is certainly arguable that the field would have evolved in a much different way without them.

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