

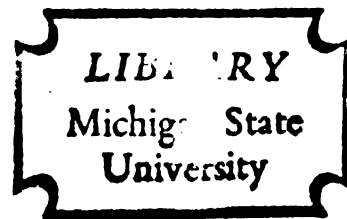
EXPRESSED ATTITUDES OF THREE SELECTED GROUPS
TOWARD INSTRUCTIONAL DEVELOPMENT AS A
FUNCTION OF (1) AGE, (2) YEARS OF EXPERIENCE,
AND (3) INSTRUCTIONAL MODE: AN EXPLORATORY STUDY

Thesis for the Degree of Ph. D.

MICHIGAN STATE UNIVERSITY

MARVIN EARL DUNCAN

1972



This is to certify that the

thesis entitled

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TOWARD INSTRUCTIONAL DEVELOPMENT AS A
FUNCTION OF (1) AGE, (2) YEARS OF EXPERIENCE
AND (3) INSTRUCTIONAL MODE: AN EXPLORATORY STUDY

presented by

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has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Education

A handwritten signature in cursive script, reading "Samuel L. Miller".

Major professor

Date June 12, 1972

ABSTRACT

EXPRESSED ATTITUDES OF THREE SELECTED GROUPS TOWARD
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The purpose of the study was to determine the degree of difference in expressed attitudes toward instructional development which existed between and among three selected groups.

The population consisted of 31 participants in an Instructional Development Institute conducted in Toledo, Ohio, 46 students enrolled in Education 831A, a graduate media course at Michigan State University, and 33 professional educators from the East Lansing, Michigan public school system. The population was selected and data were gathered during the Winter quarter of the 1971-72 academic school year.

Before administering the instrument, "Attitude Toward Instructional Development," a fifty item Likert type questionnaire, it was necessary to determine if the instrument was unidimensional, i.e., measured one and only one psychological object. Scalogram Analysis was used to determine unidimensionality. After applying Scalogram Analysis to the original instrument, the scale was modified and contained 24 items. The modified scale was shown to be sufficiently unidimensional (.85 index). A demographic

sheet designed for this study was then attached to the modified scale. The raw data was then subjected to statistical analysis. Specifically, a 2-way analysis (3 x 2 design) of variance was used to determine the degree of difference which existed between and among the three groups as a function of age and treatment. A one-way analysis of variance was used to determine the degree of difference which existed between and within the groups as a function of experience. The .05 per cent level of confidence was used for this and all subsequent analysis.

The analysis of the results supports the following conclusions:

1. The Instructional Development Institute group and the 831A class differed significantly in their expressed attitudes from the control group.
2. No significant differences were found between the groups as a result of age and experience.
3. There existed a relationship between age and experience. A correlation coefficient of $+0.766$ indicates the direction of this relationship.

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Marvin Earl Duncan

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DEDICATION

To my mother, Mary E. Duncan, who gave me life and whose strong belief in me provided constant external reinforcement when times were difficult. To my Godfather, James E. Parker, who found me in the "nick of time" and who constantly pushed and encouraged me to pursue academia more extensively.

Finally, to my daughter, Crystal Lynn, who is a ball of joy and inspiration and who never stopped loving and believing in daddy. There were times when I wished I could have shaped her thoughts, her being, and even her love. Thinking back as Watson must have, what would I have gained, for:

Your children are not your children
they are the sons and daughters of Life's longing
for itself
they come through you but not from you
and though they are with you yet they belong not to you
you may give them your love but not your thoughts,
for they have their own thoughts.
You may house their bodies but not
their souls,
for their souls dwell in the house of
tomorrow, which you cannot visit, not even
in your dreams,
You may strive to be like them, but seek
not to make them like you
for life goes not backward nor tarries
with yesterday.

Kahlil Gibran--The Prophet, p. 17.

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Thanks to Dr. Paul Witt who was very instrumental in my coming to Michigan State University and for his continued interest in my professional career. Without words of encouragement such as those provided by Dr. Witt, this task may never have been completed. My gratitude is also extended to my committee: Dr. Elwood E. Miller, Chairman, Dr. Walter G. Hapkiewicz, Dr. Curt McCarty, and Dr. Dale Alam.

Dr. Miller has stuck with me through difficult times. Thanks for everything "Woodie." Special thanks to Dr. Hapkiewicz who over time became a good friend and without whose assistance this task would have been unbearable.

To all the guys and gals in Linton Hall who journeyed along the same academic path. Finally, to Richard Boutelle--a true friend. Remember, Dick, as the distance between our physical being increases, the friendship and brotherly love nurtured the past two years shall remain invariant. I leave with immutable gratitude.

M. E. D.

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INTRODUCTION

Those genuinely concerned with education are aware that there is a tremendous amount of information to be learned by students of all ages. Much of this information may well be learned in an environment far different from the traditional "four walls." Given that students will learn in spite of the professor, it still remains paramount that the professor does adequately and efficiently what he can to insure that learning occurs while he is managing the learning environment. Smith and McAshan¹ found that as much as 85 per cent of course learning may result from sources other than the teacher. It is unquestioned that learning does occur beyond the matrix of the classroom. The question becomes, how do we best facilitate learning while controlling its parameters?

Alfred North Whitehead could well be referring to the importance of providing information basic to the formulation of a learning hierarchy. He writes:

¹Ralph Smith and Hildreth H. McAshan, "A Comparison of the Relative Effectiveness of Four Methods of Teaching Ninth Grade General Science," in New Media Studies for Improvement of Science and Mathematics Instruction, ed. by Loren Twyford et al. (New York State Department of Education, 1964), p. 122.

²Alfred North Whitehead, The Aims of Education (New York: The MacMillan Company, 1958), p. 13.

. . . what we should aim at producing is men who possess both culture and expert knowledge in some special direction. Their expert knowledge will give them the ground to start from, and their culture will lead them as deep as philosophy and as high as art.

It appears that what is needed is a systematic process of providing this basic core of knowledge given that there is general agreement on what is to be learned.

In the midst of financial stringency which is forcing educators to set priorities, it is clear that institutions are no longer under the aegis of legislators. Presently, pressure is being applied from various publics asking that educators be accountable to someone and for something. The process alluded to earlier and referred to here is termed "instructional development." This is not to suggest that instructional development is a panacea. It is simply, a systematic process of designing, carrying out, evaluating and constantly monitoring instruction with the intent of improving its quality.

As in most instances when a relatively new idea/innovation emerges, there is resistance to change. Fortunately, in time, acceptance is inevitable. Don Williams³ contends that in an age of rockets and jet airplanes, educators continue to lag behind other sectors of society in their use of modern technology. Perhaps instructional development will follow the pattern of other innovations

³Don Williams, "8 mm Mirage or Miracle," Audio-visual Instruction, Vol. 9, No. 4 (April, 1964), p. 233.

and in time its potential will come to fruition. This will take time. Can education afford to wait? Can our schools? Most importantly, can the leaders of tomorrow afford the oversight of today?

CHAPTER I

THE PROBLEM

Purpose of the Study

The purpose of this study is to determine the degree of difference, if any, in expressed attitudes toward instructional development which exist between and within three groups of teachers as a function of: (1) age, (2) years of experience, and (3) instructional mode.

Hypotheses to Be Tested

The study will specifically test the following hypotheses:

1. There will be a significant difference in the expressed attitudes of the three groups as a result of exposure to the instructional development concept via different instructional modes.
 - (a) The IDI group will express a more positive attitude toward instructional development than will the 831A group.
 - (b) The 831A group will express a more positive attitude toward instructional development than will the control group.
2. Attitude toward instructional development will become more positive with age.
 - (a) There will be a significant positive correlation between scores on the attitude scale and age.
3. Attitudes toward instructional development will

become more positive with experience.

- (a) There will be a significant positive correlation between scores on the attitude scale and experience.

Need for the Study

Instructional development is a systematic process of bringing relevant instructional goals into effective learning activity.¹ It is a relatively new concept which must be spread throughout the academic community if its full potential is to become a reality. Therefore the assessment of attitudes toward instructional development as an innovation is a necessary step prior to the diffusion process since the concept must be diffused and accepted before the innovation itself is diffused and adopted. The concern here is with the perception of the innovation rather than the innovation per se.

Aberle and Stewart, as cited by Rogers, illustrate the importance of one's perception of an innovation and write: "It matters little whether or not an innovation has a great degree of advantage over the idea it is replacing. What does matter is whether the individual perceives the relative advantage of the innovation."² Since

¹Dale G. Hamreus, Toward a Definition of Instructional Development, Presented at the 1971 AECT Annual Convention, Philadelphia, Pennsylvania, March 24, 1971, p. 1.

²Everett M. Rogers, Diffusion of Innovations (New York: The Free Press, Collier-Macmillan Limited, 1969), p. 2.

perception varies from one person to another, an objective measure of a sample population's attitude toward the innovation or psychological object can do much to provide baseline data upon which the diffusion process, and eventually the adoption process, could be developed. In other words, a logical step may be to determine how individuals perceive the idea of the innovation prior to attempts to diffuse and adopt the innovation.

An innovation is an idea perceived as being new by the potential adopter. Rogers contends that:

. . . An innovation is an idea perceived as new by the individual. It really matters little, as far as human behavior is concerned, whether or not an idea is "objectively" new as measured by the amount of time elapsed since its first use or discovery. It is the newness of the idea to the individual that determines his reaction to it.³

Without full awareness of the innovation and a positive attitude towards it, an individual may temporarily adopt the innovation, but discontinuance, a form of rejection, may follow. Ultimately, as Lin et al. noted, "it is the degree of a teacher's attitudinal acceptance of a specific innovation . . . thus, an important factor to be considered in the process of innovation would be the attitudes of the individual faculty members."⁴

³ Ibid., p. 13.

⁴ N. Leu Lin, E. M. Rogers and D. F. Schwartzs, The Diffusion of an Innovation in Three Michigan High Schools: Institution Building Through Change, Institute for International Studies in Education and the Department of Communication, Michigan State University, East Lansing, Michigan, 1966.

Instructional development has recently become quite popular as evidenced by the number and frequency of publications devoting attention and space to further refine a definition. This refinement appears to be a logical step prior to attempts at assessing attitudes which people have toward the process. That is, one must know what is to be measured before attempting to measure.

There are many definitions of instructional development, most of which point out that instructional development is a process. Recently, however, attention has been given to the human factor or element of the process. Witt⁵ contends that interpersonal relations and group dynamics are vitally important factors in group endeavors such as most instructional development efforts. Yet, devotees of the instructional development movement have not given enough attention to the human element of the process.

Gustafson asserts:

. . . the most important element of instructional development is people . . . people are its energy, its insight, its product and its consumer and to engage in instructional development is to change people. To ignore any segment of the population is to invite frustration and probable failure.⁶

⁵Paul W. F. Witt, Instructional Development: What? Why? How? Who? Presented at the Symposium on Instructional Development, Michigan State University, May 3 and 7, 1971.

⁶Kent L. Gustafson, Toward a Definition of Instructional Development, A paper presented to the Instructional Development Division, Association for Educational Communications and Technology, Philadelphia, Pennsylvania, March, 1971, pp. 6-7.

The President's Commission recognized the importance of considering the human element as evidenced by its definition:

. . . 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.⁷

In dealing with the human factor then, it appears important to assess the attitudes which people have toward the process since these attitudes may determine, to a great extent, the nature of their involvement in instructional development endeavors.

Attitudes and Behavior

The general assumption is that knowledge of one's attitudes can serve as dependable predictors of his overt behavior. Few studies have been conducted to prove or disprove this notion. However, those studies which have attempted to show that one's attitudes are predictors of his overt or verbally expressed behavior have found little or no consistent relationship. Fishbein states:

. . . after more than seventy-five years of attitude research, there is still little, if any, consistent evidence supporting the hypothesis that knowledge of an individual's attitude toward some object will allow

⁷To Improve Learning: A Report to the President and the Congress of the United States. By the Commission on Instructional Technology (Washington, D. C.: U. S. Government Printing Office, 1970), p. 5.

one to predict the way he will behave with respect to the object.⁸

Some authors have questioned the idea that a strong relationship actually exists between attitude and behavior. Cook and Sellitz⁹ stated that the measuring instrument is responsible for inconsistency of findings. Others, such as DeFleur and Westie,¹⁰ question the definitions which have developed for the concept "attitude." Still others have combined the above and question both the validity of the measuring instruments and the concept definition.¹¹

It appears that many of the research studies on attitudes attempt to assess the attitudes that a person has toward the object only and fail to consider the importance of the situation. Rokeach writes that: "If one focuses only on attitude-toward-object, one is bound to observe some inconsistency between attitude and behavior."¹² It seems then that action is determined by more than

⁸M. Fishbein, "Attitude and the Prediction of Behavior," in Readings in Attitude Theory and Measurement, ed. by M. Fishbein (New York: Wiley, 1967), p. 477.

⁹S. W. Cook and C. Sellitz, "A Multiple-Indicator Approach to Attitude Measurement," Psychological Bulletin (1964), pp. 36-55.

¹⁰M. DeFleur and F. Westie, "Attitude as a Scientific Concept," Social Forces, Vol. 42 (1963), pp. 17-31.

¹¹D. Katz and E. A. Stotland, "A Preliminary Statement to a Theory of Attitude Structure and Change," Vol. 3, Formations of the Person and the Social Context, ed. by S. Koch (New York: McGraw-Hill, 1959), pp. 423-75.

¹²Milton Rokeach, A Theory of Organization and Change (San Francisco: Yarsey-Bass, Inc., 1968), p. 126.

attitude toward object. Kretch, Crutchfield and Ballachey contend that: ". . . Action is determined not by a single attitude, but by a number of attitudes, wants, and situational conditions."¹³

The assumed relationship between attitude and behavior was addressed by La Piere¹⁴ (1934), Allport¹⁵ (1935), Doob¹⁶ (1947), Chien¹⁷ (1948) and Kutner, Wilkens and Yarrow¹⁸ (1952) to mention the most noted efforts.

La Piere and Kutner et al. found a considerable discrepancy between expressed attitude and actual behavior. They found that the respondents' expression of behavior, as indicated by a questionnaire, and actual or expressed behavior towards the psychological object in question were quite different. The results of the previous studies would probably have been expected by Allport, Chein and

¹³D. Kretch, R. Crutchfield, and E. L. Ballachey, Individual in Society (New York: McGraw-Hill, 1962), p. 163.

¹⁴R. T. La Piere, "Attitudes vs. Action," Social Forces (1934), pp. 230-37.

¹⁵G. W. Allport, "Attitudes," in Handbook of Social Psychology, ed. by C. Murchison (Worcester, Mass: Clark University Press, 1935), pp. 798-844.

¹⁶L. W. Doob, "The Behavior of Attitudes," Psychological Review, Vol. 54 (1947), pp. 135-56.

¹⁷I. Chein, "Behavior Theory and the Behavior of Attitudes: Some Critical Comments," Psychological Review, Vol. 55 (1948), p. 178.

¹⁸B. Kutner, C. Wilkens and P. R. Yarrow, "Verbal Attitudes and Overt Behavior Involving Racial Prejudice," Journal of Abnormal and Social Psychology, Vol. 47 (1952), pp. 649-52.

Doob who believed that a person's attitude toward an object may fall at three different positions in three different dimensions and that a person may act contrary to his attitude. They therefore advanced a multicomponent definition of an attitude. However, major assessment efforts continue to treat an attitude as a unidimensional concept, i.e., Guttman and Osgood.

A study conducted by Kliejunas at Michigan State University (1969) was designed to systematically examine the relationship between attitude and behavior. Kliejunas' thesis was that an individual's behavior depends upon or is in some way directly influenced by his attitudes. The results of this study revealed the following:

- (1) Attitudes, properly conceptualized and measured, can be accurate predictors of behavior.
- (2) The importance of situational attitudes and their interaction with attitudes toward objects has been generally overlooked in past research in the relationship between attitude and behavior.¹⁹

Fishbein writes that researchers have failed to predict behavior from attitudes because:

- (1) We have often measured attitudes toward an inappropriate stimulus object . . . we have often measured attitude toward a class of people or objects when we should have been measuring attitudes toward a particular member of the class.
- (2) The particular behavior being studied may be completely or partially unrelated to attitude.²⁰

¹⁹Peter T. Kliejunas, "Attitude Toward Object and Attitude Toward Situation as Predictors of Behavior," unpublished dissertation, Michigan State University, 1969.

²⁰Fishbein, p. 483.

Perhaps, as Rokeach and Kliejunas point out, there will remain inconsistent findings as long as the predictive relationship is based solely on attitude toward object and failure to consider the importance of the interaction between the object and the situation.

A review of the literature reveals few attempts to assess the attitude which people express toward instructional development. In fact, most of the past research efforts in the professional area have been designed to assess only the attitudes which people have toward the utilization of instructional media. While media may be categorized as a subset of the instructional development process, the attitudes which are expressed toward media may not be and should not be assumed to be indicative or reflective of a person's attitude toward instructional development.

There is a real need to validate an instrument which will assess the attitudes which people have toward instructional development in order that the data obtained can be functional as well as accurate. Guttman writes: ". . . the common tendency has been to plunge into the analysis of data without having a clear idea as to when a single dimension exists and when it does not exist."²¹

That is to say, efforts must be made to determine

²¹Louis Guttman, "The Basis for Scalogram Analysis," reprinted from Studies of Social Psychology in World War II, (Princeton University Press, 1949). Bobbs-Merrill Reprint Series in the Social Sciences, Print No. 5-413, p. 63.

if the psychological object in question is actually being measured prior to the analysis of data or simply to determine unidimensionality where one and only one variable is measured. Studies of this nature are needed in instructional development to:

1. Provide baseline data for related but future research efforts with respect to attitudes which people have toward instructional development.
2. Offer new dimensions insofar as structuring content for instructional development courses.
3. Help develop strategies for implementation of instructional development procedures throughout the educational and social systems.
4. Offer guidelines for instructional development personnel to more effectively deal with the human element of the process.

Definitions

Terms peculiar to this study which need defining are as follows:

Attitude

The degree of positive or negative affect associated with some psychological object. A psychological object means any symbol, phrase, slogan, person, institution, ideal or idea toward which people can differ with respect to positive or negative affect.²²

²²Edward L. Allen and Bette C. Porter, "Attitude Measurement," in The Affective Domain: A Resource Book for Media Specialists (Washington, D. C.: Communication Service Corporation, 1970), p. 117.

Attitude Scale

. . . A quantitative method for assessing an individual's relative position along a unidimensional attitude continuum. The direction and intensity of the respondent's attitude are indicated by a single score which summarizes his responses to a series of items, each of which is related to the single concept, object, or issue under study.²³

Guttman Scale

. . . Consists of a relatively small set of homogeneous items that are unidimensional. A unidimensional scale measures one variable, and one variable only. The scale, often referred to as the cumulative scale, gets its name from the cumulative relation between items and the total scores of individuals.²⁴

Instructional Development

Instructional development is

a systematic process of designing, carrying out, and evaluating the learning and teaching process based on research in learning theory and communication and combining both human and nonhuman resources in an effort to bring about more effective learning.²⁵

Ideally, instructional development is a team process though it can be carried out by an individual. Members of the team may include an instructional developer, a subject

²³Ibid., p. 123.

²⁴Fred H. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1964), p. 485.

²⁵The Commission on Instructional Technology, To Improve Learning: A Report to the President and the Congress of the United States (Washington, D. C.: U. S. Government Printing Office, 1970), p. 5.

matter specialist, an educational psychologist, an evaluation specialist, a media specialist and other personnel deemed necessary by the nature and magnitude of the problem. The team cooperatively attempts to solve instructional problems.

Theory and Rationale

Much has been written about instructional development in recent years. Most writers appear to agree that instructional development is a process . . . a process of systematically designing, sequencing, evaluating, and constant monitoring of instruction with the intent of improving its quality or effectiveness and thereby improving learning.

Hamreus discusses in his definition,²⁶ four characteristics which he contends must be carefully analyzed and put into proper perspective with respect to instructional development endeavors. These are: (1) goal definition, (2) goal relevance, (3) systematization, and (4) evaluation. Goal definition means that the goals must be clearly defined. Goal relevance states that the instructional goals, although they may be clearly defined, serve no real purpose unless they are directly related to the constraints of the educational system in which these goals are imbedded. By systematization, he means that development efforts must

²⁶Hamreus, pp. 2-3.

proceed in a systematic way in order to achieve the intended goals. Evaluation connotes simply constant monitoring and assessing instructional development efforts. Needless to say, the constant monitoring and assessing of development efforts are paramount if wise decisions are to be made in choosing among development alternatives.

It appears then that instructional development is inextricably bound to the notion of equifinality²⁷ since it affords means by which one can identify, in a systematic manner, various paths to reach a common goal or objective, i.e., improving the quality of instruction and thus learning.

Instructional development is often referred to as the systems approach. It is a system in the sense that system theories are used in the development process. Gustafson²⁸ writes that instructional development is a system which has no beginning and likewise no end. There is no fixed beginning since instructional development efforts begin at various stages. There is no end since the development efforts are constantly monitored, reassessed and recycled. Therefore, one may assume that

²⁷A discussion of equifinality is found in Elwood E. Miller, "A Descriptive Study, Evaluation and Analysis of Instructional Systems Development Activities in Selected Departments at Michigan State University During the Period 1960-1963," Unpublished dissertation, Michigan State University, 1965, pp. 37-40.

²⁸Gustafson, p. 2.

instructional development is a non-linear process. In a broad sense, the systems approach is a systematic way of looking at a process. One gets the impression, after reviewing the literature, that the phrases "systems approach" and "instructional development" are being used interchangeably. In fact, the systems approach is defined by some authors in the very same way that instructional development is defined by others. The seemingly interchangeable definition is ". . . common sense by design." While the intent here is not to overstate or over-emphasize common sense, it should be pointed out as Greely noted: "Common sense is very uncommon." In other words, instructional development is a process which lends itself well to the use of common sense or a set of heuristics to guide one in achieving desired instructional outcomes.

The Need

The exploration of space alone attests to the fact that the horizon of knowledge is continually being expanded. Society has been confronted with this so-called knowledge explosion for several decades. Brown and Norberg²⁹ stated in the middle 60's that never before has a society been faced with the problem of providing so much learning to so many, in so little time and with so much at stake. Don

²⁹James W. Brown and Kenneth D. Norberg, Administering Educational Media (New York: McGraw-Hill Book Company, 1965), p. 1.

Williams³⁰ in an article entitled, "8 MM Mirage or Miracle," wrote that despite significant technological advancements and important changes thus far, it appears that education is trailing far behind other sectors of society in its use of modern technology and innovations. Rogers tends to agree with Williams and writes:

In spite of American's generally favorable attitude toward science and technology, a considerable time lag is required before an innovation reaches wide acceptance. This is true despite the economic benefits of the innovations studied. . . A 40 year time lag was found between the first success of the tunnel oven in the pottery industry and its general use. . . About 50 years elapsed after development of a new educational practice before its adoption by all public schools. Put in another way, the average American school lags 25 years behind the best practice.³¹

In many instances, this time lag is due in part to inadequate information about the innovation. Mesthene asserts that³² inadequate information brings about the creation of Myths. Perhaps by providing adequate information about instructional development, the differences in time between the awareness stage and the adoption stage of the instructional development process could be decreased significantly. This is especially crucial since one must first accept the idea of the innovation in the awareness stage prior to adopting it.

³⁰Don Williams, "8 MM Mirage or Miracle," Audio-visual Instruction, Vol. 4 , No. 4 (April, 1964), p. 233.

³¹Rogers, p. 2.

³²Emanuel G. Mesthene, Technological Change: Its Impact on Man and Society (Cambridge, Mass.: Harvard University Press, 1970).

The How

Many attempts have been made to explain the instructional development process. Admittedly, the explanation of a process is most difficult. However, graphic models have been used to do so since they provide a simultaneous presentation of a theoretical idea or process and at the same time point out and illustrate relationships which exist between constructs or component parts of a model. The relationship between component parts of a model are indicated by directional lines. These lines clearly indicate, with respect to instructional development models, that the instructional development process is non-linear since unidirectionality is not evidenced after inspection of these models, and particularly the directional lines. Since a model serves only as a guide, one should not attempt to impose a single model on every problem situation. In other words, there is no generic model of instructional development. A model should be modified to serve as a guide for finding solutions to an existing problem.

The heuristics of Barson, Haney and Lange³³ may serve as a point of departure for those seeking to understand more explicitly how the development process works. They suggest that the developer should, among other things:

³³John Barson, John B. Haney and Phil C. Lange, "The Heuristic Dimension of Instructional Development," Audio Visual Communication Review, Vol. 16, No. 4 (Winter, 1968), pp. 358-71.

(1) learn the professor first, (2) seek out dirty jobs, (3) not let words get in the way and (4) proceed on the basis of agreement. The developer should not abandon the old and must be interested in getting the instructional job done in a way that benefits the learner most and costs less with respect to time and both human and non-human resources. As Mager stated, "the designer doesn't give a rusty zipper about whether the procedures he is using are old. He cares only whether they work."

Granted that a model for instructional systems development is universal in only a general way, three such models are provided for illustrative purposes. The models included herein are: (1) Hamreus' mini-model--a condensed version; (2) Hamreus' mini-model--a six stage flow diagram of the mini-model; and (3) Glaser's basic teaching model.

Mini-model

Hamreus³⁴ believes that the multiplicity of activities engaged in may be classified into three stages. These stages are: (1) the definition stage, (2) the design stage and (3) the development stage. Figure 1 provides a graphic representation of the condensed version of the mini-model.

³⁴Dale Hamreus, "The Systems Approach to Instructional Development," The Contribution of Behavioral Science to Instructional Technology (Teaching Research Publication A Division of Oregon State System of Higher Education), I, pp. 16-18.

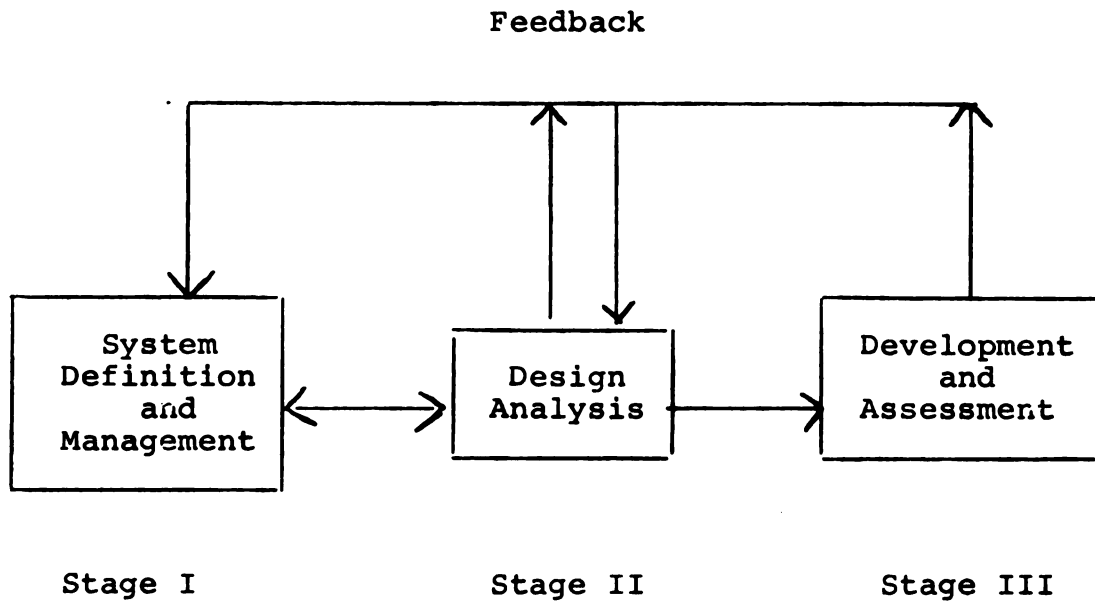


Figure 1. Major stages in a systems approach to instructional development.

Stage I. This is the preparatory stage although many developers move directly into the design stage without first determining the system definition, what resources are needed and whether these resources are human or non-human.

Stage II. Decisions regarding performance standards, material specifications and constraints found in the environment within which the system is embedded are considered in this stage.

Stage III. Development and assessment procedures are the concern in this stage. The prototype of the system is prepared including all necessary content, media and methods. The prototype is evaluated to determine the extent to which the system achieves its purpose.

The previous model is somewhat condensed. The mini-system flow diagram shown in Figure 2 provides a more

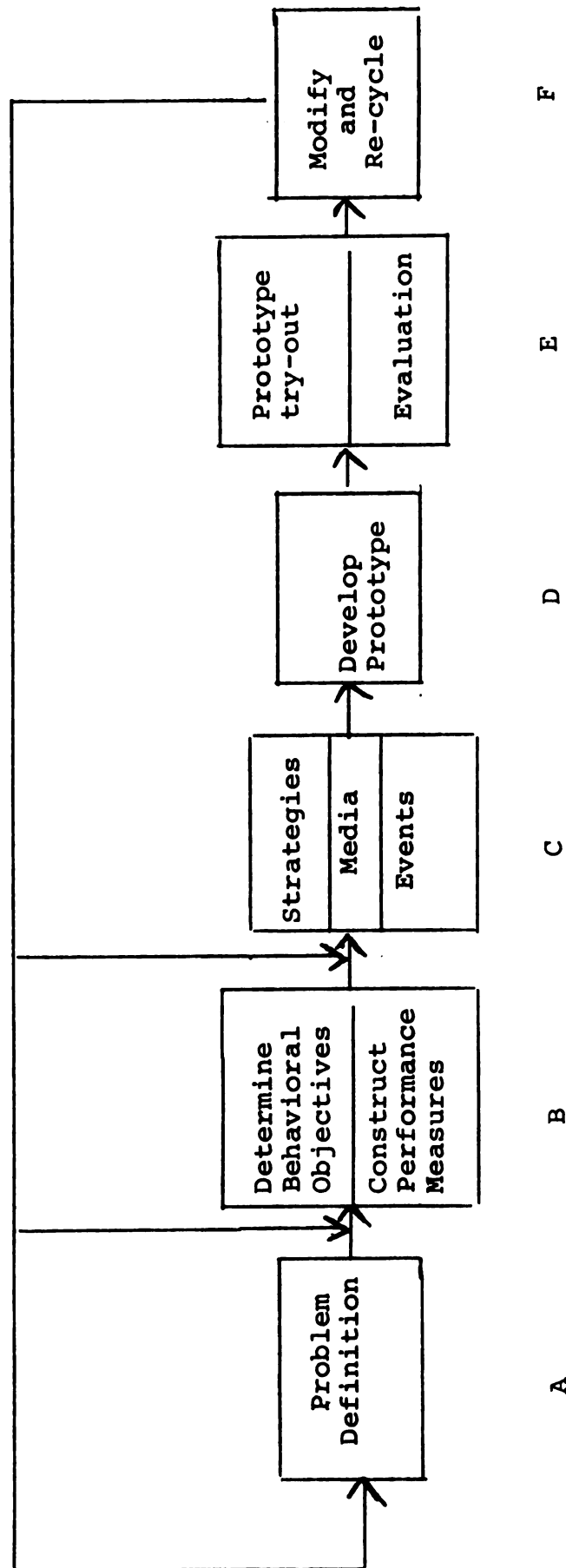


Figure 2. Mini-system flow diagram for developing instructional systems.

detailed version.³⁵ Yet, the three components discussed in the condensed version of the mini-model are also included.

Box A is an examination of what is felt to be the problem; a systematic evaluation of the context in which the new system is to operate. Box A includes: (1) students and student characteristics; (2) the existing constraints (finance, physical facilities, personnel, materials); and (3) the people affected by the problem in addition to the students.

Box B necessitates the construction of explicitly stated behavioral objectives. These objectives provide the basis for system evaluation. The remainder of the process is dependent upon the construction of objectives. In this same step, tests are constructed about the objectives to determine whether or not they are attained. Box E is particularly dependent upon these tests.

Box C involves three decision functions which occur at the same time. Strategies decisions are those related to the content selected, the sequence of the content, and how to present the content. Media decisions are aimed at selecting the most appropriate media to be used for the presentation, selection and content. The events decisions produce the kinds of interactions desired between pupils, teacher, and materials.

³⁵Ibid., I, pp. 39-42.

Box D represents the actual design of the instructional sequence--all of the materials to be used are gathered and decisions regarding the interweaving of these materials are made.

Box E is the quality control function inherent in the systems approach to instructional design. The sequence is tried out on a representative sample of students under conditions which accurately simulate the conditions under which the package will be used. The evaluation aspect involves the use of those tests devised in Box B. A visual evaluation of students as the materials are being used is also very revealing.

Box F. Once the data from the evaluation has been gathered, it is then fed back into the system in order to modify the system and correct system weaknesses. This total process is cyclical in nature and occurs continually in order to ascertain the efficiency of the system--this is, in a sense, formative evaluation.

Dale Hamreus is quite explicit as he states that the biggest gap or weakness in this total systems process involves the inability to make decisions on the basis of empirical evidence in terms of methods or procedures most appropriate to attain enabling objectives--these decisions are made mainly on the basis of past experience.

The preceding remarks point out that instructional development is much broader than the media concept. In fact, media falls within the parameters of instructional

development and serves as a vehicle by which teachers achieve desired instructional outcomes. Box C of the mini-model clearly shows that media is only a part of the instructional development process. It can not be overemphasized that while media and media-support services may well provide inroads for more inclusive development efforts, these services are only a part of the total instructional development endeavor.

Basic Teaching Model

Glaser's model,³⁶ perhaps the simplest and most basic of the instructional development models, is composed of four basic components as illustrated in Figure 3 below.

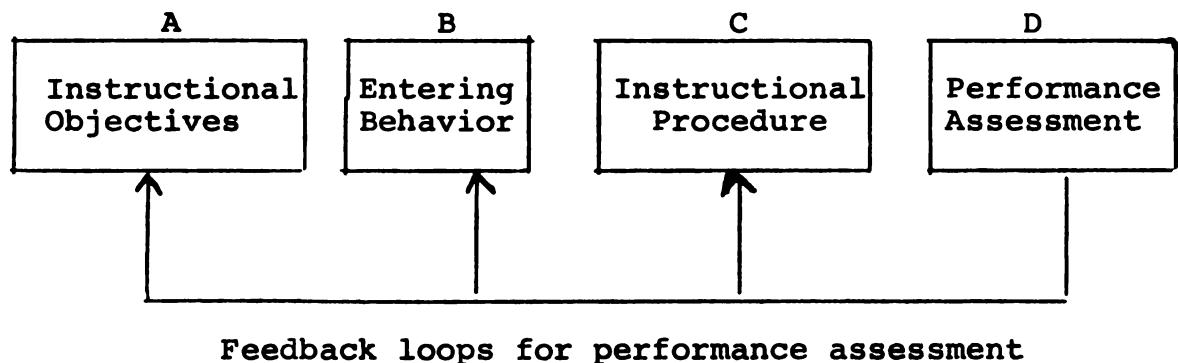


Figure 3. Basic Teaching Model.

It is difficult to discuss a process as a series of ordered steps without implying linearity. However, it is quite possible to perform either of the first two steps

³⁶John P. DeCecco, The Psychology of Learning and Instruction: Educational Psychology (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1968), pp. 11-13.

in the sequence initially, and in many instances, these two steps are performed concurrently. The first component of the model involves the construction of explicitly stated instructional objectives. The second component involves the assessment of the students' entry behavior prior to the beginning of instruction. The third component, instructional procedure, includes decisions regarding instructional procedure or techniques selected to facilitate the attainment of the stated objectives. Decisions regarding media use and sequence of presentation are included in this component. The last component, performance assessment, is an attempt to determine the extent to which the specified objectives have been attained. The assessment results determine the nature and extent of the recycling.

People Involvement

Most instructional development efforts are not likely to be such that one person is working with one faculty. At least, it should be a team approach. No one person could possibly possess all of the skills and the knowledge needed to carry out this systematic process. The process should involve people representing the following areas on the "team": (1) curriculum, (2) communication, (3) learning theories or educational psychologists, (4) evaluation, (5) content specialist and (6) a media specialist. In addition to these people, an instructional developer should be a member of the team to coordinate these efforts.

Since people are involved, attention should be given the human element of the process. Barson, Haney and Lange³⁷ stated in an article entitled, "The Heuristic Dimension of Instructional Development," that the developer should stress the human element in an instructional system. While most of the attention has in the past been centered around the process, recently, attention has been given the human factor or element of the process. It is the purpose of this study to assess the attitudes which selected groups express toward instructional development and to determine the extent to which age, experience and instructional mode serve as functions of expressed attitudes.

Related Studies

There have been numerous studies on attitudes and behavior. However, few have been designed explicitly to predict behavior from attitudes. The intent here it to determine if (1) age, (2) years of experience, and (3) instructional mode affect attitudes with respect to instructional development.

Age and Years of Experience

Voluminous research studies have been conducted to examine the relationship between measured attitudes and observed teacher characteristics. Since the purpose of

³⁷Barson, Haney and Lange, p. 363.

this section is to discuss the factors of (1) age and (2) years of experience as they relate to attitude shifts, only those studies which attempt to relate the aforementioned factors or characteristics are included. It should be pointed out that age and years of experience are closely related. Suffice it to say that experience is a function of age on the one hand, while age is not necessarily a function of experience on the other.

Leeds and Cook, as a result of their study, concluded that age, sex, length of training, teaching experience, grade level, and subject taught had little influence upon teacher attitude toward pupils.³⁸ Yet, age and experience bore the closest relationship or appeared to influence attitudes more than the other factors. Wandt,³⁹ in assessing the attitudes of teachers toward various groups within the school setting, and Eichholz and Rogers,⁴⁰ studying the adoption of audiovisual materials, found no significant difference in the number of years of teaching

³⁸Carroll H. Leeds and Walter W. Cook, "The Construction and Differential Value of a Scale for Determining Teacher-Pupil Attitudes," Journal of Experimental Education, Vol. 16 (1949), pp. 149-59.

³⁹E. Wandt, "The Measurement of Teachers' Attitudes Toward Groups Contacted in the Schools," Journal of Educational Research, Vol. 46 (1952), pp. 113-22.

⁴⁰Gerhard Eichholz and Everett M. Rogers, "Resistance to the Adoption of Audio-Visual Aids by Elementary School Teachers: Contrasts and Similarities to Agricultural Innovation," in Innovation for Education, ed. by Miles Matthews (New York: Bureau of Publications, Teachers College, Columbia University, 1964), pp. 299-316.

experience and expressed attitudes, i.e., number of years did not play a significant role in expressed attitudes. Scott,⁴¹ also concerned with attitude shifts, pointed out that age and sex were not significantly related to expressed attitudes and effectiveness of principals.

Beamer and Ledbetter⁴² examined the attitudes as measured by the Minnesota Teacher Attitude Inventory, of 212 experience and inexperienced graduate students at North Texas State College. They found that, in the experienced group, those students who had previous experience as guidance workers had a mean score higher than the remaining students. Still further, they found that inexperienced teachers had a higher mean score (90) than experienced teachers (70). Results of this study seem to indicate that there is something which causes a teacher to change his attitude toward the profession, a change in the negative direction of the attitude continuum, after gaining teaching experience. Valenti⁴³ appears to be in agreement with Beamer and Ledbetter and points out that

⁴¹Frank A. Scott, "The Development and Evaluation of An Instrument to Assess the Attitudes of Public School Principals," Journal of Experimental Education, Vol. 26 (March, 1958), pp. 185-96.

⁴²G. C. Beamer and Elaine W. Ledbetter, "The Relation between Teacher Attitude and the Social Service Interest," Journal of Educational Research, Vol. 50 (1957), pp. 655-66.

⁴³J. J. Valenti, "Measuring Educational Leadership Attitudes," Journal of Applied Psychology, Vol. 36 (1956), pp. 244-52.

young teachers are more personal, informal and integrative in their roles than older teachers. Rocchio and Kearney⁴⁴ (1956), also using the Minnesota Teacher Attitude Inventory, conducted a study to examine the relationship between MTAI scores of 395 secondary school teachers and the rate these teachers issued failing grades. The variables studied were age, sex, and subject area. They found "no significant difference in mean failure rate by age within academic and non-academic classification."

Gaylen Kelley (1960) assessed the attitudes of selected teachers toward audiovisual materials. One of the independent variables studied by Kelley was age (closely related to experience). Kelley found:

that younger teachers tend to have a more positive attitude toward the use of audiovisual materials than did older teachers. Teachers between the ages of forty and fifty tend to have less positive attitudes towards media than younger teachers and those over fifty years of age tend to be more moderate or conservative in their attitude toward these materials.⁴⁵

The John Dewey Society⁴⁶ studied the political affiliations of three hundred and twenty-nine randomly

⁴⁴p. D. Rocchio and N. G. Kearney, "Teacher-Pupil Attitudes as Related to Non-Promotion of Secondary School Pupils," Educational Psychology Measurement, Vol. 16 (1956), pp. 244-52.

⁴⁵Gaylen B. Kelley, "A Study of Teachers' Attitudes Toward Audiovisual Materials," Educational Screen and Audiovisual Guide, Vol. 39, No. 3, No. 385 (March, 1960), pp. 119-21.

⁴⁶John Dewey Society, The Teacher and Society, First Yearbook (New York: Appleton-Century Co., 1937), pp. 179-80.

selected teachers and found that tenure teachers were more liberal in their political views than non-tenure teachers. It should be pointed out that these results may well relate to age and experience since both are considered functions of tenure. No effort is made to compare the two previous studies, since the psychological object is not the same in both studies although these studies appear to present diverging points of view.

Two of the most significant and extensive studies of teachers are (1) The Teacher Characteristics Study (1960) and (2) The National Education Association Study (1960-61).

Teacher Characteristics Study

The Teacher Characteristics Study, directed by Ryans,⁴⁷ had as its major emphasis the dimensions of teacher attitudes, verbal understanding, educational viewpoint and emotional stability. The aforementioned were investigated via paper-and-pencil instruments.

The analysis of data centered around the degree of similarity or difference which existed between verbally-expressed attitudes and exhibited classroom behavior as a function of (1) age, (2) experience, (3) marital status, (4) sex, (5) school level, (6) grade, and (7) subject taught.

⁴⁷D. G. Ryans, Characteristics of Teachers (Washington, D. C.: American Council on Education, 1960).

Ryans computed 60 different F tests in analysis of the data related to age and experience and found that 45 of the sets of differences were significant at or beyond the .05 level of confidence. Ryans also found that trends with respect to extent of teaching experience are not substantially different from those noted when teachers were classified according to age.

The National Education Association Study

The research division of the NEA conducted a nationwide study to describe the characteristics of 1.4 million classroom teachers who were teaching in more than 33,000 school districts. A portion of the information generated dealt with personal characteristics (age) and professional characteristics (experience). Among the significant findings were:

Almost two-thirds or 62.7 per cent of all teachers estimated their teaching load as light or reasonable and 37.3 per cent described it as heavy or extremely heavy. Those more likely to describe their teaching load as heavy were men, secondary school teachers of book-centered subjects, those with 20 or more years of experience and those with master's degrees.⁴⁸

One-third of the teachers reported feeling considerable strain in their work. Among those comprising this group were teachers of long experience. While experienced

⁴⁸Research Division, National Education Association, The American Public School Teacher, 1960-61, Personal and Professional Characteristics, Assignments, Attitudes, Research Monograph 1963-M2 (April, 1963). (Italics added).

teachers felt they were carrying a heavier load than those with less experience, they also felt considerably more tension and strain.

Summary

Ryans concluded that age and experience were closely related. Trends related to number of years teaching were not substantially different from trends related to age. Significance was found at or beyond the .05 level of confidence for 45 of the 60 F tests computed. Therefore, age and experience were shown to be significant functions with respect to expressed attitudes (paper-pencil test) and exhibited classroom behavior. Similarly, the NEA study revealed that age and experience related and concluded that those teachers of twenty or more years of experience perceived their roles differently from those of lesser experience. These experienced teachers felt that they were carrying a heavier load and also felt considerably more tension and strain than did lesser experienced teachers. Both studies point out that age and experience are related and that once a teacher gains experience, he perceives his role differently.

Instructional Mode: Procedure

The two experimental groups included in this study, the 831A class and the IDI group, will be exposed to instructional development by very similar procedures. One variable

is the amount of time the individuals will be exposed to instructional development. The IDI group will be exposed to instructional development for a concentrated period of one week or forty instructional hours while the 831A group will be exposed for one-third of an academic year. Also, 831A does not deal exclusively with instructional development as does the IDI instruction. Still another variable may well be the careful organization and presentation of materials. It is assumed that the IDI presentations, with substantial human and non-human resources, as compared with the 831A class with one professor who has a limited amount of time, will likely to be more carefully planned/organized and presented.

The major concern is that both experimental groups, the 831A class and the IDI group, will receive formal instruction about instructional development.

In summary then, the main concern is that both experimental groups will receive formal instruction about instructional development while the control group, selected from the East Lansing, Michigan public school system will receive no instruction and will not have any previous formal exposure to instructional development.

Twyford pointed out that: "on the basis of available research, the effectiveness of a particular instructional material is more dependent upon the nature and quality of the message than upon the characteristics of

the channel of communication."⁴⁹ Continuing this trend of thought, Allen and Cooney assert that the method of presentation has less effect on students as they grow older.⁵⁰ Although this statement originally referred to film presentation, it has implications for other modes. Popham (1960) demonstrated that taped lectures at the graduate level were as effective and acceptable as the conventional lecture-demonstration method.⁵¹ It could well be that age does play a vital role with respect to determining learning outcomes. Realistically, a major portion of what is learned is attributable to sources other than the instructor regardless of the mode of presentation of materials. Smith and McAshan (1964) found that as much as 85 per cent of course learning may result from sources other than the teacher.⁵²

⁴⁹Loren Twyford, "Educational Communications Media," in Encyclopedia of Educational Research, ed. by Robert L. Ebel, et al. fourth edition (New York: The Macmillan Company, 1969), p. 371.

⁵⁰William H. Allen and Stuart M. Cooney, A Study of the Non-Linearity Variable in Film Presentation, Final Report, NDEA Title VII Project No. 422, ERIC No. ED003563. (Los Angeles: University of Southern California, 1963).

⁵¹James W. Popham, Tape Recorded Lectures in the College Classroom: An Experimental Appraisal (Kansas State College, 1960), p. 15.

⁵²Ralph Smith and Hildreth H. McAshan, "A Comparison of the Relative Effectiveness of Four Methods of Teaching Ninth Grade General Science," in New Media Studies for Improvement of Science and Mathematics Instruction, ed. by Loren Twyford et al. (New York State Department of Education, 1964), p. 122.

Newman and Highland⁵³ (1956) demonstrated that tape recordings and a workbook were as effective as an instructor who was rated above average in instructional ability for teaching a given unit of work. The intent here is not to ascertain cognitive gains as the previous citations may indicate; therefore a review of literature pointing out the supremacy of one medium over another is omitted. The point is that both experimental groups will have some formal exposure to instructional development.

Kelley found that teachers who had some formal exposure to audiovisual materials tend to have a more positive attitude toward their use than those teachers who had no formal exposure.⁵⁴ Although Kelley was referring to media and not instructional development, this data appears to be in agreement with the hypothesis that both experimental groups will express a more positive attitude toward instructional development than will the control group.

Limitations of the Study

There are specific limitations of this study which must be considered prior to making generalizations with respect to the findings. The results of this study will be

⁵³Slater E. Newman and Richard W. Highland, "The Effectiveness of Four Instructional Methods at Different Stages of a Course," (Lackland Air Force Base, 1956), p. 22.

⁵⁴Kelley, pp. 120-21.

generalizable to other populations only to the extent that other populations are similar in characteristics to the population used in this study. The specific limitations are:

1. An instrument may be considered scalable for a population at a given time and may not form a scale at a later date since a new meaning may have been added to the previous single variable. Conversely, a scale may not be scalable at one point in time but form a scale at a later date.
2. The universe of items may form a scale for the total population but will not form a scale for subgroups of that population.
3. The relatively small sample size poses a significant problem in regard to statistical analysis of the differences which may exist between subdivisions of each of the three groups.

Organization of the Study

The organization of this study is as follows:

Chapter I provides a brief introduction to the study. Also included in this chapter are: the purpose of the study, hypotheses to be tested, need for the study,, definition of pertinent terms, theory and rationale, studies related to the variables under investigation, and limitations of the study.

Chapter II presents a review of the literature on attitudes, attitudes and behavior, and attitude measurement.

Chapter III delineates the methodological procedures, a discussion of the three groups included in the study, a modification of the instrument used, and the statistical

analysis used.

Chapter IV contains the analysis of the data, and Chapter V discusses the findings and implications of the findings. A summary and a conclusion are also presented.

CHAPTER II

REVIEW OF THE LITERATURE

The Attitude Concept

No one has ever seen an attitude. An attitude, no matter how real it may appear to its possessor, is an abstraction, the existence of which is inferred either from non-verbal overt behavior or from verbal or symbolic behavior. When one is asked about his attitude toward something, and if the basic interest is how he feels about that particular thing, then one aspect of attitude is displayed.

The concept of attitude appears to have evolved as a central variable according to Thomas and Znaniecki¹ (1918) in their study of people in transition between two cultures. They perceived an attitude as: ". . . an internalized counterpart of an external subject, representing the individual's subjective tendencies to act toward that object."²

G. W. Allport, in discussing the concept "attitude,"

¹W. I. Thomas and F. Znaniecki, The Polish Peasant in Europe and America (Boston: Badger, 1918).

²Ibid., p. 404.

wrote: ". . . probably the most distinctive and indispensable concept in contemporary social psychology. No term appears more frequently in experimental and theoretical literature."³ Murphy, Murphy and Newcomb tend to agree with Allport. They suggest that: "Perhaps no single concept within the whole realm of social psychology occupies a more nearly central position than that of attitudes."⁴

Considerable effort has been made to clearly define an attitude. Thurstone, as cited by Edwards,⁵ states that an attitude may be defined as the degree of positive or negative affect associated with some psychological object. By a psychological object, Thurstone means any symbol, phrase, slogan, person, institution, ideal or idea toward which people can differ with respect to positive or negative affect. He cites the United Nations, a political party, the title of a book, a minority group, a nation, labor unions, and a particular food as examples of psychological objects. Thurstone and Chave⁶ used the concept

³G. W. Allport, "Attitudes," in Handbook of Social Psychology, ed. by C. Murchison (Worcester, Mass.: Clark University Press, 1935), p. 798.

⁴G. Murphy, L. B. Murphy and T. M. Newcomb, Experimental Social Psychology (New York: Harper, 1937), p. 889.

⁵Allen L. Edwards, Techniques of Attitude Scale Construction (New York: Appleton-Century-Crofts, Inc., 1957), pp. 2-5.

⁶Louis L. Thurstone and E. G. Chave, The Measurement of Attitude (Chicago: The University of Chicago Press, 1929), pp. 6-7.

"attitude" to denote the sum total of man's inclinations and feelings, prejudice or bias, preconceived notions, ideas, fears, threats, and convictions about any topic. They used the concept "opinion" as a verbal expression of an attitude. An opinion symbolizes an attitude, they claimed. They also used opinions as the means for measuring attitudes.

While many authors have presented definitions of an attitude, a few have argued that the concept "attitude" be discarded. Doob has suggested that the concept "attitude" be discarded and argues:

. . . while attitude is a socially useful concept, it has no systematic status as a scientific construct and therefore should be replaced with such learning theory constructs as afferent- and efferent-habit, strengths, drives, anticipatory and mediating responses.⁷

Blumer also states that the concept should be discarded and writes:

. . . it is ambiguous, therefore blocking the development of a body of sound social psychological theory, it is difficult to ascertain what data to include as part of an attitude and what to exclude; it lacks an empirical reference and hence cannot be used effectively as a unit of analysis in either personality organization or the study of social action.⁸

Rokeach disagrees with the views of Doob and Blumer. Rokeach asserts that:

⁷L. W. Doob, "The Behavior of Attitudes," Psychological Review, Vol. 54 (1947), pp. 135-56.

⁸H. Blumer, "Attitudes and the Social Act," Social Problems, Vol. 3 (1955), pp. 59-64.

. . . the confused status of the concept can best be corrected not by abandoning it, but by subjecting it to continued critical analysis with the aim of giving it a more precise conceptual and operational meaning.⁹

Although the literature reveals a multiplicity of definitions of attitudes, one is likely to become confused by this variety. Discussions about the variety of definitions of attitudes are given by Droba,¹⁰ Allport,¹¹ Bain,¹² Cantril¹³ and Farris.¹⁴ Stephen M. Corey sums up these discussions quite well when he asserts:

. . . Granting the significance from certain points of view of verbal opinions as such, they are of limited practical value unless they presage behavior. It is of interest to determine what a subject says his attitude is in regard to communism, the church, or foreign missions, but of greater moment sociologically is the way he acts in relation to these institutions.¹⁵

Corey writes that the accepted definitions of an attitude have in common an insistence that a social attitude of a particular sort predisposes one to behave in a

⁹ Milton Rokeach, "Attitudes," in International Encyclopedia of the Social Sciences, Vol. 1, ed. by D. L. Sills (New York: Macmillan Co., 1968), p. 450.

¹⁰ Daniel D. Droba, "The Nature of Attitude," Journal of Social Psychology, Vol. 4 (1933), pp. 443-63.

¹¹ Allport, Chapter 17.

¹² R. Bain, "Theory and Measurement of Attitude and Opinion," Psychological Bulletin, Vol. 27 (1930), pp. 357-79.

¹³ Hadley Cantril, "General and Specific Attitudes," Psychological Monogram, Vol. 42 (1931-32), p. 109.

¹⁴ Ellsworth Farris, "Attitude and Behavior," American Journal of Sociology, Vol. 34 (1928), pp. 271-81.

¹⁵ Stephen M. Corey, "Professed Attitudes and Actual Behavior," Journal of Educational Psychology, Vol. 28 (1937), pp. 271-80.

particular manner. In other words, a social attitude is a determiner of overt behavior. In the final analysis, the way a person acts over a period of time is a reliable and valid indication of his attitude. Stern points out that the variety of definitions of attitudes tend to agree on the following four points:

1. Attitudes are socially formed. They are based on cultural experience and training and are revealed in cultural products. The study of life history data reveals the state of mind of the individual, and of the social group from which he derives, concerning the values of the society in which he lives.
2. Attitudes are orientations toward others and toward objects. They incorporate the meaning of a physical event as an object of potential or actual activity.
3. Attitudes are selective. They provide a basis for discriminating between alternative courses of action and introduce consistency of response in social situations of an otherwise diverse nature.
4. Attitudes reflect a disposition to an activity, not a verbalization. They are organizations of incipient activities, of actions not necessarily completed, and represent therefore the underlying dispositional or motivational urge.¹⁶

An examination of the variety of definitions of attitude will forewarn one of the difficulties involved in measuring attitudes. It might seem logical to assume that if we want to know how an individual feels about some particular psychological object, that the best possible

¹⁶George G. Stern, "Measuring Non-cognitive Variables in Research on Teaching," in Handbook of Research on Teaching, ed. by N. L. Gage (Chicago: Rand McNally & Company, 1963), pp. 403-404.

procedure would be to ask him. Direct questioning may be satisfactory for some purposes. It may enable one to be classified into one of three groups: (1) those with favorable attitudes, (2) those with unfavorable attitudes and (3) those who say that they are doubtful or undecided about their attitudes toward the object or subject in question. There are, however, certain disadvantages in direct questioning. Some of these disadvantages are:

1. Reluctance of people to give public expression of their attitude;
2. Some individuals are not always immediately aware of their feeling toward a given psychological object;
3. Sometimes feelings are so mixed and confused to a direct question that it is difficult to respond on the spur of the moment; and
4. Does not conveniently lend itself (also true of direct observation) to an assessment of the degree of affect which individuals may associated with a psychological object.

Attitude and Behavior

Literature on attitude and behavior points out that there exists a relationship between the two concepts, although the nature of this relationship is not always explicitly defined. Rokeach¹⁷ contends that a person's social behavior must always be mediated by at least two types of attitudes: an attitude activated by an object (A_o), and an attitude activated by the situation in which

¹⁷Rokeach, pp. 449-58.

the object is encountered (A_s). Behavior, according to Rokeach, is a function of $A_o A_s$ and is the result of cognitive interaction between A_o and A_s . This interaction depends upon the relative importance of A_o and A_s with respect to one another in the context of $A_o A_s$.

It appears that many of the research studies on attitudes attempt to assess the attitude that a person has toward the object only and fail to consider the importance of the situation. Rokeach writes that: "If one focuses only on attitude-toward-object, one is bound to observe some inconsistency between attitude and behavior."¹⁸ It seems then that action is determined by more than attitude toward object. Krech, Crutchfield and Ballachey content that: ". . . action is determined not by a single attitude, but by a number of attitudes, wants, and situational conditions."¹⁹

While the general assumption is that knowledge of one's attitude can serve as a dependable predictor of his overt behavior, few studies have been conducted to prove or disprove this notion. However, those studies which have attempted to show that one's attitudes are predictors of his overt or verbally expressed behavior have found little or no consistent relationship. Fishbein states:

¹⁸Milton Rokeach, A Theory of Organization and Change (San Francisco: Yasssey-Bass, Inc., 1968), p. 126.

¹⁹D. Krech, R. Crutchfield, and E. L. Ballachey, Individual in Society (New York: McGraw-Hill, 1962), p. 163.

. . . after more than seventy-five years of attitude research, there is still little, if any, consistent evidence supporting the hypothesis that knowledge of an individual's attitude toward some object will allow one to predict the way he will behave with respect to the object.²⁰

Due to the inconsistency of research findings, some authors have questioned the idea that a strong relationship actually exists between attitude and behavior. Some, Cook and Sellitz²¹ for example, have stated that the measuring instrument is responsible for inconsistency of findings.²² Others, such as DeFleur and Westie²² question the definitions which have evolved for the concept "attitude." Still others have combined the above and question the validity of the measuring instrument and the concept definition.²³

The relationship between attitude and behavior was addressed by Allport in 1935. After careful study of 100 different definitions of the concept, he concluded that an attitude is a learned predisposition to respond to an

²⁰M. Fishbein, "Attitude and the Prediction of Behavior," in Readings in Attitude Theory and Measurement, ed. by M. Fishbein (New York: Wiley, 1967), p. 477.

²¹S. W. Cook and C. Sellitz, "A Multiple-Indicator Approach to Attitude Measurement," Psychological Bulletin (1964), pp. 36-55.

²²M. DeFleur and F. Westie, "Attitude as a Scientific Concept," Social Forces, Vol. 42 (1963), pp. 17-31.

²³D. Katz and E. A. Stotland, "A Preliminary Statement to a Theory of Attitude Structure and Change," Formations of the Person and the Social Context, Vol. 3, ed. by S. Koch (New York: McGraw-Hill, 1959), pp. 423-75.

object or class of objects in a consistent manner.²⁴

Attitude was conceptualized as a unidimensional concept prior to Allport's investigation. Contrary to this unidimensional view, Allport believed that two people may have the same degree of affect toward an object and yet differ qualitatively in their attitude toward the object. He therefore argued for the qualitative nature of an attitude.

Doob²⁵ suggested (1947) that there may not be any one-to-one relationship between attitude and behavior. He stated that a person has to learn the attitude and he must also learn what response to make. Two people may have the same attitude toward an object but because of conditions, they may act differently. This implies that because there is a different "action" component, these two individuals have different attitudes. Doob, appearing to agree with Allport, suggested that an attitude has several components and further advanced the multicomponent definition of an attitude previously propagated by Allport. While the multicomponent definition of an attitude was gaining recognition in the literature, few researchers attempted to assess the qualitative nature of the concept, i.e., Guttman and Osgood's Semantic Differential.

²⁴Allport, pp. 798-844.

²⁵Doob, pp. 135-56.

The discrepancy between expressed attitudes and actual behavior was discussed by LaPiere²⁶ in his classic study of 1934. LaPiere, traveling with a young Chinese couple, stopped at many hotels, motels, and restaurants throughout the United States. After visiting some 250 places, they were refused service only once. LaPiere later mailed questionnaires to the owners of the places previously visited and asked "Will you accept members of the Chinese race as guests in your establishment?" Approximately 92% of the respondents replied "No" to the question; one replied "Yes" and the remainder replied "Uncertain; depending upon the circumstances." Kutner, Wilkens and Yarrow²⁷ also studied the inconsistency between attitude and behavior and found as LaPiere found, a large discrepancy between expressed attitudes and actual behavior. Conceivably then, a person's action is not determined by a single factor and may well be contrary to his attitude. Chein states: "People may act contrary to their attitudes."²⁸

²⁶R. T. LaPiere, "Attitudes vs. Actions," Social Forces (1934), pp. 230-37.

²⁷B. Kutner, C. Wilkens, and P. R. Yarrow, "Verbal Attitudes and Overt Behavior Involving Racial Prejudice," Journal of Abnormal and Social Psychology, Vol. 47 (1952), pp. 649-52.

²⁸I. Chein, "Behavior Theory and the Behavior of Attitudes: Some Critical Comments," Psychological Review, Vol. 55 (1948), p. 178.

Peter T. Kliejunas²⁹ designed a study the purpose of which was to systematically examine the relationship between attitude and behavior. Kliejunas' hypothesis was that attitude and behavior are related and that behavior could be predicted from attitudes if the attitudes were properly conceptualized and measured. Yet, as Janis and King assert,³⁰ the relationship between attitude and behavior is most often viewed as being casual in much of the literature.

Summary

Literature on the relationship between attitude and behavior points to inconsistent findings with respect to establishing a predictive relationship. In fact, few research studies have been conducted to determine if one's attitude can serve as a dependable predictor of his overt or expressed behavior. Perhaps more conclusive findings would have resulted had there not developed two separate points of view. First, there are those who support the qualitative nature of an attitude and therefore define attitude as a multicomponent concept. Allport³¹ (1935),

²⁹Peter T. Kliejunas, "Attitude Toward Object and Attitude Toward Situation as Predictors of Behavior," Unpublished dissertation, Michigan State University, East Lansing, Michigan, 1969.

³⁰I. L. Janis and B. T. King, "The Influence of Role Playing on Opinion Change," Journal of Abnormal and Social Psychology, Vol. 49 (1954), pp. 211-18.

³¹Allport, pp. 798-844.

Doob³² (1947) and Chein³³ (1948) advanced the multicomponent definition of an attitude. They believed that a person's attitude toward an object may fall at three different positions on three different dimensions, i.e., affective, cognitive and connotive, a position held presently by many social psychologists. However, major attitudinal assessment efforts have been directed towards unidimensionality of the concept as evidenced by the writings of Guttman and Osgood. Secondly there are those who provide a unidimensional definition and attempt to establish a predictive relationship between attitude and overt behavior by considering only the attitude toward object dimension.

Fishbein provides two possibilities as to why many researchers have failed to predict behavior from attitudes. He writes:

1. We have often measured attitude toward an inappropriate stimulus object . . . we have often measured attitude toward a class of people or objects when we should have been measuring attitude toward a particular member of the class.
2. The particular behavior being studied may be completely or partially unrelated to attitude. This point must be emphasized because most investigators of attitude have been unwilling to accept it. To a large extent, however, their unwillingness to accept this statement is surprising since most investigators firmly believe that any behavior is determined by a large number of variables. Yet, time and again, a behavior is investigated because

³²Doob, pp. 135-56.

³³Chein, p. 178.

the experimenter assumes that it should be a function of attitude and then he is surprised and disappointed to find that his measure of attitude failed to predict the behavior.³⁴

Perhaps, as Rokeach and Kliejunas point out, there will remain inconsistent findings as long as the predictive relationship is based solely on attitude toward object and failure to consider the importance of the interaction between the object and the situation.

There have been marked improvements in attitude scale construction and assessing expressed attitudes in recent years. However, for research purposes, where one is most often interested in relating a single variable to another variable, a greater degree of refinement is needed. This desire for refinement has given rise to efforts to develop methods of measuring attitudes.

Attitude Measurement

Thurstone³⁵ states that the measurement problem has the limitation which is common to all measurements; namely, that one can measure only such attitudes as can be represented on a linear continuum such as volume, price, length, area, excellence, beauty, ad infinitum. Thurstone is concerned with those aspects of attitude for which one can compare individuals by the "more or less" type of judgment.

³⁴Fishbein, p. 483.

³⁵Louis L. Thurstone, "Theory of Attitude Measurement," Psychological Review, Vol. 36, pp. 222-41.

For example, we might say that one man is more in favor of prohibition than another, more militaristic than some other, more religious than another. The measurement is affected by the endorsement or rejection of statements of opinion. In devising a method of measuring attitudes, Thurstone and Chave tried to get along with the fewest possible restrictions since one is sometimes tempted to disregard so many factors that the original problem soon disappears.

Two of the earliest attempts to measure attitudes appear to have been the Social Distance Scale constructed in 1925 by Bogardus, as cited by Sax,³⁶ and Watson's Test of Fairmindedness,³⁷ also in 1925.

Bogardus' Social Distance Scale

The purpose of Bogardus' scale was to measure the amount of social distance placed between oneself and members of various ethnic, religious, national, or racial groups. The scale is made up of categories where the social distance between consecutive categories does not necessarily represent the same amount of social distance between any other two consecutive categories.

³⁶Gilbert Sax, Empirical Foundations of Educational Research (Englewood Cliffs, N. J.: Prentice-Hall, 1968), p. 219.

³⁷G. B. Watson, "The Measurement of Fairmindedness," Teachers College Constr. Educ. (1925), No. 176.

Bogardus designated acceptance in terms of:

(1) to close kinship by marriage, (2) to my club as personal chums, (3) to my street as neighbors, (4) to employment in my occupation in my country, (5) to citizenship in my country, (6) as visitors only to my country, and (7) would exclude from my country. This means then that this was a seven-point scale. A tolerance score is obtained by averaging the step values ranging from 1 to 7 assigned by the respondent to each of the groups he rated.

Stern³⁸ raised several questions about the Bogardus scale. These questions are:

1. Are all items relevant to the same measurement continuum?
2. Are the items in fact ordered as steps along that continuum?
3. Is the relative distance between the steps constant?
4. Are the responses actually a function of the attitude the items that were intended to sample, rather than some irrelevant process?

Questions 1, 2, and 4 appear to be addressing the issue of unidimensionality. Since Bogardus clearly states that the social distance between consecutive categories does not necessarily represent the same amount of social distance between any other two successive categories, Stern's question regarding constancy of the relative distance between steps appears to be inappropriate.

³⁸Stern, p. 405.

Watson's Test of Fairmindedness

The test of fairmindedness was an attempt to provide a measure of prejudice on 12 different issues, all of which related to religious observance, moral code, and political beliefs. A score for each issue was obtained by adding selected responses from a group of 300 items arranged in six categories. Each category represented a list of opinions to which the respondent indicated his degree of acceptance on a five-point scale ranging from "unqualifiedly true " (+2 points) to "unqualifiedly false" (-2 points). This scale is no longer in use because many of the items for which the scale was designed are out-dated.

There are other methods which attempt to measure attitudes. Among those most frequently used are: Thurstone Technique (1929), Likert Technique (1932), and Osgood's Semantic Differential (1952). Each of the aforementioned methods has inherent strengths and weaknesses. However, they all attempt to measure attitudes and share the common problem of determining whether or not a single variable is being measured. The Guttman Scalogram Analysis, although not a scale as such, but rather a technique for evaluating an existing scale, attempts to determine if statements on an attitude scale form a proper scale and if these statements are unidimensional.

Thurstone Technique

Several groups of people and many individuals were asked to write out their opinions about the church, and current literature was searched for suitable brief statements that might serve the purposes of the scale. By editing the material, a list of 130 statements was prepared, expressive of attitudes covering as far as possible all gradations from one end of the scale to the other. Three hundred judges were then used in obtaining scale values for the 130 statements which were used in constructing an attitude scale toward the church. Research indicates that reliable scale values can be obtained with much smaller groups of subjects, i.e., groups smaller than 300.

The Sorting Procedure

The method of equal-appearing intervals has been widely used in obtaining scale values for a large number of statements. In the method of equal-appearing intervals, each statement concerning the psychological object of interest is printed on a separate card and subjects are asked to sort the statements on the cards into a number of intervals. Along with the cards containing the statements, each subject is then given eleven cards on which the letters A to K appear. These cards are arranged in order in front of the subject with the A card to the extreme left and the K card to the extreme right. The A card is described as

representing the card on which the statements that seem to express the unfavorable feeling about the psychological object are to be placed. The statements that seem to express the most favorable feeling about the psychological object are to be placed on the K card. The middle card, often called the F card, is described as the "neutral" on which statements that express neither favorable nor unfavorable feelings about the psychological object are to be placed. Varying degrees of increasing favorableness expressed by the statements are represented by the cards lettered G to K and varying degrees of unfavorableness by the cards E to A. It may be observed that the psychological continuum from least to most favorable is regarded as continuous with the psychological continuum from least to most unfavorable and the F or neutral interval is, in essence, a zero point. Each subject is asked to judge the degrees of favorableness or unfavorableness of feeling expressed by each statement in terms of the eleven intervals represented by the cards.

Thurstone and Chave believed that the sorting or judging of the statements would be done similarly by those judges who had favorable and those who had unfavorable attitudes toward the psychological object under consideration. Only the middle and the two extreme cards on which the statements were to be sorted were defined for the subjects. They believed it was essential that the other cards not be so defined in order that the interval successive cards

would represent equal-appearing intervals or degrees of favorableness or unfavorableness for each subject. If the intervals are judged equal by the subjects, the successive integers from one to eleven can then be assigned to the lettered cards A to K and the subject has then rated each statement on an eleven point scale. The eleven point scale then becomes the psychological continuum on which the statements have been judged and all that is required is that some typical value be found for each statement. This typical or average value can be taken as the scale value of the statement on the eleven point psychological continuum. As this measure of the average value of the distribution of judgments, Thurstone and Chave used the median of the distribution for a given statement as the scale value of that statement. They recognized that some subjects may undertake the task carelessly and with little interest. Still further, other subjects may misunderstand the direction and thus not be aware of the nature of the judgments desired. The subjects may respond in terms of their own agreement or disagreement with the statements rather than in terms of the judged degrees of favorableness or unfavorableness. A criterion used by Thurstone and Chave for eliminating those subjects who performed the judging task with carelessness or who otherwise failed to respond to the instructions for making the judgment, was to reject the judgments obtained from any subject who placed thirty or more statements on any one of the eleven cards.

Thurstone and Chave used interquartile range Q (a measure of the spread of the middle 50 per cent of the judgments) as the criterion for eliminating statements. They regarded a large Q value primarily as an indication that a statement is ambiguous.

In summary, the Thurstone technique was a method whereby the distribution of attitudes of a group on a specific issue may be represented in the form of a frequency distribution. The base line represents ideally the whole range of attitudes from those at one end who are most strongly in favor of the issue to those at the other end of the scale who are as strongly against it. Somewhere between the two extremes on the base line will be a neutral zone representing indifferent attitudes on the issue in question. The ordinates of the frequency distribution represent the relative popularity of each statement.

In making the initial list of statements, several practical criteria were applied. Some of the important criteria are as follows:

1. The statements should be as brief as possible so as not to fatigue the subjects who are asked to read the whole list.
2. The statements should be such that they can be endorsed or rejected in accordance with their agreement or disagreement with the attitude of the reader. It is important to note that some statements in a random sample will be so phrased that the reader can express no definite endorsement or rejection of them.
3. Every statement should be such that the acceptance or rejection of the statement does indicate something regarding the reader's attitude about the

issue in question. For example, if the statement is made that war is an incentive to inventive genius, the acceptance or rejection of the statement really does not say anything regarding the reader's pacifistic or militaristic tendencies. He may regard the statement as an unquestioned fact and simply endorse it as a fact, in which case his answer has not revealed anything concerning his own attitude on the issue in question. However, only the conspicuous examples of this effect should be eliminated by inspection because an objective criterion is available for detecting such statements so that their elimination from the scale will be automatic. Personal judgment should be minimized as far as possible.

4. Double-barreled statements should be avoided except possibly as examples of neutrality when better neutral statements do not seem to be readily available. Double-barreled statements tend to have a high ambiguity.
5. One must insure that at least a fair majority of the statements really belong on the attitude variable that is to be measured. If a small number of "irrelevant" statements should be either intentionally or unintentionally left in the series, they will automatically be eliminated by an objective criterion, but the criterion will not be successful unless the majority of statements are clearly a part of the stipulated variable.

The Likert Technique

In 1932, Likert³⁹ published a paper in which he presented a method for developing scales to measure attitude toward internationalism, the Negro, and imperialism. It is important that one recognize the statement by Bird, as cited by Edwards,⁴⁰ in which he called the Likert method

³⁹Rensis Likert, "A Technique for the Measurement of Attitudes," Archives of Psychology, Vol. 22, No. 140 (1932), pp. 1-55.

⁴⁰Edwards, p. 149.

of scale construction "the method of summated ratings." Likert proposed, in line with the method of summated ratings, that a large number of statements be taken from the literature for which the scale values on the psychological continuum were known. The assumption was that one could obtain agreement in classifying the statement into two classes, favorable and unfavorable, with approximately the same number of statements in each class. The statements were then given to a group of subjects who were asked to respond to each one in terms of their own agreement or disagreement with the statements. To obtain responses on such a scale, respondents were permitted to use any one of five categories: "strongly agree," "agree," "undecided," "disagree" or "strongly disagree." The categories of response were weighted in such a way that the response made by individuals with the most favorable attitudes had the highest positive weight. The favorable statements were considered to be in the "strongly agree" category and the unfavorable statements in the "strongly disagree" category.

In the development of this method of scale construction, Likert found that scores based upon the relatively simple assignment of integral weights correlated .99 with the more complicated normal deviate system of weights. Thus, he used the simpler system in constructing his scale. For example, examine Table 1.

Table 1. The Proportion of Subjects (N=200) Falling in Each of Five Response Categories for a Favorable Statement and the Normal Deviate Weights for these Response Categories Based upon the Proportion.

	Strongly Disagree	Disagree	Un- certain	Agree	Strongly Agree
(1) P	.130	.430	.210	.130	.100
(2) CP	.130	.560	.770	.900	1.000
(3) Midpoint	.056	.345	.665	.835	.950
(4) Z	-1.514	-.399	.426	.974	1.645
(5) Z = 1.514	.000	1.115	1.940	2.488	3.159
(6) Z rounded	0	1	2	2	3

In row one of this table is shown the proportion of subjects falling into each response category for a favorable statement. In row two of the table is given the cumulative proportions, while row three contains the proportions below a given category plus one-half the proportion within the category. For example, the second entry in row three is obtained by: $.130 + 1/2 (.430) = .345$. The normal deviates are shown in row four and are one set of weights that might be used for the response category. All of the weights can be made positive by adding the absolute value of the largest negative value, -1.514 to all other entries in row four, thus obtaining values in row five. If we round the entries in row five to the nearest integer, we obtain the weights 0, 1, 2, 2, and 3 which are close to the values of 0, 1, 2, 3, and 4.

When dealing with the responses to an unfavorable statement, one must reverse the weightings for the response categories so that the "strongly disagree" category has the highest positive weight. Likert therefore assigned for favorable statements a weight of four to the "strongly agree" response, a weight of three to the "agree" response, a weight of two to the "undecided" response, a weight of one to the "disagree" response, and a weight of zero to the "strongly disagree" response.

Briefly, then, for each respondent a total score is obtained by summing his score for the individual items. Each response to a statement is considered a rating. These are summated over all statements. Thus Likert's method of scale construction has been called the method of "Summated Ratings," as previously mentioned.

Selection of Items

In the method of equal-appearing intervals, there is a basis for the rejection of statements in terms of Q and the criterion of irrelevance. As a basis for rejecting statements in the method of summated ratings, use is made of some form of item analysis. The frequency distribution of scores based on the responses to all statements is considered. Then the twenty-five, or some other percentage, of the subjects with the lowest scores is taken. The assumption is that these two groups serve as criterion groups for the purpose of evaluating individual statements. In evaluating

the responses of the high and low groups in relation to the individual statements, one can then determine the ratio or t value. Here, the value of t is a measure of the extent to which statements are differentiated between the high and low groups. Thus the t value (greater than or equal to 1.75), indicates that the average response of the high and low group to a statement differs significantly, provided that there are twenty-five or more subjects in each of the high and low groups. What is desired in the Likert method is a set of twenty to twenty-five statements which will differentiate between the high and the low groups. The statements which are to be used in the scale construction can be selected by finding the t value for each statement and then arranging the statements in rank-order according to their t value. The final step in this procedure is the selection of the twenty or twenty-five statements with the largest t value. Table 2 illustrates the similarities and differences between the two techniques. The major differences are presented in statements three and four.

Osgood's Semantic Differential

The semantic differential, developed in 1952 by Osgood⁴¹ is a method of measuring the connotative meaning of a concept. Concepts have both connotative and denotative

⁴¹Charles E. Osgood, "The Nature and Measurement of Meaning," Psychological Bulletin, Vol. 49, No. 3 (1952), pp. 197-237.

Table 2. A Comparison of the Thurstone and Likert Techniques.

Thurstone Technique	Likert Technique
1. Statements taken from literature or have people write the statements	1. Statements taken from literature or have people write the statements
2. Edit the statements	2. Edit the statements
3. Panel of people to sort statements to categorize the statements	3. No judges to sort
4. S and Q values used for selecting statements	4. <u>t</u> values used for selecting statement
5. Two forms of the scale are set up consisting of twenty to twenty-five statements in order to establish validity	5. Two forms of the scale are set up consisting of twenty to twenty-five statements in order to establish validity

meanings. The denotative meaning is simply the lexical definition. The connotative meaning reflects an expressed attitude toward a concept or psychological object. Sax, in discussing the denotative and connotative meaning of the concept "home," writes:

Denotatively, a home may be any fixed shelter, but the connotation of home may be differential along continua which include such polar traits as comfortable-uncomfortable, warm-cold, or bright-dark. . . . Any concept or stimuli may be rated along a number of polar traits, and the rating will operationally define

the connotative meaning of the concept for the individual doing the rating.⁴²

Thus, this technique may be used to ask respondents to rate a concept. The respondent is given some idea as to the purpose of the scale, marking procedure, and the criteria he is to use in making his responses. Scoring is achieved by assigning numbers to each bipolar trait along a seven-point continuum ranging from +3 to -3 and the 0 (zero) or middle position being the point at which the independent factors intersect.

Osgood contends that a concept can be factor analyzed to produce three factors, i.e., evaluative, activity, and potency. Each factor is composed of a set of adjectives, all bipolar in nature. For example, the three factors and the bipolar traits of each are as follows:

1. An evaluative factor--good-bad, fair-unfair, clean-dirty,
2. An activity factor--active-passive, varied-repetitive, fast-slow, and
3. A potency factor--hard-soft, sharp-dull, strong-weak.

Husek and Wittrock⁴³ asserted that a concept can be further factor analyzed so as to include the additional factors of (1) restraint, (2) tenacity, (3) predictability, and (4) stability.

⁴²Sax, p. 269.

⁴³T. R. Husek and M. C. Wittrock, "The Dimensions of Attitude Toward Teachers as Measured by the Semantic Differential," Journal of Educational Psychology, Vol. 53, No. 5 (1962), pp. 209-13.

Semantic differential is conceived of as existing in semantic space where the space is composed of K number of mutually independent factors, each varying from +3 to -3 and zero representing the point of origin where the K factors intersect. As Osgood noted, a concept can be described by a three-dimensional model representing the semantic space. Osgood, discussing this semantic space, wrote:

. . . A region of some unknown dimensionality and Euclidian in character. Each semantic space, defined by a pair of polar . . . adjectives, is assumed to represent a straight line function that passes through the origin of this space, and a sample of such scales represents a multidimensional space. The larger or more representative the sample, the better defined is the space as a whole. To define the semantic space with maximum efficiency, we would need to determine that minimum number of orthogonal dimensions (independent factors) . . . which exhausts the dimensionality of the space . . .⁴⁴

The semantic differential can be used to compare the profiles of two persons to determine unidimensionality of the concept or it can be used to determine how similar a given respondent perceives a number of concepts. There are two methods of comparing profiles. The correlation between profiles of scores is one approach. The other method is to measure the differences between profiles as suggested by Osgood and Suci.⁴⁵ The measure of index of distance D is

⁴⁴Charles E. Osgood, George J. Suci and Percy H. Tannenbaum, The Measurement of Meaning (Urbana: University of Illinois Press, 1957), p. 25.

⁴⁵Charles E. Osgood and George J. Suci, "A Measure of Relation Determined by Both Mean Difference and Profile Information," Psychological Bulletin, Vol. 49.

the square root of the sum of the squared differences between coordinates on the same dimension ($\sqrt{Ed^2}$). For example, two subjects may rate a concept as follows:

	Evaluation	Activity	Potency
subject one	-3	+3	-3
subject two	+1	-2	+2

The difference between the scores on the evaluation, activity and potency dimensions are -4, +5 and -5, respectively. Each difference is squared and summed, i.e., (16 + 25 + 25 = 66). The square root of 66 is 8.12. The use of D assumes that we have at least an approximate interval scale and that the factors are independent.

Sax⁴⁶ provides an excellent example for calculating the distance index. Assume that three subjects rate a concept in the following way:

	Subject one	Subject two	Subject three
hot-cold	5	2	6
good-bad	3	6	4
angular-round	4	3	5

Only three scales are included for illustrative purposes. The scores indicated for each subject represent the score which corresponds to the position checked on continua (seven-point scale). In comparing subject one versus subject two, D is calculated to be 4.36; subject one

⁴⁶Sax, p. 272.

versus subject three, $D = 1.73$; and subject two versus subject three, $D = 4.90$. The least amount of distance occurs between one and three, while the greatest amount of distance occurs between subjects two and three. Sax asserts that when D is used in this way, factor analysis need not be run prior to using the D index.

Summary

1. The semantic differential is a combination of the usual type of rating scale with factor analysis.
2. It is a flexible technique to use and easy to construct, administer and score.
3. It is subject to the limitations which appear to be present in rating scales, i.e., the possibility of faking responses.
4. A number of studies have demonstrated validity for the technique, and
5. It has found its widest application in the study of personality development and in the evaluation of psychotherapy. It appears to be a promising tool for educational use although this has not been the case in previous years.

Guttman's Scalogram Analysis

Scalogram analysis differs considerably from the methods of constructing attitude scales previously described. Unlike the previous methods, Guttman scalogram analysis is a process designed to determine if a proper scale exists (if the scale measures one and only one variable). It is designed to evaluate an existing scale and not for scale construction per se. Edwards writes:

. . . Scalogram analysis is not a method for constructing or developing an attitude scale, although it has been referred to as such by other writers. In practice, scalogram analysis can perhaps be most accurately described as a procedure for evaluating sets of statements or existing scales to determine whether they meet the requirements of a particular kind of scale. . .⁴⁷

Determining unidimensionality is one of the problems which exist with attitude scales. Guttman writes:

One of the fundamental problems is to determine if the questions asked on a given issue have a single meaning for the respondents. . . If a question means different things to different people, then there is no way that the respondents can be ranked in order of favorableness. Questions may appear to express but a single thought and yet not provide the same kind of stimulus to different people.⁴⁸

Oppenheim⁴⁹ states that scalogram analysis has the twin problems of unidimensionality and reproducibility. He suggests that the scalogram technique enables the researcher to know from a respondent's score, exactly which items he has endorsed with no more than 10 per cent error for the sample as a whole.

Each response is assigned a number (with the higher reflecting a more positive attitude toward the concept in question). The scores are then summed and on the basis of

⁴⁷Edwards, p. 172.

⁴⁸Louis Guttman, "The Basis for Scalogram Analysis," Reprinted from Studies of Social Psychology in World War II, Vol. 4 of Measurement and Prediction (Princeton University Press, 1949). Bobbs-Merrill Reprint Series in the Social Sciences, Print No. S-413, p. 60.

⁴⁹A. N. Oppenheim, Questionnaire Design and Attitude Measurement (New York: Basic Books, Inc., 1966), pp. 143-44.

the summed scores, individuals are ranked from high to low. A person with a more favorable attitude (higher score) than another person must also be just as favorable or more favorable in his response to every statement on the questionnaire than the person who has a lower summed score. When this happens, the scale is said to be unidimensional. This technique involves the ranking of people as opposed to the ranking of items. Guttman favors the ranking of people instead of ranking items. He contends that:

the ranking of items apparently is restricted to dichotomous items, where a person either endorses or does not endorse a statement. In such a case, it is possible to consider a ranking of endorsements, so that if a person endorses a more extreme statement, he should endorse all less extreme statements if the statements are to be considered a scale . . . If the items have more than two categories, such a consideration breaks down; "agree" to one item might be equivalent to, or even less "favorable" than, "undecided" to another item so that there remains a problem of how to rank items and response categories.⁵⁰

Guttman believes that the ranking of people provides a more general approach to the problem of scaling, since it turns out to be equivalent to the ranking of items when all items are dichotomous and it also includes the case where items have more than two answer categories.

Guttman asserts that perfect scales are not to be expected in practice and suggests a method for determining the degree of perfection by calculating what he calls the "coefficient of reproducibility." Murphy, Murphy and Newcomb

⁵⁰Guttman, p. 62.

appear to agree with Guttman with respect to the difficulty of obtaining a perfect scale. They write:

. . . there is every reason to believe that none of the rather complex social attitudes which we are primarily discussing will ever conform to such rigorous measurements.⁵¹

The coefficient of reproducibility may be calculated as follows:

$$R = 1 - \frac{\text{number of errors}}{\text{number of responses}}$$

The calculated R would then represent the coefficient of reproducibility and a figure of .85 is the point most often referred to as a base for scalability. While reproducibility is important, it is not the sole criterion for determining scalability. However, it is the most important single factor. The following should also be considered in determining scalability:

1. Range of marginal distribution--the reproducibility of any individual item can never be less than the percentage of respondents falling into a single category of that item regardless of whether or not a scale exists.
2. Pattern of errors--If an area is scalable with but 10 per cent error (and not artificially so because of extreme marginals), this implies that there is but one dominant variable in the area along which to order the persons. The errors of reproducibility may be caused by either one or two other variables of lesser magnitude that may be in the area or by many small variables.
3. Number of items--The more items included in a scale, the greater is the assurance that the entire universe

⁵¹Murphy, Murphy and Newcomb, p. 897.

of which these items are a sample is scalable.
And,

4. Number of response categories--The more response categories, the greater the assurance that the entire universe is scalable.⁵²

Summary

Literature on attitude research is abundant. However, the literature points to inconsistent findings with respect to establishing a predictive relationship between attitude and behavior. Actually, few studies have been designed to establish a predictive relationship. Inconclusive findings related to the prediction of behavior can be attributed to many factors among which are the following:

1. An accepted definition of an attitude evolved rather slowly. Some researchers define an attitude as a multicomponent concept while others define it as a unidimensional concept. Those who define an attitude as a multicomponent concept attempt to assess attitudes using a unidimensional instrument. In fact, some authors attribute inconsistent findings to the measuring instrument.
2. Failure to consider both the object and the situation, i.e., the interaction of object and situation as well as the relative importance of each has led to inconsistent findings.

It is generally agreed that attitude and behavior are related in some way. This relationship could well be established if one were to consider object and situation. However, as long as the relationship is based solely on attitude toward object only and failure to consider the importance of the interaction between object and situation, this inconsistency will prevail.

⁵²Guttman, pp. 78-79.

CHAPTER III

DESIGN OF THE STUDY

Introduction

The primary purpose of this study was to determine the degree of difference in expressed attitudes which exists between and among three selected groups as a function of: (1) age, (2) years of teaching and administrative experience, and (3) instructional mode. This chapter presents the determination of the population; procedures; modification of the instrument, Attitude Toward Instructional Development, using Guttman Scalogram Analysis; hypotheses to be tested; and statistical procedure. A summary is also included.

The Population

The population for this study consisted of participants in the Instructional Development Institute held in Toledo, Ohio and the enrollees in the Education 831A course in educational media taught during the winter term of 1972 at Michigan State University.

More specifically, the sample for this study consisted of the following three groups:

1. Those students enrolled during the winter quarter in Education 831A at Michigan State University. Education 831A is a graduate level course which addresses itself to the Instructional Development concept and provides the enrollees at Michigan State with their initial formal exposure to the concept. This group has been designated experimental group 1.
2. The Instructional Development Institute group, experimental group 2, is pre-determined in terms of composition and will include teachers, administrators (superintendents and principals), policy-makers (board members), and specialists (content, curriculum, and media). These persons are participants in the Instructional Development Institute program which is a function of the National Special Media Institute (NSMI). The IDI is a "validated training program in ten (10) units (approximately 40 hours) designed to provide teams of teachers, administrators, policy-makers and specialists (TAPS) with initial competencies and skills in applying an instructional systems approach to the development of practical solutions to critical teaching and learning problems."¹ The institutions providing the leadership are: (1) Michigan State University, (2) Syracuse University, (3) University of Southern California, and (4) United States International University.
3. A control group selected from the East Lansing, Michigan Public School System. Those persons selected for the control group will not have had either a formal course dealing with instructional development nor will they have attended an in-service workshop on instructional development.

This study will be generalizable to other populations only to the extent that other populations are similar in characteristics to the population used in this study.

¹National Special Media Institute, What Is an IDI?
U.S. Office of Education.

Procedure

The procedure for this study included:

1. The modification of Attitude Toward Instructional Development, an attitude assessment scale produced under a grant by the United States Office of Education, Bureau of Libraries and Educational Technology, Division of Educational Technology.
2. The modification was made using Guttman's Scalogram Analysis. Specifically, the writer:
 - (a) Determined the unidimensionality of the instrument with unidimensionality meaning or representing the presence of a single variable within the scale.
3. Administering the revised instrument to the three selected groups.

Instrumentation

Attitude Toward Instructional Development, a fifty item Likert-type questionnaire, was selected for this study since it is one of the few instruments designed specifically to assess attitudes which individuals have toward instructional development.

Data were not available pertaining to unidimensionality or validity of the instrument from NSMI. This, then, meant testing the instrument for unidimensionality and scalability.

Guttman Scalogram Analysis was used to determine unidimensionality and scalability. This is not a technique for scale construction but rather a method of determining if one and only one psychological object is being measured and whether or not the universe of items forms a scale.

Atherton,² interpreting Guttman, writes that "this technique is useful due to the favorable probability of providing unidimensionality in the constructed attitudinal scale." For this reason scalogram analysis was selected.

Experimental Procedures

The scale, Attitude Toward Instructional Development, (See Appendix A) was administered to 43 students enrolled in Education 831A during the fall term of 1971 at Michigan State University as a pre-test. Each statement contained five possible responses ranging from "strongly agree" to "strongly disagree." Each responses was scored by assigning it a number with the higher number reflecting a more positive attitude toward the psychological object. For example, a response of "strongly agree" was assigned a weight of 5, "agree" a weight of 4, "undecided" a weight of 3, "disagree" a weight of 2, and "strongly disagree" a weight of 1.

Scores were summed for each individual and the respondents were ranked according to these summed scores. The ranking of individuals, according to Guttman, provides a more general approach to the problem of scaling. That is, a person with a more favorable attitude, a higher cumulative score, must be just as favorable or more favorable in his

²Lawrence L. Atherton, "A Comparison of Movie and Multiple-Image Presentation Techniques on Affective and Cognitive Learning." Unpublished dissertation, Michigan State University, East Lansing, Michigan, 1971, p. 13.

response to every statement contained in the universe of items that the other persons whose cumulative scores indicate a less favorable position. If this happens, a perfect scale exists. Yet, perfect scales are not to be expected. The closeness of a scale to perfection is determined by the reproducibility index which accounts for the number of errors found in the scale pattern.

The reproducibility index for the initial instrument was found to be .75, well below the acceptable level of .85 as specified by Guttman. The reproducibility index was calculated by substituting values in the following equation:

$$R = 1 - \frac{\text{Number of errors}}{\text{Number of responses}}$$

The instrument contained 50 statements which were responded to by 43 people. The total number of responses was 2,150 or 43 x 50. There were a total of 549 scaling errors. Scaling errors are those responses which fall outside the category in which they theoretically belong. For example, responses of 1, 1, 1, 4, 1, 1, 4, and 1 would contain two errors. Additionally, no resultant category of responses should contain more errors than non-errors. Items which contained more errors than non-errors in the resultant categories were omitted. This procedure was used to insure that the coefficient was not spuriously low. Further, no items were included in the revised scale which had more than 80 per cent of the respondents falling into its most popular category

to avoid a spuriously high index. The index becomes:

$$R = 1 - \frac{549}{2,150} = 1 - .25 = .75$$

The reproducibility index for each item was then calculated and 24 items were included in the revised instrument (See Appendix B). The analysis of the data indicated that the responses to the remaining statements fluctuated back and forth between "agree" and "strongly agree," and between "disagree" and "strongly disagree." Therefore the categories of responses were collapsed and assigned new weights. "Strongly agree" and "agree" were given the same weight, and "strongly disagree" and "disagree" were equated to be equal. The questionnaires were then re-scored and the individuals were ranked according to the cumulative scores based on the new weights. The reproducibility index was calculated to be .85 for the revised instrument. "Collapsing categories is designed to measure more accurately, respondents' attitudes towards the statements."³

Hypotheses

The following hypotheses were generated and tested to determine the degree of difference in expressed attitudes which existed between and among the three groups.

³ Allen L. Edwards, Techniques of Attitude Scale Construction, Century Psychology Series, Richard M. Elliott, ed. (New York: Appleton-Century-Crofts Inc.), pp. 190-91.

1. There will be a significant difference in the expressed attitudes of the three groups as a result of exposure to the Instructional Development concept via different instructional modes.
 - (a) The IDI group will express a more positive attitude toward instructional development than will the 831A group.
 - (b) The 831A group will express a more positive attitude toward instructional development than will the control group.
2. Attitude toward instructional development will become more positive with age.
 - (a) There will be a significant positive correlation between scores on the attitudinal scale and age.
3. Attitudes toward instructional development will become more positive with experience.
 - (a) There will be a significant positive correlation between scores on the attitude scale and experience.

Analysis

The attitudinal scale for the pre-test and the revised scale administered to the three selected groups included in this study were analyzed by Guttman Scalogram Analysis. The revised scale was administered to the 831A class during the final examination week. The same scale was given to the participants in the Instructional Development Institute at the end of 40 hours of exposure to instructional development. Since the control group had no formal exposure to instructional development and no treatment was given to them, the point in time at which the questionnaire was administered was not critical. However, the questionnaire was administered

to the control group during final examination week. A two-way analysis of variance was used to determine the differences which existed between and among the three groups as a function of age and treatment. A one-way analysis of variance was used to determine the degree of difference which existed as a function of experience. All hypotheses were tested as the .05 level of confidence.

Summary

The population for this study consisted of three groups: the 831A class which had 46 enrollees; 31 participants in the Instructional Development Institute and 33 individuals from the East Lansing Public Schools who made up the control group. A demographic sheet was devised so as to gather information relative to the functions investigated in this study. This sheet was administered along with the attitude scale.

CHAPTER IV

ANALYSIS OF RESULTS

Before administering the instrument, Attitude Toward Instructional Development, it was necessary to determine if the instrument was unidimensional in nature. Scalogram Analysis was selected and is highly recommended by noted researchers. As mentioned in Chapter III, the coefficient of reproducibility generally accepted for scalability is .85. However, this figure is for dichotomous items and a lower figure is acceptable for multiple response items. The index for the original instrument was .75. After applying scalogram analysis, the index for the revised instrument was .85. Also mentioned in Chapter III was that no items were included on the modified scale which had more than 80 per cent of the respondents in any one category of response.

After the modified scale was shown to be sufficiently unidimensional (.85 index), the raw data was subjected to statistical analysis. Specifically, a 2 way analysis (3 x 2 design) of variance was used to determine the degree of difference which existed between and among the three groups as a function of age and treatment. A one way analysis of variance was used to determine the degree of

difference which existed between and within the groups as a function of experience. The .05 per cent level of confidence was used for this and all subsequent analysis.

Statistical Analysis

Univariate analysis of variance revealed that there was no significant difference between the age categories regardless of groups. Table 3 illustrates this point.

Table 3. Univariate Analysis of Variance for Attitude: Age Test and Group Test.

	Between Mean Square	F- Statistic	Degrees of Freedom	Significance Probability
Age	34.3660	0.1666	1 and 104	>.05
Group	681.3741	3.3027	2 and 104	.0407<.05
Interaction	324.1663	1.4713	2 and 104	>.05

The analysis (see Table 3) revealed that there was a difference in attitudes toward instructional development

according to treatment groups. Univariate analysis of variance revealed an F-statistic of 3.3027 which is significant at the .05 level. Since this difference was significant and the design was 3×2 , a post hoc test (Newman-Keuls)¹ was used to determine the group most favorable toward instructional development.

Test on Differences Between All Pairs of Means

The Newman-Keuls method is used to make tests on difference between all pairs of means. With unequal sample sizes, it is convenient to work with the treatment means. The treatment means are 77.1 for the control group, 86.4 for the 831A class, and 85.3 for the Instructional Development Institute group. Table 4 provides the treatment means in order of increasing magnitude, the differences between all possible pairs of means and the number of steps these possible pairs are apart and are denoted by "r."

The critical values are also included in Table 4. These values are denoted as $q_{.95}(r, 104)$ and may be obtained by examining the Tables of the Studentized Range Statistics by setting r equal to the range. $q_{.95}$ means the same as the .05 level of confidence. The critical value for the "qr" statistic when $r = 2$ or when the means are two steps apart is 2.83. When the two means are 3 steps

¹B. J. Winer, Statistical Principles in Experimental Design (New York: McGraw-Hill Book Company, 1962), pp. 80-103.

apart ($r = 3$) the critical value is 3.38.

Table 4. Tests on Differences Between All Pairs of Means.

Treatments	1	3	2	
1	Means	77.1	85.3	86.4
	77.1	-----	8.2	9.3
	85.3		-----	1.1
	86.4			-----

$q_{.95}(r,104)$

$r = 2$
2.83

$r = 3$
3.38

In making several tests, it is more appropriate to work with the critical value of the difference between a pair of means rather than the critical value of " qr ." Consequently, $MS \text{ error}/N^{q_{.95}(r,104)}$ must be calculated when means are 2 and 3 steps apart. (See Appendix D).

Summary

The first test is made on the difference 9.3 in the upper right corner of Table 4. Since this difference between two means is 3 steps apart, the value to be compared is 7.67 (3.38×2.27). Hence the hypothesis that $r_1 = r_2$ is unsupported by the experimental data.

The next test is made on the difference 8.2. Since

this difference is between 2 means that are 2 steps apart, the value to be compared is 7.05 (2.49×2.38). Hence the hypothesis that $r_1 = r_2$ is unsupported by the experimental data.

The entry 1.1 (see Table 4) is also tested against the value 7.05 since this difference between 2 means is 2 steps apart. Hence, the data support the hypothesis that $M_3 = M_2$. Schematically, this summary is presented in Table 5. The asterisks denote that the corresponding differences are significant at the .05 level.

Table 5. Summary of Significant Differences.

	1	3	2
1		*	*
3			
2			

Stated another way, the attitudes of respondents in the 831A class and those of the participants in the Instructional Development Institute (IDI) were more positive toward instructional development than were the attitudes of respondents in the control group. This difference was significant at the .05 level.

The previous discussion relates directly to the first experimental hypothesis generated.

1. There will be a significant difference in the expressed attitudes of the three groups as a result of exposure to the instructional development concept via different instructional modes.

- (a) The Instructional Development Institute participants will express a more positive attitude toward instructional development than will the 831A group.
- (b) The 831A group will express a more positive attitude toward instructional development than will the control group.

As indicated in Table 5, hypothesis 1 was supported by the data. The three groups differed in their attitudes toward instructional development as a result of treatment. Hypothesis 1_a is unsupported since there is no significant difference between the IDI group and the 831A class with respect to attitude towards instructional development. However, hypothesis 1_b was supported. Attitudes expressed by the 831A class differed significantly (.05 level) from those expressed by the control group. Similarly, the attitudes of the IDI participants differed significantly from those of the control group.

Univariate analysis of variance revealed an F-statistic of .1666 when considering the effects of age on attitude formulation. The F-statistic of .1666 is not significant at the .05 level of confidence. The correlation coefficient for the variable was $-.07$ which indicated that there was no significant correlation between the variable age and that of attitude. The following hypothesis was therefore unsupported:

- 2. Attitude toward instructional development will become more positive with age. That is,

There will be a significant positive correlation between scores on the attitude scale and age.

A comparison of scores with respect to age and experience of the three groups yielded a chi-square of 46.03 which is significant at the .05 level. Again, this indicated that the variables of age and experience are related, though not in a linear manner (see Table 6). The correlation coefficient for the variables age and experience was .77 which indicated that these variables are highly correlated in a positive manner. Although these variables each have two levels, a 2 x 2 design was not used since one cell in the design was empty. That is, when dividing the respondents into two levels of age, i.e., A_1 and A_2 , there were 75 and 35 respondents in these two levels respectively. Subdividing the variable age into two experience levels, the A_1 group (75) had 53 respondents in the first level of experience or E_1 and 22 in the second level or E_2 . The A_2 (35 respondents) contained all 35 respondents in the second experience level or E_2 . This may be represented graphically as follows:

Table 6. Number of Subjects in Each Group.

		AGE	
EXPERIENCE	E_1	53	--
	E_2	22	35

Consequently, a one way analysis of variance was performed on the experience data. Univariante analysis

of variance yielded a non-significant F-statistic of 1.6743. In determining the correlation between experience and attitude, a correlation coefficient of $-.07$ was found. Therefore the correlation between experience and attitude was not significant. On the basis of this data, the following hypothesis was unsupported.

3. Attitude toward instructional development will become more positive with experience.

- (a) There will be a significant positive correlation between scores on the attitude scale and experience.

It should be noted that while there was no significant correlation between experience and attitude, the correlation tended to be in a negative direction. Figure 4 summarizes the previous discussion.

Figure 4. Simple Correlations

Experience	$+.766$	
Attitude	$-.067$	$-.075$
	Age	Experience

Summary

As previously mentioned, there was a significant difference in the attitudes of the respondents according

to treatment. Also there was a significant difference in the expressed attitudes of both the 831A class and the Instructional Development Institute respondents when compared with the control group. Both the 831A class and the Institute participants expressed a more positive attitude toward instructional development than did the control group. There was a difference in expressed attitudes of the 831A and the Institute participants. This difference, however, was not significant at the .05 level. Although this difference was not significant, the 831A class expressed a slightly more positive attitude toward instructional development than did the Institute participants.

CHAPTER V

SUMMARY AND CONCLUSIONS

The purpose of this study was to determine the degree of difference in expressed attitudes of three selected groups of individuals toward instructional development. Experimental group I consisted of those students enrolled in 831A during the winter quarter 1971-72 at Michigan State University. Experimental group II was comprised of participants in the Instructional Development Institute held in Toledo, Ohio. The third group, the control group, contained teachers, administrators and policy makers from the East Lansing, Michigan public school system. The attitude instrument was administered to each group at about the same point in time.

Prior to determining the differences in expressed attitudes of the three groups, Guttman Scalogram Analysis was used with a sample population having similar professional and personal characteristics as the three groups used in the study. Scalogram Analysis, although not a method of scale construction, was used to determine if the instrument, "Attitude Toward Instructional Development," was unidimensional, i.e., measured one and only one variable. This instrument, a modified Likert type scale, consisted of

50 items and was revised with a 24-item questionnaire resulting.

Attempts at assessing attitudes toward a given psychological object are found quite frequently in the literature. However, few research studies have been conducted to assess the attitudes of individuals toward instructional development. Past research efforts in the area have for the most part devoted attention almost exclusively to media and media utilization. Literature is "clouded" with studies attempting to establish the supremacy of Method A over Method B. There appears to be an oversight in this regard. Namely, Method A could well be better than Method B, yet neither may have a great deal of educational value.

The literature at best presents speculations about attitude research in so far as instructional development is concerned. There appears to be a dearth of sound research which one can use to make deeper inroads. Lack of progress along these lines can be attributed to a number of factors among which are the following:

1. Instructional development is a relatively new concept and devotees of the instructional development endeavor are still attempting to generate new definitions and refine existing ones.
2. Devising an instrument which will adequately assess attitudes is difficult in itself. To assess attitudes of an emerging process such as instructional development compounds the task. In fact, very few researchers make such an arrogation. After careful study of the available attitude instruments which make this claim, one begins to question the unidimensionality and ultimately the validity of these instruments.

After determining the unidimensionality of the instrument, the data generated were subjected to statistical analysis. A two-way analysis of variance was used to determine the degree of difference which existed among the three groups as a function of age and treatment. Univariate analysis was used to determine if the groups differed according to treatment and was also used to determine the effects of experience on attitude formulation. Chi-square was used to establish whether a relationship existed between the independent variables. Where relationships existed, correlation coefficients were used to determine the direction of the relationships.

A significant difference existed between the groups as a result of treatment. A post-hoc test, Newman-Keuls, was used to determine the group most favorable toward instructional development. Directional hypotheses were tested at the .05 level.

Conclusions

Data analysis supports the following conclusions:

1. The Instructional Development Institute group and the 831A class differed significantly from the control group.
2. No significant differences were found between the groups as a result of age and experience.
3. There existed a relationship between age and experience. A correlation coefficient of $+0.766$ indicates the direction of this relationship.

Discussion of Results

Analysis of the data indicates that the groups differed only insofar as treatment. Since both the 831A class and the Instructional Development Institute participants differed significantly in their expressed attitudes toward instructional development from the control group, one begins to speculate about the effects of cognitive knowledge on attitude formulation. It may well be that the careful preparation and organization of the material in both experimental groups were more directly related to expressed differences in attitudes than the techniques used. In other words, both experimental groups were exposed to the instructional development concept only after careful preparation and organization of materials.

Univariate analyses indicated that age and experience were not significant factors in the attitudes expressed by the respondents. However, the high correlation between age and experience is consistent with past research findings.

Recommendations for Future Research

The analysis of the data revealed several interesting findings which have implications for future research. The following are recommendations, based on the analysis of the data, for which future research efforts should be directed.

1. This study should be replicated using a larger sample size. Future research efforts should therefore have a larger population from which larger treatment groups could be drawn. The composition of treatment groups should be such that each person from the population is assigned according to randomization process. Still further, a pre-test post-test design is suggested.
2. The present study was concerned with assessing attitudes of three selected groups. It is suggested that an experimental study be conducted where the emphasis is to assess and modify attitudes. This means that the researcher would decide the treatment rather than accept a treatment which is not under his control. This way, the researcher could control the number of extraneous variables and investigate the importance of both the object and the situation in terms of attitude modification.
3. Future research is needed to determine the effects of cognitive knowledge on attitude formulation and modification.

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APPENDIX A

ATTITUDE TOWARD INSTRUCTIONAL DEVELOPMENT SCALE

Check One

Male _____
Female _____

Check One

Teacher _____
Administrator _____
Specialist _____

ATTITUDE TOWARD INSTRUCTIONAL DEVELOPMENT*

DEFINITIONS

Instructional Development or I.D. is a system approach to solving instructional problems. It involves a definition stage where the problem and all related instructional elements and resources, including management organization are identified; a development stage where the behavior necessary to solve the problem is specified in measurable terms and a prototype learning experience is developed which employs the most effective methods and media that learning theory and practical experience can suggest; and finally, it involves a testing and application stage where the prototype system is tried out and revised repeatedly until some version(s) successfully teaches the desired behavior. Only then is the resulting system used by teachers who have been thoroughly trained to use it properly with qualified learners.

INSTRUCTIONS

When you answer the following statements please try to express the way you honestly feel about this idea of instructional development or I.D. Your answer is correct if it expresses your true opinion. PLEASE ANSWER EVERY ITEM. In each case encircle the letter which represents your own ideas as follows:

SA if you agree completely with the statement
 A if you agree in general but wish to modify it somewhat
 U if your attitude is undecided
 D if you disagree but with certain modifications
 SD if you completely disagree

*Produced under a grant from the U.S. Office of Education, Bureau of Libraries and Educational Technology, Division of Educational Technology, Media Specialist Program. Produced for the National Special Media Institutes by Jack V. Edling. Copyright, National Special Media Institutes, 1971.

- | | | | | | | |
|-----|--|----|---|---|---|----|
| 1. | I.D. should be a part of the professional preparation of all teachers. | SA | A | U | D | SD |
| 2. | I.D. Places too much emphasis on programming, media and technology. | SA | A | U | D | SD |
| 3. | I.D. makes one realize that you have to be specific on problems and objectives to communicate effectively. | SA | A | U | D | SD |
| 4. | I.D. really gives primary consideration to the learner's needs. | SA | A | U | D | SD |
| 5. | I.D. is a waste of time. | SA | A | U | D | SD |
| 6. | I.D. is so significant that it is urgent to promote its wide adoption. | SA | A | U | D | SD |
| 7. | I.D. allows each child to start from where he is and progress as far as he is capable. | SA | A | U | D | SD |
| 8. | I.D. enables children to find capabilities within themselves that they wouldn't have been able to find without it. | SA | A | U | D | SD |
| 9. | I.D. is nothing new. | SA | A | U | D | SD |
| 10. | I.D. seems like a better solution to our problems than anything else currently being considered. | SA | A | U | D | SD |
| 11. | I.D. will be ineffective unless all members of a team have a thorough understanding of the system and are committed to it. | SA | A | U | D | SD |
| 12. | I.D. is a flexible approach that allows for expansion and change. | SA | A | U | D | SD |
| 13. | I.D. is simply the old problem-solving method. | SA | A | U | D | SD |
| 14. | I.D. is the most challenging idea in education at the present time. | SA | A | U | D | SD |
| 15. | I.D. is the only really effective way to evolve a relevant curriculum. | SA | A | U | D | SD |

- | | | | | | | |
|-----|---|----|---|---|---|----|
| 16. | I.D. requires too many alternatives to be practical. | SA | A | U | D | SD |
| 17. | I.D. enables the teacher to better see the purposes of his instructional program. | SA | A | U | D | SD |
| 18. | I.D. cannot be compared with traditional approaches to improving instruction. | SA | A | U | D | SD |
| 19. | I.D. will work only when everyone directly involved in instruction is favorable and familiar with it. | SA | A | U | D | SD |
| 20. | I.D. requires concentrated effort at first but it becomes less demanding as it becomes better understood. | SA | A | U | D | SD |
| 21. | I.D. is something every educator can use. | SA | A | U | D | SD |
| 22. | I.D. enables people to better work together to meet the needs of students. | SA | A | U | D | SD |
| 23. | I.D. enables teachers to develop new and more effective methods for meeting student needs. | SA | A | U | D | SD |
| 24. | I.D. may have some advantages but I haven't been sold completely on it. | SA | A | U | D | SD |
| 25. | I.D. is the most productive in-service training that I can conceive. | SA | A | U | D | SD |
| 26. | I.D. is the best answer yet for teachers who are looking for an objective method for attacking curriculum problems. | SA | A | U | D | SD |
| 27. | I.D. is a boring and uninteresting activity. | SA | A | U | D | SD |
| 28. | I.D. is the means to reduce the gap between "what is" and "what should be." | SA | A | U | D | SD |

- | | | | | | | |
|-----|--|----|---|---|---|----|
| 29. | I.D. provides a means for "getting a handle" on the problems facing school districts. | SA | A | U | D | SD |
| 30. | I.D. can be the change agent that will elevate us from the morass of problems that blind, confuse and befuddle us. | SA | A | U | D | SD |
| 31. | I.D. is fine but I couldn't do it by myself. | SA | A | U | D | SD |
| 32. | I.D. is right on target--there is no better way or more opportune time than to move on it right now. | SA | A | U | D | SD |
| 33. | I.D. enables you to get the most effect for the money available. | SA | A | U | D | SD |
| 34. | I.D. has recognized and structured a systematic way to resolve problems and all educators should become committed to it. | SA | A | U | D | SD |
| 35. | I.D. is a giant step forward. | SA | A | U | D | SD |
| 36. | I.D. really makes one think about all aspects of the educational task. | SA | A | U | D | SD |
| 37. | I.D. provides a method to assess the goals of an instructional program realistically in terms of available resources. | SA | A | U | D | SD |
| 38. | I.D. has taken curriculum improvement from the abstract to tangible evidence in dealing with educational objectives. | SA | A | U | D | SD |
| 39. | I.D. is a procedure that will result in the improvement of an instructional program. | SA | A | U | D | SD |
| 40. | I.D. is long overdue--think of how many children we have failed and blamed them for their failure. | SA | A | U | D | SD |
| 41. | I.D. is a "must" for every administrator who assumes the role of instructional leader. | SA | A | U | D | SD |

- | | | | | | |
|--|----|---|---|---|----|
| 42. I.D. helps teachers who have had little training on how to plan systematically. | SA | A | U | D | SD |
| 43. I.D. and the resulting more systematic instruction has become essential since the educational process has become so complex. | SA | A | U | D | SD |
| 44. I.D. is not an end in itself, but simply a means that educators can and must use to update schools. | SA | A | U | D | SD |
| 45. I.D. is the best alternative we have to accomplish the task at hand. | SA | A | U | D | SD |
| 46. I.D. seems to be the way to go. | SA | A | U | D | SD |
| 47. I.D. is essential to get the support so often refused because we're always dealing with generalities. | SA | A | U | D | SD |
| 48. I.D. is what we have been needing for years. | SA | A | U | D | SD |
| 49. I.D. will succeed because it places primary emphasis on the learner and learning. | SA | A | U | D | SD |
| 50. I.D. is the nearest thing we have to a panacea in education. | SA | A | U | D | SD |

APPENDIX B

ATTITUDE TOWARD INSTRUCTIONAL DEVELOPMENT, REVISED SCALE

Please respond to each of the following items in order to provide essential background data.

SEX: Male Female

AGE: Please circle the appropriate age range:

up to 24; 25-29; 30-34; 35-39; 40-44; 45-49; 50-54; 55-59; 60+

YEARS OF EMPLOYMENT: Please circle the appropriate range of years of your employment in an educational capacity.

None; 1-4; 5-9; 10-14; 15-19; 20-24; 25-29; 30-34; 35-39; 40+

PRESENT POSITION: Please check your present position(s) in the following list and then indicate the number of years which you have held this position.

<u>Position</u>	<u>Years</u>
Teacher _____	_____
Administrator _____ (principal or asst.,supt. or asst.)	_____
Board member _____ (trustee, regent, etc.)	_____
Specialist _____ (counselor,media/library,curr.,content)	_____
If other, please list and explain: _____	

CURRICULAR RESPONSIBILITY: Please list the subjects(s) which you now teach.

(1) _____; (2) _____; (3) _____

TEACHING AND/OR ADMINISTRATIVE LEVEL: Please circle the appropriate response:

K-8; 9-12; if other, specify: _____

DEGREE LEVEL: Circle your present degree level:

Bachelor's; Master's; Specialist; Doctorate

ATTITUDE TOWARD INSTRUCTIONAL DEVELOPMENTDEFINITIONS:

Instructional Development or I.D. is a systems approach to solving instructional problems. It involves a definition stage where the problem and all related instructional elements and resources, including management organization are identified; a development stage where the behavior necessary to solve the problem is specified in measurable terms and a prototype learning experience is developed which employs the most effective methods and media that learning theory and practical experience can suggest; and finally, it involves a testing and application stage where the prototype system is tried out and revised repeatedly until some version(s) successfully teaches the desired behavior. Only then is the resulting system used by teachers who have been thoroughly trained to use it with qualified learners.

INSTRUCTIONS:

When you answer the following statements please try to express the way you honestly feel about this idea of instructional development or I.D. Your answer is correct if it expresses your true opinion. PLEASE ANSWER EVERY ITEM. In each case encircle the letter which represents your own ideas as follows:

SA if you agree completely with the statement

A if you agree in general but wish to modify it somewhat

U if your attitude is undecided

D if you disagree but with certain modifications

SD if you completely disagree

- | | | | | | | |
|-----|---|----|---|---|---|----|
| 1. | I.D. places too much emphasis on programming, media and technology. | SA | A | U | D | SD |
| 2. | I.D. really gives primary consideration to the learner's needs. | SA | A | U | D | SD |
| 3. | I.D. is so significant that it is urgent to promote its wide adoption. | SA | A | U | D | SD |
| 4. | I.D. enables children to find capabilities within themselves that they wouldn't have been able to find without it. | SA | A | U | D | SD |
| 5. | I.D. seems like a better solution to our problems than anything else currently being considered. | SA | A | U | D | SD |
| 6. | I.D. is the only really effective way to evolve a relevant curriculum. | SA | A | U | D | SD |
| 7. | I.D. requires too many alternatives to be practical. | SA | A | U | D | SD |
| 8. | I.D. requires concentrated effort at first but it becomes less demanding as it becomes better understood. | SA | A | U | D | SD |
| 9. | I.D. is something every educator can use. | SA | A | U | D | SD |
| 10. | I.D. is the best answer yet for teachers who are looking for an objective method for attacking curriculum problems. | SA | A | U | D | SD |
| 11. | I.D. is the means to reduce the gap between "what is" and "what should be." | SA | A | U | D | SD |
| 12. | I.D. provides a means for "getting a handle" on the problems facing school districts. | SA | A | U | D | SD |
| 13. | I.D. is right on target--there is no better way or more opportune time than to move on it right now. | SA | A | U | D | SD |

- | | | | | | | |
|-----|--|----|---|---|---|----|
| 14. | I.D. has recognized and structured a systematic way to resolve problems and all educators should become committed to it. | SA | A | U | D | SD |
| 15. | I.D. is a giant step forward. | SA | A | U | D | SD |
| 16. | I.D. really makes one think about all aspects of the educational task. | SA | A | U | D | SD |
| 17. | I.D. provides a method to assess the goals of an instructional program realistically in terms of available resources. | SA | A | U | D | SD |
| 18. | I.D. has taken curriculum improvement from the abstract to tangible evidence in dealing with educational objectives. | SA | A | U | D | SD |
| 19. | I.D. is a procedure that will result in the improvement of an instructional program. | SA | A | U | D | SD |
| 20. | I.D. is long overdue--think of how many children we have failed and blamed them for their failure. | SA | A | U | D | SD |
| 21. | I.D. is a <u>must</u> for every administrator who assumes the role of instructional leader. | SA | A | U | D | SD |
| 22. | I.D. and the resulting more systematic instruction has become essential since the educational process has become so complex. | SA | A | U | D | SD |
| 23. | I.D. is the best alternative we have to accomplish the task at hand. | SA | A | U | D | SD |
| 24. | I.D. seems to be the way to go. | SA | A | U | D | SD |

1. SEX 1 = M
 2 = F

2. AGE 0 = 24 5 = 45-49
 1 = 25-29 6 = 50-54
 2 = 30-34 7 = 55-59
 3 = 35-39 8 = 60+
 4 = 40-44

3. YEARS OF EMPLOYMENT
 0 = None 5 = 20-24
 1 = 1-4 6 = 25-29
 2 = 5-9 7 = 30-34
 3 = 10-14 8 = 35-39
 4 = 15-19 9 = 40+

4. PRESENT POSITION
 1 = Teacher 4 = Specialist
 2 = Administrator 5 = Other
 3 = Board Member

-6. YEARS

7. CURRICULAR RESPONSIBILITY
 1 = Academic
 2 = Non-academic

8. TEACHING AND/OR ADMINISTRATIVE LEVEL
 1 = K-8
 2 = 9-12
 3 = Other

9. DEGREE LEVEL
 1 = B.S. 4 = Specialist
 2 = M.S. 5 = Ph.D.
 3 = M.S.+30 6 = Other

10. GROUPS
 0 = Control
 1 = 831A
 2 = IDI

APPENDIX C
CORRESPONDENCE

MICHIGAN STATE UNIVERSITY East Lansing, Michigan 48823

Instructional Media Center

March 22, 1972

Dr. W. Robert Docking
Director of Instructional Services
East Lansing School District
East Lansing, Michigan 48823

Dear Dr. Docking:

As a follow through of our conference on Monday, March 20, 1972, I am attempting to explicate more fully the nature of my concern.

I am in the process of modifying and hopefully validating the instrument, "Attitude Toward Instructional Development," an instrument produced under a grant from the U. S. Office of Education and produced by the National Special Media Institute. The National Special Media Institute is a validated training program in ten (10) units approximately 40 hours, designed to provide teams of teachers, administrators, policy makers, and specialists with initial competencies and skills in applying an instructional systems approach to the development of practical solutions to critical teaching and learning problems.

I would like to have a select number of individuals from the East Lansing School District respond to a revised edition of the aforementioned instrument in a control group situation. More specifically, I would like to have the following:

1. 20-25 teachers (10-12 from both the elementary and secondary level)
 2. 4-6 administrators
 - a) 2-3 superintendents or assistant superintendents
 - b) 2-3 principals or assistant principals
 - c) 2-3 policy makers - school board members
- and
3. 4-5 specialists - curriculum, content areas, media.

Dr. W. Robert Docking
Page 2
March 22, 1972

Additionally, these individuals should not have had any formal training in "Media" or instructional development.

The revised instrument contains 24 items along with a demographic sheet and should take no more than 15-25 minutes to complete. I am enclosing ten copies since you agreed to distribute them to persons in the central office administration. (An equal number of males and females is needed.)

I appreciate your assistance and if I can reciprocate do not hesitate to call on me. Again, many thanks.

Sincerely,

Marvin Duncan
EPDA Fellow

bb

March 22, 1972

Dear Teacher:

I am a full-time graduate student on leave from North Carolina Central College at Durham, North Carolina. I am presently working on a dissertation to complete a doctoral degree in the Department of Instructional Development and Technology at Michigan State University.

My study is designed to examine the possible influence which selected personal and professional characteristics of educators have on the attitudes which they express toward the Instructional Development Process.

The attitudinal survey of selected administrators, teachers, specialists, and board members in the East Lansing Public School System is being conducted with the knowledge and approval of Dr. W. Robert Docking. Your building principal has allowed me to present the attached questionnaire to you for your possible response.

As a fellow educator, I fully recognize the importance of your time and have modified a previously-constructed attitude questionnaire that should take a minimum of your time to complete. Your cooperation in completing the attached questionnaire which establishes you as a member of the control group in my study will be greatly appreciated. No further requests will be made upon your time.

After the completion of this study an abstract of the findings will be sent to you should you so desire.

Should you seek further information with respect to the questionnaire, please feel free to contact me at your convenience.

Sincerely,

Marvin E. Duncan
116 Linton Hall (MSU)
Office phone: 353-8840
Home phone: 355-2946

March 22, 1972

Dear Principal:

I am a full-time graduate student on leave from North Carolina Central College at Durham, North Carolina. I am presently working on a dissertation to complete a doctoral degree in the Department of Instructional Development and Technology at Michigan State University.

My study is designed to examine the possible influence which selected personal and professional characteristics of educators have upon the attitudes which they express toward the Instructional Development process.

The attitudinal survey of selected administrators, teachers, specialists, and board members in the East Lansing Public School System is being conducted with the knowledge and approval of Dr. W. Robert Docking.

I fully recognize the importance of your time and have modified a previously-constructed attitude questionnaire that takes only a short time to complete. Your cooperation in completing the attached questionnaire and your assistance in the selection of teachers within your building for inclusion in the control group for this study will be greatly appreciated.

After the completion of this study an abstract of the findings will be sent to you should you wish to have one.

Should you seek further information with respect to the questionnaire, please feel free to contact me at your convenience.

Sincerely,

Marvin E. Duncan
116 Linton Hall (MSU)
Office phone: 353-8840
Home phone: 355-2946

March 24, 1972

Dear Board Member:

I am a full-time graduate student on leave from North Carolina Central College at Durham, North Carolina. I am presently working on a dissertation to complete a doctoral degree in the Department of Instructional Development and Technology at Michigan State University.

My study is designed to examine the possible influence which selected personal and professional characteristics of educators have on the attitudes which they express toward the Instructional Development concept or process.

An attitudinal survey of selected policy makers, administrators, teachers, and specialists in the East Lansing Public School System is being conducted with the knowledge and approval of Dr. W. Robert Docking.

I fully recognize the importance of your time and have modified a previously-constructed attitude questionnaire that should take a minimum of your time to complete, should you choose to do so. Your cooperation in completing this questionnaire will be greatly appreciated. No further requests will be made of you with respect to this study.

An abstract of the findings of this study will be made available to you should you request one.

Should you seek further information with respect to the questionnaire, please feel free to contact me at your convenience.

Sincerely,

Marvin E. Duncan
116 Linton Hall (MSU)
Office phone: 353-8840
Home phone: 355-2946

March 29, 1972

Dear I.D.I. Participant:

I am presently gathering data for my dissertation to complete the doctoral degree in the Department of Instructional Development and Technology at Michigan State University.

My study is designed to examine the possible influence which selected personal and professional characteristics of professional educators have on the attitudes which they express toward the concept of Instructional Development.

Two selected groups of educators in the East Lansing area have already completed the attached attitude survey and demographic sheet. The successful completion of my dissertation is dependent upon your willingness to respond as well.

As a fellow educator, I fully recognize the importance of your time and I feel that the completion of the enclosed materials will require a minimal amount of time.

The questionnaire itself is a modification of the attitude instrument which you responded to at the formal I.D.I. session held in Toledo. No statements have been changed, but the number of items has been significantly reduced.

Once again, your completion and immediate return of the enclosed materials are matters of extreme importance. Your cooperation will be greatly appreciated.

Should you seek further information with respect to my findings or should you wish to comment on the questionnaire I can be contacted at the address given below.

Thank you for your cooperation.

Sincerely,

Marvin E. Duncan
Room 116, Linton Hall
Michigan State University
East Lansing, Michigan 48823

March 31, 1972

Mr. Marvin Duncan
Linton Hall
Michigan State University
East Lansing, Michigan 48823

Mr. Duncan:

Enclosed is the list of names and addresses of the participants of the last IDI put on by Dr. Gentry.

Sincerely,

Karen Bird

Whitter Public School
4215 Walker
Toledo, OH 43612

Rose Lyons, Principal

Paul Mook
Norma Leflet
Ann Randolph

Sherman Public School
Sherman & Walnut
Toledo, OH 43608

Frances Mattox, Principal

Mary Ann Pinkstaff
Nancy Gamble
Dorothy Hudgens
Wille Green

Raymer Public School
1419 Nevada
Toledo, OH 43605

Irene Poletes, Principal

Joan Breier
Equilla Roach
Wanda Penn
Carol Lopez

Pickett Public School
Blum & Hoag
Toledo, OH 43607

Gussie Hawkins, Principal

Priscilla Coleman
Ethel Shoto
Gwendolyn Hopkins
P. Griffin

Lincoln Public School
N. Detroit & Lincoln
Toledo, OH 43607

Robert Stubblefield,
Principal

Margaret Brooks
Wilma Smith
Edith Gholdston
Wesley Jones

Jones Public School
550 Walbridge
Toledo, OH 43609

George Hathaway, Principal

Ronald Black
Myrna Bryan
Bill Murphy
Juantila Loyd

Hamilton Public School
E. Manhattan Blvd. &
Cecelia Ave.
Toledo, OH 43608

Dorothy Moreland,
Principal

Ruth Smith
Martha McConnell
Sarah Shone

Fulton Public School
333 Melrose
Toledo, OH 43610

Lilly Szyshowski,
Principal

Relda Griffith
Lucille Morse
Sara Germain

April 5, 1972

Mrs. Mary Good
Switchboard Operator
Board of Education
Manhattan Blvd. and Elm
Toledo, Ohio 43608

Dear Mrs. Good:

Many thanks for assisting me in locating several persons within the Toledo Public School System. Without your consideration and time, I would probably be still trying to locate these individuals.

Again, many thanks.

Sincerely,

Marvin E. Duncan

April 6, 1972

Mr. Wayne Graham,
Assistant Principal
Gesup W. Scott High School
Toledo, Ohio

Dear Mr. Graham:

I discussed with Merle Dixon the possibility of having members of the Toledo Instructional Development Institute respond to a 24-item questionnaire.

Enclosed you will find a copy of the letter sent to Mr. Dixon which explains the nature of my research project. If you have questions, feel free to call collect.

Thank you for your cooperation.

Sincerely,

Marvin E. Duncan
Room 116, Linton Hall
Michigan State University
East Lansing, Michigan 48823
Phone: 353-8840

April 6, 1972

Mr. Merle Dixon
Head Start
Manhattan Blvd. and Elm
Toledo, Ohio 43608

Dear Mr. Dixon:

As a follow-up to our phone conversation, I am attempting to be more specific with respect to the research project I am engaged in.

I am presently gathering data for a dissertation to complete the doctoral degree in the Department of Instructional Development and Technology at Michigan State University.

My study is designed to examine the possible influences which selected personal and professional characteristics of educators have on the attitudes which they express toward the concept of instructional development.

Two selected groups of educators in East Lansing have already completed the enclosed attitude survey and demographic sheet. The successful completion of my dissertation is dependent upon your willingness to respond as well.

The questionnaire itself is a modification of the attitude instrument which you responded to at the formal I.D.I. session held in Toledo. No statements have been changed, but the number of items has been significantly reduced.

There are several persons I would like to contact with you serving as the coordinator. I would like to know if these people actually participated in the Instructional Development Institute. If they did in fact participate, I would like to know if they would be willing to respond to the enclosed questionnaire.

These persons are as follows:

1. Rubelle Ashly Model Cities
2. Phil Workman Title I
3. Peggy Moore Title I
4. Bruce Jacobson. Music Director
5. David Alvarado Director, Mexican
American Curriculum

Mr. Merle Dixon
Page 2
April 6, 1972

As a fellow educator, I fully recognize the importance of your time and feel that the completion of the enclosed materials will require a minimal amount of time.

Once again, your completion and immediate return of the enclosed materials are matters of extreme importance.

If you so desire, feel free to make copies of this letter for each of the persons in the preceding list. I will be willing to absorb the cost of such duplication.

Should you seek further information with respect to the findings or should you have comments about the questionnaire I can be contacted at the address given below.

I look forward to meeting you during your visit to Michigan State University.

Thank you for your cooperation.

Sincerely,

Marvin E. Duncan
Room 116, Linton Hall
Michigan State University
East Lansing, Michigan 48823

cc: Wayne Graham

APPENDIX D
CALCULATIONS

APPENDIX D
CALCULATIONS

(A) When means are 2 steps apart (groups 1 and 3), the critical value of the difference between the means is:

$$\sqrt{\text{MS error}/N} \quad q_{.95}(r, 104); \text{ variance} = 206.31$$

where:

$$N = \frac{K}{\frac{1}{N_1} + \frac{1}{N_3}}$$

$$N = \frac{2}{\frac{1}{33} + \frac{1}{31}} = \frac{2}{.03 + .03} = \frac{2}{.06} = 33.3$$

Therefore,

$$\sqrt{\text{MS error}/N} = \sqrt{206.21/33.3} = 2.49$$

The value to be compared with the mean difference of 8.2 is 2.49×2.38 or 7.05.

(B) When the means are 3 steps apart (groups 1 and 2), the critical value of the difference between the mean s:

$$\sqrt{\text{MS error}/N} \quad q_{.95}(r, 104); \text{ variance} = 206.31$$

where:

$$N = \frac{K}{\frac{1}{N_1} + \frac{1}{N_2}}, \quad N = \frac{2}{\frac{1}{33} + \frac{1}{46}} = 40$$

Therefore:

$$\sqrt{\text{MS error}/N} = \sqrt{206.31/40} = \sqrt{5.16} = 2.27$$

The value to be compared with the mean difference 9.3 is 2.27×2.83 or 7.67.

*See B. J. Winer for further explanation of the Newman-Keuls test.

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