

AN ANALYSIS OF
POTENTIAL GOALS FOR
INSTRUCTIONAL
TECHNOLOGY IN HIGHER
EDUCATION, 1972-1992, AS
A BASIS FOR
RECOMMENDATIONS FOR
PROGRAMS OF
PREPARATION FOR
INSTRUCTIONAL
TECHNOLOGISTS

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This is to certify that the

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ABSTRACT

AN ANALYSIS OF POTENTIAL GOALS FOR
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Harry Lawrence Ackerman, Jr.

The challenge to instructional technology in higher education is to exploit the benefits of technology, yet avoid over-mechanizing or over-standardizing teaching and learning methods. Instructional technology offers exciting opportunities for both teaching and learning, yet inept or unskilled use can vitiate its effectiveness. Educators must think about technology and the future in terms of how to utilize it for optimum human benefits. The need to stimulate such thinking led this investigator to gather opinions from authorities in the field as indicators for determining future instructional strategies and appropriate applications for technology in the future roles to be played by higher education.

A concept and a process served as a base for soliciting goals and gaining a consensus of their value from acknowledged leaders in curriculum and instruction in higher education. The concept is goal-setting as a function of leadership; the process is the Delphi technique. The persons selected as participants were

acknowledged leaders in curriculum and instruction. They were selected by their peers as persons qualified to originate and make value judgments on goals and directions for instructional technology as well as for other aspects of higher education. The Delph technique is recognized as an effective method for achieving a consensus opinion from thinkers widely separated geographically. It appeared to be a legitimate means of sampling and distilling the opinions and perspectives of these leaders concerning goals and the values ascribed to them. A group of 42 recognized leaders was identified and invited to participate; 27 accepted and proposed a list of 73 goals for instructional technology for the next 20 years. These goals were categorized and submitted to the participants for a value rating on a five point scale. The goals and ratings were resubmitted to the participants for final review and change or comment. In the final tabulation, mean and standard deviation scores were computed for each goal to obtain both the group's consensus of value and the dispersion of ratings for each goal.

The list of 73 goals for instructional technology in higher education in the next 20 years was rank ordered according the group's consensus of value. The Delphi technique proved to be an effective instrument for gaining consensus both on goals and their relative values; the participants manifested enthusiasm for the project; and 23 of the 27 accepting invitations completed the study. Based on the list of goals established, several recommendations were made for preparing future instructional technologists.

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By

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A DISSERTATION

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1974

DEDICATION

My Children

Larry

Jim

Jon

Jennifer

Who willingly and cheerfully adjusted to great changes
in their lives in order for me to study at Michigan State
University.

My Mother and Father

Doris

Harry

Whose love and generosity has always helped so much;
who first instilled in me the desire to know and to accept
challenges.

My Sisters

Virginia, Shirley, Sandra

Who made me try harder.

Aunt Myrtle

Whose spirit is an example to follow.

. . . and, most importantly . . .

Fame

I love you,
Not only for what you are,
But for what I am
when I am with you.

Roy Croft

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I have not reached this point alone. There are many who have inspired, encouraged, and supported me along the way, some consciously, some never knowing. For the seeds of this study were planted long ago and it was some time before I realized what was growing; only now, as I am looking backward, can I accurately identify the roles these many people played along the way. And, I want them to be here, too. Therefore, these acknowledgements are for this study as well as for experiences before it.

First, to my outstanding committee.

Dr. Charles F. Schuller, chairman, whose enthusiasm for this study eclipsed my own and repeatedly carried me from problem to solution. It has been a high privilege for me to have had his guidance in my work. From one who has encouraged so many to make changes in a world resenting change, I have gained in spirit, illegitimi non carborundum!

Dr. Walter Hapkiewicz has made this study so much easier with his suggestions for clarifying statistical procedures. His balance of cool rational thinking and warm good humor have made me think of him as a friend, rather than an advisor.

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Finally, special and deep thanks to my wife Fame. So many sacrifices, so much strength and love - without her, it never would have happened.

No one knows what will happen next,
Such portents fill the days and nights;
Years prophetic! the space ahead as I walk,
As I vainly try to pierce it, is full of phantoms,
Unborn deeds, things soon to be,
Project their shapes around me,
This incredible rush and heat,
This strange ecstatic fever of dreams O years!
Your dreams O years, how they penetrate through me!
(I know not whether I sleep or wake;)
The perform'd America and Europe grow dim,
Retiring in shadow behind me,
The unperform'd, more gigantic than ever,
Advance, advance, upon me.

From "Years of Moderns," Leaves of Grass
by Walt Whitman.

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CHAPTER I

INTRODUCTION TO THE STUDY

The purpose of this study is threefold: (1) to solicit goals for instructional technology in higher education for the next 20 years from acknowledged leaders in curriculum and instruction; (2) to ascertain from the participants the relative value of each goal; and (3) in terms of those goals, to recommend appropriate learning experiences for future instructional technologists.

NEED FOR THE STUDY

The challenge to instructional technology in higher education is to exploit the benefits of technology, yet avoid over-mechanizing or over-standardizing teaching and learning methods. Instructional technology offers exciting opportunities for both teaching and learning, yet inept or unskilled use can vitiate its effectiveness. Educators must think about technology and the future in terms of how to utilize it for optimum human benefits. The need to stimulate such thinking led this investigator to gather opinions from authorities in the field as indicators for determining future instructional strategies and appropriate applications for technology in the future roles to be played by higher education.

New instructional strategies have emerged in the past 20 years as a result of changes in technology. Developments such as miniaturization of equipment and materials, electronic information retrieval systems, learning resource centers and individualization

of learning, offer new techniques for teaching (Eurich, 1963:46). The adoption of these techniques by colleges and universities has been swift, making prospects good for more rapid and comprehensive changes in the future (Eurich, 1963:46). Saettler (1968:354) feels innovations in instructional technology are the result of efforts to cope with the so-called "knowledge explosion" and are rapidly accelerating the rate of change in teaching methods.

New knowledge is thus being generated and Toffler (1970:31) says this is cyclical: "Knowledge is change and accelerating knowledge acquisition, fueling the great engine of technology, means accelerating change." Thus, the speed of change is clearly increasing, but there is little evidence of needed evaluation of which changes are worthy ones. Watson (1968) feels that benefits of technology are being gained, but emphasizes that responsibility for the direction and use of it rests with professional educators, who must decide technology's role in the field. There is evidence that this responsibility, if recognized, has not been taken seriously to this point.

Brown and Thornton (1968) surveyed a large number of institutions of higher learning to determine what innovational media practices exist in higher education. One of their significant findings was that applications of instructional technology to higher education appear to be far more adaptive than creative. One result seen by Brown and Thornton, is that "educational objectives are often subordinated to the needs and adaptability of media instructional equipment." It appears that designers of

instructional methods have more often placed a higher priority on "fitting" course content to media equipment than to the needs of learners. The same criticism has been made of instructional technologists (Carnegie Foundation for the Advancement of Teaching, 1972, p. 15) who have stressed the "potentials of the new media and systems" and failed to define "reasonable objectives for the development of technology itself." Determining technology's development in higher education is important for universities and colleges as they respond to pressure for a new role in society.

The stereotyped image of universities as groups of cloistered scholars going about their studies in an ivory tower atmosphere, oblivious of the world and its woes, has long been dispelled; they are shifting to involvement in community affairs and away from isolation from them (A Report to the President of Michigan State University from the Committee on the Future of the University, 1959, p. 213). More direct action in community affairs is expected of universities. Many faculty and administrators are actively involving their institutions in solving the problems of society, in "building a two-way street between society and the university." Green (1972:24-26) describes how a university may become involved in the urbanization of America. He calls for "problem-oriented and multidisciplinary" urban and racial studies that transcend internal university organizational structures and send students beyond campus, into "urban affairs" in action-oriented programs. Such changes cause controversy on and off university campuses. Opposing constituent groups within

universities press for and against continuation of these alternative instructional practices. Leaders of universities are challenged to develop simultaneously new and more effective programs and to sustain traditional values and functions of the university. Imaginative leadership for future reforms must be developed to establish direction for innovations in higher education (Brown & Thornton, 1963:176). Instructional technology appears to be one of the promising areas for change.

If we can accept McLuhan's (1966:viii) assumption that "any technology gradually creates a totally new human environment," there are serious challenges ahead for instructional technologists and other agents of educational change both in terms of their own innovative practices and in how they relate to the forces within and beyond the academic world. In preparing future instructional technologists it is essential to identify these challenges as best we can and to determine the more promising directions in which they may influence change. It is possible to identify changing goals for higher education, arrive at some reasoned consensus of their relative values and to plan future courses of action to attain them (Helmer and Rescher, 1959:40).

RATIONALE

A concept and a process serve as a base for soliciting goals and gaining a consensus on their value from acknowledged leaders in curriculum and instruction in higher education. The concept is goal-setting as a function of leadership; the process is the Delphi Technique.

GOAL SETTING AS A FUNCTION OF LEADERSHIP

Goal-setting is acknowledged as a key function of leadership. Lippitt (1955:556-557) listed "giving information or advice on setting directions of growth," and "indicating plans," as two major functions of leadership. In an analysis of skills aiding in the identification of leadership, Kissinger (1959:30) agreed. He claimed the ability to "infuse and occasionally to transcend routine with purpose," is found in men rising to leadership positions from specialized functions of a bureaucracy. Skertchly (1968) stated that leaders must make goal decisions relating to both quantity and quality in their organizations by asking:

"What do I want the enterprise to become:
...Having decided upon reasonable and attainable objectives, the process through which these goals can be reached will then determine the product or service range...
(these may be) quantitative goals... (or)
qualitative goals..." (p.61).

Hollander (1964:8) reviewed the results of four leadership studies which indicated that peer recognition of a person's capacities to point-the-way is evidence of leadership. Taking the form of hierarchical status in organizations and professional groups, recognition includes acknowledgment of a leader's accurate perception of the aims the group seeks or should seek to achieve.

Leadership exists on all organizational levels. Acknowledgment of leadership capability involves more than recognition of the individual as an innovator. Sartain and Baker (1965:237) state that the person must be a "thinker... who almost without exception, ...(will) be found to be an authority in his field, an experienced

'doer' who has exhibited operational capabilities for being entrusted with top-level planning decisions."

The present study undertook to use the above concept of leadership as a point of reference for identification of probable long-range goals for instructional technology in higher education. The persons selected as participants are acknowledged leaders in curriculum and instruction. They were selected by their peers as persons qualified to originate and make value judgments on goals and directions for instructional technology as well as for other aspects of higher education. These leaders are located in various parts of the United States and it would have been impractical to try to bring them together. Even if this could have been done, face-to-face consultation on this project could have distorted the results. It was therefore decided to apply the Delphi technique as the instrument to solicit and gain value judgments on goals for instructional technology in higher education.

THE DELPHI TECHNIQUE

The Delphi technique, developed at the Rand Corporation in the 1950's under the guidance of Olaf Helmer, is recognized as one of the most effective methods for achieving a consensus opinion from thinkers widely separated geographically (Pfeiffer, 1968:152). Conference-type meetings are frequently used as an aid to planning to obtain advice and assess opinions of individuals who work in close or relative proximity. It has been known for some time, however, that direct conferring of this nature has some inherent weaknesses (Kelly and Thibaut, 1954). Asch (1958)

substantiates this with the following listing, among others:

(1) group opinion is strongly influenced by dominant, talkative individuals; (2) much discussion in group situations, though appearing to be problem-oriented, is often meaningless or prejudicial to progress toward problem solution; (3) group pressure to conform can distort individual judgment. In an experiment by Dalkey (1969), it was found that "after face-to-face discussion, more often than not the group response is less accurate than a simple median of individual estimates without discussion."

Gaining a consensus by the Delphi technique is normally accomplished by having consultants complete a series of questionnaires. Among the advantages of the Delphi technique are savings in time and money (Uhl, 1971), but accuracy of opinions or estimations of the consultants is the more important goal. The method seeks to reduce "influence of certain psychological factors, such as specious persuasion, unwillingness to abandon publicly expressed opinions, and the bandwagon effect of majority opinion" (Helmer and Rescher, 1959:40). The experimenter controls interaction among participants to aid them to think independently and to provide time for them to form rational opinions. The respondents remain anonymous throughout the study.

The first step in a Delphi study is to provide selected subjects with a questionnaire that asks them to list their opinions on a particular topic. A second questionnaire randomly lists all responses from all participants in the first round and asks each subject to rate or evaluate each item by some criterion such as importance, probability of success, and so on. In the third

round, the list and a summary of responses to the items are sent to the participants. Each may revise his opinion, if in the minority, or indicate his reasons for remaining outside the consensus of the group. Finally, the fourth questionnaire includes list, ratings, the consensus, and minority opinions. This gives each respondent a final chance to revise his opinions. The procedure usually succeeds in gaining convergence of opinion and provides a clearly defended minority opinion (Pfeiffer, 1968: 152-153).

LIMITATIONS

Naturally, there are potential limitations in the Delphi technique. Dennis Weaver (1972), for example, saw a "serious sterility in the process of summarizing mass information into numerous narrowly terse statements" in his critical review of the Delphi technique. Despite its limitations, however, the Delphi technique has proved particularly useful and suitable for studies concerned with opinions and estimates of future developments.

Uhl (1972), Cyphert and Gant (1971), Anderson (1970), Norton (1970), and Judd (1970), had to cope with Delphi's limitations. Each declared that useful knowledge was gained for determining future directions of growth for the institutions involved in their studies. Data gained by the Delphi technique made aspirations of constituent groups common knowledge to all. Priorities were achieved for each institution and constituent groups in all were pulled together in focusing on a common direction of growth.

There are few alternative methods to the Delphi technique for gaining a consensus of opinions. As previously indicated, face-to-face conference meetings also have limitations. It would be particularly difficult if not impossible to assemble the participants in the present study due to wide geographical separation and the normal difficulties in scheduling such a meeting among leading educators. Useful knowledge will be gained of the opinions of leaders in curriculum and instruction in higher education regarding desirable directions for the future development of instructional technology. It is also anticipated that attention will be focused on the need for other studies to provide information on alternative goals and directions so that increased emphasis will be focused on planning for the future.

In summary, there appears to be a real need for the establishment of new goals for instructional technology in higher education. Recognized leaders in curriculum and instruction in higher education are the logical sources for identification of such goals and the relative merits of each - by virtue of the goal setting responsibilities inherent in their leadership positions. The Delphi technique appears to be a legitimate means of sampling and distilling the opinions and perspectives of these leaders concerning goals and the relative values ascribed to them. Therefore, it appears that useful knowledge may be acquired by applying the Delphi technique to gaining a consensus on values held for goals in instructional technology by acknowledged leaders in curriculum and instruction in higher education, in the United States.

DEFINITIONS OF TERMS

Several terms used in the study are of importance in interpreting it.

Acknowledged Leader

As used in this study, "acknowledged leader" includes three classifications of persons all of whom share generally recognized high reputations for demonstrated interest and skills in dealing with problems of instruction and curriculum in higher education. These classifications include individuals who:

- (1) hold or have formerly held a college or university professional appointment of high administrative responsibility;
- (2) hold or have formerly held a position of leadership in a national foundation or professional organization devoted to improving curriculum and/or instruction in higher education;
- (3) are recognized for scholarship and knowledge of instructional and curriculum problems in higher education through publications, participation in pertinent national studies and/or through the recommendations of other nationally known scholars.

Goal

A goal is a statement, submitted by a participant in the study, of a condition or action which he considers desirable and worthy of achieving for instructional technology in higher education.

Instructional Technology (I.T.)

The definition of Instructional Technology (I.T.) used by the Commission on Instructional Technology (1971:5) is used in this study because it is sufficiently comprehensive and clearly stated.

"Instructional technology...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."

Higher Education

Higher Education refers to colleges and universities in the United States that offer baccalaureate degrees.

Delphi Technique

The Delphi Technique is a method of technological forecasting that can be used to achieve a consensus of opinions and/or value judgments of consultants without bringing them together, by having them complete a sequence of questionnaires concerning desirable or needed future developments.*

OVERVIEW

A need and framework for the study have been attempted in this chapter. A literature review of uses of the Delphi technique in education and of current professional training programs of instructional technologists is contained in Chapter II.

*Delphi is also used for prediction and conflict resolution purposes; neither purpose was used in this study.

Chapter III contains a discussion of the subjects and procedures of the study and the method of analysis employed. The results of the study and an analysis of data are reported in Chapter IV. A summary of the study, conclusions, recommendations, discussion, and implications for further research are found in Chapter V.

CHAPTER II

REVIEW OF THE LITERATURE

INTRODUCTION

In this study, acknowledged leaders in higher education originate and place relative values on goals for instructional technology during the next 20 years. The consensus of their considered judgments is used as a basis for recommendations of programs to prepare instructional technologists for the future. The present chapter contains a review of the literature of studies in education that have employed the Delphi technique for comparable forecasting; it also contains a review of studies and reports on current professional programs for the preparation of instructional technologists.

DELPHI STUDIES IN EDUCATION

Researchers generally have utilized two types of Delphi studies - exploratory and normative - to obtain a perspective of the future. Exploratory studies are concerned with "what may occur and when" (Cetron and Monahan, 1968, p.165). Exploratory studies are analyses of "data in terms of short run as well as long-range potentialities, and relevant environment, in order to establish a pattern of events and dates for the future" (p.165). Normative studies are concerned with what "should be," with determining desirable goals for the future. Normative studies involve "goals, needs, objectives, or desires ... specified ... and rated... for

an overall figure of merit" (p.165). Some educators have expressed a need for more normative studies, i.e., goal setting, as prerequisites to setting priorities for scarce resources and for selecting strategies for future growth. Exploratory studies have been criticized for failing to serve as guideposts in planning, since they only point out possible events and dates that may occur (Dressel, 1972). Both exploratory and normative studies employing the Delphi technique are reviewed in this chapter.

EXPLORATORY STUDIES USING THE DELPHI TECHNIQUE

Two studies found the Delphi technique effective in forecasting future events for educational institutions. The purposes of these exploratory studies were slightly different, i.e., one sought to predict dates events would occur, the other sought to identify needs from a perspective of future events. The method of each, however, was similar. Participants in the study generated both the events and the possible dates of their occurrence.

Berghofer (1970) in a study of general education in post-secondary institutions, systematically selected student and faculty subjects to explore possible dates for future events. Berghofer discovered the subjects were moving dates further into the future as the study progressed. He felt this was a result of two characteristics of the Delphi technique: (1) opportunities for individual subjects to think soberly without interference of

others' opinions, and (2) feedback of opinions from fellow participants. The advancing of the dates was considered by Berghofer to be productive. There were differences in the predictions of young and old panelists. The older group seemed to take a more absolute position on the events that were to occur. The younger group appeared to agree less on what events would take place. However, Berghofer synthesized the following conclusions from respondents opinions in ten problem areas identified in the study:

"...(both young and old) respondents looked forward to a society in which equality of opportunity is emphasized; quality of life is placed above quantity in life; leisure is used creatively; communication skills are stressed; concern is shown for major human problems, and a philosophic basis is sought for social, cultural, economic and medical changes" (p.14).

Berghofer did not estimate the value of the data gathered to planning for the future. The ideas expressed in the above quotation, though desirable, do not provide sufficiently specific goals for achievement.

Seeking to predict vocational educational needs for New York State, Hudspeth (1970) used the Delphi technique in an exploratory study involving professionals selected from the field. In addition to generating events and projecting dates of occurrence, the group also rated each event for its value to them personally and to society and in addition identified sources of power and strategies that could encourage or discourage the occurrence of each event. Convergence of opinion on dates of occurrence was achieved for most events and most were seen as more beneficial to

society than to the subjects themselves. The subjects agreed on power groups that would encourage or discourage the occurrence of specific events, but disagreed on appropriate strategies to achieve either circumstance. Hudspeth felt an identification of the needs of vocational education in New York was achieved by interpreting the events identified by participants. No value rating of the needs was undertaken. Though supporting power groups were identified, no direction was gained as to which needs should receive highest priorities. Hudspeth did not discuss how the data he obtained would aid future planning of vocational education in New York.

Exploratory studies using the Delphi technique have succeeded in identifying possible events and dates of occurrence. Determining what may occur and when, has some value in providing productive information for planning, even though that data is indefinite. Data from exploratory studies provides less positive direction than data from normative studies. Researchers favoring normative studies have rejected the idea of forecasting the future; rather they have set out to determine alternative worthwhile futures in the opinions of groups of people. Researchers in such studies tend to believe that their work will be more productive than exploratory studies in guiding efforts toward goals generally agreed to be worthy of the necessary expenditures of time, effort and/or money to achieve.

NORMATIVE STUDIES USING THE DELPHI TECHNIQUE

In a massive normative study involving thousands of

participants across the country, Helmer sought to determine long-range goals for educational innovation in America (Helmer, 1966). Hoping to explore potential applications of the Delphi technique to educational planning, Helmer wanted also to gain a priority list of innovations for expenditures of national resources. A long list of innovations was developed and rank ordered. Helmer also found the Delphi technique to be effective in gaining original ideas and a consensus of opinions from educators on goals for their future work. The participants in the study were favorably impressed with the methodology and were eager to apply it to other problems in the future.

Also applying the Delphi technique, Clark and Coutts (1971) found that a group of 198 of today's teachers agreed that future teachers need to be skilled not only in the use of technology, but also in individual and group instruction techniques, team teaching and learning principles. The subjects disagreed, however, on the amount of control necessary in teacher education programs and in standards for certification.

Cyphert and Gant (1970) used the Delphi technique to survey and clarify opinions on goals from selected members of constituent groups, i.e., alumni, students, faculty, business people, state legislators, of the School of Education of the University of Virginia. Goals were solicited from the subjects and returned to them for value ratings. Cyphert and Gant concluded that data generated were useful in establishing a perspective of the institution's priorities for planning. The authors felt this to be more productive for educational planning than

previous techniques they had encountered, e.g., face-to-face group sessions. Following the study, many participants expressed a change in attitude from indifference to positive concern for the future of the college. Cyphert and Gant recommended eliminating the fourth round of questionnaires in the method due to insignificance of data, desirability of getting-on with the work and for convenience of the subjects.

Anderson (1970), applied the Delphi technique to gain a perspective of preferred services for a public school district. Participants in the study were selected from groups within the school systems. Results provided the staff with directions for developing resources and made them aware of the complexity of their work. Anderson found that the work of conducting a Delphi study becomes increasingly burdensome as the number of subjects increases. He recommended that teams of researchers be involved in value studies where more than 25 consultants are used.

Uhl (1971) conducted a study of five colleges for the Education Testing Service (E.T.S.), to determine goal preferences of students, faculty, administrators, trustees, alumni, parents of students and community leaders. The subjects were arranged into two groups, on-campus and off-campus, and asked to respond to questionnaires on goal items originated by E.T.S. Respondents were instructed to rate the goals for their actual importance at their own institutions as well as to how important each should be. Convergence of opinion occurred on goal preferences. Uhl felt the Delphi technique to be a valuable aid to planning in higher education because it provides a method for assessing how

an institution's various publics feel about its goals. Since it is often not possible to assemble these groups, the Delphi study is a useful method for communicating with them, Uhl concluded.

STUDIES OF EDUCATIONAL PROGRAMS FOR INSTRUCTIONAL TECHNOLOGISTS

Several recent studies and reports have been made to provide useful information for designing programs of study for students of instructional technology. The findings of some provide a base from which one is able to view and assess needs for programs to prepare instructional technologists of tomorrow.

In their extensive survey of colleges and universities, Brown and Thornton (1968) found educational needs being subordinated to the technical demands of media equipment. Brown's and Thornton's work apparently pointed up the need to provide media professionals with a broader based training in other fields as well as in audiovisual technology. Brown and Thornton stimulated others to investigate the problem and recommend improvements in educating instructional technologists.

Recognizing the need for a new type of educator, the "instructional developer," Clark and Hopkins recommended providing such professionals with knowledge to enable them to bridge the gap between research-based educational theory and actual classroom practice. The program of studies included training in: (1) research, (2) educational media, (3) communications, (4) evaluation of strategies of instruction. In addition, Clark and Hopkins believe instructional developers need field experiences in the real world of education so they

may better recognize educational problems, appreciate their ramifications and learn to communicate more effectively with faculty. Apparently, the instructional developer is more concerned with learning, instruction and message design, than with the demands of media equipment (Hornet, 1970:61-67).

Larson (1970) agrees with Clark and Hopkins regarding the need for persons prepared in research and development in instruction. He criticizes most educational media programs for preparing professionals for traditional instructor-centered learning environments, and placing instructional materials in a peripheral role. He found that only a few institutions were preparing students to serve in systems-oriented, student-centered learning environments that integrate instructional materials in planning strategies for teaching (Larson, 1970). He, too, expressed a desire for more creative educational experiences for instructional developers so as to develop and demonstrate unique methods of instruction.

In a manpower study, Fleury, Cappelluzzo and Wolf (1970) criticized the traditional training of educational researchers. They indicate that innovation research demonstrates a need for development and diffusion personnel as well as for researchers in order to bring about changes in educational programs. York (1968) agreed, concluding with more specific criticisms, "skills in which the least training is being provided are (1) needs assessment, (2) long-range planning, and (3) systematic analysis of present" (p. 9-10).

Exploring job classifications and competencies in

instructional media, Wallington and Hyer (1970) recommended that instructional technologists be trained to generalize solutions to instructional problems from one application to another. They also wish them to be able to design instructional systems that meet the needs of learners and not to consistently focus on producing mediated instructional materials as standard solutions to problems.

Beilby, Miller and Murphy (1972) list several conclusions drawn from a conference on curriculum for preparing instructional technologists. A few recommendations by them bear directly on program content. Stating that students of instructional technology feel insulated from the world of experience, the authors advocate field experiences as a means of instruction. Since instructional technologists are to be involved in planning, Beilby, Miller and Murphy feel they need experiences in future forecasting. There is also a need to recognize continuing education as a reality requiring technologists to devise ways of reaching adult learners. Most significant among their conclusions, however, is that instructional technologists be proficient in solving instructional problems with their clients.

SUMMARY

Two types of Delphi studies have been employed in education: (1) exploratory studies that seek to establish a pattern of events and dates for the future and (2) normative studies that seek to specify goals, needs, objectives, or desires and determine their relative values. Several studies have employed

each of the types with success, Exploratory studies in public education, teacher training and vocational education have yielded a convergence of the opinions of subjects regarding probable events and dates of the future. However, exploratory studies have been criticized for failing to provide a valid basis for planning. Such criticism has led to wider use of the Delphi technique in normative studies, resulting in several educational institutions having gained directions for planning future growth and development. Normative studies have been employed to assess opinions from subjects for desirable innovative changes in education and to determine preferred goals for some colleges and universities. The results of normative Delphi studies have produced useful information for planning.

Studies of educational programs of instructional technologists, along with reports on the state-of-the-art of instructional technology, have produced information and recommendations useful for the preparation of instructional technologists. It has been found that innovational media practices may, at times, have subordinated educational objectives to the demands of media equipment. Recommendations have been made to provide instructional technologists with (1) backgrounds in communications and learning theory; (2) field experiences in the real world of education; (3) training in educational media; and (4) training in evaluation of strategies of instruction. Other findings have revealed that many future instructional technologists are being prepared to serve in traditional instructor-centered, rather than systems-oriented, student-centered learning environments. It has been

recommended that proficiency in transferring solutions to instructional problems from one application to another, be somehow acquired by neophyte instructional technologists. The ability of instructional technologists to solve instructional problems is believed to be necessary for designing effective instructional systems.

CHAPTER III

DESIGN OF THE STUDY

INTRODUCTION

This study attempts to gain a consensus from acknowledged leaders in higher education on goals for instructional technology over the next 20 years in order to make recommendations for improved programs of preparation for instructional technologists. A group of 42 recognized leaders was identified by a pre-selection process described in this chapter and invited to participate. From the 27 who accepted, a list of 73 goals for instructional technology for the next 20 years was obtained. These goals were categorized and submitted to the participants for a value rating on a five-point scale. The goals and ratings were resubmitted to the participants for final review and change or comment. This procedure, known as the Delphi technique, and the manner in which the results were dealt with are further described in subsequent sections of this chapter.

SELECTION OF PARTICIPANTS IN THE STUDY

Participants in this study were persons with generally recognized high reputations for interest and skills in dealing with problems of curriculum and instruction in higher education in the United States.

An initial selection of 75 persons was made from professional publications and directories* and submitted independently to three professors familiar with national leadership in higher education and instructional technology. Three criteria were established for selecting participants who:

- (1) hold or have formerly held a college or university professional appointment of high administrative responsibility;
- (2) hold or have formerly held a position of leadership in a national foundation or professional organization devoted to improving curriculum and/or instruction in higher education;
- (3) are recognized for scholarship and knowledge of instructional and curriculum problems in higher education through publications, participation in pertinent national studies and/or through the recommendations of other nationally known scholars.

From the initial group of 75, 42 persons were agreed upon by two or more of the above professors to be leaders in curriculum and instruction in higher education and were invited to participate

*Who's Who in American Education, Leaders in Education, Directory of the Association for Higher Education, Directory of the Association for Educational Communications and Technology.

in the study.

Though leadership in curriculum and instruction in higher education was a characteristic common to the group, they held a variety of professional career positions. Several were college and university administrators, others were scholars and writers in curriculum and instruction, others were associated with national educational foundations or professional organizations. The table below indicates their distribution:

<u>Administrators in Higher Education</u>	<u>Scholars & Writers in Curriculum and Instruction</u>	<u>Officers of Foundations and Professional Organizations</u>
16	13	13

PROCEDURE

Two letters accompanied the first questionnaire. One was a statement of support for the project from Dr. Charles F. Schuller (see Appendix A). A second letter from the investigator explained the purpose and procedure of the study, the technique to be employed, and invited recipients' participation (see Appendix B). Participants were asked to list the goals on Questionnaire I (see Appendix C) which they believed would be most important for instructional technologists to achieve in higher education during the years 1972 to 1992. Two weeks were allotted for completion and return of Questionnaire I.

The invitation to participate was accepted by 27 persons. They submitted 144 possible goals. It was necessary to categorize each goal, to avoid duplication of similar ideas. These categories were established after the first round of questionnaires and were

as follows:

1. Definition and Refinement of the Role of Instructional Technology.
2. Economic Support.
3. Diffusion of Instructional Technology.
4. Evaluation and Measurement.
5. Development of Non-Human Resources.
6. Development of Human Resources
7. Research.
8. Organizational and Administrative Changes.

A naive collator, one formally trained in the field of instructional technology and its nomenclature, but unfamiliar with the categorization system, was employed to confirm the validity of the categories by arranging the 144 goal statements in them.

The naive collator performed his task with 83% agreement with the investigator's judgment. Goal statements that were similar in content, but expressed in different terms, were thus identified and a generic goal statement was written. This process yielded 73 goals. These goals were again presented to a second naive collator, who categorized them with 86% agreement with the first collator.

Questionnaire II (see Appendix D), consisted of a random listing of the 73 goal statements. In a cover letter (see Appendix E), participants in the study were asked to rate each goal for its importance according to the following scale: 1 - of extremely high importance, 2 - of high importance, 3 - of medium importance, 4 - of low importance, 5 - of no importance. Two weeks were

alloted the respondents to complete and return the form. Twenty-three responses were received, from which goal ratings were tabulated for convenience and accuracy of computing the mode score. The 23 persons who completed all questionnaires in the study included 9 higher education administrators, 8 scholars and writers in curriculum and instruction, and 6 officers of foundations and professional associations.

On Questionnaire II (see Appendix F), each subject's previous rating for each goal was indicated on the form. The value rating most chosen by members of the group was also indicated for each goal. Participants were requested to review each goal, their ratings and the group's ratings. If they wished, participants could change their ratings, (see Appendix G).

Twenty-three subjects returned Questionnaire III. Each questionnaire was reviewed and the value rating for each goal statement was recorded.

ANALYSIS OF DATA

The mean score of the value ratings of each goal was computed. This score represented the group's consensus on the value of each goal statement. The standard deviation of the value rating of each goal was also computed; this score represented the degree to which the value rating of each goal fluctuated from the mean score. In addition to standard deviations which clearly showed a high degree of reliability among most ratings, inter-rater reliability measures, i.e., an analysis of variance of each goal rating, were obtained as a cross-check.

In the final tabulation, mean and standard deviation scores were computed for each goal to obtain both the group's consensus of value and the dispersion of ratings for each goal. Statements submitted by each participant to support value ratings he recorded differently from the group's consensus rating were also recorded. These statements provided minority opinions on each goal (see Appendix H). Since majority opinions are reflected in the consensus rating, separate supporting statements were not solicited from participants.

Recommendations of learning experiences to meet the future needs of instructional technologists were made on the basis of the goals secured. Goal statements were rank ordered within categories in order to provide a useful base from which to make recommendations for the future preparation of instructional technologists.

SUMMARY

The population of this study consisted of persons with generally recognized high reputations for interest and skills in dealing with problems of curriculum and instruction in higher education in the United States.

From an initial list of 75 persons, three consultants selected 42 persons who were invited to participate in the study. Three criteria were established for selecting participants who:

- (1) hold or have formerly held a college or university professional appointment of high administrative responsibility;

- (2) hold or have formerly held a position of leadership in a national foundation or professional organization devoted to improving curriculum and/or instruction in higher education;
- (3) are recognized for scholarship and knowledge of instructional and curriculum problems in higher education through publications, participation in pertinent national studies and/or through the recommendations of other nationally known scholars.

Letters explaining the study and inviting participation accompanied the first questionnaire sent to prospective participants. Each was asked to submit several goals for instructional technology in higher education over the next 20 years. The invitation was accepted by 27 persons who submitted a total of 144 goals. These were reduced to 73 goal statements by employing a classification system to identify duplicate goals and writing generic statements for them.

The second questionnaire contained the 73 goal statements. Each participant was asked to rate each goal on a five-point likert scale. Within two weeks 23 subjects returned the completed questionnaire. The ratings on the questionnaires were recorded and the mode score of the ratings of each goal was computed. The 23 persons who completed all questionnaires in the study included 9 higher education administrators, 8 scholars and writers in curriculum and instruction, and 6 officers of

foundations and professional associations.

In the third round of questionnaires, each participant was asked to review the mode score of each goal and to compare it with his own rating. Participants could either change or defend their ratings. All 23 participants returned their questionnaires.

In the final tabulation, mean and standard deviation scores were computed for each goal to obtain both the group's consensus of value and the dispersion of ratings for each goal.

The statements submitted by each participant to support value ratings he recorded differently from the group's consensus rating were recorded. These statements provided minority opinions of each goal. Statements in support of majority opinions were not solicited.

Recommendations for learning experiences for future instructional technologists were made from rank ordered listings of the goal statements within categories.

CHAPTER IV

RESULTS

This study undertakes to gain a consensus from acknowledged leaders in curriculum and instruction in higher education on goals for instructional technology over the next 20 years in order to make recommendations for programs of preparation of future instructional technologists. This chapter contains a description of the method employed to analyze the data as well as a list of the goals and their value ratings.

METHOD OF ANALYSIS OF DATA

In analyzing the data secured in this study, the investigator was faced with several problems. First, the study is not a sampling study. It is an attempt to elicit statements of significant goals from a small and highly select group of persons. The purpose of the study is to identify what leaders in the field consider important for future development in order to guide designers of programs to prepare instructional technologists. Because of the eminent position of the participating leaders in higher education, certain inferences were made from the data in order to recommend learning experiences that will meet the future needs of instructional technologists.

In summarizing the data it is necessary to have some measure of central tendency and some measure of dispersion. In classical statistics, the arithmetic mean, the median and the mode are used to determine central tendency; the average deviation,

standard deviation or point measures of variability (such as quartile deviation, inter-quartile range and percentile points) as measures of dispersion.

Judging from the experiences of other researchers using the Delphi Technique in normative studies, it seemed wise to choose a measure of central tendency that would precisely pinpoint group consensus because the ratings of goals have varied relatively little among participants in other studies. Thus, the median score was rejected as too crude for the data and the mode score was also rejected to avoid obtaining bi- or tri-modal scores. Such scores by reason of their range could appear to embrace alternative points of view and thus make the data appear ambiguous. Ambiguous results would, of course, reduce their value for decision-making purposes. In selecting the mean score it was assumed that the intervals between ratings on the scale are constant, that is, the interval between first and second is the same as between second and third, third and fourth, and fourth and fifth.

Standard deviation was selected to measure the dispersion of ratings. Such a measure is necessary in order to establish the range of ratings for each goal and to reveal how closely the group agreed on each value rating.

Since it is quite possible for individual ratings at extremes of the scale to strongly influence both the mean and standard deviation scores, inter-rater reliability measures were also made as a cross-check. Inter-rater reliability estimates were obtained by comparing each rating with all the other ratings in the study for each goal statement. These data indicated the

degree to which the consensus of value for each goal was influenced by every individual rating. A very high degree of reliability was found in the ratings, indicating that the mean and standard deviation scores are reasonably accurate measures of the group's responses in all cases.

The above statistical measures of consensus have been used successfully by numerous researchers who have employed the Delphi technique. This investigator found consistent successful uses of the mean and standard deviation scores as measures of conversion and dispersion in all Delphi studies excepting those involving large numbers of participants. In these cases the standard deviation score was often replaced by an inter-quartile range score.

Statistical treatment is normally used to describe a set of measurements or relations between sets of variables when too large a number of cases is involved for first-hand observation. When the number of cases is small as in the present study, it is possible to present the data in tabular form as well as statistically. More importantly it is necessary here to present the data in both tabular and statistical form because the goals are an essential part of the results since they were originated by the participants.

Because the tabular presentation is somewhat lengthy and difficult to interpret, the goals are presented first by classifications and second by the relative values of the participants on each goal in relation to all the others. In the latter case all 73 goals are arranged in rank order by mean scores.

It is important to remember that the purpose of this study

was to solicit goals from leaders in curriculum and instruction in higher education in order to recommend learning experiences for future instructional technologists. In the presentation by categories, goals are arranged in rank order of importance within each category. The reader is cautioned to keep in mind that the categories in the presentation do not represent greater or lesser importance to the participants. The categories are presented in random order. Subjects of the study did not review or judge the value of goals by categories; indeed, they were never informed that the goals were to be categorized. The categories were set up to facilitate use of the data for the ultimate purpose of the study and to identify and eliminate duplicate goal statements solicited in the first questionnaire. They have been used in this chapter as an aid to the reader in synthesizing the data. They are also used in Chapter V as an aid in synthesizing recommendations for programs of preparation for instructional technologists.

Presentation of Goals by Categories

In the following presentation, the 73 goals are arranged in rank order of importance within each category. This presentation is intended to aid the reader in synthesizing the data.

Evaluation and Measurement

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
1. To learn how to use technology to increase learning significantly.	1.1	0.34

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
2. To develop methods of diagnosis and evaluation of learning problems	1.3	0.57
3. To develop more suitable methods of evaluation.	1.4	0.65
4. To revise instructional systems on the basis of field tests and validation.	1.4	0.66
5. To develop cost-effective measures based on student learning.	1.6	0.85
6. To formulate, implement and periodically revise quantitative standards in instructional technology.	2.0	0.60
7. To improve techniques for teaching minority groups.	2.0	0.87
8. To develop new procedures for cost studies of instructional strategies.	2.1	0.99
9. To reduce the unit cost of instruction.	2.3	1.03
10. To use P.P.B.S. as a means of resource control and accountability.	2.7	1.00

Development of Non-Human
Resources

1. To develop alternative self-instructional units for most students' educational programs.	1.8	0.67
2. To increase accessibility of instructional materials and equipment.	1.9	0.76

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
3. To develop skills in users of technology for goal-directed behavior	2.0	0.72
4. To create hardware that is simple and inexpensive to use.	2.0	0.47
5. To influence manufacturers of technological devices to meet curriculum designer applications with products.	2.1	0.46
6. To set standards for educational equipment and materials.	2.2	0.60
<u>Development of Human Resources</u>		
1. To involve students in the design of their own educational programs.	2.0	0.92
2. To increase numbers of persons in instructional technology for work in institutions on all levels of education.	2.3	1.01
3. To establish the team concept for instructional technology work on campuses.	2.3	0.92
4. To set national certification of training programs for technologists in higher education.	2.7	1.25
<u>Research</u>		
1. To adapt learning opportunities to different learning styles.	1.7	0.62

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
2. To conduct research to determine the effectiveness of instructional technology in various physical settings.	1.7	0.96
3. To conduct research to identify appropriate settings for various types of learning.	1.8	0.62
4. To disseminate results of research establishing the instructional value of educational media.	2.0	1.23
5. To conduct studies to establish the validity of instructional technology.	2.1	1.23
6. To develop systems to locate and reproduce research materials swiftly, at low costs.	2.5	0.95

Organizational and Administrative Changes

1. To develop and refine processes for management of technology.	1.5	0.85
2. To encourage instructional improvements within the traditional system of higher education.	1.8	0.73
3. To utilize instructional systems in academic planning.	1.9	0.46
4. To assign responsibility for instructional technology to the highest possible academic officers.	1.9	1.04

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
5. To set accreditation standards for learners instead of institutions.	2.0	0.91
6. To form multi-state consortia of colleges and universities for joint efforts in Instructional Development and technology.	2.0	0.73
7. To change faculty to measure institutional outputs in terms of student achievement.	2.1	1.04
8. To direct education toward a role of deliberate change agent rather than an accidental change agent.	2.1	0.83
9. To specify architectural and environmental conditions necessary for instructional technology.	2.1	0.84
10. To design institutional management systems.	2.4	1.09
11. To restructure higher education fiscal apparatus to eliminate F.T.E. as basis for funding.	2.5	1.63
12. To provide expertise to enable universities to establish external degree programs.	2.5	0.99
13. To develop macro-systems to provide any learner with materials to achieve any behavior he desires.	2.6	0.93
14. To refocus higher education from technological innovation to social innovation.	2.6	0.93

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
15. To develop synergistic systems of public school, college and university personnel for joint goal setting and planning.	2.7	0.89
16. To devise full international access systems of all instructional materials.	2.7	0.89
17. To establish independent credit granting office within institutions with power to invest technologically based instruction with as much authority as is vested in faculty.	2.7	1.11
18. To establish credit and degree granting authorities independent of institutions.	3.0	1.04
19. To develop a statement of student/faculty rights to ensure that technology serves them, rather than the reverse.	3.1	0.99
20. To adjust laws to protect creative endeavor.	3.1	0.81
21. To provide up to 80% of instruction in "open university" type systems.	3.1	0.99
22. To promote the establishment of a National Institute of Instructional Technology.	3.2	1.21
23. To orient college education away from occupational competence toward a liberal education.	3.6	0.96

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
24. To employ instructional technology to enable individuals to acquire a baccalaureate degree by age 18.	3.8	0.96
25. To recommend the use of a voucher system for higher education.	4.0	0.72

Definition and Refinement of
the Role of Instructional
Technology

1. To establish human values as paramount in the application of instructional technology.	1.4	0.34
2. To conduct research to determine technology's effectiveness in all types of learning.	1.7	0.65
3. To determine how instructional technology can be applied to enhance learning in the affective domain.	1.7	0.87
4. To define the area of instructional technology.	1.9	1.01
5. To adopt a code of performance and performance standards by a professional national organization for professionals in instructional technology.	2.4	0.84

Economic Support

1. To provide funding of local projects of instructional technology.	2.1	0.46
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<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
2. To influence higher educational administration to increase budget figures for instructional technology.	2.3	1.11
3. To establish federal support for instructional technology at 1% of the total national expenditure for higher education.	2.4	1.01

Diffusion of Instructional Technology

1. To assist in the design of curriculum and instructional strategies.	1.4	0.89
2. To design competency-based instructional programs.	1.4	0.79
3. To develop in-service programs to train faculty to understand and utilize instructional technology.	1.5	0.84
4. To incorporate a wider range of disciplinary resources in instructional technology.	1.7	0.84
5. To change faculty to measure learning according to achievement.	1.8	1.15
6. To develop strategies to gain faculty adoption of instructional technology.	1.9	0.62
7. To provide pre-service instructors with knowledge of the potential of modern technology for improving learning.	2.0	0.76

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
8. To create more awareness in the U.S.O.E. of the value of instructional technology in higher education.	2.2	1.13
9. To extend instructional technology to public schools.	2.3	0.95
10. To develop a close bond with those concerned with the expressive and affective side of students' growth and development.	2.3	1.01
11. To integrate instructional technology with library resources.	2.3	1.01
12. To cooperate with scholars abroad toward mutual development of instructional technology.	2.6	0.65
13. To develop a higher education division in A.E.C.T. to advance instructional technology.	3.0	1.13
14. To prepare instructional technologists for work in foreign countries.	3.2	0.83

RANK ORDER PRESENTATION OF GOALS

In the following presentation, the 73 goals are arranged in rank order of importance according to mean scores. This presentation provides the reader with the value each goal held to the study's participants relative to all the goals stated by them.

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
1. To learn how to use technology to increase learning significantly.	1.1	0.34
2. To develop methods of diagnosis and evaluation of learning problems.	1.3	0.57
3. To develop more suitable methods of evaluation.	1.4	0.65
4. To assist in the design of curriculum and instructional strategies.	1.4	0.89
5. To establish human values as paramount in the application of instructional technology.	1.4	0.34
6. To design competency-based instructional programs.	1.4	0.79
7. To revise instructional systems on the basis of field tests and validation.	1.4	0.66
8. To develop and refine processes for management of technology.	1.5	0.85
9. To develop in-service programs to train faculty to understand and utilize instructional technology.	1.5	0.84
10. To develop cost-effective measures based on student learning.	1.6	0.85
11. To conduct research to determine technology's effectiveness in all types of learning.	1.7	0.65

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
12. To incorporate a wider range of disciplinary resources in instructional technology.	1.7	0.84
13. To determine how instructional technology can be applied to enhance learning in the affective domain.	1.7	0.87
14. To adapt learning opportunities to different learning styles.	1.7	0.62
15. To conduct research to determine the effectiveness of instructional technology in various physical settings.	1.7	0.96
16. To conduct research to identify appropriate settings for various types of learning.	1.8	0.62
17. To develop alternative self-instructional units for most of students' educational programs.	1.8	0.67
18. To encourage instructional improvements within the traditional system of higher education.	1.8	0.73
19. To change faculty to measure learning according to achievement.	1.8	1.15
20. To utilize instructional systems in academic planning.	1.9	0.46
21. To develop strategies to gain faculty adoption of instructional technology.	1.9	0.62

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
22. To define the area of instructional technology.	1.9	1.01
23. To increase accessibility of instructional materials and equipment.	1.9	0.76
24. To assign responsibility for instructional technology to the highest possible academic officers.	1.9	1.04
25. To develop skills in users of technology for goal-directed behavior.	2.0	0.72
26. To create hardware that is simple and inexpensive to use.	2.0	0.47
27. To provide pre-service instructors with knowledge of the potential of modern technology for improving learning.	2.0	0.76
28. To involve students in the design of their own educational programs.	2.0	0.92
29. To set accreditation standards for learners instead of institutions.	2.0	0.91
30. To form multi-state consortia of colleges and universities for joint efforts in instructional development and technology.	2.0	0.73
31. To formulate, implement and periodically revise quantitative standards in instructional technology.	2.0	0.60

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
32. To disseminate results of research establishing the instructional value of educational media.	2.0	0.60
33. To improve techniques for teaching minority groups.	2.0	0.87
34. To change faculty to measure institutional outputs in terms of student achievement.	2.1	1.04
35. To direct education toward a role of deliberate change agent rather than an accidental change agent.	2.1	0.83
36. To develop new procedures for cost studies of instructional strategies.	2.1	0.99
37. To specify architectural and environmental conditions necessary for instructional technology.	2.1	0.84
38. To conduct studies to establish the validity of instructional technology.	2.1	1.23
39. To influence manufacturers of technological devices to meet curriculum designer applications with products.	2.1	0.46
40. To provide funding of local projects of instructional technology.	2.2	0.72
41. To create more awareness in the U.S.O.E. of the value of instructional technology in higher education.	2.2	1.13

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
42. To set standards for educational equipment and materials.	2.2	0.60
43. To extend instructional technology to public schools.	2.3	0.60
44. To develop a close bond with those concerned with the expressive and affective side of students' growth and development.	2.3	1.01
45. To increase numbers of persons in instructional technology for work in institutions on all levels of education.	2.3	1.01
46. To integrate instructional technology with library resources.	2.3	1.33
47. To reduce the unit cost of instruction.	2.3	1.03
48. To influence higher education administration to increase budget figures for instructional technology.	2.3	1.11
49. To establish the team concept for instructional technology work on campuses.	2.3	0.92
50. To design institutional management systems.	2.4	1.09
51. To adopt a code of performance and performance standards by a professional national organization for professionals in instructional technology.	2.4	0.84

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
52. To establish federal support for instructional technology at 1% of the total national expenditure for higher education.	2.4	1.01
53. To restructure higher education fiscal apparatus to eliminate F.T.E. as basis for funding.	2.5	1.63
54. To develop systems to locate and reproduce research materials swiftly, at low costs.	2.5	0.95
55. To provide expertise to enable universities to establish external degree programs.	2.5	0.99
56. To develop macro-systems to provide any learner with materials to achieve any behavior he desires.	2.6	0.93
57. To refocus higher education from technological innovation to social innovation.	2.6	1.12
58. To develop synergistic systems of public school, college and university personnel for joint goal setting and planning.	2.6	1.01
59. To cooperate with scholars abroad toward mutual development of instructional technology.	2.6	0.65
60. To devise full international access systems of all instructional materials.	2.7	0.89

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
61. To set national certification of training programs for technologists in higher education.	2.7	1.25
62. To use P.P.B.S. as a means of resource control and accountability.	2.7	1.00
63. To establish independent credit granting office within institutions with power to invest technologically based instruction with as much authority as is vested in faculty.	2.7	1.11
64. To establish credit and degree granting authorities independent of institutions.	3.0	1.04
65. To develop a higher education division in A.E.C.T. to advance instructional technology.	3.0	1.13
66. To develop a statement of student/faculty rights to ensure that technology serves them, rather than the reverse.	3.1	0.99
67. To adjust laws to protect creative endeavor.	3.1	0.81
68. To provide up to 80% of instruction in "open university" type systems.	3.1	0.99
69. To prepare instructional technologists for work in foreign countries.	3.2	0.83
70. To promote the establishment of a National Institute of Instructional Technology.	3.2	1.21

<u>GOAL</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
71. To orient college education away from occupational competence toward a liberal education.	3.6	0.96
72. To employ instructional technology to enable individuals to acquire a baccalaureate degree by age 18.	3.8	0.96
73. To recommend the use of a voucher system for higher education.	4.0	0.72

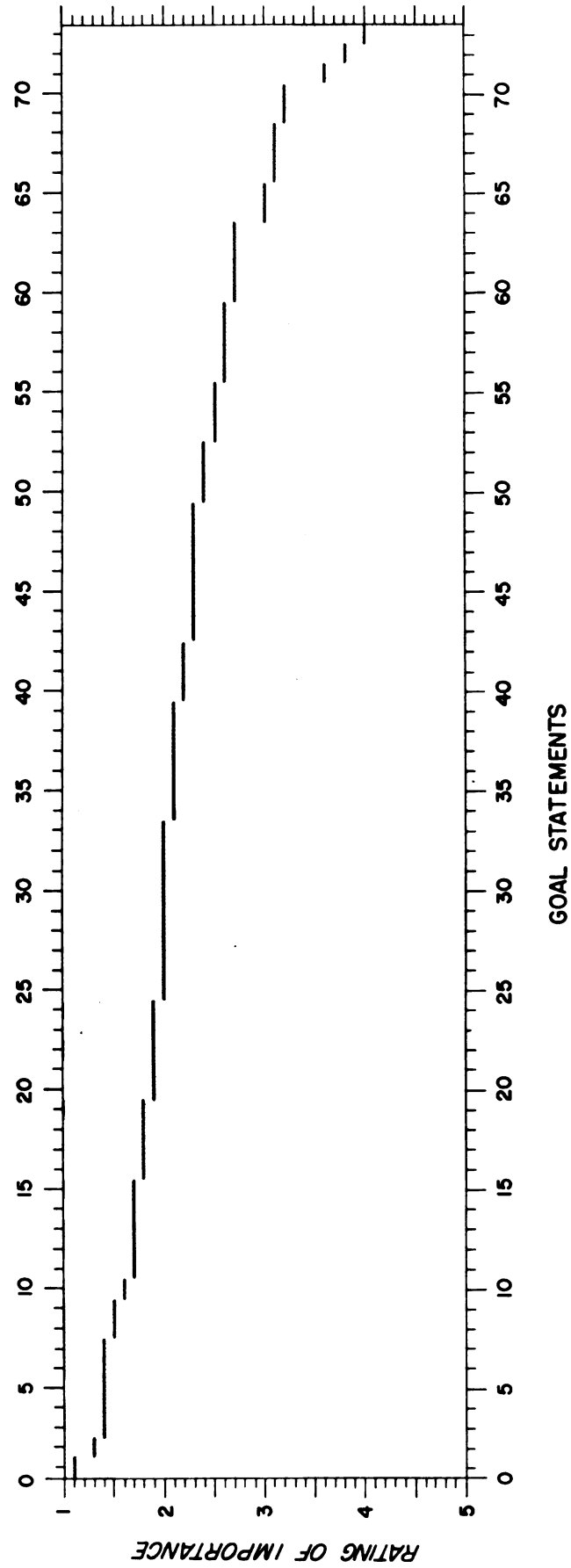
SUMMARY

Since both goals and value ratings of them were obtained from the subjects of this study, the data are presented in tabular form. These data include mean and standard deviation scores to display both points of consensus and range of dispersion for each goal. An analysis of variance of each goal rating indicates a high degree of reliability among ratings. These procedures for the analysis of data are widely used by researchers using the Delphi technique.

The goals were first presented by category to aid the reader to identify the various goals in a classification system and to more easily read and synthesize them into coherent groupings. In the second presentation, all 73 goals are arranged in rank order by mean score; this tabulation illustrates how the participants valued each goal in relation to all the others. Minority statements to support ratings different from the consensus rating appear in Appendix G.

MEAN SCORES AND STANDARD DEVIATIONS AS REPRESENTATIONS OF VALUE RATINGS OF GOALS BY SUBJECTS

VARIABILITY (PLUS AND MINUS ONE STANDARD DEVIATION) OF THE RATINGS OF IMPORTANCE



CHAPTER V

SUMMARY AND CONCLUSIONS

INTRODUCTION

The three main purposes of this study were: (1) to solicit goals for instructional technology in higher education and instruction; (2) to gain a consensus on the relative importance of each goal, (3) to recommend learning experiences for preparing future instructional technologists in relation to the stated goals. A summary of the results of the study with respect to these three purposes is presented in this chapter, followed by conclusions, recommendations, and implications.

SUMMARY

There appears to be a real need for the establishment of new goals for instructional technology in higher education. Recognized leaders in curriculum and instruction in higher education are logical sources for identification of such goals and the relative merits of each by virtue of the goal setting responsibilities inherent in their leadership positions. The Delphi technique appeared to be a legitimate means of sampling and distilling the opinions and perspectives of these leaders concerning higher education goals and the relative values ascribed to them.

Two types of Delphi studies, exploratory and normative, have been successfully employed in education. Exploratory studies in public education have yielded a convergence of opinions on

probable events and dates of the future. Because exploratory studies have been criticized for failing to provide a valid basis for planning, normative studies have been employed to assess opinions from subjects on desirable changes in education and to determine preferred goals for institutions. The results of normative Delphi studies have proved useful for future planning by educational administrators.

Studies of educational programs of instructional technologists, along with reports on the state-of-the-art of instructional technology, have produced information and recommendations useful for the preparation of instructional technologists. It has been found that the needs of learners have at times been subordinated in applying media technology to instruction. It has also been demonstrated that instructional technologists need backgrounds in communications, learning theory, educational media, evaluation of strategies of instruction, and field experiences in solving educational problems. Other findings show that instructional technologists are typically being prepared to serve in traditional instructor-centered, rather than in systems-oriented, student-centered learning environments.

In order to establish a base from which to recommend changes in preparing instructional technologists, 42 persons with generally recognized reputations for demonstrated interest and skills in dealing with problems of instruction and curriculum in higher education were identified by a pre-selection process and invited to participate in the study. Twenty-seven persons accepted the invitations, and provided statements which were

synthesized into 73 goal statements and submitted to the participants for value rating on a five-point likert scale. Two weeks were allowed in which 23 subjects returned the completed questionnaire. Mode scores were computed for each goal, recorded and resubmitted to the participants for comparison with their own ratings. All 23 participants returned the questionnaires on which they either retained and defended their ratings or changed them.

The final tabulation included computations of mean and standard deviation scores for each goal as well as a recording of minority opinions. All goals were arranged in rank order of importance so as to identify the relative importance of each. In addition, all goals were then rank ordered within categories to provide a base from which recommendations could be made for programs for preparing instructional technologists.

CONCLUSIONS

The following conclusions may be drawn from the results of the study.

1. The participants proposed 73 goals for instructional technology in higher education in the next 20 years. The participants, acknowledged leaders in their fields, had apparently given substantial consideration to determining desirable directions for the development of instructional technology prior to their participation in this study. Accordingly, they appeared to be particularly appropriate persons to provide

information on desirable goals on which to base recommendations for preparing instructional technologists for the future. Moreover, the participants' estimations of the importance of each goal substantially coincide, as indicated by the degree of consensus achieved.

2. The achievement of a consensus of value for each goal was the second purpose of this study. A review of the data indicates that the participants agreed on the relative value of achieving each goal. As leaders, all the participants are apparently seeking to guide the development of instructional technology toward the same goals. Since there was no face-to-face contact among participants during the study, both their judgements of desirable goals and of the relative values of those goals were reached on a largely individual basis. This does not, of course, rule out the possibility of mutual interaction prior to participation in the study as a result of face-to-face contact or the reading of one another's published articles or discussions at professional meetings.
3. The Delphi technique was effective in identifying both goals and the relative value of each from participants in the study. This information could probably not have been obtained by other means

since assembling the distinguished group of subjects would have been difficult if not impossible.

4. The participants were clearly in favor of the study. A high percentage (68%) of the initially selected 42 subjects accepted invitations to participate and 23 of the 27 completed all three of the required questionnaires. All who could not accept invitations for whatever reasons and the four who later withdrew wrote letters of regret to the investigator and all requested that results of the study be sent to them. This degree of response has not been found in similar studies reviewed by the investigator. Thus, both the pre-selected group and the study participants seem to have recognized the need for the study and to have viewed the instrument as adequate for measuring their goal perceptions and values.
5. Much useful information was gained for recommending desirable educational experiences for future instructional technologists. The recommendations are presented below under categories established by the investigator to synthesize the information provided by participants and thus may reflect some degree of interpretation on his part. The categories themselves, however, are presented randomly.

RECOMMENDATIONS

1. Evaluation and Measurement.

The mean scores of the following goals relating to evaluation and measurement indicate participants substantially agreed on their importance:

- (1) increase learning significantly (1.1);
- (2) develop methods of diagnosing and evaluating learning problems (1.3);
- (3) revise instructional systems on the basis of field tests and validation (1.4);
- (4) develop more suitable methods of evaluation (1.4);
- (5) formulate, implement and periodically revise quantitative standards in instructional technology (2.0),

Therefore, future instructional technologists should be competent in designing and conducting studies that empirically validate instructional strategies and tactics. Courses of study in psychological testing and measuring should be required as well as field studies or simulated experiences to practice strategies for gauging the effectiveness of various learning environments. Courses and field experiences in diagnosing and evaluating learning problems should also be required for students of instructional technology so that they may be better able to analyze learning needs and to apply technology in these terms in a variety of instructional settings.

Mean scores of the following goals indicate their importance in evaluation and measurement in the collective

opinion of participants:

- (1) develop cost-effective measures based on student learning (1.6);
- (2) conduct cost studies of instructional strategies (2.1);
- (3) reduce the unit cost of instruction (2.3);
- (4) apply P.P.B.S. as a means of resource control and accountability (2.7).

Accordingly, future instructional technologists should be provided educational experiences which enable them to determine the cost effectiveness of various instructional strategies as a means of reducing unit costs of instruction as well as determining a critical variable in arriving at other viable solutions to teaching/learning problems.

2. Development of Non-Human Resources.

Mean scores of the following goals on development of non-human resources indicate participants' agreement on their relative importance:

- (1) develop alternative self-instructional units (1.8);
- (2) increase accessibility of instructional materials and equipment (1.9);
- (3) develop skills in users of technology for goal-directed behavior (2.0);
- (4) create hardware that is simple and inexpensive to use (2.0);
- (5) influence manufacturers of technological devices to meet curriculum designer applications with products (2.1);
- (6) set standards for educational equipment and materials (2.2).

In the above terms, future instructional technologists need to know how to develop tools of instruction and materials that can be used by learners without an instructor. They should know how to use programmed instruction and media equipment and materials of various kinds to create effective self-instructional learning environments. Thus, students in instructional technology should become familiar with programmed instruction in order to apply the process in learning situations when it is appropriate. They should understand how and where various instructional media can be most appropriately used and the limitations of each medium for particular teaching/learning needs. Further, they should be aware of problems incurred by users of both instructional materials and equipment. In studying these problems, students of instructional technology should explore and seek to develop unique applications of technology for getting instructional materials to learners and for distributing media equipment.

3. Developing Human Resources

Mean scores of the following goals on developing human resources indicate participants' relative agreement on their importance:

- (1) involve students in the design of their educational programs (2.0);
- (2) increase numbers of persons in instructional technology at all levels of education (2.3);
- (3) establish the team concept of instructional technology (2.3);

- (4) set certification of training programs for technologists (2.7).

Since the improvement of instruction is a group process involving students, faculty, administrators and support personnel, future instructional technologists should have experiences as members of teams responsible for changing traditional learning environments. They should work closely with practicing Instructional Development specialists, media production personnel and content specialists. These experiences could be provided in field study or in simulated settings, and should emphasize applying technology to creating more effective instructional methods. In addition, students of instructional technology should evaluate the roles they play in the design and evaluation of their own courses and programs of study. They should be encouraged to modify, evaluate and design alternatives to the courses they study and to explore ways in which students can be more effectively involved in the Instructional Development process.

4. Research

Mean scores of the following goals in research indicate that the participants were in substantial agreement on their importance:

- (1) adapt learning opportunities to different learning styles (1.7);
- (2) determine the effectiveness of instructional technology in various physical settings (1.7);
- (3) determine the validity of instructional technology in general (2.1);

- (4) identify appropriate settings for various types of learning (1.8).

In the opinions of the consultants, instructional technologists will be increasingly concerned with determining the effectiveness of matching various instructional strategies with different learning styles and physical settings. Such work will require considerable experience in designing experimental studies and in evaluating results. Therefore, students of instructional technology should be required to complete a suitable program of studies in research and statistics. These studies should provide knowledge of research results in identifying learning styles, in applying technology in various physical settings, and in matching media to various learning styles.

As mean scores indicate, the participants were also in substantial agreement on the value of these related goals:

- (1) disseminate results of research establishing the instructional value of educational media (2.0);
- (2) develop systems to locate and reproduce research materials swiftly, at low costs (2.5).

Thus, future instructional technologists should become familiar with methods for disseminating information and should explore applications of technology to make dissemination more effective. Knowledge of storage and retrieval techniques involving telecommunications technologies should be studied. Experiences might be provided in learning how to most effectively reach practicing educators with attention-

getting and stimulating information about instructional technology. Studies should be required in communications techniques to familiarize future instructional technologists with the most effective techniques for motivating faculty towards adoption of principles and practices of instructional technology and toward a willingness to improve their current teaching methods.

5. Organizational and Administrative Changes.

As indicated by mean scores, the participants substantially agreed on the importance of the following goals with respect to organization and management of instructional technology:

- (1) develop and refine processes for managing technology (1.5);
- (2) encourage instructional improvements within the traditional system of higher education (1.8);
- (3) utilize instructional systems in academic planning (1.9);
- (4) assign responsibility for instructional technology to the highest possible academic officers (1.9);
- (5) set accreditation standards for learners instead of institutions (2.0);
- (6) form multi-state consortia of colleges and universities for joint efforts in Instructional Development and Technology (2.0);
- (7) change faculty to measure institutional outputs in terms of student achievement (2.1);
- (8) direct education toward a role of deliberate rather than accidental, change agent (2.1);
- (9) specify architectural and environmental conditions necessary for instructional technology (2.1);

- (10) design institutional management systems (2.4);
- (11) restructure higher education fiscal apparatus eliminating F.T.E. as funding basis (2.5);
- (12) provide expertise enabling universities to establish external degree programs (2.5);
- (13) develop macro-systems to provide any learner with materials to achieve any behavior he desires (2.6);
- (14) refocus higher education from technological innovation to social innovation (2.6);
- (15) develop synergistic systems of public school, college and university personnel for joint goal setting and planning (2.6);
- (16) devise full international access systems of all instructional materials (2.7);
- (17) establish independent credit granting office within institutions with power to invest technologically based instruction with as much authority as is vested in faculty (2.7);
- (18) establish credit and degree granting authorities independent of institutions (3.0).

In terms of the above goals, future instructional technologists should be prepared to develop and refine processes for the management of technology. They must be able to apply technology to academic and institutional planning, to communication processes among constituent groups of institutions, to achieving goals for instructional improvements within traditional higher education systems, to establishing consortia of colleges and universities for joint efforts in improving instruction, to electronic information systems and to distributing instructional media equipment, to devising external degree programs and to providing full access systems for all

instructional materials. Studies and field experiences should, therefore, be provided students of instructional technology in processes of communications, management and administration, and the planning of change.

6. Definition and Refinement of the Role of Instructional Technology.

Mean scores of the following goals with respect to the role of Instructional Technology indicate their significant importance in the collective opinions of the participants:

- (1) establish human values as paramount in the application of instructional technology (1.4);
- (2) conduct research to determine technology's effectiveness in all types of learning (1.7);
- (3) determine how instructional technology can be applied to enhance learning in the affective domain (1.7);
- (4) define the area of instructional technology (1.9);
- (5) adopt a code of performance and performance standards by a professional national organization for professionals in instructional technology (2.4).

Programs preparing future instructional technologists should continue to encourage them to commit their careers to improving instruction for the benefit of learners rather than for the development of technology per se. These programs should provide students with an historical perspective of the impact of technology on civilization. Students should explore the possible uses of instructional technology in changing attitudes, perhaps through the development of simulations of social experiences in which learners are caused to explore

their personal value systems. Students of instructional technology should also probe for the parameters of their field to define its limitations and to establish acceptable standards of performance of its practitioners. Studies, position papers, discussions and debates on the uses of technology for solving social and educational problems should be required.

7. Economic Support

Based on their mean scores, participants agreed on the following goals as important with respect to economic support:

- (1) provide funding of local projects of instructional technology (2.1);
- (2) influence higher education administration to increase budget figures for instructional technology (2.1);
- (3) establish federal support for instructional technology at 1% of the total national expenditure for higher education (2.4).

To function effectively in the field, instructional technologists should be knowledgeable of institutional fiscal processes, sources of monetary support and techniques for gaining financial support. Students of instructional technology should study budgeting procedures, sources for grant monies and how to prepare successful grant applications. They should also explore strategies and techniques for influencing higher education administrative decision-makers toward gaining support for projects in instructional technology.

8. Diffusion of Instructional Technology.

Mean scores on the following goals again indicate general agreement among participants on the importance of the following elements relating to diffusion of Instructional Technology:

- (1) assist in the design of curriculum and instructional strategies (1.4);
- (2) design competency-based instructional programs (1.4);
- (3) develop in-service programs to train faculty to understand and utilize instructional technology (1.5);
- (4) incorporate a wider range of disciplinary resources in instructional technology (1.7);
- (5) change faculty to measure learning according to achievement (1.8);
- (6) develop strategies to gain faculty adoption of instructional technology (1.9);
- (7) provide pre-service instructors with knowledge of the potential of modern technology for improving learning (2.0);
- (8) create more awareness in the U.S.O.E. of the value of instructional technology in higher education (2.2);
- (9) extend instructional technology to public schools (2.3);
- (10) develop a close bond with those concerned with the expressive and affective side of students' growth and development (2.3);
- (11) integrate instructional technology with library resources (2.3);
- (12) cooperate with scholars abroad toward mutual development of instructional technology (2.6);

- (13) develop a higher education division in A.E.C.T. to advance instructional technology (3.0).

Students of instructional technology should be given opportunities to develop a perspective of the shifting role of higher education in society and the resulting changes and innovations. They should explore and determine the place of instructional technology within this larger context. Opportunities should be provided them to define what, where, how and when to apply the principles of instructional technology toward achieving the more fundamental goals of higher education. Therefore, they need experiences in planning and guiding the change process. Educational programs for preparing instructional technologists should provide them with skills in strategies and tactics for dealing with faculty and other constituent groups in higher education to achieve desirable goals. They should be skilled in inter-personal relations and sensitivities and in the factors in diffusion necessary to bring about constructive change.

DISCUSSION

Some general comments on three aspects of this study seem appropriate at this point. These aspects are: (1) the rationale for the study, (2) the Delphi technique and, (3) the recommendations made for preparing future instructional technologists.

Combining the concept of goal-setting as a function of leadership with the process of the Delphi technique to obtain and rate future goals for instructional technology has proved to be

a valid theoretical and operational basis for the study. The participants, acknowledged leaders in curriculum and instruction in higher education, produced data confirming that persons in such positions have given serious thought to the future requirements which instructional technology should fulfill. As leaders in curriculum and instruction, they seek to change teaching practices in higher education by setting goals and applying instructional technology to achieving them. Their decisions point the way for the future development of instructional technology at their respective institutions. It is also apparent that these leaders are in agreement as to what are the most valid goals for that development. This agreement has been confirmed by the Delphi technique which provided a mechanism for achieving group consensus on the establishment and evaluation of appropriate goals.

The Delphi technique proved to be an effective instrument both for establishing goals and for achieving consensus on their relative significance. The standard procedure of the Delphi technique was modified in this study by eliminating the fourth round of questionnaires. This modification did not adversely affect the results because both goals and a consensus on their respective values had been achieved by the third round of questionnaires. Differences of opinions concerning the value of goals also existed initially among participants, yet substantial agreement on the point was achieved by the third round of questioning. This is not to imply that initial attitudes were changed; they may or may not have been. It may have been that changes occurred through feedback as a result of participants considering dimensions

of the goals they had not previously considered. For whatever reason, differences of opinions on the values of identified goals were substantially minimized in the process followed.

Uhl (1971) also modified the Delphi technique in his study by presenting participants with a validated inventory of goals for higher education institutions. He requested his participants to simply rate those goals, rather than contributing any of their own. This modification offers several advantages, in that it eliminates the difficult task of collating the many goals submitted by participants and then writing generic statements for similar goals. The major weakness of this modification is its failure to provide participants with the opportunity of contributing goals they feel are of significance to the study. The present study sought to find what leaders in the field consider to be valid directions for developing instructional technology. A secondary achievement of this study is the inventory of goals obtained. All of these goals were originated by leaders in the field whose decisions are guiding uses of instructional technology in their respective institutions. Prior to this study these persons probably had little or no knowledge of goals held by their counterparts in other institutions. The study produced an inventory of goals which was then reviewed by all participants. This was the first time any of the participants had seen a listing of goals for instructional technology. The achievement of a high consensus of values for each goal was somewhat remarkable, considering these circumstances. It may not have been possible under the limitations of such a study to have obtained either the goal

inventory or the consensus of values without use of the Delphi technique.

The inventory of goals was used as a basis from which to make recommendations for programs of preparation for instructional technologists. It may also be useful for planning in other areas of instructional technology. For example, the inventory may prove useful as a basis for designing an Instructional Development model for a college or university or as a basis for planning conferences of instructional technologists. Readers of the study may find other uses for the goal inventory. The investigator agrees with Dressel (1972) that normative studies, i.e., those seeking to identify appropriate directions for the future, are more valuable to planners than are studies that seek to identify specific events and the dates of their probable occurrence, or than exploratory studies of the status quo. The goal inventory achieved in this study tends to support this position. More normative studies of this type probably need to be conducted.

In using the Delphi technique researchers must consider the logistics involved. The process consists of at least three, and possibly four, rounds of questionnaires. The information returned by respondents to each round of questionnaires requires extensive time and effort in collating and summarizing responses, computing scores and preparing materials to be sent again to participants. The clerical work, alone, is a formidable task. Accordingly, researchers planning to use the Delphi technique should be aware of the need to employ the assistance of additional personnel and, if possible, data processing equipment. Indeed,

if a study employing the Delphi technique is undertaken by a single researcher, it should be limited to 25 participants, as Anderson (1970) has recommended. Within that limitation, the researcher will still need to employ clerical help for typing and mailing materials.

The Delphi technique multiplies an additional problem found in survey studies. Respondents must be informed and reminded of deadlines for receipt of their responses by the researcher. This investigator set three week intervals for return of materials and both mailed and telephoned reminders to each participant 10 days after the mailing dates on each set of questionnaires. Respondents never objected to this pressure, appearing consistently and universally to appreciate the reminders. This procedure is therefore recommended to investigators considering use of the Delphi technique in order to facilitate the prompt return of questionnaires and to capitalize on the potentials of the technique.

The Delphi technique is a valuable tool for instructional technologists as change-agents. By obtaining the views of constituent groups of an institution regarding directions for future growth, instructional technologists gain a perspective of where to apply energy and resources that will yield the greatest pay-off to them and the most satisfaction to clients of the institution. Moreover, the Delphi technique provides a method for gathering minority opinions thus revealing why people in the system feel and think the way they do. As Uhl (1971) stated, groups can be identified, though individual participants remain anonymous, and

their opinions for and against supporting changes can be compiled. Valuable knowledge for devising strategies for working with various groups might be disseminated among them. That information can contribute to modifying prejudices through developing awareness of others' opinions. A greater cohesiveness of purpose among constituent groups might be the result.

Recommendations for programs of preparation of future instructional technologists were based on goals rated "of extremely high importance," "of high importance," and "important." Goals rated lower than the above categories were deleted from the data on which recommendations were based. Since goals rated "of low importance" and "of no importance" were not regarded by the investigator as worthy of inclusion.

Despite fairly extensive individual differences of the participants in this study, of the 73 goals originated by them, 65 were rated as "important" or higher. The reasons for this are difficult to determine. It may be that individual participants tended to support most strongly the goals he contributed. That is, each participant rated as high as possible those goals he identified as his on each questionnaire. However, this would have been somewhat difficult. All goal statements were constructed in the same style on all questionnaires to aid participants in their work. Many goals on the questionnaires were generic statements created from the original goals submitted by participants. Therefore, many goals submitted to the study were rewritten. Naive collators, who classified both original and final goal statements with a high degree of accuracy, also controlled this

factor. In addition, the process of the Delphi technique averages ratings of members of the group, thus reducing the impact of individual ratings in the study. In this study, inter-rater reliability estimates confirmed the effectiveness of this aspect of the Delphi technique by substantiating that no individual ratings had distorted the data.

A more likely reason for the overall high ratings are the career similarities of participants in the study. The criteria for selection of participants were very specific. Only a select group of leaders in curriculum and instruction in higher education were sought. These persons are confronted with comparable problems in their careers and probably generate similar solutions to them. Therefore, both goals and their respective values are likely to be perceived in similar contexts. Since these persons are contemporary decision-makers in this area of higher education, what they see as desired directions for the future of instructional technology is important. The decisions made by these persons today may well set the course for instructional technology tomorrow. Therefore, today's designers of programs to prepare future instructional technologists should be aware of what is valued by leaders in instruction and curriculum in higher education. In summary, that is the purpose of this study, and the first step in additional work to be done.

IMPLICATIONS

With the possible exception of the need for more emphasis on using technology to sustain human values, goals submitted by participants in this study seem to confirm the adequacy of the

few outstanding programs for the preparation of instructional technologists. There is a need to determine whether other constituent groups hold the same opinions. Leaders in curriculum and instruction are but one of several constituent groups in higher education. The results of this study prove that persons in the select group participating in the present study do perceive goals for instructional technology which suggests that constituent groups in higher education can be identified and asked to contribute their opinions on desirable directions of growth. Very probably, students, faculty in other fields, alumni, business people, law-makers and others could also contribute goals or valuable interpretations from their respective vantage points. Additional studies, using the Delphi technique, need to be undertaken to identify what goals members of each of these groups have for instruction and curriculum in higher education as well as for higher education as a whole.

There is a need to investigate programs of preparation of instructional technologists in more depth. The present study produced recommendations that are concerned mostly with what future instructional technologists should know; the recommendations are largely concerned with topical information. The investigator feels that contemporary programs of preparation need to be re-viewed and evaluated as to how students of instructional technology can be taught most effectively. What concepts of instructional technology are employed in these programs? What instructional strategies or tactics are being employed? How many are competency-based programs? How many integrate telecommunications technologies

as instructional materials? Is cognitive-mapping being used with these students? What contingency-management principles are being applied to these programs? Are courses offered future instructional technologists linking together the three domains of learning by logical design relationships or by intuition? What aspects of these programs are "open-ended?" How are they being evaluated? How are they teaching program evaluation? What proportion of instruction uses printed materials as a tactic? Visual materials? Aural instruction? What kinds of problem-solving learning experiences do students encounter? In what areas? Under what circumstances? There is much yet to be learned.

There is need to apply the Delphi technique for determining what is happening in programs of preparation of future instructional technologists in terms of what ought to be. Limitations of the present study precluded the gathering of such data. There are implications of the need for them, however, in the goals initiated by the participants and in the recommendations based on them. The present study should be regarded as a first and hopefully a significant step toward better programs for the preparation of future instructional technologists and also as a small step towards improved instructional programs, generally, in higher education.

LIST OF REFERENCES

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- A Report to the President of Michigan State University From the Committee on the Future of the University. East Lansing, Michigan, 1959.
- Anderson, D. P., "Clarifying and Setting Objectives on an Intermediate School District's Objectives Utilizing the Delphi Technique." Paper presented at the A.E.R.A. symposium on Exploring the Potential of the Delphi Technique by Analyzing Its Application, Minneapolis, Minn.
- Asch, S. E., "Effects of Group Pressure Upon the Modification and Distortion of Judgements," Eleanor E. Maccoby, et. al., (Eds), Readings in Social Psychology, 3rd ed. London: Holt, Rinehart and Winston, 1958.
- Beilby, A., Miller, P., and Murphy, F., "The Future: Some Implications for Instructional Technology," AV Instruction, Vol. 17, May, 1972.
- Berghofer, D. E. "General Education in Post-Secondary Non-University Institutions in Alberta." Research Studies in Post-Secondary Education, No. 9, Alberta Colleges Commission, Edmonton, Alberta. (April, 1970).
- Brown, James W. and Thornton, James W., Jr., New Media in Higher Education, Association for Higher Education and Division of Audiovisual Instruction Services, N.D.A., Washington, 1963.
- Brown, J. W., and Thornton, J. W., Jr., New Media and College Teaching, Washington: Association for Educational Communications and Technology, 1968.
- Carnegie Foundation for the Advancement of Teaching. The Fourth Revolution: Instructional Technology. Hightstown, N. J.: McGraw-Hill Book Co, 1972.
- Cetron, M. J., and Monahan, T. I., "An Evaluation and Appraisal of Various Approaches to Technological Forecasting." Technological Forecasting for Industry and Government. Edited by J. R. Bright. Englewood Cliffs, N. J.: Prentice-Hall, 1968, pp. 144-179.

- Clark, D. J., and Hopkins, J. E., Preliminary Estimate on Research, Development and Diffusion Personnel Required in Education, 1971 and 1972, Special Project Memorandum, Bloomington: Indiana University, September 1, 1966. (Mimeographed Paper pp. 17).
- Commission on Instructional Technology, To Improve Learning, Sterling M. McMurrin (Chairman). Washington, D. C.: Government Printing Office, March, 1970.
- Cyphert, F. R. and Gant, W. L., "The Delphi Technique: A Case Study," Phi Delta Kappan, 52, January, 1971.
- Dalkey, N. C., The Delphi Method: An Experimental Study of Group Opinion. The Rand Corporation. June, 1969.
- Dressel, P. L., Personal Interview, April 11, 1972.
- Eurich, Alvin C., "A Twenty-first Century Look at Higher Education," National Education Association, 1963.
- Fleury, B. J., Jr., Cappelluzzo, E. M. and Wolf, W. C., Jr. Demographic data for trainers of educational researchers, In: Design of a Survey for Determining Training and Personnel Requirements for Educational Research, Development and Evaluation, Volume 1, Main Report Final Report, Office of Education (DHEW), Washington, D. C., Bureau of Research, January, 1972.
- Green, Robert L., "Urban America and Crucial Issues Facing Higher Education." Paper presented to the First National Congress of Black Professionals in Higher Education, The University of Texas at Austin, April 5-7, 1972.
- Helmer, O. "The Use of the Delphi Technique in Problems of Educational Innovations." Rand Corporation, P-3499, December, 1966.
- Helmer, O. and Resher, N., "On the Epistemology of the Inexact Sciences," Management Science, Vol. 6, October, 1959.
- Hollander, E. P., Leadership, Groups and Influence. Cambridge: Oxford University Press, 1964.
- Hornet, J. J., "The Training of Educational Developers," Bulletin (School of Education, Indiana University), Vol. 46, March, 1970.
- Hudspeth, D. "A Long-Range Planning Tool for Education: The Focus Delphi." State University of New York, June, 1970.

- Judd, R. C. "Delphi Method: Computerized Oracle Accelerates Consensus Formation." College and University Business, September, 1970.
- Kelly, H. H. and Thibaut, J. W., "Experimental Studies of Group Problem Solving and Process." Handbook of Social Psychology, ed. by Gardner Lindzey, Vol. II. Reading, Mass.: Addison-Wesley Publishing Co., 1954.
- Kissinger, Henry A., "The Policy Maker and the Intellectual," The Reporter, 20 (March, 1959).
- Larson, L. C., "Alternative Strategies For Multi-Purpose Programs in Instructional Technology," AV Instruction, Vol. 15, June-July, 1970.
- Lippitt, Gordon L., "What Do We Know About Leadership?," National Education Association Journal, December, 1955.
- McLuhan, Marshall, Understanding Media: The Extensions of Man, 2nd. ed., New York: McGraw-Hill Book Company, 1966.
- Norton, D. P. The Governors State University Needs Survey. Evanston, Illinois: Educational Testing Service (Midwestern Office), 1970.
- Pfeiffer, J., New Look at Education. New York: The Odyssey Press, 1968.
- Saettler, Paul, A History of Instructional Technology. New York: McGraw-Hill Book Company, 1968.
- Sartain, A. Q., and Baker, A. W., The Supervisor and His Job. New York: McGraw-Hill Book Company, 1970, p. 237.
- Toffler, Alvin, Future Shock. New York: Random House, 1970.
- Uhl, N. P., "Encouraging Convergence of Opinion Through the Use of the Delphi Technique, in the Process of Identifying an Institution's Goals," Educational Testing Service: Princeton, February, 1971.
- Wallington, C. J. and Hyer, A., Jobs in Instructional Media. Washington: Assoc. For Educational Communications and Technology, 1970.
- Watson, T. J., Jr. "Technology and Society." The Unfinished Journey. New York: The John Day Co., 1968.

Weaver, W. T., "Delphi, A Critical Review." Syracuse: Educational Policy Research Center, Syracuse University, February, 1970.

York, L., Arrangements and training for effective use of educational information, in: Design of a Survey for Determining Training and Personnel Requirements for Educational Research, Development, Dissemination and Evaluation, Volume 1, Main Report, Final Report, Office of Education (DHEW), Washington, D. C., Bureau of Research, January, 1972.

APPENDICES

APPENDIX A
LETTER OF SUPPORT

April 20, 1972

Gentlemen:

The critical problems facing higher education and the potentials of Instructional Development and Technology to help ameliorate or resolve some of these problems suggest the value of securing a consensus of expert opinion with respect to the directions we should be planning to move in higher education during the next decade or two. We hope you agree and that you may be willing to give an hour or two of your time to that effort.

I would not request your cooperation for an ordinary survey, but Mr. Ackerman is a highly capable and responsible individual and I think the results of his survey may be worthwhile to us all.

Your assistance will accordingly be appreciated, if you can give it. The results will be sent to you if you so desire.

Cordially,

Charles F. Schuller
Professor of Education
Director, Instructional Media
Center

CFS/cs

APPENDIX B
COVER LETTER
FOR
QUESTIONNAIRE I

April 20, 1972

Gentlemen:

A new attitude toward future-planning has developed in several sectors of American society, an attitude which indicates that future-planning based on informed, intuitive judgements about the future may enable man to exert considerable influence over future events, and perhaps to give them direction.

Instructional technology faces a challenging future in higher education. Rapid changes on college and university campuses have placed heavy responsibilities on professionals in the field. Indications are that more comprehensive changes will occur at an accelerated rate. What do these developments imply for instructional technology? Where and how should professionals in the field attempt to guide change? How can we best prepare persons to assume positions of responsibility on the campuses of tomorrow?

A study is currently underway at Michigan State University to attempt to gain expert agreement on goals for instructional technology in higher education over the next twenty years. The method to be used for this study is the Delphi Technique. Developed in the early 1950's by Olaf Helmer and his colleagues at the Rand Corporation, the procedure obtains a consensus of expert opinion on a given topic by means of a series of questionnaires, interspersed with information and opinion feedback, rather than face-to-face meetings of such experts. The anonymity of participant response contributes to the effectiveness of the technique.

During a preliminary survey to identify persons who could provide significant contributions to this study, one or more colleagues recommended that you be invited to participate.

Page 2

The procedure for the study will be as follows:

1. The first questionnaire, which is included with this letter, asks each participant to list those goals he feels are most important for instructional technology to achieve in higher education by 1992.
2. A second questionnaire will randomly list all of the responses of all of the participants and will ask each to rate each item on a 1 to 5 scale, according to his judgment of the value of the particular goal.
3. A third questionnaire will report the individual's prior rating and the mode score of the group for each item. Each participant will be asked to review the data and to re-rate any item he wishes to change in the light of the information received.

You will receive a duplicate copy of each questionnaire for your files. Please return the enclosed questionnaire by May 5, 1972. Subsequent questionnaires will follow at approximately two-week intervals. A final report will be provided to each participant who desires one.

We feel that leaders in higher education should provide direction for their profession as well as their institutions. Establishing a consensus of desirable goals for instructional technology is a first step in that direction. We believe that our study will provide this information. For this reason we hope you will be willing to participate; we need your expertise to accomplish the task.

Thank you very much for your cooperation.

Sincerely,

Harry L. Ackerman

HLA:af
Encl.

APPENDIX C
QUESTIONNAIRE I

Instructional Media Center

MICHIGAN STATE UNIVERSITY

Delphi Questionnaire I

*Name: _____ Position: _____

*(Names will not be used in published tabulations)

Your position of responsibility and recognized professional accomplishments make you uniquely qualified to recommend desirable goals for instructional technology in higher education. Please use the space provided below to list those developments you believe most important for instructional technologists to achieve in higher education within the next twenty years. Possible examples of items you might list would be: (1) Apply concerted pressure on administration to cause development of cost-efficiency studies. (2) Support instructional programs that involve higher education in social change. These two examples are provided as examples only; no value judgement is implied.

If you wish to make additional suggestions, you may use the reverse side of this sheet.

Please return this questionnaire by May 5, 1972, in the envelope provided.

We appreciate your cooperation in this study.

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3.

4.

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APPENDIX D
QUESTIONNAIRE II

Instructional Media Center
MICHIGAN STATE UNIVERSITY
Delphi Questionnaire II

*Name: _____ Position: _____
 *(Names will not be used in published tabulations)

If you have difficulty in responding to an item as it is worded, please indicate the problem in the "Comments" column. The questionnaire should take approximately 45 minutes to complete.

GOALS

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high importance importance importance importance importance Comments

To establish credit and degree granting authorities independent of institutions.

1 2 3 4 5

To develop and refine processes for management of technology.

1 2 3 4 5

To adjust laws to protect creative endeavor.

1 2 3 4 5

To provide funding of local projects of instructional technology.

1 2 3 4 5

To learn how to use technology to significantly increase learning.

1 2 3 4 5

GOALS

	<u>of extremely</u> <u>high importance</u>	<u>of high</u> <u>importance</u>	<u>of medium</u> <u>importance</u>	<u>of low</u> <u>importance</u>	<u>of no</u> <u>importance</u>	<u>Comments</u>
To integrate instructional technology with library resources.	1	2	3	4	5	
To establish federal support for instructional technology at 1% of the total national expenditure for higher education.	1	2	3	4	5	
To direct education toward a role of deliberate change agent rather than an accidental change agent.	1	2	3	4	5	90
To cooperate with scholars abroad toward mutual development of instructional technology.	1	2	3	4	5	
To conduct research to determine technology's effectiveness in all types of learning.	1	2	3	4	5	
To specify architectural and environmental conditions necessary for instructional technology.	1	2	3	4	5	

<u>GOALS</u>	<u>of extremely high importance</u>	<u>of high importance</u>	<u>of medium importance</u>	<u>of low importance</u>	<u>of no importance</u>	<u>Comments</u>
To develop in-service programs to train faculty to understand and utilize instructional technology.	1	2	3	4	5	
To conduct studies to establish the validity of instructional technology.	1	2	3	4	5	
To assist in the design of curriculum and instructional strategies.	1	2	3	4	5	
To develop skills in users of technology for goal-directed behavior.	1	2	3	4	5	
To conduct research to determine the effectiveness of instructional technology in various settings.	1	2	3	4	5	
To provide expertise to enable universities to establish external degree programs.	1	2	3	4	5	

<u>GOALS</u>		<u>of extremely</u> <u>high importance</u>	<u>of high</u> <u>importance</u>	<u>of medium</u> <u>importance</u>	<u>of low</u> <u>importance</u>	<u>of no</u> <u>importance</u>	<u>Comments</u>
To establish the team concept for instructional technology work on campuses.		1	2	3	4	5	
To develop synergistic systems of public school, college and university personnel for joint goal setting and planning.		1	2	3	4	5	
To design competency-based instructional programs.		1	2	3	4	5	
To determine how instructional technology can be applied to enhance learning in the affective domain.		1	2	3	4	5	
To involve students in the design of their own educational programs.		1	2	3	4	5	
To develop a higher education division in A.E.C.T. to advance instructional technology.		1	2	3	4	5	

<u>GOALS</u>	<u>of extremely high importance</u>	<u>of high importance</u>	<u>of medium importance</u>	<u>of low importance</u>	<u>of no importance</u>	<u>Comments</u>
To provide up to 80% of instruction in "open university" type systems.	1	2	3	4	5	
To utilize instructional systems in academic planning.	1	2	3	4	5	
To encourage instructional improvements within the traditional system of higher education.	1	2	3	4	5	
To provide pre-service instructors with knowledge of the potential of modern technology for improving learning.	1	2	3	4	5	
To assign responsibility for instructional technology to the highest possible academic officers.	1	2	3	4	5	
To create hardware that is simple and inexpensive to use.	1	2	3	4	5	

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<u>GOALS</u>	<u>of extremely high importance</u>	<u>of high importance</u>	<u>of medium importance</u>	<u>of low importance</u>	<u>of no importance</u>	<u>Comments</u>
To conduct research to identify appropriate settings for various types of learning.	1	2	3	4	5	
To influence higher education administration to increase budget figures for instructional technology.	1	2	3	4	5	
To use P.P.B.S. as a means of resource control and accountability.	1	2	3	4	5	
To set standards for educational equipment and materials.	1	2	3	4	5	
To orient college education away from occupational competence toward a liberal education.	1	2	3	4	5	
To extend instructional technology to public schools.	1	2	3	4	5	
To develop systems to locate and reproduce research materials swiftly, at low costs.	1	2	3	4	5	

of extremely high importance	of high importance	of medium importance	of low importance	of no importance	Comments

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<u>GOALS</u>		<u>of extremely</u>	<u>of high</u>	<u>of medium</u>	<u>of low</u>	<u>of no</u>
		<u>high importance</u>	<u>importance</u>	<u>importance</u>	<u>importance</u>	<u>importance</u>
To adopt a code of performance and performance standards by a professional national organization for professionals in instructional technology.		1	2	3	4	5
		1	2	3	4	5
		1	2	3	4	5
To restructure higher education fiscal apparatus to eliminate F.T.E. as basis for funding.		1	2	3	4	5
		1	2	3	4	5
		1	2	3	4	5
To prepare instructional technologists for work in foreign countries.		1	2	3	4	5
		1	2	3	4	5
		1	2	3	4	5
To form multi-state consortia of colleges and universities for joint efforts in instructional development in technology.		1	2	3	4	5
		1	2	3	4	5
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	high importance	importance	importance	importance	Comments
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<u>GOAL</u>	<u>of extremely high importance</u>	<u>of high importance</u>	<u>of medium importance</u>	<u>of low importance</u>	<u>of no importance</u>	<u>Comments</u>
To employ instructional technology to enable individuals to acquire a baccalaureate degree by age 18.	1	2	3	4	5	
To adapt learning opportunities to different learning styles.	1	2	3	4	5	
To set national certification of training programs for technologists in higher education.	1	2	3	4	5	
To develop cost-effective measures based on student learning.	1	2	3	4	5	
To disseminate results of research establishing the instructional value of educational media.	1	2	3	4	5	
To develop strategies to gain faculty adoption of instructional technology.	1	2	3	4	5	

<u>GOALS</u>	<u>of extremely high importance</u>	<u>of high importance</u>	<u>of medium importance</u>	<u>of low importance</u>	<u>of no importance</u>	<u>Comments</u>
To establish human values as paramount in the application of instructional technology.	1	2	3	4	5	
To incorporate a wider range of disciplinary resources in instructional technology.	1	2	3	4	5	
To revise instructional systems on the basis of field tests and validation.	1	2	3	4	5	
To establish independent credit granting office within institutions with power to invest technologically based instruction with as much authority as is vested in faculty.	1	2	3	4	5	
To develop macro-systems to provide any learner with materials to achieve any behavior he desires.	1	2	3	4	5	

<u>GOALS</u>	<u>of extremely high importance</u>	<u>of high importance</u>	<u>of medium importance</u>	<u>of low importance</u>	<u>of no importance</u>	<u>Comments</u>
To devise full international access systems of all instructional materials.	1	2	3	4	5	
To set accreditation standards for learners instead of institutions.	1	2	3	4	5	

APPENDIX E
COVER LETTER
FOR
QUESTIONNAIRE II

MICHIGAN STATE UNIVERSITY

INSTRUCTIONAL MEDIA CENTER

EAST LANSING • MICHIGAN • 48824

June 6, 1972

Dear Dr. _____:

Thank you for accepting our invitation to participate in our study of potential goals for instructional technology in higher education over the next twenty years. I am, personally, very pleased that you are a participant.

Questionnaire II is enclosed. It consists of a listing of goals submitted by you and fellow participants. Each goal statement is presented once. You are asked to react to each according to how important, in your judgement, it is for professionals in instructional technology to strive for its achievement. Please indicate the importance you assign each goal by encircling the appropriate numeral under the value classification that best matches your judgement.

EXAMPLE

GOALS	of extremely high importance	of high importance	of medium importance	of low importance	of no importance
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To prepare professionals to assume administrative roles in higher education.

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In the above example, the person has indicated that he believes the goal "to prepare professionals to assume administrative roles in higher education" is of medium importance to instructional technology in higher education over the next twenty years.

Please complete and return Questionnaire II by June 16, 1972.

Thank you very much for your cooperation.

Sincerely,

Harry L. Ackerman

HLA:af

APPENDIX F
QUESTIONNAIRE III

***Name:** _____ **Position:**
***(Names will not be used in published tabulations)**

If you have difficulty in responding to an item as it is worded, please indicate the problem in the "Comments" column. The questionnaire should take approximately 45 minutes to complete.

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To establish credit and degree granting authorities independent of institutions.

**To develop and refine
processes of management
of technology**

To adjust laws to protect creative endeavor.

To provide funding of local projects of instructional technology.

To learn how to use
technology to signifi-
cantly increase learn-
ing.

<u>GOALS</u>	<u>of extremely high importance</u>	<u>of high importance</u>	<u>of medium importance</u>	<u>of low importance</u>	<u>of no importance</u>	<u>Comments</u>
To integrate instructional technology with library resources.	1	2	3	4	5	
To establish federal support for instructional technology at 1% of the total national expenditure for higher education.	1	2	3	4	5	
To direct education toward a role of deliberate change agent rather than an accidental change agent.	1	2	3	4	5	
To cooperate with scholars abroad toward mutual development of instructional technology.	1	2	3	4	5	
To conduct research to determine technology's effectiveness in all types of learning.	1	2	3	4	5	
To specify architectural and environmental conditions necessary for instructional technology.	1	2	3	4	5	

1. The first part of the document is a list of names and addresses of the members of the committee. The names are listed in alphabetical order, and the addresses are listed below each name. The list includes the names of the members of the committee, the names of the members of the sub-committee, and the names of the members of the advisory committee. The addresses are listed in the same order as the names.

2. The second part of the document is a list of the names and addresses of the members of the committee. The names are listed in alphabetical order, and the addresses are listed below each name. The list includes the names of the members of the committee, the names of the members of the sub-committee, and the names of the members of the advisory committee. The addresses are listed in the same order as the names.

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2	1	1	1	1	1
3	1	1	1	1	1
4	1	1	1	1	1
5	1	1	1	1	1

1 2 3 4 5

1 2 3 4 5

<u>GOALS</u>		<u>of extremely</u> <u>high importance</u>	<u>of high</u> <u>importance</u>	<u>of medium</u> <u>importance</u>	<u>of low</u> <u>importance</u>	<u>of no</u> <u>importance</u>	<u>Comments</u>
To establish the team concept for instructional technology work on campuses.	1		2	3	4	5	
	1		2	3	4	5	
To develop synergistic systems of public school, college and university personnel for joint goal setting and planning.							
	1		2	3	4	5	
To design competency-based instructional programs.							
	1		2	3	4	5	
To determine how instructional technology can be applied to enhance learning in the affective domain.							
	1		2	3	4	5	
To involve students in the design of their own educational programs.							
	1		2	3	4	5	
To develop a higher education division in A.E.C.T. to advance instructional technology.							
	1		2	3	4	5	

<u>GOALS</u>	<u>of extremely high importance</u>	<u>of high importance</u>	<u>of medium importance</u>	<u>of low importance</u>	<u>of no importance</u>	<u>Comments</u>
To provide up to 80% of instruction in "open university" type systems.	1	2	3	4	5	
To utilize instructional systems in academic planning.	1	2	3	4	5	
To encourage instructional improvements within the traditional system of higher education.	1	2	3	4	5	
To provide pre-service instructors with knowledge of the potential of modern technology for improving learning.	1	2	3	4	5	
To assign responsibility for instructional technology to the highest possible academic officers.	1	2	3	4	5	
To create hardware that is simple and inexpensive.	1	2	3	4	5	
To develop methods of diagnosis and evaluation of learning problems.	1	2	3	4	5	

<u>GOALS</u>	<u>of extremely high importance</u>	<u>of high importance</u>	<u>of medium importance</u>	<u>of low importance</u>	<u>of no importance</u>	<u>Comments</u>
To refocus higher education from technological innovation to social innovation.	1	2	3	4	5	
To design institutional management systems.	1	2	3	4	5	
To promote the establishment of a National Institute of Instructional Technology.	1	2	3	4	5	
To develop a statement of student/faculty rights to ensure that technology serves them, rather than the reverse.	1	2	3	4	5	
To increase accessibility of instructional materials and equipment.	1	2	3	4	5	
To formulate, implement and periodically revise quantitative and qualitative standards in instructional technology.	1	2	3	4	5	

<u>GOALS</u>	<u>of extremely high importance</u>	<u>of high importance</u>	<u>of medium importance</u>	<u>of low importance</u>	<u>of no importance</u>	<u>Comments</u>
To conduct research to identify appropriate settings for various types of learning.	1	2	3	4	5	
To influence higher education administration to increase budget figures for instructional technology.	1	2	3	4	5	
To use P.P.B.S. as a means of resource control and accountability.	1	2	3	4	5	
To set standards for educational equipment and materials.	1	2	3	4	5	
To orient college education away from occupational competence toward a liberal education.	1	2	3	4	5	
To extend instructional technology to public schools.	1	2	3	4	5	
To develop systems to locate and reproduce research materials swiftly, at low costs.	1	2	3	4	5	

GOALS

of extremely of high of medium of low of no
high importance importance importance importance importance Comments

To increase numbers of persons in instructional technology for work in institutions on all levels of education.

To create more awareness in the U.S.O.E. of the value of instructional technology in higher education.

To develop more suitable methods of evaluation.

To develop alternative self-instructional units for most of students' educational programs.

To improve techniques for teaching minority groups.

To adopt a code of performance and performance standards by a professional national organization for professionals in instructional technology.

1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	

<u>GOALS</u>	<u>of extremely</u> <u>high importance</u>	<u>of high</u> <u>importance</u>	<u>of medium</u> <u>importance</u>	<u>of low</u> <u>importance</u>	<u>of no</u> <u>importance</u>	<u>Comments</u>
To restructure higher education fiscal apparatus to eliminate F.T.E. as basis for funding.	1	2	3	4	5	
To prepare instructional technologists for work in foreign countries.	1	2	3	4	5	
To recommend the use of a voucher system for higher education.	1	2	3	4	5	
To form multi-state consortia of colleges and universities for joint efforts in instructional development in technology.	1	2	3	4	5	
To influence manufacturers of technological devices to meet curriculum designer specifications with products.	1	2	3	4	5	
To develop a close bond with those concerned with the expressive and affective side of student's growth and development.	1	2	3	4	5	

<u>GOALS</u>	<u>of extremely high importance</u>	<u>of high importance</u>	<u>of medium importance</u>	<u>of low importance</u>	<u>of no importance</u>	<u>Comments</u>
To develop new procedures for cost studies of instructional strategies.	1	2	3	4	5	
To change faculty to measure learning according to achievement.	1	2	3	4	5	
To define the area of instructional technology.	1	2	3	4	5	
To change faculty to measure institutional outputs in terms of student achievement.	1	2	3	4	5	114
To employ instructional technology to enable individuals to acquire a baccalaureate degree by age 18.	1	2	3	4	5	
To adapt learning opportunities to different learning styles.	1	2	3	4	5	
To set national certification of training programs for technologists in higher education.	1	2	3	4	5	

<u>GOALS</u>	<u>of extremely high importance</u>	<u>of high importance</u>	<u>of medium importance</u>	<u>of low importance</u>	<u>of no importance</u>	<u>Comments</u>
To develop cost-effective measures based on student learning.	1	2	3	4	5	
To disseminate results of research establishing the instructional value of educational media.	1	2	3	4	5	
To develop strategies to gain faculty adoption of instructional technology.	1	2	3	4	5	
To establish human values as paramount in the application of instructional technology.	1	2	3	4	5	115
To incorporate a wider range of disciplinary resources in instructional technology.	1	2	3	4	5	
To revise instructional systems on the basis of field tests and validation.	1	2	3	4	5	

<u>GOALS</u>	<u>of extremely of high of medium of low of no</u>				
	<u>high importance</u>	<u>importance</u>	<u>importance</u>	<u>importance</u>	<u>importance</u>
To establish independent credit granting office within institutions with power to invest technologically based instruction with as much authority as is vested in faculty.	1	2	3	4	5
To develop macro-systems to provide any learner with materials to achieve any behavior he desires.	1	2	3	4	5
To devise full international access systems of all instructional materials.	1	2	3	4	5
To set accreditation standards for learners instead of institutions.	1	2	3	4	5

APPENDIX G
COVER LETTER
FOR
QUESTIONNAIRE III

Dear Dr. _____:

This is the third and last questionnaire you will receive in this study. It is also the most important, and should be the most interesting one. After completion of this questionnaire, please return it within 7 days in order that the data may be tabulated and analyzed. We hope that we will have your continued cooperation since the study will be severely limited if each participant does not complete this last phase.

The same goal statements are used on the same questionnaire form. Note that for each goal statement the category that was selected by most participants on the second questionnaire has been circled. When two categories were selected about equally often, both have been circled. Your rating of each, as taken from Questionnaire II, is indicated by the symbol "X" over the numeral in the category. We are interested in your opinion of the importance of each goal statement now that you have some indication of how others have responded. The objective of this phase is to identify the reasons for opinions that differ from the majority opinion. You are requested to react to each goal as follows:

1. How important is the goal to instructional technology in higher education between 1972 and 1992? If the category you have selected is not the same as the one which is circled, you may, if you wish, shift your selection to the circle by lining out your selection and marking an "X" in the circle.
2. If you wish to leave your rating as selected, though it is not within the circle, if possible, briefly give one or two reasons for your opinion in the comments column opposite the goal, on the right of the form.
3. If you have selected the circled category, no comments are necessary.

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The questionnaire should take not longer than 45 minutes to complete. Of course, time will be influenced by the number of comments made. Please, do not spend undue time on any single goal.

Members of the staff of the Instructional Media Center at Michigan State University, and I, personally, thank you again for your outstanding cooperation.

Sincerely,

Harry L. Ackerman

HLA:af

APPENDIX H
GOALS AND MINORITY
OPINIONS

The data are presented here to provide the reader with minority opinions of the value of the goals. The reader is cautioned to bear in mind that the statistical scores are of paramount importance in determining the groups opinion of the value of each goal. The presence of verbal expressions of support for extreme opinions could tend to overshadow the importance of the mean and standard deviation scores. It should be kept in mind that most of the participants in the study disagreed with the extreme positions taken by a few. Those extremes must nonetheless be cited for and considered by the reader because the viewpoints can help maintain a balanced perspective and in some instances provide dimensions which might be overlooked or too casually discarded.

1. To learn how to use technology to increase learning significantly.

MEAN SCORE: 1.1 STANDARD DEVIATION: 0.34

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"But delaying effort to develop materials until perfection is achieved, or an ideal is realized is also defeating."

"Already known; what is lacking is facilitating and encouraging institutional structures."

"Important, but not highest priority."

2. To develop methods of diagnosis and evaluation of learning problems.

MEAN SCORE: 1.3 STANDARD DEVIATION: 0.57

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"We're further along on this than our applications suggest."

"Already being done."

"If it could only be done in concert with evaluation people, O.K.; but the times aren't right."

3. To develop more suitable methods of evaluation.

MEAN SCORE: 1.4 STANDARD DEVIATION: 0.65

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"I would have rated this higher, if it did not further the 'stall approach'."

"First determine unsuitability - and for whom."

"Needs development of programs with direction ahead of evaluations."

4. To assist in the design of curriculum and instructional strategies.

MEAN SCORE: 1.4 STANDARD DEVIATION: 0.89

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"Overstress on methodology."

"I don't want curriculum determined by technology."

5. To establish human values as paramount in the application of instructional technology.

MEAN SCORE: 1.4

STANDARD DEVIATION: 0.34

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"This is part and parcel of I.T. A broad definition of I.T. includes human values - and should not be set up as a separate entity."

"Rhetorically and ideologically desirable, but operationally?"

"Human values don't seem to be that unimportant to warrant such crucial attention."

"I vote, still, for #2. Important - but we're already aware of and doing something about this."

6. To design competency-based instructional programs.

MEAN SCORE: 1.4

STANDARD DEVIATION: 0.79

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"Agree with high importance, but the goal seems very general. I have some reservations about trying to reduce all educational goals to behavioral objectives - if that's what is implied."

"All else in education falls below this one goal in importance; essential to any other purpose."

"A term of doubtful precise significance."

"I'm not sure this can be done."

7. To revise instructional systems on the basis of field tests and validation.

MEAN SCORE: 1.4

STANDARD DEVIATION: 0.66

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"Are these bases the final word?"

8. To develop and refine processes for management of technology.

MEAN SCORE: 1.5 STANDARD DEVIATION: 0.85

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"Management important but clearly secondary."

"An all-society function."

"Instructional technologists will move more toward instructional development than management."

"I'm not as ego-involved as some on this."

9. To develop in-service programs to train faculty to understand and utilize instructional technology.

MEAN SCORE: 1.5 STANDARD DEVIATION: 0.84

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"Many faculty are already trained, therefore, not a #1 priority."

"If this item had said 'design,' I might have rated it higher."

"Faculty - many of them - have intelligence to learn and to ask."

"In my judgement, the effectiveness of such in-service programs is limited."

"I feel this is premature until other items are finalized."

10. To develop cost-effective measures based on student learning.

MEAN SCORE: 1.6 STANDARD DEVIATION: 0.85

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"I'm not against, I just don't think we had better concentrate on cost-effectiveness in a new field."

11. To conduct research to determine technology's effectiveness in all types of learning.

MEAN SCORE: 1.7 STANDARD DEVIATION: 0.65

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"This is a 'global' objective than cannot be solved by 'more research.' There's more to it than that."

"We now know more than we are allowed to apply."

"Is technology effective or suitable in all types of learning?"

12. To incorporate a wider range of disciplinary resources in instructional technology.

MEAN SCORE: 1.7 STANDARD DEVIATION: 0.84

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"I think this to be an inherent necessity and not necessarily a goal."

"Vague goal."

"The 'mouse trap' principle will bring them in."

"Only those that lend themselves to I.T."

13. To determine how instructional technology can be applied to enhance learning in the affective domain.

MEAN SCORE: 1.7 STANDARD DEVIATION: 0.87

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"My ranking is probably too low. But, although I have sympathy for the sentiment, I fear again, that expecting technology to prove itself before it is well developed invites a stall - and inevitably delays progress. No one demanded such determinations of the printed word, or other now widely accepted instructional technologies."

"This is a task of education, broadly conceived."

"I don't believe that affective learning will be a primary objective. Affective objectives will be considered along with cognitive objectives."

"I'm not sure this can be done."

14. To adapt learning opportunities to different learning styles.

MEAN SCORE: 1.7 STANDARD DEVIATION: 0.62

Minority opinion, goal more important than indicated by mean score:

"To my mind, this is one of the foremost problems and opportunities ahead for instructional technology."

Minority opinion, goal less important than indicated by mean score:

"Good teachers do this."

15. To conduct research to determine the effectiveness of instructional technology in various physical settings.

MEAN SCORE: 1.7 STANDARD DEVIATION: 0.96

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"Eventually, this will be of extremely high importance, but at the moment it is dangerous because of the low level of sophistication of our research, there are so many uncontrolled variables in our studies and mis-applications of design and statistical application, that we are setting ourselves up to be proven ineffective when our research is looked at closely. Not because we are right or wrong, but because of the compromises we are forced into. As an example, all applications of I.T. must match up objectives with means, but there are few systematic bridges available. Even the Gagne learning conditions are insufficient, etc."

"I'll up this if the operations research context is implied in 'various settings'."

"Such studies must continue, but in discussing priorities, by ranking them number 1 implies all developments must mark time until such studies are completed. This would be too bad."

"Field is already repleat with effectiveness studies."

16. To conduct research to identify appropriate settings for various types of learning.

MEAN SCORE: 1.8 STANDARD DEVIATION: 0.62

Minority opinion, goal more important than indicated by mean score:

"I think this is very important, if we are to get the most and best use of technology."

Minority opinion, goal less important than indicated by mean score: None.

17. To develop alternative self-instructional units for most of students' educational programs.

MEAN SCORE: 1.8 STANDARD DEVIATION: 0.67

Minority opinion, goal more important than indicated by mean score:

"Other people's responses on this item don't compare with the 80% open university responses."

Minority opinion, goal less important than indicated by mean score:

"Doubtful about 'most'."

18. To encourage instructional improvements within the traditional system of higher education.

MEAN SCORE: 1.8 STANDARD DEVIATION: 0.73

Minority opinion, goal more important than indicated by mean score:

"This has got to happen if media is to be significant at all levels of education."

"We need to get rid of tradition fast if we are to get anywhere in the years to come."

"If many private institutions do not improve, there may not be a traditional system left."

Minority opinion, goal less important than indicated by mean score:

"This can also be done in other ways."

"With instructional technology, I'm sure the existing system can cope with it."

19. To change faculty to measure learning according to achievement.

MEAN SCORE: 1.8 STANDARD DEVIATION: 1.15

Minority opinion, goal more important than indicated by mean score: None.

"Conscientious faculty does this."

"I don't think you can do this; they already think they are. Evaluation should become a 'public' process. You'd get more change this way."

"Important, but better left to other groups."

"... rather than according to ...?"

"Aren't most faculty trying to do that now?"

"I cannot agree with the following statements: 'change faculty,' 'measure according to achievement.' I don't think it is our job to change faculty - we help them change - we need to provide the contingencies that will help them change ..."

20. To utilize instructional systems in academic planning.

MEAN SCORE: 1.9 STANDARD DEVIATION: 0.46

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"Important, but this is not the whole story."

"Overstress on methodology."

21. To develop strategies to gain faculty adoption of instructional technology.

MEAN SCORE: 1.9 STANDARD DEVIATION: 0.62

Minority opinion, goal more important than indicated by mean score:

"Extremely important - part of our trouble, a large part, could be overcome by faculty adoption."

Minority opinion, goal less important than indicated by mean score:

"I think that this will be of high importance once the area of instructional technology has been adequately defined and the range of its use and effectiveness better understood."

"If pressure is implied, I'm against it."

22. To define the area of instructional technology.

MEAN SCORE: 1.9 STANDARD DEVIATION: 1.01

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"It's highly important, but we can operate fairly well without an exact definition."

"There will always be 'definers'."

"Not a top priority."

"The job is done for awhile. A.E.C.T. committee on Definition will publish its statement in October, 1972, A.V.I., Carnegie Report, Commission on I.T., have all pretty well spelled out the definition. However, the task is never done."

"It's important, but we've already done a pretty fair job of this."

"Why? Self-serving?"

"I think through massive application and systematic reporting the area will define itself. To force a standard definition at this point might limit (or expand) the concept to the detriment of its evolution."

23. To increase accessibility of instructional materials and equipment.

MEAN SCORE: 1.9 STANDARD DEVIATION: 0.76

Minority opinion, goal more important than indicated by mean score:

"I believe that easy access to material and equipment is essential even though, in and of themselves, insufficient - also need well trained people and leadership."

"This is our chief purpose! Our raison de etre!"

"Access is all important. If I.T. doesn't do it, who will?"

"S.T.E.T. - sometimes the reverse is the modus operandi and we need to get away from that."

Minority opinion, goal less important than indicated by mean score:

"I don't think this is a major problem. In many cases the equipment and materials are there, but not used."

"Important, but not that crucial."

"I feel they are already quite accessible; if only they were used!"

24. To assign responsibility for instructional technology to the highest possible academic officers.

MEAN SCORE: 1.9 STANDARD DEVIATION: 1.04

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"Assign it to those who use it."

"Prefer faculty responsibility."

"I am fearful of traditional values and their impact on development."

"Ego trip!"

"Highest is not always best. Better support often comes from an Academic V.P. rather than the President, for example."

"If instructional technology is what it can be, I don't think it will have to be assigned to the 'highest officers'."

25. To develop skills in users of technology for goal-directed behavior.

MEAN SCORE: 2.0 STANDARD DEVIATION: 0.72

Minority opinion, goal more important than indicated by mean score:

"Must attempt to align with competency-based programs-goal directed."

"Definitely among the skills - extremely important."

"Seems to me this is the essence of the systems approach to technology's involvement, thus imperative."

Minority opinion, goal less important than indicated by mean score:

"Overstress on methodology."

"I don't think this is of high importance, inasmuch as all behavior is goal directed, although maybe not appropriately so."

26. To create hardware that is simple and inexpensive to use.

MEAN SCORE: 2.0 STANDARD DEVIATION: 0.47

Minority opinion, goal more important than indicated by mean score:

"This ensures widespread use of equality of opportunity."

Minority opinion, goal less important than indicated by mean score:

"Also pertinent to 'use'."

27. To provide pre-service instructors with knowledge of the potential of modern technology for improving learning.

MEAN SCORE: 2.0 STANDARD DEVIATION: 0.76

Minority opinion, goal more important than indicated by mean score:

"This is a must - to come early in training - if we haven't incorporated this in thinking and action, it's a bit late to begin after pre-service."

Minority opinion, goal less important than indicated by mean score:

"I feel this is a much neglected item, but could produce improved results if it were done."

"I assume pre-service instructors are there because they want to be. Do they have to be 're-sold'?"

"They also need to know other approaches."

28. To involve students in the design of their own educational programs.

MEAN SCORE: 2.0 STANDARD DEVIATION: 0.92

Minority opinion, goal more important than indicated by mean score:

"Students learn more effectively when programs are geared to their individual needs, abilities and desires."

"This is a key to relevance of subject matter and instructional technology."

"I can't downgrade the increased importance of student determination in educational planning."

"Isn't this what it's all about? Why not give students more opportunity to make decisions for themselves under guidance?"

"This is the way education is going and I agree with its importance."

"This helps students to learn more about the educational process - what it is and how it works; fosters greater sense of responsibility for their education."

Minority opinion, goal less important than indicated by mean score:

"The idea is appealing, and I endorse it. But the full development of technology for instruction can progress enormously before this becomes a matter of high priority."

"Not this high, but is important. It certainly is a trend."

"To involve competent and ambitious students."

29. To set accreditation standards for learners instead of institutions.

MEAN SCORE: 2.0 STANDARD DEVIATION: 0.91

Minority opinion, goal more important than indicated by mean score:

"This correlates with output instruction."

Minority opinion, goal less important than indicated by mean score:

"Important, but better left to other groups."

"Important - but probably not feasible for anything like the near future."

30. To form multi-state consortia of colleges and universities for joint efforts in instructional development and technology.

MEAN SCORE: 2.0 STANDARD DEVIATION: 0.73

Minority opinion, goal more important than indicated by mean score:

"I don't see how the recommendations made recently, re: Kerr Report, can be implemented without them."

"Do not feel too strongly here, but still feel disinclined to change my response."

Minority opinion, goal less important than indicated by mean score:

"Consortia will not influence instructional technology very much."

"A matter of degree of importance."

"This is straining at something that is more distracting than helpful."

31. To formulate, implement and periodically revise quantitative and qualitative standards in instructional technology.

MEAN SCORE: 2.0 STANDARD DEVIATION: 0.60

Minority opinion, goal more important than indicated by mean score:

"Again, I believe easy access to material and equipment is essential even though in and of themselves, insufficient - also need well trained people and leadership."

Minority opinion, goal less important than indicated by mean score:

"Important, but not that crucial."

32. To disseminate results of research establishing the instructional value of educational media.

MEAN SCORE: 2.0 STANDARD DEVIATION: 0.60

Minority opinion, goal more important than indicated by mean score:

"Also opposite results, whenever they occur."

Minority opinion, goal less important than indicated by mean score: None.

33. To improve techniques for teaching minority groups.

MEAN SCORE: 2.0 STANDARD DEVIATION: 0.87

Minority opinion, goal more important than indicated by mean score:

"Present systems are not doing well in teaching minority groups."

Minority opinion, goal less important than indicated by mean score:

"Silly question! Currently we don't know how to teach any group. This is plugging one hole in a sieve. All of us are minorities in some fashion. This goal aspires to treat symptoms, not the disease."

"Emphasis should not be confined only to minority groups. Goal is discriminatory."

"Abide by my assessment. Don't think this is key to development."

34. To change faculty to measure institutional outputs in terms of student achievement.

MEAN SCORE: 2.1 STANDARD DEVIATION: 1.04

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"Important, but better left to other groups."

"Sorry, but this goal is too ambiguous. I have trouble with the concept of 'changing' faculty. 'Persuade' or 'require' might have helped. And I think something ought to be said to indicate the standard against which 'achievement' is to be measured - student ability? national norm? class norm? pretested knowledge?"

"Too often becomes simplistic."

35. To direct education toward a role of deliberate change agent rather than an accidental change agent.

MEAN SCORE: 2.1 STANDARD DEVIATION: 0.83

Minority opinion, goal more important than indicated by mean score:

"Education must do this or expire as a public enterprise. To avoid haphazard development of education in meeting needs of society."

Minority opinion, goal less important than indicated by mean score:

"O.K., but does technology do this?"

"This concept is much broader than just technological developments. Energy devoted here will 'slow down' gains."

"Who or what determines choice of change agent?"

36. To develop new procedures for cost studies of instructional strategies.

MEAN SCORE: 2.1 STANDARD DEVIATION: 0.99

Minority opinion, goal more important than indicated by mean score:

"We cannot neglect instructional cost in our total instructional development planning."

"I feel, this should stay #1, particularly if we are to change faculty to measure learning according to achievement."

Minority opinion, goal less important than indicated by mean score:

"I see little relationship between cost studies and instructional strategies."

"Important, but better left to other groups."

"Better, not necessarily new."

37. To specify architectural and environmental conditions necessary for instructional technology.

MEAN SCORE: 2.1 STANDARD DEVIATION: 0.84

Minority opinion, goal more important than indicated by mean score:

"It so often sets the limits of what can be done. All our philosophy and plans can be for naught if the environment is not there."

"Environmental conditions are a necessary component to success."

Minority opinion, goal less important than indicated by mean score:

"'Packaging' is not all that important."

"Not a basic priority."

38. To conduct studies to establish the validity of instructional technology.

MEAN SCORE: 2.1 STANDARD DEVIATION: 1.23

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"Validity already established by research and instruction."

"Such studies must continue, but in discussing priorities, by ranking them number 1 implies all developments must mark time until such studies are completed. This would be too bad. Also, how do you define 'validity' in this context?"

"It's been done. What we need is to change education in the light of what we know about I.T.."

"Instructional technology is here. It is established. To devote finite time to justification studies is a waste."

"No one says that I.T. isn't valid. Some say it is dangerous, which it is, some say it is impotent in its present application in education, which it is. What is lacking are people with the significant skills at different levels of application."

"Just get the results disseminated in a meaningful way."

"I think the validity of instructional technology has been established. How, when, where, with whom is another question."

"Not a basic priority."

39. To influence manufacturers of technological devices to meet curriculum designer applications with products.

MEAN SCORE: 2.1 STANDARD DEVIATION: 0.46

Minority opinion, goal more important than indicated by mean score:

"A long-felt need - must have technological devices which are designed for the job."

Minority opinion, goal less important than indicated by mean score:

"This goal is straining at something that is more distracting than helpful."

40. To provide funding of local projects of instructional technology.

MEAN SCORE: 2.2 STANDARD DEVIATION: 0.72

Minority opinion, goal more important than indicated by mean score:

"Without money you don't go!"

Minority opinion, goal less important than indicated by mean score:

"There is a danger that too much local funding will dilute high quality."

"I am convinced that continued change will take place only through reallocation of existing resources as a result of using a systematic management system (P.P.B.S.)."

"A basic function of government and industry."

"I don't think we want to over-encourage the notion that instruction must be local invention."

"Although both local and general application projects are very important, general application projects promise greater savings and will make use attractive more rapidly."

41. To create more awareness in the U.S.O.E. of the value of instructional technology in higher education.

MEAN SCORE: 2.2 STANDARD DEVIATION: 1.13

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"With increasing use of instructional technology, U.S.O.E. will see its value."

"I still maintain that continued change must be through reallocation of internal funds, rather than through external agencies."

"The U.S.O.E. awareness is already sufficient."

"Grass roots is greater than Washington, D.C."

"I think there is an awareness there - more so than on part of the practitioners in the field."

"I'm impressed by what they have done. Besides, the priority effort would be to pinpoint responsibility within this large agency."

"The awareness will come if and when that awareness is politically expedient."

"Cart before the horse?"

"An associate commissioner for educational technology has been designated, so that problem is being met."

"Isn't awareness enough?"

42. To set standards for educational equipment and materials.

MEAN SCORE: 2.2 STANDARD DEVIATION: 0.60

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"Standards tend to mediocrity."

"Important, but not crucial."

43. To extend instructional technology to public schools.

MEAN SCORE: 2.3 STANDARD DEVIATION: 0.95

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"I protest this arrogance."

"I think there is far more use of instructional technology in the public schools than there is in higher education."

"This is not a major purpose of higher education."

"Public schools are now far ahead of higher education. This goal is only of minor importance when contrasted with goals necessary to service higher education."

"This sounds as though the public schools have little technology. They have much."

"Better to improve aims, content, materials, methods, and guidance."

44. To develop a close bond with those concerned with the expressive and affective side of student' growth and development.

MEAN SCORE: 2.3 STANDARD DEVIATION: 1.01

Minority opinion, goal more important than indicated by mean score:

"I'd like to stay with #1 (of extremely high importance), because I think this area is grossly overlooked and is as important as intellectual growth, if we are to encourage the growth of well-educated people."

Minority opinion, goal less important than indicated by mean score:

"Who are 'those concerned with expressive growth'? Same as those concerned with cognitive growth?"

"Affective and expressive side should be recognized as influencing the mind and learning but schools should not become sensitivity centers."

45. To increase numbers of persons in instructional technology for work in institutions on all levels of education.

MEAN SCORE: 2.3 STANDARD DEVIATION: 1.01

Minority opinion, goal more important than indicated by mean score:

"S.T.E.T. - let's practice what we preach and not be afraid to put it in print!"

"In the history of I.T., the barriers have been different at different times. Barriers of equipment, materials, money, and so forth. Today's barrier is people."

"Read the Carnegie Commission report. 45,000 needed by 1980 for higher education alone."

"People are a most important resource."

Minority opinion, goal less important than indicated by mean score:

"Not until they are realized as necessary and backed - not as a fad and then act.

"Demand will generate supply."

"Cart before the horse."

"Have any studies been made of the effectiveness of persons working in instructional technology and how they might be more efficient?"

"Empire building?"

46. To integrate instructional technology with library resources.

MEAN SCORE: 2.3 STANDARD DEVIATION: 1.33

Minority opinion, goal more important than indicated by mean score:

"It's not done widely; common sense says it must be to achieve the media field goals."

"Total learning experience."

Minority opinion, goal less important than indicated by mean score:

"It depends on how we define I.T. If resources are paramount, I would indicate #1 (of extremely high importance). However, if I.T. is instructional development, then I must stay at #4 (of low importance). (I believe it is closer to instructional development)."

"Such integration is desirable for some situations and aspects of I.T., but would be too delimiting for some other aspects, e.g., C.C.T.V., C.A.I. and other innovations to come."

"Some library programs are poor and I don't want technology to lose any further ground. Librarians aren't ready!"

"To my mind this is the easiest task before us."

"Helpful, but not critical."

47. To reduce the unit cost of instruction.

MEAN SCORE: 2.3 STANDARD DEVIATION: 1.03

Minority opinion, goal more important than indicated by mean score:

"Education is pricing itself out of the market!"

"If we in I.T. don't do it, who will? Economic pressures will continue. We must respond."

"The economic situation in general warrants a close look at cost/benefits."

"Instructional technology simply will not be developed, whatever its other benefits, unless it becomes cost effective. One can agree that its other advantages may be overwhelming, but any practical assessments of chances for future development hinges on economic considerations."

Minority opinion, goal less important than indicated by mean score:

"We are not spending enough on instruction."

48. To influence higher education administration to increase budget figures for instructional technology.

MEAN SCORE: 2.3 STANDARD DEVIATION: 1.11

Minority opinion, goal more important than indicated by mean score:

"Higher education does not adequately support I.T. from appropriate funds."

"This will come with proof of value, but the pump needs priming!"

"Even with outside aid, institutions will have to do a great deal themselves."

"How can we do anything without support, financial and otherwise, of administration? S.T.E.T."

Minority opinion, goal less important than indicated by mean score:

"There is something about this goal that doesn't seem right. If it means influence based on evidence and need, I'll raise my rating."

"'Influence' implies pressure. To convince by scholarly evidence is preferable."

49. To establish the team concept for instructional technology work on campuses.

MEAN SCORE: 2.3 STANDARD DEVIATION: 0.92

Minority opinion, goal more important than indicated by mean score:

"I don't understand other people on this one. If one believes in a systems approach, he has to rate this high."

"Highly important - the successful projects on most campuses are team efforts."

"Instructional technologists cannot do their work alone. They will almost always work on a team of at least two."

"There is no way to utilize instructional technology fully if such utilization depends upon discipline - oriented innovators alone."

Minority opinion, goal less important than indicated by mean score:

"Another extraneous concept."

"Coordination is greater than 'team'."

"Individual work is underrated vis-a-vis fear."

50. To design institutional management systems.

MEAN SCORE: 2.4 STANDARD DEVIATION: 1.09

Minority opinion, goal more important than indicated by mean score:

"As long as educational management systems are organized like medieval fiefdoms, and as long as budgets are incremental, territorial imperatives - unaccountability will continue to haunt I.T. applications."

Minority opinion, goal less important than indicated by mean score:

"Of peripheral interest to I.T."

"Management is not going to be the major forum of I.T. This goal could be better handled by management specialists."

51. To adopt a code of performance and performance standards by a professional national organization for professionals in instructional technology.

MEAN SCORE: 2.4 STANDARD DEVIATION: 0.84

Minority opinion, goal more important than indicated by mean score:

"This is of primary importance."

"Ethics should be included in code."

"Feel this is of great importance. If national organizations adjudicate against us, we're in big trouble."

"Primary means of self-improvement for a profession."

"Unless we can 'police' our profession and the preparation of people for it we will be subject to charlatanism."

"This is a mark of a profession, a criterion that must be taken very seriously."

Minority opinion, goal less important than indicated by mean score:

"I'll stick with the importance of licensing our own people."

52. To establish federal support for instructional technology at 1% the total national expenditure for higher education.

MEAN SCORE: 2.4 STANDARD DEVIATION: 1.01

Minority opinion, goal more important than indicated by mean score:

"Rapid progress cannot be made without generous federal support early in the game. Some respondents may be reluctant to endorse so specific a figure. But, the figure is not unreasonable and seems to me to be the least amount that can make an effective difference."

"Good idea, but we aren't that strong in Washington."

Minority opinion, goal less important than indicated by mean score:

"Federal support important, but specification of 1% national expenditure is not."

"I don't think federal support will solve the problem. It has to be done at the institutional level."

"I really have no idea what 1% would do, or whether it would be sufficient or not. Would depend on how it is used, and whether its use is based on research evidence."

"To be effective, this program needs local support mainly, federal support only peripherally."

"I don't like quotas or percentages. If I had to pick a percentage, it would be considerably higher."

53. To restructure higher education fiscal apparatus to eliminate F.T.E. as basis for funding.

MEAN SCORE: 2.5 STANDARD DEVIATION: 1.63

Minority opinion, goal more important than indicated by mean score:

"This problem is better left to other groups."

"Replace something with nothing?"

"We could get something worse? Have we a better alternative? Could we define F.T.E. in a better way?"

"This strikes me as only one of several techniques, the impacts of which may not be realized early enough to constitute a reason for developing and using instructional technology."

"Worthy goal, but how appropriate for I.T.?"

"I can't see that this has much basis for instructional technology. One standard is as good as another when both are artificial."

54. To develop systems to locate and reproduce research materials swiftly, at low costs.

MEAN SCORE: 2.5 STANDARD DEVIATION: 0.95

Minority opinion, goal more important than indicated by mean score:

"As the amount of knowledge increases it becomes more and more difficult for individuals to not only master it but also locate it."

"We must tie development to research - desperately need materials."

Minority opinion, goal less important than indicated by mean score: None.

55. To provide expertise to enable universities to establish external degree programs.

MEAN SCORE: 2.5 STANDARD DEVIATION: 0.99

Minority opinion, goal more important than indicated by mean score:

"If education becomes universal it will need different types of universities to provide education for different population groups."

"To ensure diversity in the programs of internal degrees."

Minority opinion, goal less important than indicated by mean score:

"Seems to be a 'red herring' to instructional technology."

"Present institutional design can accommodate this goal already."

"This is primarily a convenience to part-time students. It represents a dilution of control and resources."

"Many universities already are ready for this but not backed by the state."

56. To develop macro-systems to provide any learner with materials to achieve any behavior he desires.

MEAN SCORE: 2.6 STANDARD DEVIATION: 0.93

Minority opinion, goal more important than indicated by mean score:

"In this way content and style can be adapted to different learning styles."

"This isn't medium, this is extremely important if learner is to choose and have options in his program."

Minority opinion, goal less important than indicated by mean score:

"Any behavior, only if socially good behavior."

"No - not any behavior he desires - might be behavior dangerous to himself and his neighbors."

57. To refocus higher education from technological innovation to social innovation.

MEAN SCORE: 2.6 STANDARD DEVIATION: 1.12

Minority opinion, goal more important than indicated by mean score:

"A must, if innovation to be implemented throughout technology."

"Neglected, needed."

"The purpose of education is social improvement!"

"Social innovations, in the long run, are more important and lasting than technological innovations."

Minority opinion, goal less important than indicated by mean score:

"Higher education, particularly liberal arts, should not be focused primarily on technological or social innovation."

"There should be equal emphasis on both, perhaps."

"This statement implies that technology is necessarily separate from social - this is a narrow concept of technology."

"Concern for the social scientist and academic faculty."

"Innovation toward what?"

58. To develop synergistic systems of public school, college and university personnel for joint goal setting and planning.

MEAN SCORE: 2.6 STANDARD DEVIATION: 1.01

Minority opinion, goal more important than indicated by mean score:

"We need to 'unisolate' the universities from the rest of the educational system."

"I think it is very important to see education as a 'continuing' process."

"Highly important that the university become involved in this rather than operate from an 'ivory tower' position."

"Must have a cooperative effort among R & D and users of technology."

"As long as the 'right hand knoweth not what the left doeth,' private interest will overcome the public good. Tight little enclaves of I.T. applications will never be sufficient. Each part of the system effects the other parts. The engine is running nicely, but let's get some air in that rear tire!!"

"I think this is very important. We need much more cooperative efforts in planning."

Minority opinion, goal less important than indicated by mean score:

"Isn't this actually the kind of rhetoric that enables educators to accomplish nothing?"

"Important, but only medium, in view of all the other requirements."

59. To cooperate with scholars abroad toward mutual development of instructional technology.

MEAN SCORE: 2.6 STANDARD DEVIATION: 0.65

Minority opinion, goal more important than indicated by mean score:

"If technology is to achieve its potential we must get help whenever it is available."

"One year from now I would rate this even higher. I'm afraid we're being leapfrogged."

"So as not to duplicate research efforts or to waste human resources."

"Technology is an area different countries can work together easily."

"Cosmopolitan, not parochial approach."

Minority opinion, goal less important than indicated by mean score:

"Of medium importance, the field will develop regardless of this."

60. To devise full international access systems of all instructional materials.

MEAN SCORE: 2.7 STANDARD DEVIATION: 0.89

Minority opinion, goal more important than indicated by mean score:

"To foster globalism and to avoid duplication of both human and material resources."

"International cooperation is essential for good education in university."

Minority opinion, goal less important than indicated by mean score:

"Very unwieldy concept, 'all instructional materials' is too inclusive."

61. To set national certification of training programs for technologists in higher education.

MEAN SCORE: 2.7 STANDARD DEVIATION: 1.25

Minority opinion, goal more important than indicated by mean score:

"Colleges of education, etc., are incapable of rapid enough change on their own. Internal entrenchment could more readily be broken up."

"There are far too many institutions of higher learning where I.T. courses are taught by unqualified teachers. We require certification for elementary and secondary teachers. It is extremely important that they be taught by highly qualified personnel and we won't get these except by certification."

Minority opinion, goal less important than indicated by mean score:

"Certification implies a standard and will tend to stultify the creature development of instructional technology."

62. To use P.P.B.S. as a means of resource control and accountability.

MEAN SCORE: 2.7 STANDARD DEVIATION: 1.00

Minority opinion, goal more important than indicated by mean score:

"Yes, in order for us to achieve greater accountability."

Minority opinion, goal less important than indicated by mean score:

"P.P.B.S. (at least as a specific approach) has been demonstrably ineffective and is on its way out, to be replaced by something else."

"Our impression is that P.P.B.S. is not the panacea it was once believed to be."

63. To establish independent credit granting office within institutions with power to invest technologically based instruction with as much authority as is vested in faculty.

MEAN SCORE: 2.7 STANDARD DEVIATION: 1.11

Minority opinion, goal more important than indicated by mean score:

"Good strategy to overcome the conservatism of the academic world."

Minority opinion, goal less important than indicated by mean score:

"It would be better to provide flexibility and correct any deficiencies in the institution. Transferring this responsibility to other authorities would open a Pandora's box of cheap credit."

"This appears to be a technique of subversion, to me. Just as the lowly private can screw up a military operation, so can any faculty member sabotage instructional development efforts. The real need is to make what we do and what we aim to do, clearly visible. Accountability must surely follow. Only if all groups within the system perceive the relevance of I.T. applications will such applications succeed."

"The profession must set its own standards, or anyone can walk it. Quality control needed."

"Keep me at #1, this would be a great help to the field."

"Another good way to ensure a 'quality professional'."

64. To establish credit and degree granting authorities independent of institutions.

MEAN SCORE: 3.0 STANDARD DEVIATION: 1.04

Minority opinion, goal more important than indicated by mean score:

"Increasing opportunities to non-university persons."

"The others fail to understand the dynamics of technology or the systemic problems of education."

"Need to attack the conservatism of institutions."

Minority opinion, goal less important than indicated by mean score:

"Must have support of institutions."

"I feel degrees and credits will still reside within established institutions."

65. To develop a higher education division in A.E.C.T. to advance instructional technology.

MEAN SCORE: 3.0 STANDARD DEVIATION: 1.13

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"Organizations are already too numerous and wasteful of time and energy."

"Professionalism."

"I am inclined to regard this type of goal as meaningless; an organizational shuffle."

66. To develop a statement of student/faculty rights to ensure that technology serves them, rather than the reverse.

MEAN SCORE: 3.1 STANDARD DEVIATION: 0.99

Minority opinion, goal more important than indicated by mean score:

"If you look at most of the programs that boast I.T. applications, you will find that the large majority of objectives fall into the cognitive and psychomotor domains, few are in the affective. Technology is a means, and as a means it is subject to Machiavellian ends. System technology is purposeful in making processes more efficient and effective, but it does not do so in terms of human values. We must set up these controls."

Minority opinion, goal less important than indicated by mean score:

"Because of the atmosphere in colleges - free inquiry, autonomy, etc., I do not think this will be a danger."

"Are we trying to set goals or rebuild the world? A statement of rights would be so maudlin as to defy respect."

"This is 'strawman' breastbeating."

67. To adjust laws to protect creative endeavor.

MEAN SCORE: 3.1 STANDARD DEVIATION: 0.81

Minority opinion, goal more important than indicated by mean score: None.

Minority opinion, goal less important than indicated by mean score:

"Tight copyright will kill much graphics in education."

68. To provide up to 80% of instruction in "open university" type systems.

MEAN SCORE: 3.1

STANDARD DEVIATION: 0.99

Minority opinion, goal more important than indicated by mean score:

"Actually this is not a goal so much as it is an expectation, although successful competition with the 'core' institutions, using instructional technology to gain an advantage, will have great impact in the direction of encouraging introduction of instructional technology in traditional institutions."

"80% is arbitrary and a bit high. It probably should not even be a goal since it does not arise from specific problems."

"While I don't like percentages, I used this item to show how strongly I feel about breaking the present structure."

Minority opinion, goal less important than indicated by mean score:

"Not enough information at present to set a figure as definite as 80%. It is important that we ascertain the right percentage before we can make the statement."

"80% is arbitrary - may not apply to all situations."

"Completely unrealistic."

"I balk at a fixed point."

69. To prepare instructional technologists for work in foreign countries.

MEAN SCORE: 3.2

STANDARD DEVIATION: 0.83

Minority opinion, goal more important than indicated by mean score:

"Because we are the most advanced and affluent country we should be able to help others."

Minority opinion, goal less important than indicated by mean score:

"I have very few missionary feelings. I regard this as a further dissipation of our energies. This, in no way, means that I am against countries studying each others educational or instructional technologies."

"A ghetto is a foreign country for most of us - if you mean 'ghetto,' I would shift to 'extremely high importance'."

"Can't see importance to us. O.K. as offshoot of our efforts."

"We have some obligation, of course, but our needs are here and our money comes from U.S. governmental sources. Not isolationism, but priority setting, on my part."

70. To promote the establishment of a National Institute of Instructional Technology.

MEAN SCORE: 3.2 STANDARD DEVIATION: 1.21

Minority opinion, goal more important than indicated by mean score:

"To provide research, education, and knowledge in a centralized fashion."

"This could become the research and development focal point for I.T."

"I don't understand how people can not respond to this if they responded the way they did on others."

Minority opinion, goal less important than indicated by mean score:

"For what purpose?"

"Every problem cannot be solved by a national institute."

71. To orient college education away from occupational competence toward a liberal education.

MEAN SCORE: 3.6 STANDARD DEVIATION: 0.96

Minority opinion, goal more important than indicated by mean score:

"Occupational competence is training, not education."

"Amen, I stand pat!"

Minority opinion, goal less important than indicated by mean score: None.

72. To employ instructional technology to enable individuals to acquire a baccalaureate degree by age 18.

MEAN SCORE: 3.8 STANDARD DEVIATION: 0.96

Minority opinion, goal more important than indicated by mean score:

"A logical possibility with an output instructional orientation."

"I'm not arguing that every student should be able to get the baccalaureate by age 18, but if he or she were, we might begin to solve some important social problems."

Minority opinion, goal less important than indicated by mean score: None.

73. To recommend the use of a voucher system for higher education.

MEAN SCORE: 4.0 STANDARD DEVIATION: 0.72

Minority opinion, goal more important than indicated by mean score:

"Freedom of choice."

Minority opinion, goal less important than indicated by mean score:

"Technology is not the proper vehicle."

"We already use a voucher system."

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