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Pursch, William Claude

THE EFFECT OF PROVIDING INSTRUCTIONAL OBJECTIVES TO FACILITATE LEARNING IN AN ADULT CONTINUING EDUCATION COURSE

The Ohio State University

Ph.D. 1982

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THE EFFECT OF PROVIDING INSTRUCTIONAL OBJECTIVES TO FACILITATE LEARNING IN AN ADULT CONTINUING EDUCATION COURSE

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By
William Claude Pursch, B.A., M.S.

* * * * *

The Ohio State University
1982

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Approved By
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To my dear wife, Lenore, and our children, Wendy and Heidi. Without their support and sacrifices, I never would have completed this work.

To the memory of my father, William J. Pursch, and the honor of my mother, Emma M. Pursch. I owe them a son's gratitude for their encouragement to better myself through education and their sacrifices to help me succeed in life. As I continue to mature, I am better able to understand and appreciate their wisdom and love.
ACKNOWLEDGEMENTS

I wish to express my grateful appreciation to Dr. William D. Dowling for his sage counsel, generous contribution of ideas, time on my behalf and his patience and understanding as I transitioned through mid-life career changes; and to the members of my committee, Dr. David L. Boggs and Dr. Robert J. Silverman whose contributions have helped make this dissertation possible. I owe a lasting debt to Dr. Robert W. McCormick for his encouragement early in my graduate program and to Dr. Herman J. Peters for his guidance and friendly counsel.

I am deeply indebted to the Air Force Institute of Technology and the Dean of the School of Systems and Logistics for the authorization and resource support to conduct this study, and to the many students who participated in the study.

I shall be eternally grateful to Professor Roger H. Terzian, the course director of Contract Administration PPM-152, for his willing support of my study and his keen interest in furthering the knowledge base of the field of Adult Education. Course instructors who assisted in test questions development and validation were Professors

I am grateful to Dr. Richard F. Adams who suggested I investigate the use of instructional objectives in an adult learning experience and who gave permission to use his opinionnaire format.

Professor Daniel E. Reynolds of the Air Force Institute of Technology was helpful in obtaining access to the AFIT computer system so that the data produced by this study could be processed.

Particular appreciation is extended to my colleagues Dr. John W. Demodovich, and Dr. Herbert G. Hoehl for their support and encouragement throughout my course of study.

Last, but by no means, least, to my wife Lenore, and my daughters Wendy and Heidi my deepest thanks for their love, encouragement, and patience. Without their support I would not have undertaken a doctoral program.
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There is a controversy in the field of education which ranges across most of the disciplines, is present at all levels of education, and has divided the educational community into two factions (Duchastel and Merrill, 1972). The controversy is over the use of instructional objectives in the classroom. A review of the more teacher-oriented journals reveals the contention of one side that if educational goals were clarified by developing measurable criteria for evaluating student behavior at each stage of learning, the instructors would know where they are going, how far they have gone, and how far they still have to go. On the other side is the contention that a system of measurable criteria reduces a subject to trivialities, imposes an autocratic and monolithic no-exit system of learning, and does not allow for stimulation of student creativity (Kirkton, 1971).

The value of the use of instructional objectives is an empirical question that has not been sufficiently answered (Eisner, 1967). Findings on the use of
instructional objectives range from highly significant to inconclusive (Adams and Munsterman, 1977). The critics of instructional objectives have argued from an a priori basis rather than from empirical data (Coop and White, 1972). Much of the research that has been accomplished in the use of instructional objectives has been at the K-12 educational level and only one study has been located that involves adult subjects. One factor that contributes to the paucity of research at the adult level is the lack of a sufficient number of subjects available over a long enough period to perform significant research. There is at least one organization with a sufficient number of adult subjects to permit meaningful research—the Department of Defense.

The Department of Defense averages 350,000 personnel (16 percent of the Department of Defense work force) in training and education on any given work day and spends over $6 billion annually to fund this effort (Demidovich, 1975). Great emphasis is placed on education in the military so that all individuals will be capable of performing their duties and responsibilities under the extreme stress of battle conditions. Field Marshal Foch said "No study is possible in battle. One does there simply what he can to apply what he has already learned" ("Principles and Techniques of Instruction," 1974).
The Air Force Institute of Technology (AFIT) plays a significant role in the Department of Defense educational process. Accredited in 1956 by the North Central Association of Colleges and Schools, the Institute spends $27 million annually to provide education for 14,000 students. The education is provided through AFIT's on-campus schools of Engineering, Civil Engineering, and Systems and Logistics and through the Civilian Institutions Program which monitors personnel enrolled by the Air Force in selected colleges and universities throughout the United States. The School of Systems and Logistics confers 150 graduate degrees each year and conducts more than forty continuing education courses from one to ten weeks in length for nearly 6,000 adult students to meet Department of Defense requirements.

As Chairman of the Department of Contracting Management in the School of Systems and Logistics from 1977 to 1980, the author was vitally concerned with the educational processes used within the department and the quality of learning that was achieved in the classroom. Discussions with faculty, observations of classroom instruction, and a review of the continuing education course curricula within the department, revealed that the use of instructional objectives in the classroom was not emphasized. Appendix A is a representative sample of a course syllabus, typical of those used in each continuing education course,
which is provided each student at the beginning of a course.

**Research Objective**

As part of the administrative process of each continuing education course offering, a class leader is appointed. Each class leader has an exit interview with the department chairman before graduation of the class. As a result of discussions with many class leaders over the past five years, the author realized that the desired learning outcomes were not sufficiently specific to communicate to the students the knowledge they were expected to gain from the course. This realization gave rise to the research question: To determine whether adult student learning would be enhanced if precise instructional objectives were provided to adult students instead of general desired learning outcomes?

Subquestions to be addressed are:

1. What relationship exists between age and post-test score?

2. What relationship exists between sex and post-test score?

3. What relationship exists between educational level and posttest score?
Limitations

The following limitations exist in this study:

1. The conclusions from this research cannot be
generalized beyond the population from which the sample
is drawn.

2. The research data used in this study were
obtained from a specific career field of Department of
Defense personnel.

3. Longitudinal knowledge retention data are
unavailable for this study.

Summary

This study was designed to examine the relationships of age, sex, and educational level and the use of
instructional objectives in an adult learning environment. The need for instructional objectives in the field of adult
education has not been empirically investigated.

Chapter II is a review of the related research and
theory of instructional objectives.

Chapter III discusses the experimental methodology
used to conduct the study.

Chapter IV presents the analysis and interpretation
of the data.

Chapter V summarizes the study and its results and
discusses findings, conclusions, and recommendations for
future research.
CHAPTER II

BACKGROUND OF THE PROBLEM

The originator of the concept of the instructional objectives is generally recognized to be Dr. Ralph W. Tyler, who, while at The Ohio State University, published an article in a 1931 issue of the Educational Research Bulletin in which he emphasized the value of defining educational objectives in behavioral terms. Since then, other educators and psychologists such as R. M. Gagné, Benjamin S. Bloom, Virgil E. Herrick, David R. Krathwohl, and Henry H. Walbesser have also advocated the need for instructional objectives (Phi Delta Kappan, 1973).

In 1962, Robert F. Mager published a programmed text titled Preparing Instructional Objectives, and this caused the educational community to seriously consider using instructional objectives and their value to teaching and learning. Adult educators have not sufficiently researched the issue of instructional objectives for adult learning experiences. The questions, should instructional objectives be used, should they be specific or general, and for which type of adult education, are still to be resolved.
Determining a consistent definition of instructional objectives is difficult. In reviewing the literature, the following terms are found to be used interchangeably and synonymously with instructional objectives: behavioral objectives; educational objectives; performance objectives; and competency-based objectives.

Palmer (1974) believes that most educators make the task of defining objectives far too complicated. Gagné and Briggs (1974) state that the first step in defining objectives is to identify the purpose of the course.

Although Bloom (1956), Lindvall (1961) and Popham (1970) have all defined instructional objectives, Mager's (1962) definition has probably influenced educators more than any other. Mager (1962) defines instructional objectives as a statement containing three basic parts. These include: (1) a description of the type of behavior sought, (2) a specification of the conditions under which the behavior will be exhibited, and (3) the minimum acceptable level of performance. The purpose of instructional objectives is to communicate as clearly as possible to students the instructional intent of a particular area of study (Edwards, 1973). Instructional objectives have been classified into three domains: cognitive; affective; and psychomotor (Janeczko, 1970). Gronlund (1970) has identified a taxonomy of educational objectives with a complete
classification system for the cognitive and affective domains, and a partial classification system for the psychomotor domain.

There is conflict in attempting to define instructional objectives. For example, Newport (1971) supports Mager's definition when he states instructional objectives are precise statements which describe some type of learner behavior, or a product of his behavior, which is desired following instruction. Instructional objectives accurately convey the meaning intended and permit precise evaluation. Yet, Edwards (1973) states that instructional objectives must be written which are both precise and yet broad enough to be general in nature. Gagné and Briggs (1974) agree with Mager's (1962) three basic criteria but state that the choice of verb in an objective is of critical importance. Barron et al. (1976) confirmed the importance of the verb in objectives. Haygood et al. (1977) state that "no single component, such as the verb, should be singled out as being of primary importance."

Brown and Coppedge (1976) specify four components of an instructional objective:

1. Identification of Learner--it is not necessary to restate this in each instructional objective, but teachers should keep in mind who the learner is and be able to formulate tailor-made objectives for individual learners.
2. Condition under which Learning Occurs—this may be necessary for both the learner and the teacher to be absolutely clear about the proficiency level to be reached.

3. Expected Behavior—this is the most essential characteristic of the objective. This is the learning expected by the teacher and/or desired by the learner.

4. Achievement Level—statement of expected proficiency.

Although instructional objectives are difficult to construct and time-consuming to develop, once they are defined, only minor revisions are needed annually to keep them up-to-date (Shockley, 1973). Many teachers have not been trained in the proper use of instructional objectives (Newport, 1971; Harlen, 1972). The major flaw in many attempts to develop effective objectives is that they are not stated in terms of terminal behavior, but rather in terms of behavior the student must engage in to complete the objective (Yarger, 1971). An instructional objective is intended to communicate (to a specified recipient or groups of recipients) the outcome of some unit of instruction (Gagné, 1972). The specification of instructional objectives is a necessary condition for effective teaching in that they provide a sound basis for making decisions as to whether desired changes in learner behavior have actually occurred (Moore, 1969).
For the purpose of this research the term instruc-
tional objectives is used synonymously with behavioral 
objectives, educational objectives, performance objec-
tives, and competency-based objectives. Mager's definition 
of instructional objectives will be closely followed.

Dubin and Okun (1973) grouped learning theories 
into four principle orientations: (1) behaviorism which is 
concerned with the observables of behavior—stimuli and 
responses; (2) neo-behaviorism which considers stimuli 
and responses but also what happens between the input of 
stimuli and the output of responses in terms of mediat-
tional processes; (3) cognitivism which considers man as 
a rule-forming being and therefore the cognitive structure 
of the individual is of paramount importance for learning; 
and (4) humanism which considers an individual's real 
world to be that which the individual alone perceives, 
and therefore only the individual can fully know that 
world.

Dubin and Okun developed the taxonomy of learning 
theories shown in Table 1. The descriptive comparison of 
learning theories is developed in terms of orientation, 
central concept, role of instructor, amount of structure, 
and appropriate conceptual level. The amount of structure 
is the extent to which the process of instruction is con-
trolled by the instructor. The blank spaces occur in
**TABLE 1**  
A TAXONOMY OF LEARNING MODELS

<table>
<thead>
<tr>
<th>Learning Theory</th>
<th>Name of Model</th>
<th>Exponent</th>
<th>Key Concepts</th>
<th>Role of Instructor</th>
<th>Amount of Structure</th>
<th>Appropriate Conceptual Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behaviorist</td>
<td>Operant Conditioning</td>
<td>B. F. Skinner</td>
<td>Reinforcement Shaping</td>
<td>Behavior Modifier</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Neo-Behaviorist</td>
<td>Drive Reduction</td>
<td>Clark Hull</td>
<td>Habit-Family Hierarchy</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Neo-Behaviorist</td>
<td>Neuro-Physiological</td>
<td>Donald Hebb</td>
<td>Cell Assemblies and Sequence</td>
<td>Source</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Neo-Behaviorist</td>
<td>Social Learning</td>
<td>Albert Bandura</td>
<td>Imitation Vicarious Learning</td>
<td>Model and Prompter</td>
<td>High</td>
<td>Low</td>
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</tbody>
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*Model is not perceived to be related to the instructional process.*
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<tr>
<th>Learning Theory</th>
<th>Name of Model</th>
<th>Exponent</th>
<th>Key Concepts</th>
<th>Role of Instructor</th>
<th>Amount of Structure</th>
<th>Appropriate Conceptual Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neo-Behaviorist</td>
<td>Learning</td>
<td>Robert Gagné</td>
<td>Task Analysis of Conditions</td>
<td>Manager of High Categories of Learning</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Cognitivist</td>
<td>Discovery</td>
<td>Jerome Bruner</td>
<td>Categorization</td>
<td>Prompter</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>Learning</td>
<td></td>
<td>Coding Systems</td>
<td></td>
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<tr>
<td>Cognitivist</td>
<td>Reception</td>
<td>David Ausubel</td>
<td>Advance Disseminators</td>
<td>High</td>
<td>Low</td>
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<tr>
<td></td>
<td>Learning</td>
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<td>Subsumers Cognitive Structure</td>
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</tr>
<tr>
<td>Humanist</td>
<td>Nondirective</td>
<td>Carl Rogers</td>
<td>Self-Actualization of Knowledge</td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teaching</td>
<td></td>
<td>Phenomenological Field</td>
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those instances where the model is not perceived to be related to the instructional process.

A review of the taxonomy of learning theories reveals that at least four theorists would be proponents of using instructional objectives. Skinner would use instructional objectives to reinforce learning of specific tasks. Hebb would use instructional objectives to facilitate the process of learning for the students. Gagné would use instructional objectives to define the course curriculum and structure and learning experience. Ausubel would use instructional objectives as advance organizers to facilitate learning.

Since there is a controversy over the use of instructional objectives in education, the obvious questions for an adult educator are: (1) should instructional objectives be used; (2) should the instructional objectives be specific or general; (3) for which type of adult education are they best suited. The literature is replete with the pros and cons of using instructional objectives.

The Case Against Instructional Objectives

Nichols (1972) takes exception to the use of instructional objectives for the following reasons:

1. The primary responsibility of the teacher is not to shape the behavior of the student, but rather develop in the student what is needed to let him choose
from all alternative behaviors the one that is best for a
given occasion. Asking teachers to spell out instruc­
tional objectives in advance and to shape their teaching
in only those terms that are measurable is training not
education.

2. To use instructional objectives it must be
assumed there is a clear-cut relationship between the
teaching of something and the behavior that is caused by
the knowledge of it and this has not been proven.

3. Instructional objectives do not prescribe
how a concept should be taught.

4. Instructional objectives must be prescribed
in detail and in advance, but neither life nor teaching
is that way.

5. Instructional objectives frustrate the
innovator.

6. Instructional objectives have forced teachers
to debate what is and what is not behavior.

Duchastel and Merrill (1973) and MacDonald-Ross
(1973) state that there is a lack of specificity in deter­
mining if objectives are behavioral. Woodruff and Kapfer
(1972) state that the level of specificity in constructing
objectives has transformed education into a mechanistic
program with no regard for the student.

Eisner (1967) argues that instructional objectives
that are clearly and specifically stated can hamper as well
as help instruction. In support of his position, he discusses the following points:

1. The dynamic and complex process of instruction yields outcomes far too numerous to be specified in behavioral and content terms in advance.

2. The theory concerning instructional objectives fails to take into account that some subject matter just cannot be specified in behavioral terms.

3. Instructional objectives are standards by which to measure educational achievement, yet there are some modes of achievement that are incapable of being measured.

4. Instructional objectives need not precede the selection and organization of content.

5. The specification of objectives will encourage students to seek the line of least resistance and lower their own educational goals.

Ebel (1967) supports Eisner and believes that the contributions of formally stated objectives to effective teaching have been vastly overrated by educational theorists.

Adams (1972) feels the use of instructional objectives dehumanizes the teaching process. Anything that cannot be measured is unimportant to those who advocate the use of instructional objectives, yet what can be measured may be trivial, insipid, and useless. The attempt to
channel learning according to preconceived objectives may very well waste the best human powers to learn.

Educators argue that it takes an enormous amount of time and energy to formulate and use instructional objectives. Ebel (1970) believes that teachers should not spend much of their valuable time in writing elaborate statements of their objectives, nor should the statements be in behavioral terms because of the limitations of instructional objectives. One limitation is the problem of validity. Just stating that something is an objective does not make it a desirable one. Objectives may impose a rigid formality on teaching methods. Instead of prescribing what a teacher ought to do, Ebel feels that objectives should describe what a teacher plans to do. Sheehan (1974) feels that instructional objectives advocates tend to see objectives as ends in themselves rather than as aids to instruction. Pascal (1975) states that in the rush to express educational goals in objective form, important outcomes of education are underemphasized.

Kneller (1972) states it is impossible to coordinate learning or knowing with behaving, because there is no theory which interrelates these phenomena, and consequently there is no way of understanding how their putative instances might be brought into relationship in actual practice.
Flaherty (1974) states that instructional objectives are too inflexible, rigid, and leave no room for stimulation of discussion.

From an extensive review of the literature, the following disadvantages in using instructional objectives are offered in support of not using this technique. Magnus (1971) offers these disadvantages:

1. It is impossible to describe all the outcomes of a lesson because a student learns from peripheral information for which instructional objectives cannot be developed.

2. Instructional objectives restrict teacher innovativeness and flexibility.

3. Students are more concerned with proper response to the instructional objectives than with learning.

Eiss (1970) adds these disadvantages:

1. Many instructional objectives tend to be trivial.

2. The list of instructional objectives may become encyclopedic.

3. Too many instructional objectives are written at the lower levels of the cognitive domain and too few examples of instructional objectives are written for the affective domain.
Yost (1971) reports the results of his research reveal:

1. Each instructional objective does not convey the same meaning to all readers.

2. Instructional objectives tend to be written in a form that is characteristic of the teaching style of the objective writer.

3. Instructional objectives developed by one teacher tend to be difficult for another teacher to employ.

Edwards (1973) cautions instructors that learning activities exist for which no specific behavioral responses are possible. These are activities associated with flexibility and creativity. Stein (1976) believes instructional objectives will lead students to expect and depend upon spoon-feeding. Most of the work done with instructional objectives has been in the realm of the cognitive domain. If they are to be of great value to the educator, the objectives must also be applicable to the affective domain (Magnus, 1971).

Some fairly strong arguments have been proffered in opposition to using instructional objectives. However, the reader must keep in mind that these are all the negative comments that could be found in the literature. Having examined the negative comments, a review will be made of the literature favoring instructional objectives.
The Case for Instructional Objectives

Proponents of instructional objectives maintain that objectives improve student performance because the student knows what is required to master a course (Gagné, 1970; Mager, 1968; Popham, 1970; and Tyler, 1964).

Kirkton (1971) reports that students need to know what the instructor expects of them in a course of instruction. Instructional objectives are like a road map for the student showing the way to a final destination—the outcomes of learning, the goals of teaching. The instructional objectives reinforce the learning a student must acquire to demonstrate mastery of subject matter.

Mager (1968) and Popham (1970) have emphasized the necessity for more effective communication between teachers and students regarding the desired outcomes of education.

Hayes and Steinmetz (1975) report that students share the educator's enthusiasm for instructional objectives. Hayes and Steinmetz advocate provision of objectives in advance of instruction, and report that most students want, need, use, and profit from instructional objectives.

Instructional objectives are particularly suited for individualized instruction. One of the principles of adult education is to allow the learner an opportunity to set course objectives. This is not in conflict with the
intent of instructional objectives. Magnus (1971) supports this idea when he states that instructional objectives should be more of a means rather than an end. The objectives should lead a student toward the acquisition of knowledge. Magnus (1971) believes that through the use of instructional objectives, each individual's education can be unique. Instructional objectives lend themselves to individualized instruction, including programmed instruction.

Shockley (1973) reports that if instructional objectives are given to students in advance of instruction, the students know exactly what is expected of them, and can evaluate their own progress. In addition, if a student misses a class, he knows what he has to make up. Dalis (1970) studied the effect of specificity of objectives on student achievement using precisely stated and vaguely stated objectives and short paragraphs of subject matter information. Results indicated that the precisely stated objective group performed significantly better than two other groups who received vaguely stated objectives and short paragraphs of subject matter information. Doty (1968), Engel (1968), and Lawrence (1970) also reported that students who received instructional objectives in advance of instruction scored significantly higher on posttests than did students who did not have the objectives.
Instructional objectives facilitate the organization of subject matter and course content. Yarger (1971) reports that instructional objectives add clarity to a course of instruction. Cohen (1970) observed that when used properly, instructional objectives can be an instructional form in their own right. Towle and Merrill (1975) found that graduate students use instructional objectives to focus their studying, to organize what is learned, and to provide feedback concerning how their performance relates to the objectives. Towle and Merrill (1975) also found in their study that although instructional objectives do not always significantly improve performance on a post-test they do seem to facilitate the study process. Lewenstein (1976) believes the teacher, filling the role of director of learning in the classroom, needs instructional objectives to guide his/her behavior.

Brown and Coppedge (1976) report that once instructional objectives have been established, the teacher can more accurately define learning activities that will be used to help students achieve the objectives. Instructional objectives provide an empirical method for curriculum development.

Instructional objectives can be used to evaluate a program of instruction as well as student performance. Gagné (1972) states that instructional objectives identify for the teacher how the outcome of instruction should be
assessed. The instructional objectives serve as standards for evaluation. They provide a base for systematic program review and development.

The age of accountability has brought about a revival of instructional objectives (Frey, 1974). Advocates of instructional objectives believe that objectives allow teachers to collect data that demonstrate to others the effectiveness of their program and thus answer the accountability challenge (Davis, 1973). Gagné (1972) believes that the only valid answer to accountability will be instructional objectives.

Instructional objectives can improve teacher performance in the classroom. Durio (1976) believes there is no substitute for thorough knowledge of the discipline in which objectives are to be developed in order that major concepts are emphasized over extraneous detail. Yarger (1971) supports this position and claims that instructional objectives promote "spin-off" functions as follows:

1. Require a teacher to possess adequate knowledge of the subject matter to be taught.

2. Require a teacher to develop educational priorities.

3. Highlight the need for appropriate evaluation procedures.

4. Require a teacher to state explicitly what he is attempting to teach.
Nappi (1973) observed that studies have revealed a discrepancy between what teachers required in their objectives and what their test questions appeared to evaluate. He cautions that care must be taken to insure that the instructional objectives correlate with the test questions.

In order to design appropriate instructional objectives for the affective domain the teacher must be prepared to state in general terms the appropriate value or attitude that is to be taught and must be able to identify specific behaviors that are exemplars of that attitude or value. These two tests must be met or any attempt to write an instructional objective in the affective domain will fail (Yarger, 1971).

Coop and White (1972) suggest that the critics of instructional objectives have argued from an a priori basis rather than from empirical data. Studies have shown that teachers can clearly communicate their instructional intent to students and construct valid measures of achievement. They do so through the use of instructional objectives.

Bassett and Kibler (1975) studied the effect of training students in the use of instructional objectives using undergraduate students enrolled in a communication course as their subjects. The treatment group received training in the use of instructional objectives while the
control group received no training. The treatment group scored significantly higher on the course examination than the control group. Raghubir (1979) also studied the effect of training and prior knowledge of instructional objectives using students in an eleventh grade biology class. Students in the treatment group were provided instructional objectives which were referred to at times as the teacher interacted with the students. The control group received no instructional objectives. The treatment group scored higher than the control group on both achievement and retention tests.

Significance of this Study

Duchastel and Merrill (1972) reviewed the empirical studies concerning the effects of instructional objectives on learning. They report instructional objectives serve three main instructional functions: (1) direction for teaching and curriculum development; (2) guidance in evaluation; and (3) facilitation of learning. They focused their review on the function of instructional objectives as an aid to learning. The important factors they considered were the specificity of objectives; the type of learning involved in the learning task; and student characteristics. They conclude the results of empirical studies are inconsistent and advocate a more basic line
of research to investigate the possible interactions of objectives with learner characteristics.

Eisner (1967) reports the value of the use of instructional objectives in curriculum construction, teaching, and learning is an empirical question that has not been sufficiently substantiated. Adams (1977) reports that research findings on the use of instructional objectives range from highly significant to inconclusive. Clark and Wilson (1971) call for research programs to evaluate the use of instructional objectives. Durio (1976) believes that instructional objectives have a place in adult education but the place needs to be more completely defined. Towle and Merrill (1975) support the need for further study of the use of instructional objectives across age levels and content areas. Okun (1977) also calls for research in the use of instructional objectives with older adults. In particular he supports research in the context of the classroom.

The studies cited thus far have used children and/or youths as subjects. An extensive review of the literature reveals a paucity of research involving the use of instructional objectives in adult education programs. Only one piece of research has been located at the adult education level. Etter (1969) used 40 male and 40 female adult volunteers from a public adult school, a junior college, and two university extension programs in Southern
California to observe individual differences of adult learners as they related to achievement with prior knowledge of objectives. The results were inconclusive.

The use of instructional objectives in the field of adult education to facilitate learning needs further study. This study offered an opportunity to empirically investigate the value of instructional objectives in an adult continuing education course. Specifically, this study affords an opportunity to determine if instructional objectives will facilitate adult learning in an adult continuing education course; examine the effect of the student characteristics of sex, age group, and educational level on posttest scores when instructional objectives are provided to adult students; and develop a research design that can be easily replicated in order to increase the knowledge base of the field of adult education concerning the effectiveness of the use of instructional objectives.

**Summary**

After an extensive review of the literature, the major advantages of using instructional objectives are summarized by Duchastel and Merrill (1973) as follows:

1. Instructional objectives allow the student to discriminate between relevant and incidental course content.
2. Instructional objectives give organization to the subject matter of a course of instruction.

3. Each student can better organize his time because the instructional objectives let him know what is expected in order to master the course.

4. Instructional objectives sometimes help and are almost never harmful. Each individual's education can be a unique experience.

The above advantages form the conceptual basis for this study. The instructional objectives used in this study (Appendix C) gave organization to the subject matter because the instructors used the instructional objectives to organize their instruction. Each student who uses the instructional objectives should be better able to discriminate between relevant and incidental course content and organize study time to learn what is expected.

Magnus (1971) found that instructional objectives facilitate the learning process and allow for evaluation of the effectiveness of a course or program. In addition he found that instructional objectives communicate the goals of a course, reduce student competition, and provide feedback to the learner.

Chapter III is a detailed discussion of the methodology used in this study.
CHAPTER III

METHODOLOGY

The purpose of this chapter is to describe the experimental approach utilized to answer the central question of the study—Would learning be enhanced if precise instructional objectives were provided to adult students? This research is an exploratory study in adult education.

Experimental Design

Campbell and Stanley (1966) state that internal validity is the sine qua non of any experimental design. The key question is whether the treatment did make a difference in the results of this study. External validity affects the generalizability of the study. The ideal design would be strong in both types of validity. However, Campbell and Stanley (1966) have stated that without internal validity any experiment is uninterpretable. For this reason the author selected Campbell and Stanley's Pretest-Posttest Control Group Design for this study.

The design, modified for this study, is as follows:

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>0_1 X 0_2 0_3 0_4 0_5 0_6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>0_7 0_8 0_9 0_10</td>
</tr>
</tbody>
</table>

28
0₁ and 0₇ are the course pretest. X is the treatment-instructional objectives. 0₂ and 0₈ are the instructional objectives test 1. 0₃ is opinionnaire 1. 0₄ is opinionnaire 2. 0₅ and 0₉ are instructional objectives test 2. 0₆ and 0₁₀ are the end of course posttest.

It was important to assess the strength of the treatment, because if the students in the treatment group were not aware of the purpose of the instructional objectives (the treatment) and did not use them as a study guide, then the entire study would be in jeopardy. Since only the students in the treatment group would receive the instructional objectives, it was decided to use an opinionnaire to measure any increase in student awareness of the importance of the instructional objectives. It was hypothesized that if student awareness of the use of the instructional objectives actually increased, then students in the treatment groups would score significantly higher on opinionnaire 2 than opinionnaire 1. It was further hypothesized that as a result of increased awareness, students in the treatment group would score significantly higher on instructional objectives test 2 than on instructional objectives test 1.

The t-test is used to answer the question, Is the difference between two sample means statistically significant? Since only the treatment group was administered the opinionnaires, a paired t-test was used to test the group
means of opinionnaires 1 and 2. A paired t-test was also used to test the group means of the instructional objectives test 1 and test 2.

Students in the treatment group and control group were administered instructional objectives tests on day 8 and day 13 of the course. Each test item measured a specific instructional objective of the course. Since only the treatment group received the instructional objectives, it was hypothesized that the treatment group would score significantly higher on the instructional objectives test than the control group. An independent t-test was used to test the group means of instructional objectives tests 1 and 2 given to both the treatment group and the control group.

Although both the treatment group and the control group received the pretest and posttest, only the treatment group received the instructional objectives and the opinionnaires. The pretest and posttest were based on general objectives rather than specific instructional objectives. It was hypothesized that the adult students in the treatment group would score significantly higher on the posttest than the adult students in the control group since no specific instructional objectives were given for the posttest. Chi-square analysis was used to determine if the posttest scores were independent of age, sex, and educational level.
Analysis of Variance

Analysis of variance is a statistical tool that enables the comparison of all sample means simultaneously to determine if a statistically significant difference exists between variables. Analysis of variance provides information about the main effects of particular variables by themselves and also about interactions between variables. Analysis of variance answers the question, Is the variability between groups large enough to infer that the means of the populations, from which the sample was drawn, are different. If the variability between group means is large enough, then a conclusion can be made they probably came from different populations and that there is a statistical significance present in the data (Guilford and Fruchter, 1973).

Hypotheses

The hypotheses developed for this study were as follows. The null hypothesis ($H_0$), is assumed for each. For the sake of brevity, only the alternative hypotheses are listed.

1. Research Hypothesis ($H_1$) -- students in the treatment group would score significantly higher on opinionnaire 2 than on opinionnaire 1.

2. Research Hypothesis ($H_2$) -- students in the treatment group would score significantly higher on
Instructional Objectives Test 2 than on Instructional Objectives Test 1.

3. Research Hypothesis (H3)—students in the treatment group would score significantly higher on Instructional Objectives Test 1 than students in the control group would score on Instructional Objectives Test 1.

4. Research Hypothesis (H4)—students in the treatment group would score significantly higher on Instructional Objectives Test 2 than students in the control group would score on Instructional Objectives Test 2.

5. Research Hypothesis (H5)—students in the treatment group would score significantly higher on the posttest than the students in the control group would score on the posttest.

6. Research Hypothesis (H6)—there will be a significant difference in posttest scores based on age group.

7. Research Hypothesis (H7)—there will be a significant different in posttest scores based on sex.

8. Research Hypothesis (H8)—there will be a significant difference in posttest scores based on educational level.

The level of significance for this study will be $\alpha = .05$ for evaluating all the research hypotheses.
Research Instruments

The study involved the use of six instruments listed in the order they were administered:

1. Pretest (Appendix B)
2. Instructional Objectives Test 1 (Appendix D)
3. Opinionnaire 1 (Appendix E)
4. Opinionnaire 2 (Appendix E)
5. Instructional Objectives Test 2 (Appendix D)
6. Posttest (Appendix B)

It should be noted that only students in the treatment group received the instructional objectives (Appendix C) and the two opinionnaires (Appendix E).

Reliability of Research Instruments

The reliability of the research instruments used in any study is critical to the outcome of the experiment. Reliability is logically defined as the amount or proportion of variance that is true variance. Looked at from a more intuitive perspective, reliability is a numerical estimate of the consistency of items in an instrument and their stability over time (Cronbach, 1947):

\[ r_{tt} + e^2 = 1.00 \]

Thus, it may be seen that the greater the reliability coefficient, the less the error in the measure under
investigation and the greater the confidence that may be placed in the consistency and stability of the instrument.

According to Guilford and Fruchter (1973) there are three general procedures for estimating reliability: (1) the method of internal consistency; (2) the method of alternate forms; or (3) the retest reliability. The latter two methods respectively, have been termed coefficients of equivalence and stability by Cronbach (1947). One of the most common measures of internal consistency is the split-half approach wherein the items are divided into two groups and a numerical estimate of their comparability (consistency) is developed. Because an instrument may be split in half many ways and each way may yield a different reliability estimate, it is argued that a method of estimating the reliability based on individual items rather than two arbitrary subsets of items is more appropriate (Guilford and Fruchter, 1973). The two most commonly used estimates are the Kuder-Richardson 20 and 21 formulas or Cronbach's alpha. Cronbach's alpha (α) provides a more conservative estimate of reliability and is probably the most widely used and available method for estimating reliability coefficients (Guilford and Fruchter, 1973). For these reasons, Cronbach's alpha was used in this study. Table 2 shows the reliability coefficient for each instrument used in the study.
TABLE 2
RELIABILITY COEFFICIENTS OF RESEARCH INSTRUMENTS

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Cronbach's Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>.93</td>
</tr>
<tr>
<td>Instructional Objectives Test 1</td>
<td>.60</td>
</tr>
<tr>
<td>Opinionnaire 1</td>
<td>.91</td>
</tr>
<tr>
<td>Opinionnaire 2</td>
<td>.92</td>
</tr>
<tr>
<td>Instructional Objectives Test 2</td>
<td>.62</td>
</tr>
<tr>
<td>Posttest</td>
<td>.84</td>
</tr>
</tbody>
</table>

NOTE: .60 or greater is acceptable reliability.

Discussion

A major difficulty with empirical investigation is conceiving an adequate design for the research experiments. The design of this study is complex because it was conducted in an actual classroom environment, with live subjects, under field conditions.

The course curriculum for Contract Administration prior to the conduct of the study is outlined in the syllabus at Appendix A. Student evaluation prior to the conduct of this study consisted of only a pretest administered on Day 1 and a posttest administered on Day 15. To conduct this study, the student evaluation was modified by introducing two instructional objectives tests and two opinionnaires. On Day 8 of the course the students
were administered Instructional Objectives Test 1 and immediately thereafter Opinionnaire 1. On Day 13 of the course the students were administered Opinionnaire 2 and immediately thereafter Instructional Objectives Test 2. Each of these instruments will be discussed in detail.

Pretest and Posttest

The pretest used in the Contract Administration course consisted of 100 multiple choice questions and the posttest consisted of 94 multiple choice questions (see Appendix B). The pretest and posttest had been administered to over 2000 students over a period of five years prior to this study. No revisions were made to either the pretest or posttest for this study. Test items for both tests were developed by a team of five instructors based on their lesson plans and class notes, pretested on a group of students, and refined by the instructors to determine the discriminatory capability of each test item. The instructors were senior Department of Defense personnel with an average of 15 years experience each in the field of contracting management. They all possess a Masters Degree in Business Administration from accredited academic institutions and have over seven years teaching experience. All have consulted widely and are recognized by the Department of Defense as authorities in the field of contracting management. The pretest and posttest were
submitted to a curriculum review committee composed of senior Department of Defense representatives who manage the procurement workforce. After a review of the test items, the curriculum review committee recommended revisions to the test items which were accomplished by the instructors. The pretest and posttest were retested on a group of students and the results were presented to the curriculum review committee for validation and approval.

**Instructional Objectives**

Each of the five course instructors has responsibility for specific days in the course curriculum for the Contract Administration course. To develop the specific instructional objectives, the researcher interviewed each course instructor, wrote objectives for each day, and provided the objectives to each instructor for review and revision. The final list of instructional objectives (Appendix C) was not changed during the conduct of the study. Only the treatment group received the instructional objectives.

**Instructional Objectives Test 1 and Test 2**

Instructional Objectives Test 1 (Appendix D) is composed of 30 multiple choice questions that test the objectives for the first six days of the course. Instructional Objectives Test 2 (Appendix D) is composed of 40 multiple choice questions that test the objectives for
course days seven through thirteen. Day fourteen is a
group exercise and day fifteen is the end-of-course test.

The author wrote a test question for each of the
instructional objectives for the first thirteen days of
the course. Each test question was reviewed by the five
course instructors and revised until each instructor was
satisfied the test questions would adequately measure the
instructional objectives. The two instruments were pilot
tested during course offerings of Contract Administration
18 months prior to the start of this study. Based on the
test results, the instruments were revised by the instruc-
tors and submitted to a curriculum review committee for
validation in the same manner as the pretest and posttest
were validated. The two tests were introduced into the
course curriculum over a year in advance of the study in
order to avoid abrupt change in course curriculum. The
research strategy described above would reduce any threat
to internal validity of the study because of a "Hawthorne
effect" should the students sense an abrupt change in
course curriculum. The "Hawthorne effect" is named after
the Hawthorne plant of the Western Electric Corporation
where the effect was first noted during research on
employee productivity. The "Hawthorne effect" occurs when
subjects have knowledge they are participating in a study,
and as a result of this knowledge, the subjects change
their behavior, biasing the experimental data.
Opinionnaires 1 and 2

The opinionnaires (Appendix E) were used to measure student awareness of the instructional objectives and determine if the students used the instructional objectives to study for exams. The format for the opinionnaires was adapted from a similar format developed and validated by Adams (1974).

In order to select the instructional objectives to include in the opinionnaire, each instructor was asked to rank order the instructional objectives with the most important objective being ranked number one, the next important number two, and so forth, for each of their class days. The author then selected the number one instructional objective for each class day to be included in the opinionnaires.

Sources of Research Data

The sources of the data for this study are discussed in terms of the universe and population from which the sample was drawn.

Universe

Over 137,000 persons are employed by the federal government in the procurement, logistics, and transportation occupational groups. Both military and civilian personnel comprise the occupational groups. Over 41,000 employees are found in the procurement occupational group.
The procurement occupational group is composed of six subgroups according to skill. The six subgroups are General Business and Industry (1101); Contract and Procurement (1102); Industrial Property Manager (1103); Purchasing (1105); Procurement Clerical (1106); and Industrial Specialist (1150). The universe for this study is these employees in the procurement occupational group.

Population

Of the more than 41,000 employees in the procurement occupational group, two-thirds work for the Department of Defense. The Office of Personnel Management records as of November 1978 (Contract Management, 1980), show that 27,065 military and civilian employees work world-wide for the Department of Defense. The grade levels of the employees range from GS-4 through GS-18 for civilians, and Second Lieutenant through Major General for the military. The higher grades (GS-12 through GS-18 and Lieutenant Colonel through Major General) are considered to be journeymen and senior levels. Grades GS-4 through GS-11 and Second Lieutenant through Major are considered to be training or entry grades. It is from the training or entry grades that the sample for this study was drawn.

Sample

The sample of 250 students was drawn from those Department of Defense military and civilian employees who
attended Contract Administration course offerings at the Air Force Institute of Technology, Wright-Patterson AFB, Ohio. This course was selected because of the large number of students (40-50) who attend each offering. The course is an entry level course for career progression in the field of contract management. Military and civilian employees are highly motivated and attend this course at government expense. Each course offering of Contract Administration was three weeks long (15 class days). Students attended class six hours a day from 9:00 a.m. to 4:00 p.m., with an hour off for lunch. Selection of students for attendance was accomplished through a complex quota system distributed throughout the Department of Defense and controlled by unit training officers located worldwide. Students who attended the six course offerings between September 1979 and May 1980 were selected by unit training officers on the basis of the quota system. The training officers were unaware that a study would be conducted during the six course offerings and had no reason to bias their selection of students. The quotas controlled by the training officers were filled on a voluntary basis from a pool of eligible employees. No one eligible person had a greater chance of attending the course offerings than any other eligible person.

The quota system used for selection of students permits a degree of randomization in the selection process.
The sample used in the study is considered to be a random sample of the population.

**Characteristics of the Research Sample**

The research sample was comprised of 250 Department of Defense military and civilian employees from the field of contracting management who attended the six course offerings between September 1979 and May 1980. Three of the six course offerings were chosen at random to be the treatment group and the other three course offerings were designated the control group. A total of 121 subjects were in the treatment group, while 129 subjects were in the control group.

The selection of variables to be observed in this study was based on several factors. First, the researcher wanted to avoid obtaining data in such a manner that would alert the students that they were participants in a study (Hawthorne effect). Second, the Family Rights and Privacy Act limited the accessibility of personal data, particularly at a government institution, when these data were gathered. Finally, the variables that have been used by other researchers should be considered of importance to the field of knowledge. After considering the above factors, sex, age group, and educational level were selected for this study because these variables appear in the literature as significant to researchers.
Application of the chi-square test for homogeneity to the three demographic variables of the sample revealed that the treatment group and the control group are not statistically different. The data presented in Table 3 show that the observed chi-square is not statistically significant when alpha = .05. This means that the null hypothesis of no difference in the distribution of the variables, within the treatment group and the control group, cannot be rejected. Thus the sex, age and educational level of the treatment group are not unlike the control group.

TABLE 3

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observed Chi-Square</th>
<th>Degrees of Freedom</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>2.483</td>
<td>1</td>
<td>.115 NS</td>
</tr>
<tr>
<td>Age Group</td>
<td>.013</td>
<td>4</td>
<td>.404 NS</td>
</tr>
<tr>
<td>Educational Level</td>
<td>.012</td>
<td>2</td>
<td>.994 NS</td>
</tr>
</tbody>
</table>

NS = not significant.

The youngest subject was 23 years of age and the oldest was 62 years of age. Table 4 shows the distribution of the subjects in the treatment group and the control group over five age groups. Over half the subjects were under 34 years of age. Since the Contract Administration
TABLE 4
DISTRIBUTION OF THE SAMPLE BY AGE

<table>
<thead>
<tr>
<th>Group</th>
<th>23-28</th>
<th>29-33</th>
<th>34-40</th>
<th>41-50</th>
<th>51-62</th>
<th>Mean Age</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>25.6</td>
<td>26</td>
<td>21.5</td>
<td>24</td>
<td>19.8</td>
<td>24</td>
</tr>
<tr>
<td>Control</td>
<td>37</td>
<td>28.7</td>
<td>39</td>
<td>30.2</td>
<td>20</td>
<td>15.5</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td>68</td>
<td>27.2</td>
<td>65</td>
<td>26.0</td>
<td>44</td>
<td>17.6</td>
<td>45</td>
</tr>
</tbody>
</table>
course is oriented to the entry level in the field of contracting management, the students would be expected to be younger employees. Older students enrolled in the course are usually changing career fields due to voluntary actions on their part and/or reduction in force actions in related career fields creating a need for re-education of the work force and development of new skills. The distribution of subjects in the treatment group among the five age groups and the distribution of subjects in the control group among the five age groups is fairly even. The mean age of the treatment group was 36.74 years and the mean age of the control group was 35.09 years.

Over 65 percent of the subjects had a Bachelor's Degree or higher. Table 5 shows the distribution of subjects in the treatment group and the control group over three educational levels. The subjects in the two groups are distributed evenly among the three educational levels.

Table 6 shows the distribution of subjects by sex. Males outnumbered females 3 to 2. Actually, the number of females is high compared to the Department of Defense male-female ratio of 5 to 1. The high number of females can be attributed to the increased emphasis by the government to open the procurement career field and other career fields to more women.

The similarity of the treatment and control groups in educational level and age groupings suggests the groups
TABLE 5
DISTRIBUTION OF THE SAMPLE BY EDUCATIONAL LEVEL

<table>
<thead>
<tr>
<th>Group</th>
<th>Less Than Bachelor's</th>
<th>Bachelor's but Less than Master's</th>
<th>Master's &amp; Higher Including Jurisdoctor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Treatment</td>
<td>42</td>
<td>34.7</td>
<td>63</td>
<td>52.1</td>
</tr>
<tr>
<td>Control</td>
<td>44</td>
<td>34.1</td>
<td>68</td>
<td>52.7</td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td>34.4</td>
<td>131</td>
<td>52.4</td>
</tr>
</tbody>
</table>

TABLE 6
DISTRIBUTION OF THE SAMPLE BY SEX

<table>
<thead>
<tr>
<th>Group</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Treatment</td>
<td>66</td>
<td>54.5</td>
<td>55</td>
</tr>
<tr>
<td>Control</td>
<td>84</td>
<td>65.1</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>60.0</td>
<td>100</td>
</tr>
</tbody>
</table>
are homogeneous. A comparison was made between the groups using scores on the pretest. Table 7 shows the results of the t-test of student scores on the pretest. Since there was no significant difference between groups, sufficient common characteristics exist to permit comparison between the groups.

### Table 7

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean Scores</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>121</td>
<td>57.8</td>
<td>16.6</td>
</tr>
<tr>
<td>Control</td>
<td>129</td>
<td>59.6</td>
<td>15.5</td>
</tr>
</tbody>
</table>

\[ t = .91; p = .363 > .05; df = 248. \]

Not significant at .05 level.

**Administration**

The following administrative procedures were followed throughout the experiment:

1. Each instructor taught the same blocks of instruction for both treatment and control groups for the six course offerings conducted from September 1979 through May 1980.

2. Permission was obtained from The Ohio State University Behavioral and Social Sciences Human Subjects
Review Committee to waive the student written consent form to reduce the "Hawthorne effect" and reduce the threat to the internal validity of the study.

3. Instructors were not aware of which students were the control group and which students were in the treatment group. This information was only available to the course director and the researcher. The treatment was assigned at random to three of the six course offerings.

4. No changes were made in any of the research instruments during the conduct of the study.

5. No curriculum changes were made in the course during the conduct of the study.

6. Each course offering was conducted in the same classroom.

7. No attempt was made to instruct the treatment group in the use or purpose of the instructional objectives. The instructional objectives were included as part of the course materials distributed to the students at the beginning of the course along with the course syllabus.

8. The opinionnaires were administered only to the students in the treatment group in the following sequence:

   a. Opinionnaire 1 was administered immediately after Instructional Objectives Test 1.

   b. Opinionnaire 2 was administered immediately before Instructional Objectives Test 2.
The sequence was expected to reinforce the importance of the instructional objectives as a study aide.

Summary

This chapter described the design of the study, the instruments used to obtain the data, and the characteristics of the subjects. The design was described in detail as well as the statistics used to analyze the data.

The study used analysis of variance (ANOVA) procedures to: (1) determine the overall relationship between the dependent (posttest scores) and independent (age, sex, educational level) variables; (2) test for statistical significance; and (3) examine and interpret the patterns of effects between group means.

Chapter IV examines the results of the study in terms of the research objectives of the study.
CHAPTER IV

ANALYSIS AND INTERPRETATION OF THE DATA

Introduction

The purpose of this chapter is to report the results of the study. Interpretation of the data will permit conclusions to be made about the research objective and hypotheses. The objective of this study was to determine if adult student learning would be enhanced if precise instructional objectives were provided to adult students and to determine the effect of age, sex, and educational level on the posttest scores.

Testing the Hypotheses

Research Hypothesis No. 1--students in the treatment groups would score significantly higher on Opinionnaire 2 than on Opinionnaire 1. It was important to determine if there would be an increase in awareness of the use of instructional objectives as a study guide in the treatment group. If the treatment group was given the instructional objectives and failed to use them, the outcomes of the research would be severely affected. To assess student awareness of the objectives and also reinforce the need to use the objectives, opinionnaires were
used. The sequencing of the instructional objectives tests and the opinionnaires was very important. By giving Instructional Objectives Test 1 before Opinionnaire 1, it was hoped to capture the data for the Instructional Objectives Test 1 before reinforcing the importance of using the instructional objectives with Opinionnaire 1. It was theorized that after taking Instructional Objectives Test 1 and answering Opinionnaire 1, the subjects in the treatment group would realize that their chances of scoring higher on the instructional objectives test would be greater if they would study, using the instructional objectives as a guide. To assess the increase in awareness, Opinionnaire 2 was administered prior to Instructional Objectives Test 2. A higher score on Opinionnaire 2 than on Opinionnaire 1 would indicate that the students were more aware of the use of the instructional objectives as a study guide and more students would report using them. Table 8 shows the paired t-test results obtained by comparing the scores of the treatment group on Opinionnaires 1 and 2. There was a significant increase in student awareness of the use of instructional objectives as a study guide. Frequency analysis of data obtained by Opinionnaires 1 and 2 shows that 52.9 percent of students in the treatment group did not use the instructional objectives to study for Instructional Objectives Test 1, while
TABLE 8

COMPARISON OF TREATMENT GROUP SCORES
ON OPINIONNAIRES 1 AND 2

<table>
<thead>
<tr>
<th>Instrument</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opinionnaire 1</td>
<td>121</td>
<td>91.9</td>
<td>13.3</td>
</tr>
<tr>
<td>Opinionnaire 2</td>
<td>121</td>
<td>106.4</td>
<td>14.5</td>
</tr>
</tbody>
</table>

\[ t = 13.51; \ p < .001; \ df = 120. \]

only 40.5 percent reported not using the instructional objectives to study for Instructional Objectives Test 2.

Research Hypothesis No. 2—students in the treatment group would score significantly higher on Instructional Objectives Test 2 than they would score on Instructional Objectives Test 1. If the students in the treatment group were more aware of the importance of using the instructional objectives as a study guide, it was theorized there should be a corresponding increase in scores on Instructional Objectives Test 2. Table 9 shows the paired t-test results obtained by comparing the scores of the treatment group on Instructional Objectives Tests 1 and 2. There was a significant difference in the scores on Instructional Objectives Test 2 compared to the scores on Instructional Objectives Test 1. The data suggest that the difference in scores may be attributed to the increased awareness of the students of the importance of using the instructional objectives as a study guide.
TABLE 9

COMPARISON OF TREATMENT GROUP SCORES ON INSTRUCTIONAL OBJECTIVES TESTS 1 AND 2

<table>
<thead>
<tr>
<th>Instrument</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Objectives Test 1</td>
<td>121</td>
<td>18.7</td>
<td>3.6</td>
</tr>
<tr>
<td>Instructional Objectives Test 2</td>
<td>121</td>
<td>23.3</td>
<td>3.8</td>
</tr>
</tbody>
</table>

\[ t = 13.14; \ p < .001; \ df = 120. \]

Research Hypothesis No. 3—students in the treatment group would score significantly higher on Instructional Objectives Test 1 than the students in the control group would score on Instructional Objectives Test 1. The students in the treatment group received the instructional objectives which were used to develop the instructional objectives tests. The control group did not receive the instructional objectives. It was theorized that the students in the treatment group would have an advantage over the students in the control group because of the influence of the instructional objectives, and should score higher on Instructional Objectives Test 1 than the students in the control group. Table 10 shows the independent t-test results obtained by comparing the scores of the treatment group on Instructional Objectives Test 1 with the scores of the control group on Instructional Objectives Test 1. There was a significant difference in
TABLE 10

COMPARISON OF TREATMENT GROUP SCORES AND CONTROL GROUP
SCORES ON INSTRUCTIONAL OBJECTIVES TEST 1

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>121</td>
<td>18.7</td>
<td>3.6</td>
</tr>
<tr>
<td>Control</td>
<td>129</td>
<td>17.4</td>
<td>4.0</td>
</tr>
</tbody>
</table>

\[ t = 2.65; \ p < .009; \ df = 248. \]

the scores of the treatment group on Instructional Objectives Test 1 over the scores of the control group on Instructional Objectives Test 1. Since there was no significant difference in the treatment group and control group on the pretest (see Table 6), the data suggest that the difference in scores may be attributed, at least in part, to the use by the treatment group of the instructional objectives as a study guide.

Research Hypothesis No. 4—students in the treatment group would score significantly higher on Instructional Objectives Test 2 than students in the control group would score on Instructional Objectives Test 2. The students in the treatment group had completed Instructional Objectives Test 1 and Opinionnaire 1 one week prior to receiving Opinionnaire 2 and Instructional Objectives Test 2, and had received the instructional objectives at the beginning of the course. The students in the control group had only been exposed to Instructional Objectives
Test 1 prior to receiving Instructional Objectives Test 2. Table 11 shows the independent t-test results obtained by comparing the scores of the treatment group on Instructional Objectives Test 2 with the scores of the control group on Instructional Objectives Test 2.

TABLE 11
COMPARISON OF TREATMENT GROUP SCORES AND CONTROL GROUP SCORES ON INSTRUCTIONAL OBJECTIVES TEST 2

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>121</td>
<td>23.3</td>
<td>3.8</td>
</tr>
<tr>
<td>Control</td>
<td>129</td>
<td>20.7</td>
<td>4.6</td>
</tr>
</tbody>
</table>

\[ t = 4.86; p < .001; df = 248. \]

There was a significant difference in the scores of the treatment group on Instructional Objectives Test 2 over the scores of the control group on Instructional Objectives Test 2. Since there was no significant difference in the treatment group and control group on the pretest (see Table 6), the data suggest that the difference in the scores may be attributed, at least in part, to the use by the treatment group of the instructional objectives as a study guide. As shown in Table 9, the treatment group scored significantly higher on the Instructional Objectives Test 2 than on the Instructional Objectives Test 1, which suggests that the improvement in scores on the
Instructional Objectives Test 2 may have been the result of the influence of the instructional objectives given to the treatment group.

Research Hypothesis No. 5—students in the treatment group would score significantly higher on the posttest than the students in the control group would score on the posttest. The pretest results (see Table 6) indicated there was no significant difference between the treatment group and the control group. The treatment group has consistently scored significantly higher on the Instructional Objectives Test 1 and 2 and has been exposed to the instructional objectives. The use of the instructional objectives has been reinforced by two opinionnaires. Table 12 shows the independent t-test results obtained by comparing the scores of the treatment group on the posttest with the scores of the control group on the posttest.

TABLE 12

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>121</td>
<td>77.2</td>
<td>7.5</td>
</tr>
<tr>
<td>Control</td>
<td>129</td>
<td>76.5</td>
<td>9.1</td>
</tr>
</tbody>
</table>

\[ t = .71; p < .477; df = 248. \]
There was no significant difference between the treatment group and the control group on the posttest. Since the data suggest the treatment had no effect on the results of the posttest, further analysis will be made to attempt to identify those variables that may be affecting the posttest results. The posttest data were subjected to Analysis of Variance.

**Analysis of Variance**

Identification of the independent variables that may have an effect on posttest scores is important. Analysis of variance is a statistical technique that is designed to make such an assessment.

The independent variables examined in this study were: (1) educational level; (2) age group; and (3) sex. A three-way analysis of variance using a classical regression approach was used to compensate for unequal sample sizes. The results of the analysis of variance are shown in Table 13. To reject the null hypothesis of no significant relationship requires a significant F value.

The contribution of the educational level is significant given that the contribution of sex and age group have already been accounted for. The educational level had a significant F value at the .001 level. The contribution of the age group is not significant given that the contribution of sex and educational level have already
TABLE 13
THREE-WAY ANOVA OF TREATMENT GROUP AND CONTROL GROUP
SCORES ON POSTTEST BY SEX, EDUCATIONAL LEVEL, AND AGE GROUP

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>.051</td>
<td>.051</td>
<td>.976 NS</td>
</tr>
<tr>
<td>Educational Level</td>
<td>2</td>
<td>894.597</td>
<td>447.299</td>
<td>.001 *</td>
</tr>
<tr>
<td>Age Group</td>
<td>4</td>
<td>514.887</td>
<td>128.722</td>
<td>.058 NS</td>
</tr>
<tr>
<td><strong>2-Way Interactions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex x Educational Level</td>
<td>2</td>
<td>121.525</td>
<td>60.762</td>
<td>.336 NS</td>
</tr>
<tr>
<td>Sex x Age Group</td>
<td>4</td>
<td>76.502</td>
<td>19.126</td>
<td>.847 NS</td>
</tr>
<tr>
<td>Educational Level x Age Group</td>
<td>7</td>
<td>294.048</td>
<td>42.007</td>
<td>.623 NS</td>
</tr>
<tr>
<td>Residual (Error)</td>
<td>229</td>
<td>12697.348</td>
<td>55.447</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>249</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .001; NS = not significant.
been accounted for. The contribution of sex is not significant given that the contribution of educational level and age group have already been accounted for. Two-way interactions between the variables age group, educational level, and sex were not significant.

Research Hypothesis No. 6—there will be a significant difference in posttest scores based on age group. As shown in Table 13 there was no significant difference in mean scores based on age group at $\alpha = .05$. Table 14 shows the rank ordered age group means by scores on the posttest. It is interesting to note that adults in the age groups 41-50 and 51-62 had lower scores than the adults in age groups 23-28, 29-33, and 34-40. The age group with the highest mean score was the 29-33 group. Younger adults have been subjected to instructional objectives longer than the older adults. There is a strong possibility that some older adults in the sample had never been exposed to instructional objectives before this research study. If this is so, then the older adults would not have known what to do with the instructional objectives and would have achieved a lower score.

Research Hypothesis No. 7—there will be a significant difference in posttest scores based on sex. As shown in Table 13 there was no significant difference in posttest scores based on sex.
Research Hypothesis No. 8—there will be a significant difference in posttest scores based on educational level. As shown in Table 13 there was a significant difference in posttest scores based on educational level. Table 15 shows the rank ordered educational means by score on the posttest. Those students with the lowest educational level achieved the lowest mean score and those with the highest educational level achieved the highest mean score.
A chi-square test for independence was conducted comparing educational level and age group. The results as shown in Table 16, were significant at \( \alpha = .05 \). It is interesting to note that 20.3 percent of the students under 40 years of age had an educational level of Associate degree or below, while 68.5 percent of the students over 40 had an educational level of Associate degree or below. There is a strong possibility that the older adults scored lower on the posttest because their educational level was low.

### TABLE 16

CHI-SQUARE TEST OF INDEPENDENCE COMPARING EDUCATIONAL LEVEL AND AGE GROUP

<table>
<thead>
<tr>
<th>Educational Level</th>
<th>Age Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Under 40</td>
<td>Over 40</td>
</tr>
<tr>
<td>Associate Degree or Less</td>
<td>36</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>20.3%</td>
<td>68.5%</td>
</tr>
<tr>
<td>BA and Higher</td>
<td>141</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>79.7%</td>
<td>31.5%</td>
</tr>
<tr>
<td>Total</td>
<td>177</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

\( p < .05 \)

**Discussion**

The performance of the treatment group on Instructional Objectives Tests 1 and 2 was significantly better statistically than the control group. However, there was
no significant difference between the treatment group and the control group on the pretest and posttest. Table 17 shows a comparison of the treatment group and control group mean scores on the examination administered during this study.

Although the treatment group's achievement on Instructional Objectives Test 1 and Test 2 was statistically significant, the difference in mean scores of the treatment group and control group was less than 2 points on Instructional Objectives Test 1 and less than 3 points on Instructional Objectives Test 2. Greater differences might have occurred had the treatment group been instructed in the use of the instructional objectives at the time they were distributed to the students. Recent research (Raghubir, 1979) has shown that students who are given specific instructional objectives, and are trained and encouraged to use the instructional objectives, will not only achieve higher scores on posttests, but will also retain the knowledge longer than those students who do not receive instructional objectives.

Although there was no significant difference between the treatment group and the control group on the posttest, this doesn't mean that instructional objectives as used in this study are not important as a study guide. The researcher believed that the instructional objectives, reinforced by the opinionnaires and the instructional
<table>
<thead>
<tr>
<th>Group</th>
<th>Instructional Objectives Test 1</th>
<th>Instructional Objectives Test 2</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Treatment</td>
<td>18.7</td>
<td>3.6</td>
<td>23.3</td>
<td>3.8</td>
</tr>
<tr>
<td>n=121</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>17.4</td>
<td>4.0</td>
<td>20.7</td>
<td>4.6</td>
</tr>
<tr>
<td>n=129</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
objectives tests, might be sufficient to produce significant differences between the groups. However, each instructional objective (see Appendix C) can be matched to a specific test item on the instructional objectives tests (see Appendix D) while the pretest and posttest (see Appendix B) were written using the general topics in the summary course outline in the course syllabus (see Appendix A). It is not surprising then, that the results of the posttest produced no significant difference between the groups. Were this study to be replicated it would be highly advisable to conduct training in the use of instructional objectives for the treatment group and not rely solely on the students to discover the purpose of the instructional objectives. However, since this study was exploratory in nature and to avoid the possibility of influencing the student response (Hawthorne effect), the researcher elected not to give training in the use of instructional objectives.

Summary

The analysis of data obtained by this study reveals the following:

1. Students in the treatment group scored significantly higher on Opinionnaire 2 than on Opinionnaire 1.
2. Students in the treatment group scored significantly higher on Instructional Objectives Test 2 than on Instructional Objectives Test 1.

3. Students in the treatment group scored significantly higher on Instructional Objectives Test 1 than the control group.

4. Students in the treatment group scored significantly higher on Instructional Objectives Test 2 than the control group.

5. Students in the treatment group did not score significantly higher on the posttest than the control group.

6. There was no significant difference in mean scores on the posttest between age groups.

7. There was no significant difference in mean scores on the posttest for the variable sex.

8. There was a significant difference in mean scores on the posttest between educational levels.

Analysis of variance with a regression approach was used to compensate for unequal sample sizes. As a result, the variables sex and age group were found to be not significant and the variable educational level was found to be significant at $\alpha = .001$.

A summary of this study, the findings, conclusions, limitations, and recommendations for future research are discussed in Chapter V.
CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This chapter includes a summary of the previous chapters, findings based on the data, and conclusions and recommendations that have been developed from this research study.

Summary

A need for meaningful research in adult education continues to exist. The objective of this research effort was to determine if adult learning could be enhanced by using specific instructional objectives as a study guide, for 121 Department of Defense military and civilian employees in the treatment group and 129 Department of Defense military and civilian employees in the control group, who attended Contract Administration courses, at the Air Force Institute of Technology, between September 1979 and May 1980.

Duchastel and Merrill (1972) reviewed the empirical studies concerning the effects of instructional objectives and concluded the results of empirical studies are inconsistent. Adams (1977) reports that research
findings on the use of instructional objectives range from highly significant to inconclusive. This study offered an opportunity to add to the body of knowledge in adult education.

There is a controversy in education concerning the use of instructional objectives. The literature is replete with the pros and cons of using instructional objectives and the difficulty of arriving at a common definition. There is a paucity of research involving the use of instructional objectives in adult education programs.

An exploratory research effort was conducted using a modified Campbell and Stanley (1966) Pretest-Posttest Control Group Design. Instructional objectives were written for the treatment group and two tests were developed with test items for each instructional objective. Two opinionnaires were used to measure student awareness of the instructional objectives. A pretest and a posttest were given to each student. These research instruments were tested for reliability and the results were favorable for each instrument. Chi-square analysis was conducted on pretest results to determine if there was a significant difference between the treatment and control group on the variables sex, age group, and educational level, before beginning the research. The t-test was used to test the difference between group mean scores on the
Pretest, Instructional Objectives Test 1 and Test 2, Opinionnaires 1 and 2, and the Posttest. Posttest data was subjected to analysis of variance to determine the effect of the independent variables sex, age group, and educational level on the dependent variable—posttest scores.

**Findings**

The findings of the study were:

1. Pretest results showed no significant difference between the treatment group and the control group on the variables educational level, age group, and sex at the beginning of the study.

2. The research instruments were reliable measures of student learning as evidenced by the Cronbach alpha reliability coefficients ranging from 0.60 to 0.93.

3. **Research Hypothesis** (H₁)—students in the treatment group would score significantly higher on Opinionnaire 2 than on Opinionnaire 1.

   Evidence supports H₁ at the α = .001 level of significance.

4. **Research Hypothesis** (H₂)—students in the treatment group would score significantly higher on Instructional Objectives Test 2 than on Instructional Objectives Test 1.
Evidence supports $H_2$ at the $\alpha = .001$ level of significance.

5. **Research Hypothesis** ($H_3$) -- students in the treatment group would score significantly higher on Instructional Objectives Test 1 than students in the control group would score on Instructional Objectives Test 1.

   Evidence supports $H_3$ at the $\alpha = .01$ level of significance.

6. **Research Hypothesis** ($H_4$) -- students in the treatment group would score significantly higher on Instructional Objectives Test 2 than students in the control group would score on Instructional Objectives Test 2.

   Evidence supports $H_4$ at the $\alpha = .01$ level of significance.

7. **Research Hypothesis** ($H_5$) -- students in the treatment group would score significantly higher on the posttest than the students in the control group would score on the posttest.

   Evidence does not support $H_5$.

8. **Research Hypothesis** ($H_6$) -- there will be a significant difference in posttest scores based on age group.

   Evidence does not support $H_6$.

9. **Research Hypothesis** ($H_7$) -- there will be a significant difference in posttest scores based on sex.

   Evidence does not support $H_7$. 
10. **Research Hypothesis (H₉)**—there will be a significant difference in posttest scores based on educational level.

Evidence supports H₉ at the α=.001 level of significance.

**Conclusions**

The following conclusions are drawn from the findings of this study.

1. The educational level of an adult student, at the beginning of a course of study, will have a strong influence on posttest achievement. Results of this study showed that educational level contributed to a significant difference in posttest scores.

2. Adult educators who decide to use instructional objectives in a course of study, should conduct training for older adults in the purpose and use of those instructional objectives. Older adults (over 41 years of age) had a tendency to score lower on the posttest than younger adults.

3. Adult educators who make an effort to group students by educational level, when possible, will facilitate student learning. If an adult educator can determine the educational level of a student, either through a pre-course questionnaire or examination, prior to the student's enrollment in a course of study, then students...
of similar educational level can be grouped together. This would alleviate having students of varied educational level in the same course and allow the adult educator to teach on the same plane to each student. Otherwise, the adult educator would have to deal with students of varied educational level. Results of this study indicate that the higher the adult student's educational level is, the higher will be the student's score on the posttest.

4. Instructional objectives can facilitate adult student learning, even though they might not always significantly improve performance on a posttest. Adult students in the treatment group scored significantly higher on Instructional Objectives Tests 1 and 2 than the students in the control group. Students in the treatment group received the instructional objectives while those in the control group did not receive the instructional objectives. The instructional objectives test items were matched to the specific instructional objectives that were provided to the treatment group. The posttest was based on general learning outcomes rather than specific instructional objectives and the questions were similar to those used in the pretest. There is a possibility that the posttest was an easier test and consequently there was no significant difference in posttest scores between the treatment group and the control group.
5. The use of instructional objectives does not inhibit learning. Both the treatment group and the control group mean scores on the posttest were considerably higher than their mean scores on the pretest. Both groups received instruction based on the instructional objectives. While the control group did not receive the instructional objectives, it is obvious, from their posttest scores, that the lack of the instructional objectives did not inhibit their learning.

**Recommendations**

While the results of this study are encouraging, it is obvious that further research is needed before a definitive statement can be made concerning the effect of instructional objectives on adult learning. Specifically, research is needed regarding: (1) the types of learning that are facilitated by using instructional objectives; (2) the most effective way to provide objectives to adults; and (3) the most effective way to use objectives in various types of adult learning situations. Future investigations of adult learner exposure to instructional objectives should take into consideration adult learner competence in their use. If it is discovered that adult learners lack the ability to use instructional objectives, then the researcher should consider training the adult
learners to use the instructional objectives as a study guide.

The following specific recommendations for further research are made:

1. Replicate this study using a variety of strategies, educational settings and populations from other career fields to determine if similar results can be obtained.

2. Replicate this study with modifications, e.g., giving prior instruction in the use of instructional objectives to students in the treatment group; and using a posttest based on specific instructional objectives.

3. Replicate this study and examine additional student characteristics, such as socioeconomic status, ethnic background, marital status, motivation, and life goals.

4. Replicate this study in courses given in adult basic education programs; adult public evening schools; junior college education programs; business and industry continuing education programs; and university adult career planning and extension service programs.

5. Conduct a longitudinal study of student retention of subject matter.

6. Conduct research on the use of instructional objectives in the affective domain.
APPENDIX A

COURSE SYLLABUS FOR CONTRACT ADMINISTRATION COURSE
APPENDIX A

The complete course syllabus for Contract Administration was 24 pages long and consisted of administrative instructions, reference lists, summary course outline and detailed daily reading assignments. Only the summary course outline is included as a representative sample. The complete syllabus is available upon request.
## School of Systems and Logistics

### Contract Administration

#### SUMMARY OUTLINE

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Day 13 0830-1530   DISPUTES, CLAIMS, TERMINATIONS & CLOSEOUT

Disputes and Appeals Procedures  
GAO, Contracting Officer, ASBCA, Courts  
Contract Adjustments Claims (P L 85-804)  
Other Contractor Remedies  
Terminations - Default/Convenience  
Default Excuses and Waivers  
Authority, Responsibility, Relationships ACO/PCO/TCO  
Use of Cure Notice and Show Cause  
Closeout of Contracts

Day 14 0830-1530   NEGOTIATION OF CHANGES - NEGOTIATION SIMULATION

Final Preparation for Negotiation Session  
Daily questions and Team Preparation, from Day 4, requires Teams to submit Pre-Negotiation positions to their Negotiation Monitor prior to Negotiations  
Contractor and Government ACO Teams negotiate Contract Changes in Presence of an Instructor Monitor  
Instructor Monitor Briefings provide Student Experiences from Separate Team Negotiations  
Students Tie Course Ideas Together in this Negotiation Simulation by personal participation as Negotiation Team Members

Day 15 0830-1200   REVIEW, TRENDS, EXAMINATION, GRADUATION

ACO Support to Buying Offices/Program Managers  
Procurement Commission Ideas  
Final Examination/Review  
Course Evaluation  
Graduation
APPENDIX B

PRETEST AND POSTTEST
APPENDIX B

Pretest

The pretest for the Contract Administration course consisted of 100 questions. A representative sample of 20 questions is included. The complete examination is available on request.

Posttest

The posttest for the Contract Administration course consisted of 94 questions. A representative sample of 20 questions is included. The complete examination is available on request.
1. The general policy of the DOD concerning materials used in government contracts is that the
   a. Government will furnish materials because it can buy them for less.
   b. Contractor will obtain his materials from the General Services Administration (GSA).
   c. Contractor will furnish materials.
   d. Contractor will obtain his materials from sources recommended by the Defense Logistics Agency (DLA).

2. Under which of the following circumstances would an Administrative Contracting Officer (ACO) become involved with a contract of $5,000 or less?
   a. When the contract fails to provide provisions for further procurement.
   b. When the contract fails to contain a liquidating damages clause.
   c. When the contract delivery schedule becomes delinquent.
   d. When the contract is unclassified.

3. Which of the following statements best describes a contract?
   a. It is an agreement which must have the payment of a sum of money to be valid.
b. It is an agreement which must be written to be enforceable.

c. It is an agreement that the law will enforce.

d. It is an agreement that must be prepared by a lawyer.

4. Under which of the following circumstances should a fixed-price contract be awarded?
   a. Where costs can be closely predicted and performance is a certainty.
   b. Where performance is a certainty but costs are uncertain.
   c. Where costs and performance are both uncertain.
   d. Where costs are predictable but performance is doubtful.

5. The two broad categories of contract types are
   a. Fixed-price and cost-reimbursement.
   b. Projected cost-plus-fixed-fee and cost-reimbursement.
   c. Cost-plus-incentive-fees and fixed-price.
   d. Projected cost-plus-fixed-fee and cost-plus-incentive fees.

6. One objective of the Department of Defense with regard to profit is to
   a. Reduce contractor profits to less than 6 percent.
b. Lessen the need for a contractor to assume greater financial risks.

c. Establish a range of profits now achievable.

d. Motivate contractors to improve performance.

7. In incentive contracts, what is generally considered to be the key to contractor motivation?

   a. Profits
   b. Financial risk
   c. Personal satisfaction
   d. Performance

8. A fixed-price-incentive-firm (FPIF) contract does NOT include as one of its elements a

   a. Target cost.
   b. Sharing formula.
   c. Ceiling price.
   d. Maximum fee.

9. The purpose of the weighted guidelines method is to support the negotiation

   a. Cost profit.
   b. Fixed profit.
   c. Composite profit.
   d. Profit objective.

10. Using the application of an 80 percent learning curve (assuming the first unit requires 1000 hours) which one of the following units has the incorrect production hours?
11. A certificate of current cost and pricing data is required
   
a. So that contracting officers can rely on the pricing data while negotiating.
   
b. For procurement actions of less than $100,000.
   
c. On all contracts that have been successfully completed.
   
d. When the negotiated price is based on the contractor's actual or estimated cost.

12. Subcontract review and consent is generally required under
   
a. Cost type subcontracts.
   
b. Cost type prime contracts.
   
c. Fixed-price type prime contracts.
   
d. Applicable fixed-price type and cost type prime contracts.

13. In reaching pricing agreements, the negotiator is concerned primarily with the
   
a. Total price.
   
b. Elements of cost proposed.
   
c. Costs plus a minimum profit.
d. Eventual profit and cost to a contractor.

14. Failure of the government to take action under the default clause may be construed as
   a. An implied default action.
   b. A waiver of the delivery schedule.
   c. An automatic 30-day extension of default action.
   d. A waiver of the contractor's claim under the changes clause.

15. Which of the following is an administrative reservation of funds against a future obligation on a contract?
   a. Allocation
   b. Allotment
   c. Commitment
   d. Apportionment

16. Patent and copyright laws derive their authority from
   a. The Supreme Court.
   b. The Constitution.
   c. Congress.
   d. Various state statutes.

17. The contractor must submit his termination inventory schedules promptly to
   a. Provide information for plant clearance.
   b. Make possible screening of material for use within the government.
c. Help with the disposition of items which are surplus to government requirements.

d. All of the above-mentioned items.

18. Use of government property acquired under a government contract is restricted for such use **EXCEPT** as approved by the

   a. Comptroller.
   b. Project Officer.
   c. Government Property Administrator.
   d. Administrative Contracting Officer.

19. The title to contract items transfers to the government upon

   a. Testing.
   b. Inspection.
   c. Correction of defects.
   d. Acceptance.

20. Who is responsible for controlling the quality of a product?

   a. The contractor
   b. The inspector
   c. The PCO
   d. The ACO
REPRESENTATIVE SAMPLE POSTTEST QUESTIONS

1. Under the plant cognizance program, the cognizant service is responsible for administration of
   b. Contracts issued by the cognizant service.
   c. Contracts issued by the cognizant service and NASA.
   d. Contracts issued by all Department of Defense activities.

2. The action taken by an authorized individual to approve some completed action of an unauthorized individual best defines
   a. Ratification.
   b. Appointment.
   c. Operation of law.
   d. Conduct.

3. Determination of contractor appeals from a cost disallowance are the responsibility of the
   b. Finance Officer.
   c. General Accounting Office.
   d. Administrative Contracting Officer.

4. Responsibility for contract closeout is a function of the
   a. Auditor.
b. Contracting Officer.
c. Property Officer.
d. Finance Officer.

5. The preferred type of contract for Department of Defense procurements is the

   a. Firm fixed-price contract.
   b. Fixed-price cost incentive contract.
   c. Fixed-price redeterminable contract.
   d. Fixed-price multiple incentive contract.

6. A cost-plus-fixed-fee (CPFF) contract is chiefly used in research or exploratory development when

   a. The costs involved are insignificant.
   b. The work specifications are definable.
   c. It is practical to attempt to establish an incentive arrangement.
   d. The level of contractor effort is unknown.

7. A supplemental agreement

   a. Is bilateral.
   b. Meets required essential elements of a contract (is a new contract in itself).
   c. Does not require a basic authority in the existing contract.
   d. All of the above are correct.

8. Profit or fee for changes

   a. Is not authorized.
   b. Is negotiated on the merits of the change.
c. Is limited to the basic contract fee.
d. Is held in abeyance pending completion of the contract.

9. The maximum profit objective in a cost-plus-fixed-fee (CPFF) contract for research and development is limited to
   a. 8 percent.
   b. 12 percent.
   c. 15 percent.
   d. 18 percent.

10. Price analysis is the evaluation of
    a. Total price.
    b. Element cost.
    c. Commercial ranges.
    d. Noncomparable elements.

11. ASPR Section XV (Contract Cost Principles and Procedures) encourages the use of advance agreements to establish the extent of allowability of
    a. Interest expense.
    b. Losses on other contracts.
    c. Contributions and donations.
    d. Independent research and development expenses.

12. Price analysis does NOT include which one of the following?
    a. Evaluation of separate cost items.
    b. Comparison of price quotations.
c. Use of "rule-of-thumb" techniques.
d. Historical prices.

13. Consent to a subcontract does **NOT** indicate that
   a. The subcontractor is considered responsible.
   b. All costs incurred under the subcontract are allowable.
   c. The subcontract is consistent with the contractor's MAKE or BUY program.
   d. Consideration has been given for no-charge use of government facilities.

14. Prior to initial prime contract negotiation, the negotiator should review the
   a. Contractor's site.
   b. Potential follow-on.
   c. Technical potential.
   d. Contractor proposal.

15. Where the contractor willingly waives his right to collect a claim for a convenience termination, it is called a
   a. Default.
   b. No-cost settlement.
   d. None of these.

16. Progress payment requests, when authorized in a contract, are approved by the
   a. Auditor.
17. Surveillance over the disposition and sale of government property in possession of the contractor is generally assigned to the
   a. Plant Clearance Officer.
   b. Industrial Specialist.
   c. Procuring Contracting Officer.
   d. Administrative Contracting Officer.

18. The DD Form 250 (Material Inspection and Receiving Report) may be used by the contractor
   a. As proof of shipment.
   b. As justification for billing the government.
   c. To obtain the method of transportation.
   d. To determine the carrier and destination.

19. Acceptance of supplies in accordance with the contract and signing of the DD Form 250 (Material Inspection and Receiving Report) is generally the responsibility of the
   a. Transportation Officer.
   b. Property Administrator.
   c. Quality Assurance Representative.
   d. Administrative Contracting Officer.
20. The primary responsibility for production surveillance on defense contracts belongs to the
   a. ACO.
   b. PCO.
   c. Quality Assurance Representative (QAR).
   d. Industrial Specialist (IS).
APPENDIX C

INSTRUCTIONAL OBJECTIVES
STUDENT OBJECTIVES
FOR
CONTRACT ADMINISTRATION

DAY 1

1. Given a list of organizations, select the major DOD organization responsible for contract administration.

2. Demonstrate a knowledge of the DOD Plant Cognizance program by distinguishing between correct and incorrect criteria for program establishment.

DAY 2

1. Given a list, select the basic elements that are found in a legally constituted contract.

2. Define the term "agency" as it pertains to government contracting.

3. Explain the impact on government contract administration as a result of the decision in the G. L. Christian case.

4. Define the role of the Administrative Contracting Officer as a member of the contract administration team.

5. Differentiate between government contracting and commercial contracting.

DAY 3

1. Given the elements of a Fixed Price Incentive Firm Target contract and final contract cost, be able to correctly compute the contractor's profit, if any.

2. From a list of contract types, correctly select the type of contract best suited for a given requirement.
3. Given the elements of a Cost Plus Incentive Fee Contract and final contract cost, be able to correctly compute the contractor's fee.

4. Be able to define the point of total assumption in a Fixed Price Incentive Contract.

5. Given the formula and pertinent data, correctly compute the point of total assumption.

6. Be able to differentiate between cost type contracts and fixed price type contracts.

**DAY 4**

1. Given a hypothetical situation, demonstrate a knowledge of negotiation strategy by developing negotiation objectives.

2. Distinguish between the various techniques of negotiation and give examples of those which tend to optimize results.

3. Distinguish between the various phases of negotiation and, given the techniques used, select the appropriate phase.

4. Differentiate between the concepts of cost element negotiating and total price negotiating.

5. From a list of basic skills, select those that can be used to develop a meaningful negotiation strategy.

**DAY 5**

1. Be able to differentiate between financial and managerial accounting systems.

2. Be able to differentiate between direct and indirect costs.

3. Be able to identify the accrual concept.

4. Be able to differentiate between the factors to be considered in determining allowability of costs.

5. Given a situation and appropriate data, determine the number of direct labor hours involved.
6. Be able to identify those conditions under which the principles enumerated in section XV of ASPR are applicable.

**DAY 6**

1. Be able to differentiate between cost analysis and price analysis techniques of evaluating contractor proposals.

2. Given a series of situations, select the one that requires use of cost analysis techniques.

3. Be able to differentiate between fixed, variable and semi-variable costs as they relate to changes in production.

4. Given a contractor's proposal, select appropriate techniques to analyze the various cost elements.

5. Outline the concept of field pricing support as provided by the contract administration team.

6. Outline the concept of price theory as it relates to supply and demand.

**DAY 7**

1. Be able to define the concept of a "constructive change."

2. Be able to define the limits of the changes clause.

3. Given a situation that requires a change, select the correct course of action.

4. Differentiate between a unilateral change and a bilateral change in government contracts.

5. Be able to define the concepts of "acceleration" of government contracts.

**DAY 8**

1. Given a list of techniques, be able to select those techniques used to monitor a contractor's progress.
2. Given a definition, be able to select the applicable technique used to monitor a contractor's progress.

3. Be able to define the "critical path" in a PERT network.

4. Be able to define a "rated order."

5. Be able to select the appropriate response regarding order of priorities in government contracts.

6. Be able to describe the duties and responsibilities of the industrial specialist.

**DAY 9**

1. Be able to identify the objectives of a Contractor Procurement System Review.

2. Differentiate between the concept of apportionment, allocation, allotment, and obligation.

3. Differentiate between expenditure control responsibilities in Fixed Price Contracts and Cost Reimbursement Contracts.

4. Be able to identify methods of government financing.

5. Given appropriate data, determine the status of progress payments liquidation.

6. Be able to differentiate between consent to subcontracting requirements in Fixed Price Contracts and Cost Reimbursement Contracts.

**DAY 10**

1. Be able to select the alternative which demonstrates a knowledge of the relationship between the PCO and the Small Business Administration with regard to contractor responsibility.

2. Be able to select the alternative which best describes the purpose of a pre-award survey.

3. Be able to differentiate between Federal and Military design and performance specifications.
4. Be able to differentiate between the five levels of quality assurance used in government procurement.

5. Be able to differentiate between the five categories of effort used in Government Procurement Quality Assurance.

6. Be able to differentiate between the methods of Quality Assurance corrective action.

**DAY 11**

1. Be able to differentiate between acceptance and implied acceptance.

2. Be able to define the government's rights under the inspection clause.

3. Be able to define "latent defect."

4. Be able to differentiate between a supply warranty and the correction of Deficiencies Clause.

5. Be able to differentiate between the factors to be considered to determine if a warranty should be used in a contract.

**DAY 12**

1. Differentiate between methods of disposing of excess property.

2. Differentiate between types of government property.

3. Be able to determine who is responsible for "risk of loss" of government property.

4. Given a specific type of government property, select the correct DOD policy concerning that type of property.

5. Be able to differentiate between the government property clause for a fixed price supply contract and a cost reimbursement supply contract.

6. Be able to identify the government responsibilities involved in providing property to contractors.
DAY 13

1. Differentiate between Termination for Convenience and Termination for Default in a given situation.

2. Differentiate between excusable delay and nonexcusable delay in a given situation.

3. Given a hypothetical situation, select the correct remedial process for a contractor to follow to resolve a dispute.

4. Differentiate between a "show cause" letter and a "cure notice" in a given situation.

5. Demonstrate a knowledge of PL 85-804 by selecting the appropriate response to a given situation.

6. Differentiate between contract termination and contract close out.

DAY 14

1. Demonstrate an understanding of negotiation techniques by active participation in a negotiation simulation exercise.

2. Be able to outline the essential facts, concepts, and requirements contained in the negotiation exercise case.

3. Demonstrate an ability to organize a negotiation team and plan for the conduct of a negotiation.

DAY 15

1. Demonstrate the extent of knowledge gained from the course by successfully passing a final exam.
INSTRUCTIONAL OBJECTIVES TEST 1

Instructional Objectives Test 1 consisted of 30 questions. A representative sample of 6 questions is included. The complete test is available on request.

INSTRUCTIONAL OBJECTIVES TEST 2

Instructional Objectives Test 2 consisted of 40 questions. A representative sample of 8 questions is included. The complete test is available on request.
1. Which of the following is not a criteria for establishing plant cognizance?
   a. Future contracts with the plant.
   b. The military department desiring cognizance has a contract in a plant for a major system or major subsystem.
   c. The system is of critical military importance to the nation and requires control by a Program Manager.
   d. Duration of the contract.

Tests Instructional Objective 2, Day 1

2. Government contracts and commercial contracts are similar in all the following, except:
   a. Application Law.
   b. Rules of Interpretation.
   c. Essential Elements.
   d. Obligation to Perform.

Tests Instructional Objective 5, Day 2

3. The following elements of a Cost-Plus-Incentive Fee (CPIF) contract are negotiated:
Target Cost - 100,000
Target Fee - 8,000
Maximum Fee - 12,000
Minimum Fee - 4,000
Share Formula - 60/40

At the completion of the contract, the negotiated cost was 112,000. The contractor would make a total fee of:

a. $3200.
b. $7200.
c. $4600.
d. $4000.

Tests Instructional Objective 3, Day 3

4. In making a review of a contractor's proposal, a government contract negotiator comes to the conclusion that the price being asked is too high. In his search to establish a fair and reasonable price, which technique might he use in determining the profit objective?

a. Contractor Weighted Average Share.
b. Contractor Procurement System Review.
c. Weighted Guidelines.
d. Element of cost negotiation.

Tests Instructional Objective 1, Day 4

5. A DOD contractor distinguishes between direct costs and indirect costs according to:
a. The environment in which the contractor operates.

b. A cost policy negotiated between the government and the contractor.

c. Established criteria set forth in ASPR.

d. The Cost Accounting Standards

Tests Instructional Objective 2, Day 5

6. Costs that fluctuate directly with changes in volume of production can best be described as:

   a. Semi-variable.
   
   b. Variable.
   
   c. Indirect.
   
   d. Fixed.

Tests Instructional Objective 3, Day 6
1. The changes clause used in government contracts:
   a. Permits unilateral changes by the contracting officer.
   b. Limits the change to the scope of work.
   c. Requires the contractor to proceed with the change even if he disagrees with the change.
   d. All of the above.

Tests Instructional Objective 2, Day 7

2. Generally used for in-production analysis, a technique which measures the status of production and reveals where a particular production item is with respect to where it should be is called:
   a. Phase planning.
   b. Line of balance.
   d. Delivery forecasting.

Tests Instructional Objective 2, Day 8

3. The objectives of a Contractor Procurement System Review might include:
   a. Evaluating a Contractor's procurement efficiency and effectiveness.
b. Granting, withdrawing or approving a Contractor's Procurement System.

c. Determining contract type, and establishing profit or fee objective.

d. All of the above.

Tests Instructional Objective 1, Day 9

4. One of the main purposes of a pre-award survey is to assist the PCO in determining:

   a. The reliability of a contractor's proposal.

   b. The reasonableness of a contractor's proposal.

   c. The responsibility of the contractor to perform.

   d. The reporting capability of the contractor's system.

Tests Instructional Objective 2, Day 10

5. The difference between acceptance and implied acceptance is:

   a. Acceptance is at destination, implied acceptance is at origin.

   b. Acceptance is final, implied acceptance is not final.

   c. Acceptance is transfer of ownership, implied acceptance is not.
Tests Instructional Objective 1, Day 11

6. A latent defect is a defect that:
   a. The contractor has no continuing obligation for under a cost-reimbursement contract.
   b. The contractor is responsible not only for supplies and services but also for design.
   c. Could not be discovered by a reasonable inspection.
   d. All of the above.

Tests Instructional Objective 3, Day 11

7. What is the DOD's policy concerning special tooling?
   a. The government will provide and retain title to special tooling.
   b. Contractors will provide and retain title to special tooling.
   c. Contractors will provide special tooling and lease it to the government at negotiated rental fees.
   d. Contractors will provide special tooling, but the government will retain title to it.

Tests Instructional Objective 4, Day 12
When a dispute arises between the contractor and the contracting officer regarding a question of fact, the contractor should seek remedial action from the:

a. Court of Claims.
b. General Accounting Office.
c. Armed Services Board of Contract Appeals.
d. Federal Courts.

Tests Instructional Objective 3, Day 13
APPENDIX E

OPINIONNAIRES 1 AND 2
STUDENT OPINIONNAIRE

INSTRUCTIONAL OBJECTIVES

1. Your answers to the questions in this opinionnaire will be of assistance in determining how well instructional objectives assisted you in your studies.

2. There are no right or wrong answers.

3. Your answers will not influence your course grade.

4. Your feelings and interest are your own. Please answer each question as you truly feel without extensive reflection or going back to change answers.

5. You are asked to respond to the questions for each instructional objective by placing a check mark in the box directly below the statement which best reflects your answer to the question. There are five questions for each instructional objective.

6. Your participation in this educational research survey is appreciated and will help enhance the quality of our instructional methods.
<table>
<thead>
<tr>
<th>OBJECTIVE</th>
<th>Do you recognize this objective from your course material?</th>
<th>Do you understand each of the terms in this objective?</th>
<th>Did you use this objective as a guide in your study?</th>
<th>Do you feel this objective provided help for better understanding of the material?</th>
<th>If you were to teach this course, would you expect students to know enough to achieve this objective?</th>
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<tbody>
<tr>
<td>Demonstrate a knowledge of the change-planning process by distinguishing between correct and incorrect criteria for program establishment.</td>
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<tr>
<td>Outline the concept of price theory as it relates to supply and demand.</td>
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**Student Number**

**SEX: MALE, FEMALE**

**AGE:**

How many months since you last attended a continuing education course?

<table>
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<td>Be able to describe the duties and responsibilities of the Industrial specialist.</td>
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<tr>
<th>Don't recognize it</th>
<th>Finally notice it</th>
<th>Clearly understand it</th>
<th>Not clear</th>
<th>Absolutely understand it</th>
<th>For review</th>
<th>For next review</th>
<th>Did I know it?</th>
<th>A little help</th>
<th>Substantially helped</th>
<th>Not at all</th>
<th>No idea</th>
<th>How very well</th>
</tr>
</thead>
</table>

How often would you expect students to know enough to achieve this objective if you were to teach this course?
BIBLIOGRAPHY


"Father of Behavioral Objectives Criticizes Them: An Interview with Ralph Tyler [The]." *Phi Delta Kappan* 55 (September 1973), 55-57.


Gagné, R. M. "Behavioral Objectives?—Yes!" *Educational Leadership* 29 (February 1972), 394-6.


Janeczko, R. J. "Behavioral Objectives or Objections." Journal of Industrial Teacher Education 7 (Summer 1970), 47-50.


Kneller, G. F. "Behavioral Objectives?—No!" Educational Leadership 29 (February 1972), 397-400.


Newport, J. F. "Behavioral Objectives: Ready or Not, Here They Come." School and Community 57 (May 1971), 224.

Nichols, E. D. "Are Behavioral Objectives the Answer?" Education Digest 38 (December 1972), 50-2.

Okun, M. A. "Implications of Geropsychological Research for the Instruction of Older Adults." Adult Education 27 (1977), 139-55.


Popham, W. J. "Must All Objectives Be Behavioral?" Education Leadership 29 (April 1972), 605-8.


