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THE IMPACT OF BEHAVIORAL OBJECTIVES OF THE ACHIEVEMENT OF COLLEGE FRESHMAN ECONOMICS STUDENTS: AN EXPERIMENT

by

C. Frank Zarnowski

A Dissertation
Presented to the Graduate Committee
of Lehigh University
in Candidacy for the Degree of
Doctor of Arts
in
The College of Business and Economics

Lehigh University
1978

DEDICATION

To all those students who have opened an economics text with dismay, and to my Mother, who doesn't fall into the above category.

CERTIFICATE OF APPROVAL

Approved and recommended for acceptance as a dissertation in partial fulfillment of the requirements for the degree of Doctor of Arts.

September 20, 1978
(date)

Bruce R. Dalgaard
Professor in Charge

Accepted_____

Special committee directing the doctoral work of Mr. Zarnowski.

Bruce R. Dalgaard
Chairman

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ABSTRACT

This study assessed the effects on achievement of economics students when they are provided a specific type of instructional objective.

The experiment was conducted at Mount St. Mary's College, Emmitsburg, Maryland during the fall semester, 1977. The subjects were eighty-six freshman students enrolled in principles of economics. The experimental treatment involved providing the students, alternatively, with behaviorally written instructional objectives of the Gronlund style. The test instruments, which showed adequate levels of reliability and validity referenced to a learning taxonomy of cognitive levels, measured achievement.

Using an analysis of variance the treatment had no significant differential effect on the achievement of students studying principles of economics. A second major contribution was that the study described a systematic method for writing instructional objectives, indexed the objectives to various levels of cognitive learning and tested the resulting economic achievement. The treatment did not enhance economic achievement, but learning what does not improve student economic understanding is as important as learning what does.

I. INTRODUCTION

This study assesses the effects of achievement of economics students when they are provided a specific type of instructional objective.

Background

Economists today are concerned with the need for greater economic knowledge and understanding. Those in the teaching profession are faced with the task of introducing the economics student to those principles essential to an understanding of economic problems and policy alternatives society may utilize to contend with these problems. But often courses in principles of economics do not have stated learning objectives for students. At times the principles course becomes a forum for current events discussion. At other times they are exercises in applied mathematics. Often the concepts essential for economic understanding are not identified and communicated to the student.

A problem of economic education is that students are unsure of what economic concepts they must master and how they are to demonstrate such mastery. It has often been taken for granted that teaching of economics

will be improved and student learning enhanced when instructional objectives are provided. More specifically, when instructional objectives stated in behavioral terms are used, understanding of economic principles will increase. Robert Mager states that "when clearly defined goals are lacking it is impossible to evaluate a course or program efficiently, and there is no sound basis for selecting appropriate materials, content or instructional methods."[1]

The present study is based on the desire to stimulate interest in and to attempt to improve teaching of collegiate economics.

Statement of the Problem

The goal of evaluating effective use of precisely stated instructional objectives at the college level has eluded the economics profession. The review of the literature notes a dearth of effort in this important area. Objectives of economics instruction exist in many college outlines. But these objectives rarely inform the student of the exact concepts to be mastered or the manner by which such mastery is to be evaluated.

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[1]Robert Mager, Preparing Instructional Objectives, (San Francisco, Fearon Publishers), 1962, p. 3.

Such "semi" instructional objectives are vaguely stated as "produces better economic citizens," "understands how the price system works," or "knows the mechanics of supply and demand." Such statements communicate little for student understanding of instructional aims and offer little basis upon which the instructor may evaluate the results of his teaching. In many cases objectives are not explicitly stated but may be implied. Therefore instructional objectives, written in behavioral terms, may be a desirable addition to evaluating student economic education.

Stated explicitly, the premises underlying this study are: 1) effective instruction requires the development and testing of specifically written instructional objectives; 2) the use of instructional objectives stated in behavioral terms is deficient in economic education; and 3) the effect of such instructional objectives on student performance is unmeasured. The problem therefore is to assess the effect of specific instructional objectives on student cognitive achievement in a principles of economics course.

While this study aims specifically at the instructional area of economics by measuring the performance

of college freshman economics students, perhaps the same basic issue could be posed for all fields of economic education. One of the basic problems facing pedagogical efforts is that of defining goals, working to achieve them and measuring the results.

But to what extent have we in economic education really defined explicitly what we wish our students to learn? A beneficial way to state the goals, the instructional objectives, is to specify the types of outcomes expected from teaching activity in terms of student performance. That is, the objectives direct the teacher's attention to the student and his behavior. Norman Gronlund developed behavioral objectives and his stylized objectives will be used in this study. With Gronlund's style objectives students know what is expected of them. Students are not only given general goals as understanding, appreciating or realizing. In addition the objectives specifically communicate the type of observable behavior which exemplify the general goals. This is to avoid guessing as to the intent and expectation of the teacher.

Do economics students achieve at a higher level when provided with behaviorally stated instructional objectives? It is this question which the present study investigates.

Rationale and Purpose of the Study

Clearly, research on effects of instructional objectives in economic education appears warranted and overdue. The lack of such objectives results from a disagreement on what type of instructional objective should be employed and how effective various forms of instructional objectives are. But selection of course content and evaluation of teaching effectiveness cannot take place until a choice of instructional objectives is made. This study assumes that acceptable instructional objectives will permit an accurate measurement of achievement.

There is always the possibility that students in economics do not need stated instructional objectives. That is, possibly the students will already know what the objectives are from another source, e.g. text, former students, or hearsay. While in individual cases this might be true, the author feels in general that this is not the case. And so, preparing and testing instructional objectives is a recognized problem in economic education. This investigation seeks to design and test the effect of a specific type of instructional objective in economic education. The purpose of the study is to investigate the impact of such objectives

on achievement. Collegiate freshman economics students are the subjects. The general hypothesis to be tested is:

> The economic achievement by collegiate freshmen will be significantly greater when the students are provided with behavioral objectives than when they are not provided with the objectives.

Accordingly, the procedure (described fully in Chapter IV) involves 1) formulating the instructional objectives in behavioral terms, 2) writing the test items to conform to a learning taxonomy, 3) administering the instructional objectives in the form of a learning sheet, 4) administering immediate tests to determine achievement levels, and 5) administering an attitudinal questionnaire.

The study thus measures differences in economic understanding, as measured by achievement scores on localized instruments, between those students who receive instructional objectives and those students who do not. The hypotheses testing was intended to research the impact of instructional objectives on final scores. Homogeneous student groups were used.

Definition of Terms

Economic Education: that part of formal education which has as its primary goal the raising of the level of economic understanding of society; generally considered the education in economics from elementary levels through the principles course in college.

Ceiling Effect: refers to unreliable test score experimentation because all subjects achieve scores which approach a maximum level. Thus, no treatment differential can be noted.

Instructional Objectives: educational goals stated in general terms. Behavioral objectives are a form of instructional objectives. They are specific and are stated in behavioral terms. They attempt to specify to the student what is to be learned and how such learning is to be demonstrated. For example, "select the term that best fits the definition of substitute goods" is a behavioral objective. The student must be able to "select". It is a specific goal and the student knows how he will demonstrate learning.

Hawthorne Effect: refers to biased and unreliable experimental results. Results are distorted because the subjects are aware of the experimentation and they may not act in a "normal" fashion.

Learning Sheet: a one page sheet provided to subjects in the experiment which included a content outline and specifically stated behavioral objectives.

Taxonomy: a classification system used by educators in teaching and testing. It describes educational attainment levels arranged in hierarchial form, from simplest to most complex. Knowledge, comprehension, application, analysis, synthesis and evaluation are considered layers of learning in the cognitive domain.

Test for Economic Understanding (TEU) and Test for Understanding in College Economics (TUCE): two specific measures of economic understanding prepared by the Joint Council for Economic Education. Both are nationally normed instruments but neither was written for any set of instructional objectives.

Organization of the Study

The present chapter introduces the problem of research and the rationale for the study. A general hypothesis, methodology and important definitions are introduced. In the following chapter the literature relating to instructional objectives stated in behavioral terms is reviewed. Studies noting the impact on student achievement, studies dealing with economic education and recent doctoral dissertations using behavioral objectives are traced. Summary tables are provided. Implications for the present investigation are incorporated in the summary of the second chapter.

Chapter three explains, defines and prepares instructional objectives stated in behavioral terms. The instructional objectives are developed using the style of Norman Gronlund. The prepared objectives are classified with the use of a taxonomy of educational objectives. A sample learning sheet is also prepared. Instrument validity and reliability are assessed and summarized in the fourth chapter which explains the design of the study and the procedures followed in conducting the investigation. Background characteristics of the subjects and a summary time schedule are also presented.

Findings of the investigation are presented in the fifth chapter. A comparison of test scores is outlined with reference to hypotheses tested. The results of the student questionnaire are also presented and summarized. Finally, the summary, conclusions and recommendations are outlined. Basic implications and suggestions for the use of instructional objectives are presented.

II. REVIEW OF THE LITERATURE

As teachers of economics many of us do not define clearly for our students what concepts they must master to achieve economic understanding. In particular this happens most often at the principles level. The educational literature pays high praise to instructional objectives written in behavioral terms. Such authorities as Mager and Gronlund strongly suggest that learning is much improved if learning goals are clearly stated to the student.[2] It would be expected that a survey of literature (both in education and economic education) would turn up many research studies which back the claim of effectiveness of instructional objectives written in behavioral terms. In the field of education the number of empirical studies proving or disproving the aforementioned claim is small and the results, to say the least, inconsistent. Far fewer research studies have been completed to test the learning effect of instructional objectives in economic education. An examination of 700 studies of research

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[2]Reference is to Robert F. Mager, Preparing Instructional Objectives, Palo Alto, Fearon Publishers, 1962. and Norman E. Gronlund, Stating Behavioral Objectives for Classroom Instruction, New York, Macmillan, 1970.

in economic education by George Dawson, Journal of Economic Education, Spring, 1976, provides an illustration. Only six dealt with the use of instructional objectives in teaching economics.

The review of the literature covers three types of studies: those which test the effect of behaviorally written instructional objectives on student achievement, those which have attempted to investigate the impact of behavioral objectives on students of economics and all recent (1975-77) doctoral dissertations which deal in any way with instructional objectives written in behavioral terms.

As Duchastel and Merrill[3] have pointed out, there are various rationales for the use of instructional objectives in education. Instructional objectives serve three main functions: 1) direction for teaching and curriculum development; 2) guidance in evaluation; and 3) facilitation of learning. In 1973 Duchastel and Merrill reviewed all empirical research for the latter instructional function, the facilitation of learning. They focused their attention on those studies

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[3]Phillippe C. Duchastel and Paul F. Merrill, "The Effects of Behavioral Objectives on Learning: A Review of Empirical Studies," Review of Educational Research (Winter, 1973), pp. 53-69.

which asked the question: "Does communicating behavioral objectives to students have a facilitative effect on their learning?"[4] Ten studies investigated the hypothesis that students provided with instructional objectives would achieve more than students not provided with objectives. Therefore the review of the literature begins with these ten empirical studies reviewed by Duchastel and Merrill and adds two additional investigations.

Review of Studies of Student Achievement

The first category to be reviewed involves those studies which have investigated whether students provided with instructional objectives written in behavioral terms achieve more than those not provided with such objectives. A table at the completion of each subsection is presented. It compacts the major variables of each study and allows a tally of important achievement and attitudinal questions to be addressed in the present study.

Smith investigated the effect of providing 162 slow learners from ten eighth grade classes with

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[4] Ibid., p. 54

behavioral objectives.[5] The subject was a semi-programmed unit in elementary probability. Half of the subjects in each of the ten classes were assigned to a behavioral objectives treatment while the other half were assigned to a no-objective treatment. Results failed to indicate any significant differences between the two groups on an objective referenced posttest.

Doty investigated the effect of prior knowledge of behavioral objectives in science courses for 190 seventh grade students sampled from seven public schools.[6] The results showed that the subjects who received objectives scored significantly higher on posttests. Doty concluded that the teacher interaction did not influence the results of the experiment.

A study by Engel used 48 college students majoring in elementary education to determine the effect of behavioral objectives on achievement in a partially

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[5]S.A. Smith, "The Effects of Two Variables on the Achievement of Slow Learners on a Unit in Mathematics" (Master's thesis, University of Maryland, 1967).

[6]C.R. Doty, "The Effect of Practice and Prior Knowledge of Educational Objectives on Performance" (Ph.D. dissertation, Ohio State University, 1968).

programmed unit of instruction in mathematics.[7] The twelve lessons included in the unit were administered during eight consecutive class days. One half of the students received a cover sheet stating the objectives of the unit. The results revealed significant differences between the objectives and no-objectives groups on both immediate posttests and three-week interval retention tests in favor of the behavioral objectives group.

The first study attempting to measure the effect of behavioral objectives in economics was conducted by Tiemann.[8] He provided behavioral objectives to students in a college economics course during a four week treatment period. The students viewed eight videotaped lectures and attended a weekly seminar. The subjects received either general or specific objectives. No significant effects were found for the latter type of objective when using mid-term exam scores as a criteria.

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[7]R.S. Engel, "An Experimental Study of the Effect of Stated Behavioral Objectives on Achievement in a Unit of Instruction on Negative and Rational Base Systems of Numeration" (Master's thesis, University of Maryland, 1968).

[8]P.W. Tiemann, "Student Use of Behaviorally-stated objectives to Augment Conventional and Programmed Revisions of Televised College Economics Lectures," paper presented at the annual meeting of the American Educational Research Association, Chicago, 1968.

However, significant effects were found using retention test scores as criteria. The group receiving behavioral objectives scored higher. A more favorable attitude, as measured by a course evaluation questionnaire, was also associated with the provision of behavioral objectives. Tiemann's study will be given more extensive review in the subsection dealing with economic education.

Blaney and McKie investigated the effects of providing behaviorally written objectives to a group of conference attendees.[9] A two-day conference for adult educators dealt with new management techniques in education. Sixty adults volunteered and were divided into three groups: a behavioral group, a general introduction group, and a pretest group. A preconference treatment was administered just prior to the beginning of the conference program. A significant difference between the first two groups was found on the immediate posttest. There was no significant difference between the first and third groups nor between the second and third groups.

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[9] J.P. Blaney and D. McKie, "Knowledge of Conference Objectives and Effect Upon Learning," Adult Education Journal 29, (1969).

Bishop investigated the effect of behavioral objectives in a ninth grade vocational agricultural course.[10] The class was divided into forty-four subjects each and no significant difference was found between the behavioral objective group and the no-objective group on either immediate posttest scores or retention scores obtained after a thirty-day interval.

Dalis studied the effect of specifically written objectives on achievement in a three-week unit on growth and development.[11] The subjects were 133 tenth graders from five health and safety classes taught by the same teacher. The subjects received one of three treatments: (a) precisely-stated behavioral objectives; (b) vaguely stated objectives; or (c) short passages of general health information. Results of a sixty-eight item criterion test indicated that the first group (precisely-stated objectives) performed significantly

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[10] D.D. Bishop. "Effectiveness of Prior Exposure to Performance Objectives as a Technique for Improvement of Student Recall and Retention" (Ph.D. dissertation, Ohio State University, 1969).

[11] G.T. Dalis, "Effect of Precise Objectives Upon Student Achievement in Health Education," The Journal of Experimental Education, 1970, No. 39.

better than the other two groups, which in turn did not differ significantly from one another. No significant differences between groups were found using the amount of time spent outside of each class as the criterion. Boardman's study was designed to test whether an advance knowledge of behavioral objectives would enhance student learning.[12] Testing remedial chemistry classes and employing analysis of variance she concluded there was no significant difference between groups with behavioral objectives and those without. Boardman found a definite indication that students need instructions in the use of behavioral objectives. This help needs to be more than mere printed matter (which she used) if the objectives are to be of significant value in enhancing learning. Students apparently need to understand the rationale behind the use of behavioral objectives before such objectives can be effectively employed as an aid to learning.

Lawrence used 216 nursing students to note the effect of three variables: (a) a factual information

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[12]Doris E. Boardman, "The Effects of Students' Advanced Knowledge of Behavioral Objectives in their Achievement in Remedial Chemistry" (Ed.D. dissertation, U.C.L.A., 1970).

organizer; (b) a list of behavioral objectives; and (c) a pretest, all on nursing care.[13] Her objectives were more a presentation of rules than behaviorally stated objectives. A fifty-item posttest indicated that the behavioral objective treatment was significantly superior to other treatments.

Weinberg studied the effect of behavioral objectives in a physical education course dealing with bowling knowledge and skill.[14] Students enrolled in four classes received either no objectives, general objectives, or behaviorally stated objectives of two types. The first type described terminal (end of course) behavior only, while the second type of behavioral objectives stated both intermediate steps and terminal behavior. The test covered a ten-week instructional period and touched on ability to bowl, form, game strategy, rules, scoring and the mechanics of bowling. Weinberg found no significant differences between

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[13]R.M. Lawrence, "The Effects of Three Types of Organizing Devices on Academic Achievement" (Ed.D dissertation, University of Maryland, 1970).

[14]H. Weinberg, "Effects of Presenting Varying Specificity of Course Objectives to Students on Learning Motor Skills and Associated Cognitive Material" (Ed.D. dissertation, Temple University, 1970).

treatment groups.

Chang developed a study to determine the effects of instructional objectives on student learning in a special education class for university students.[15] She investigated differences in achievement between students provided with instructional objectives and those not provided. Retention was also tested. The subjects were eighteen graduate and undergraduate students in an eight-week summer session. There was no significant difference in the achievement on immediate or delayed retention posttest scores. Chang noted that the non-significant finding could have resulted from the small sample size.

An unpublished study by Chadwick found no significant difference on immediate posttests for college students in principles of accounting.[16] He used instruments classified by an educational taxonomy.

Table I summarizes the important characteristics of the initial twelve studies reviewed. Generally, this

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[15]Theresa Chang, "Effect of Instructional Objectives on College Student Achievement," Education 97, no. 2, Winter, 1976.

[16]Lester Chadwick, "Teaching Accounting: Behavioral Objectives and Multi-Media Presentation," paper presented at the First Annual Maryland Association of CPA's Accounting Educators Conference, Columbia, Maryland, February, 1977.

first group of studies shows a lack of consistent results. On immediate retention, measured by a post-test, five studies reported a significant effect due to the availability of behavioral objectives, while seven studies reported no such effect. On measures of delayed retention, two investigations found objectives to enhance performance and two found no facilitative effect. In summary, the availability of objectives was found to facilitate learning in about half the instances. Attitudinal questionnaires, although seldom used, gave consistent results. The student's attitude toward the subject matter or the objectives themselves were viewed as improved in all four cases.

Review of Studies in Economic Education

A review of the literature concerning the use or effects of behavioral objectives in economic education notes a deficiency of such studies. Economists have ignored this area. Few studies have even touched on the topic and those that do range from two page reports to 377 page dissertations. The studies yield inconclusive results. They differ according to intent, design, subjects and economic material. The review in economic education is divided into two parts, those studies which test the effectiveness of behavioral objectives in

Table 1

A Summary of Studies on Student Achievement with Communicated Behavioral Objectives as the Independent Variable, 1967-1976

Author	Date	#Ss	Level	Subject	Length	A	B	C	D
Smith	1967	162	8th grade*	mathematics	na	No	--	--	--
Doty	1968	190	7th grade	science	1 week	Yes	--	--	--
Engel	1968	48	college	mathematics	8 days	Yes	Yes	--	--
Tiemann	1968	na	college	economics	4 weeks	No	Yes	Yes	--
Blaney & McKie	1969	60	adults	management	2 days	Yes	--	--	--
Bishop	1969	88	9th grade	agriculture	1 month	No	No	--	--
Dalis	1970	133	10th grade	health	3 weeks	Yes	--	--	--
Boardman	1970	na	9th grade	chemistry	na	No	--	--	Yes
Lawrence	1970	216	post high school	nursing	na	Yes	--	--	--
Weinberg	1970	na	na	bowling	10 weeks	No	--	--	--
Chang	1976	18	college**	special ed.	8 weeks	No	No	Yes	Yes
Chadwick	1976	na	college	accounting	1 semester	No	--	--	--

legend: A - Was there a significant difference in achievement on immediate posttest?
B - Was there a significant difference in achievement on a delayed posttest?
D - Did the subjects feel that the behaviorally written objectives were either helpful or useful?
* - Slow learners ** - Plus graduate students
na - not available -- - question not investigated

economic education, and those studies which report on the use of such objectives. A summary is provided in Table 2.

As noted earlier in this review of the literature, Tiemann investigated the effects of providing behavioral objectives to students in a college economics course during a four week period.[17] Students viewed eight videotape lectures and attended a weekly seminar. The subjects received either general objectives or specific objectives. Duchastel and Merrill note that "most of the behavioral objectives were very close to summary statements. For example: 'Recognize that...(rule): Indicate that...(rule).' The general objectives, on the other hand, were similar to the following; 'Understand the relationship between....' No significant effects were found using midterm exam scores as criteria."[18] Tiemann did find significant effects using a retention score as the criterion, with the behavioral objectives group scoring higher than the general objectives group. He also found a more favorable attitude associated with students who received

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[17] Op. cit., Tiemann.

[18] Op. cit., Duchastel and Merrill, pp. 55-56.

behavioral objectives through the use of a course evaluation questionnaire. Tiemann did experience the problem of not referencing the objectives to exam questions, a problem characterizing other studies in economic education.

Conlon attempted to discover interactions between the availability of objectives and certain learner characteristics.[19] The Conlon investigation did not specifically deal with students in economics courses. Two seventh grade classes were provided with material from the Intermediate Science Curriculum Study program and behavioral objectives, while two additional classes were provided with the same material but no objectives. The subjects were grouped (high, medium, low) on the College Aptitude Rating Test scores. The experimental classes received one to three pages of specific instructional objectives each week of the course. On a standardized test of understanding in college economics, TUCE, (taken by seventh graders) the performance of the

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[19] B.A. Conlon, "A Comparison of the Performance of Seventh Grade Students With and Without Prior Knowledge of the Objectives of an Individualized Science Program" (Ed.D. dissertation, Forida State University, 1970).

behavioral objectives group was superior to that of the control group.

Nelson conducted an experiment at the University of Minnesota, Duluth, with 117 freshmen enrolled in a principles of microeconomics course.[20] Students were divided into experimental and control groups. The experimental treatment involved providing the students with one to three pages of specific instructional objectives each week of the course. Two instruments were used: TUCE (parts A & B) and the department's own test (UMD). Analysis of variance procedures were applied and significant mean differences, in favor of the experimental group, resulted at the .01 level or better. Nelson concluded that the treatment had a statistically significant differential effect on the achievement of students studying the principles of microeconomics. Achievement was significantly enhanced by having provided the experimental students with specific instructional objectives.

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[20]Dennis L. Nelson, "The Effect of Specifically Stated Instructional Objectives on the Achievement of Collegiate Undergraduate Economics Students" (Ph.D. dissertation, University of Minnesota, Duluth, 1970).

Nelson also polled students on a simple attitudinal questionnaire relating to the use, value and application of the specific objectives. 87.1% of the students in the experimental group indicated they had used each set of objectives in studying for the course; 93.4% indicated the specific objectives were very beneficial; 86.2% indicated a desire to have specific objectives made available in other courses. Nelson concluded that the students viewed the specific objectives as being beneficial and helpful.

Phillips noted a deficiency in reported research findings and attempted to determine the effects of specific objectives upon economic understanding.[21] His 1970 study utilized three community colleges in the Southern California area and involved over 300 students. Phillips administered the TUCE on a pretest and post-test basis in a one semester economics principles course to measure the effect of instructional objectives. Phillips did not find a significant difference at the .05 level of achievement scores between experimental

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[21]James A. Phillips, "Instructional Objectives and Economic Understanding," Journal of Economic Education 3 (Spring 1972), pp. 112-117.

and control groups. He concluded that the significant impact of instructional objectives treatment was not determined. A review of findings did reveal several test factor "impurities" which may have depressed the level of significance. Such factors included large differences in the grading procedures used by participating economics instructors to weight posttests. Phillips did come close to finding a significant difference between achievement levels of the two groups (a .06 level of significance). He concluded that the lack of significance at .05 did not necessarily mean that the instructional objective treatment had little impact on economic understanding. He specifically recommended that the instructional objectives be more carefully prepared and designed. He urged that the objectives be more conceptually specific and arranged in the hierarchial learning theory of Bloom's taxonomy.[22] Phillips experienced the problem, as others have, of not writing behavioral objectives in a hierarchial form nor

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[22]Benjamin S. Bloom, Ed., Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook I: Cognitive Domain (New York: David McKay Co., 1956).

of referencing them to achievement tests. This was the major flaw in his design.

Casper conducted an empirical investigation of the effect of behavioral objectives in two sections of a principles of economics course (microeconomics) taught by the same instructor during the Winter at Kent State University.[23] Her goals were to evaluate the success of behavioral objectives as measured by a standardized exam (TUCE) and to determine whether students develop a more positive attitude toward economics when using behavioral objectives. The attitudes were surveyed at the end of the quarter. For each student Casper collected data which related to student performance: class standing, college of major, sex, grade point average, and whether the student had taken high school economics. Part II, Form A of the TUCE examination was administered to each section at the beginning of the quarter, and Form B was administered at the end of the quarter. Casper used a "gap-closing" model which uses as the dependent variable the ratio of the student's actual

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[23]Cheryl A. Casper, "An Empirical Study of the Effect of Behavioral Objectives in Principles of Economics," Journal for Economic Education 8 (Spring, 1977).

improvement to potential improvement on the two TUCE examinations. Casper noted that a major weakness of using the TUCE examination was that the exam left unspecified the objectives for which it tests. The TUCE may have been inappropriate because of the differences in emphasis in subject content in the exam and that stressed by the individual instructors. Casper used adjusted TUCE scores and ran a stepwise multiple regression on the dependent variable. Her results suggest that there is no significant difference in achievement of students using behavioral objectives over students who did not use the objectives.

Most of the empirical analysis of Casper's study centered on the impact of behavioral objectives on student learning. A second hypothesis--students using behavioral objectives develop a more positive attitude toward economics--was evaluated as well. In her study there is no clear indication that students using behavioral objectives develop more positive attitudes than students in the control group. From survey responses, student interest in economics appeared to be less in the experimental group than in the control group. Despite difficulties in interpreting student interest, students using behavioral objectives judged

them useful. 53% rated them "very useful or helpful" and 35% rated them "moderately useful or helpful." Only 11% responded that they were "not useful or helpful" and one percent did not use the objectives at all. Casper concluded that, like other "innovative" teaching techniques, it is difficult to demonstrate statistically the superiority of behavioral objectives.

Only a few reports exist on the use of behavioral objectives in economic education. The Fall 1972 issue of the Journal of Economic Education included a small "Special Report" on behavioral objectives and their impact on the teaching of economics. The report defines behavioral objectives as an attempt to "specify student goals in terms of measurable or readily observable performances (behavior) expected of the learner."[24] The differences between vaguely presented traditional objectives and behavioral objectives are illustrated. The report notes that not all educators agree that behavioral objectives are the answer to pedagogical prayers, and no commonly accepted formula for writing

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[24]Special Report, "Behavioral Objectives and Student Learning Contracts in the Teaching of Economics," Journal of Economic Education 4 (Fall, 1972), p. 43.

them exists. The report contains no research. It concludes by stating that a well written behavioral objective does not merely summarize content, but describes the intended outcome in terms of what the learner will be doing when demonstrating that he has achieved the objective. The report extols the benefits of clearly communicated behavioral objectives but offers no empirical validation of the claim.

Phillips[25] summarized a study of results obtained from a questionnaire mailed to over 1000 community college economics departments in the fall of 1971. His intent was to ascertain the extent and type of instructional objectives developed and used in community college economic education. 224 questionnaires were returned. This represented 21.9% of the survey and included replies from 43 states. Of those answering, 40% used instructional objectives and 30% reported either present or planned development. 87% of those responding indicated an interest in using a set of instructional objectives prepared on a professional basis. Many of those reporting present use of instructional objectives indicated that their objectives were quite general in

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[25]James A. Phillips, "Instructional Objectives in Community College Economic Education," Journal of Economic Education 5 (Spring, 1974), pp. 116-118.

nature, and did not include statements of learning behavior, learning conditions or level of achievement required.

In summary, of the seven studies and reports which investigated the effectiveness or use of behavioral objectives in economic education three authors claimed either effectiveness or usefulness and three did not. One made no claim. One study (Phillips) measuring the use of behavioral objectives reports the enhancement of student economic achievement as insignificant at the .05 level but significant at the .06 level. One study (Tiemann) measured delayed retention and found behavioral objectives to be the cause of significant improvement in delayed retention. Four of the studies used the nationally normed TUE or TUCE as the measurement variable. Three studies (Tiemann, Nelson and Casper) used attitudinal surveys and all found that the students felt behavioral objectives were both valuable and useful. But one attitudinal questionnaire dealing with attitude improvement (Casper) found that the students' attitudes toward the subject of economics was not improved after exposure to behavioral objectives.

This group of studies in economic education is difficult to summarize because of the lack of consistent

results. They are similar to other groups of studies on the effectiveness of behavioral objectives in education. No trends develop because of inconsistent subjects, unlike subject matter, varying presentation form and different time horizons. The subjects were not homogeneous. They ranged from seventh graders to college students. The economic material was presented in either traditional lecture form, programmed form or television videotapes. The studies were administered over time horizons ranging from four weeks to one semester.

The three investigations which found no significant learning effect from behavioral objectives (Tiemann, Phillips and Casper) had a common design flaw. None referenced the communicated behavioral objectives to the measurement device. The exam questions were inappropriate to the behavioral objectives. This may help explain why significant differences did not result.

A general summary (as presented in Table 2) of the studies of behavioral objectives in economic education illustrates that although students view behavioral objectives as overwhelmingly helpful, economists have yet to prove it.

Table 2

A Summary of Empirical Studies on the Effectiveness of Behavioral Objectives in Economic Education, 1968-1977

author	date	#Ss	level	subject	length	A	B	C	D
Tiemann	1968	na	college	televised economics	4 weeks	No	Yes	Yes	--
Conlon	1970	na	7th grade	economics	na	Yes	--	--	--
Nelson	1970	117	college	principles	1 semester	Yes	--	--	Yes
Phillips	1972	300	junior college	principles	1 semester	No	--	--	--
Casper	1977	na	college	principles	1 quarter	No	--	No	Yes

note: Two non-empirical reports are excluded.

legend:
A - Was there a significant difference in achievement on immediate posttest?
B - Was there a significant difference in achievement on a delayed posttest?
C - Did the subjects' attitude toward economics improve?
D - Did the subjects feel that the behaviorally written objectives were either helpful or useful?
na - not available
-- - question not investigated.

Recent Dissertations

The most recent doctoral dissertations (1976-77) include fourteen studies on the use of behavioral objectives in education. Five are Ph.D. dissertations, while the remaining nine are Ed.D. dissertations. Of the fourteen, seven specifically treat the question of whether or not the use of behavioral objectives enhances student achievement. They are reviewed first. The remaining seven recent studies investigate such topics as the placement of behavioral objectives, various instructional methods, guidance in evaluation and history of behavioral objectives. They are reviewed afterwards. In all, nine of the fourteen authors made definite statements about the effectiveness of behavioral objectives on student achievement.

Seven of these most recent dissertations mirror the group of studies initially reviewed. They all investigate the hypothesis that students provided with behavioral objectives would achieve more than students not provided with objectives.

Cooper investigated the interaction between tolerance of ambiguity and use of behavioral objectives within the classroom on achievement in English

sentence writing skills.[26] The study was conducted with fifteen senior English classes in an inner-city New York high school. Behavioral objectives were formulated in accordance with Mager's guidelines. The analysis of the data showed that the use of behavioral objectives had a significant effect on learning. The group receiving behavioral objectives, irrespective of trait differences, significantly outperformed the group not receiving behavioral objectives.

Miles tested the relative effectiveness of behavioral and non-behavioral objectives in collegiate geology classes.[27] Multivariate analysis of demographic variables was used to establish equivalence of the experimental and control groups. An analysis of variance showed that the experimental (with behavioral objectives) group achieved significantly higher test scores. Interestingly, an attitude scale indicated that, given a choice of behavioral objectives or a

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[26]Martin Cooper. "The Effect of Behavioral Objectives and Tolerance of Ambiguity on Achievement in English Skills," (Ph.D. dissertation, Fordham University, 1976).

[27]Roy G. Miles, "The Effect of Behavioral and Non-Behavioral Objectives on Achievement in Introductory College Geology) (Ed.D. dissertation, Virginia Polytechnic Institute and State University, 1976).

simple outline of material, a majority of subjects indicated a preference for the outline form and viewed the outline form as significantly more useful.

The effect of instructional objectives, designed to aid in the understanding of material to be mastered in preparation for a quiz, was one of the three independent variables assessed in Serena's study.[28] In part Serena concluded that no significant increase in the number of correct responses on a multiple-choice examination resulted when instructional objectives were introduced. He theorized that optimized motivation led subjects to ceiling levels.

In a controlled experiment in a ninth grade unit on sex education, Wingard obtained significant student achievement results using written copies of behavioral objectives.[29] A secondary purpose was to determine

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[28]Michael S. Serena, "A Comparative Study of Norm and Criterion-Referenced Measures with an Examination of Effects of Manipulating Instructional Objectives and Methods of Study as they Relate to Student Multiple-Choice Quiz Performance," (Ed.D. dissertation. University of Tennessee, 1976).

[29]Harold E. Wingard, "The Effects of Presenting and Discussing Specifically Stated Behavioral Objectives on Learning in a Ninth Grade Unit on Sex Education," (Ph.D. dissertation, Southern Illinois University, 1976).

whether specific behavior objectives affected student attitude toward the unit of instruction. A statistically significant difference existed between experimental (with behavioral objectives) and control groups on an overall achievement posttest. Student attitude toward the unit of instruction improved significantly with behavioral objectives.

A study by Davidson sought to compare student achievement for classes presented with behavioral objectives to classes not given formal lists of behavioral objectives.[30] Using textbook-provided objectives for four classes of 173 students of a traditional undergraduate survey course in American History, Davidson found that scores of six 40-item posttests did not indicate a significant difference in performance among them at the .05 level. Davidson's results were complicated because non-homogeneity existed in the classes.

The purpose of Farrah's 1977 study was to investigate how the availability of behavioral objectives, coupled with instructional pacing, is related to achievement of remedial mathematics students at a

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[30] Barry S. Davidson, "An Evaluation of the Use of Behavioral Objectives in a First Course in American History," (Ed.D. dissertation, University of Arkansas, 1977).

two-year college.[31] For our purposes his main hypothesis was that students whose instruction was group-directed and teacher-paced and who used behavioral objectives had higher achievement scores than those students whose instruction was group-directed, teacher-paced, and who used no behavioral objectives. Results of a two-way analysis of co-variance did not support his hypothesis. He also hypothesized that the attitude toward mathematics of students whose instruction was group-directed and teacher-paced, and who used behavioral objectives would be more positive than the mathematics attitude of students whose instruction was group-directed and teacher-paced and used no behavioral objectives. This hypothesis was also not supported by results. Farrah recommended that future studies plan more carefully for control of the teacher variable.

Hass investigated the effect of providing performance objectives to one class (64) of non-science majors enrolling in a collegiate biology course and providing

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[31]Aloysius H. Farrah, "An Investigation of the Relationships of Specifically Stated Behavioral Objectives to Mathematics Achievement Within Teacher-Paced and Self-Paced Instructional Modes," (Ed.D. dissertation, New York University, 1977).

no objectives to another class (111).[32] Objectives were provided throughout one semester. American College Test (ACT) natural science reading scores were used as a co-variate in adjusting means of achievement. Hass found significant achievement differences between groups. Table 3 illustrates the continued diversity of results.

The remaining seven recent dissertations do not have a common theme. They deal with such varied topics as the placement of behavioral objectives, the use of behavioral objectives with different instructional methods, and the use of behavioral objectives in guiding evaluation. Although they do not deal with a specific topic of investigating the effectiveness of behavioral objectives as measured by student achievement a review of these studies is useful for three reasons. First, they provide history, insight and background into the use of objectives in the education process. Second, numerous investigators venture opinions concerning the value of behavioral objectives, and that is the underlying question in this study. Finally, the studies

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[32]Jerry N. Hass, "The Effects of Performance Objectives on Attitude and Achievement of Students Enrolled in a Principles of Biology Course for Non-Science Majors at the University of Southern Mississippi," (Ph.D. dissertation, University of Southern Mississippi, 1977).

Table 3

A Summary of Recent Empirical Doctoral Dissertations Concerning the Use of Behavioral Objectives in Education, 1975-1977.

author	date	#Ss	Level	Subject	Length	A	B	C	D
Cooper	1976	227	12th grade	English	several weeks	Yes	--	--	--
Miles	1976	62	College	Geology	1 quarter	Yes	--	--	No
Serena	1976	80	College	Psychology	few days	No	--	--	--
Wingard	1976	240	9th Grade	Sex Education	9 weeks	Yes	No	Yes	--
Davidson	1977	173	College	American History	1 year	No	--	--	--
Farrah	1977	146	Junior College	Mathematics	1 semester	No	--	No	Yes
Hass	1977	175	College	Biology	1 semester	Yes	--	No	--

legend: A - Was there a significant difference in achievement on immediate posttest?
B - Was there a significant difference in achievement on a delayed posttest?
C - Did the subjects' attitude toward the material improve?
D - Did the subjects feel that the behaviorally written objectives were either helpful or useful?
-- - question not investigated

are the most recent interpretations of the effectiveness of behavior objectives.

Ritter compared two methods of instruction using behavioral objectives for an undergraduate biology course.[33] He concluded that achievement in teacher-directed instruction and self-paced instruction showed no significant differences when both groups have access to behavioral objectives.

Baker examined differences in learning achievement attributable to the differential placement of behavioral objectives in text material dealing with birth control and sexual anatomy.[34] It was expected that variations in the placing of behavioral objectives would influence the acquisition of both relevant and incidental information contained in the textual material. The research hypothesis was not supported,

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[33]William R.M. Ritter, "A Comparison of Achievement for Two Methods of Instruction, With the Use of Behavioral Objectives," (Ed.D. dissertation, University of Pennsylvania, 1975).

[34]Shelton D. Baker, "A Differential Response to Behavioral Objectives on Student Achievement in a Sex Education Instructional System," (Ph.D. dissertation, University of Florida, 1976).

but the investigator found numerous reasons for the ineffectiveness of the behavioral objective treatment.

The current debate about behavioral objectives was discussed by Broekhoff.[35] She noted that although there is a need for empirically verifiable teaching goals, there is a wide-spread and intense resistance to such goals, particularly among teachers of literature. She noted that difficulty of expressing learning, in terms of behavioral objectives, especially in subjects such as literature. And further, she expressed doubts whether the benefits of using behavioral objectives are worth the effort required to develop them. She concluded that, despite many drawbacks, work with behavioral objectives should continue because such objectives may have beneficial effects. Most notable among these is that teachers are encouraged to think longer and harder about their teaching goals.

Hawk investigated the use of behaviorally stated objectives upon achievement of high school students in

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[35]Marina L.B. Broekhoff, "Behavioral Objectives and the Teaching of Literature," (Ph.D. dissertation, University of Michigan, 1976).

social studies.[36] Specifically, Hawk's hypothesis predicted the effect of behaviorally stated objectives when and only when used by both teachers and their students. He applied objectives to an American Studies unit on immigration to fifteen classes from four high schools. He strongly concluded that teacher's use of behaviorally stated objectives, when combined with a well organized unit of instruction and their own experience using that unit, does not contribute to increased achievement. Secondly, student use of behaviorally stated objectives under those same conditions does not contribute to increasing achievement.

Lewis examined the congruency, on the cognitive level, between the objectives and questions planned by social studies student teachers at the junior high and senior high level.[37] The objectives and questions were classified into two cognitive categories -- higher and lower -- based on a modified version of Bloom's

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[36]Duane C. Hawk, "The Effects of Behaviorally Stated Objectives on Student Achievement in a Eleventh Grade American Studies Unit on Immigration," (Ed.D. dissertation, State University of New York at Buffalo, 1976).

[37]Mary Ann Lewis, "The Development of a Technique to Examine the Congruence between Instructional Objectives and Questions Planned by Social Studies Student Teacher," (Ed.D. dissertation Virginia Polytechnic Institute and State University, 1976).

classification scheme of educational objectives.[38] She concluded, among other things, that student teachers tended to design unit test questions with more emphasis at the lower cognitive level than the cognitive level of their unit objectives.

Stewart's study analyzes the arguments for and criticism against behavioral objectives in educational practice.[39] Stewart traced the behavioral objectives movement historically and concluded that it developed for two reasons in twentieth century education: the increasing interest and sophistication in the measurement of learning outcomes by educators and the behavioral analysis of the learning process by psychologists.

A lengthy comprehensive study by Wentling analyzed the relationship between behavioral objectives and behaviorism hoping a clarification of the relationship in question would contribute to the understanding of aspects of the debate surrounding the use of behavioral

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[38] Op. cit., Bloom.

[39] Therese M. Stewart, "The Behavioral Objectives Controversy and Conception of Teaching," (Ed.D. dissertation, Columbia University Teachers College, 1977).

objectives.[40] She, like Stewart, traced the behavioral movement historically. The study unintentionally supplied strong support for claiming that there are no sound educational reasons for using behavioral objectives. Table 4 summarizes those recent doctoral dissertations dealing with the general use of behavioral objectives in education.

Summary

Results obtained from the thirty-two research studies and reports of behavioral objectives are, to say the least, inconclusive. Reviewing all three classifications (student achievement studies, economic education investigations and recent dissertations) the empirical studies which found no significant differences between experimental and control groups (13) are as numerous as those which have found a difference (11). Using all opinions from the studies reviewed, the count of twenty-six authors finds twelve in favor of behavioral objectives and fourteen not in favor. Furthermore, five studies attempted to measure retention with and without objectives. Two found significant

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[40]Jo Anna Wentling, "An Analysis of the Relationship Between Behavioral Objectives and Behaviorism," (Ed.D. dissertation, Lehigh University, 1977).

Table 4

A Summary of Recent Doctoral Dissertations Concerning the General Use of Behavioral Objectives in Education, 1975-1977.

author	date	#Ss	Level	Subject	Length	A	B	C	D
Ritter	1975	na	College	Biology	1 semester	--	--	--	--
Baker	1976	110	high school	Sex Education	2 weeks	--	--	--	--
Broekhoff	1976	na	na	Literature	none	--	--	--	--
Hawk	1976	na	11th grade	American History	3 weeks	No	--	--	No
Lewis	1976	none	high school	Social Studies	none	--	--	--	--
Stewart	1977	none	all levels	Behavioral Objectives	none	--	--	--	--
Wentling	1977	none	all levels	Behavioral Objectives	none	No	--	--	--

legend:
A - Was there a significant difference in achievement on immediate posttest?
B - Was there a significant difference in achievement on a delayed posttest?
C - Did the subjects' attitude toward the material improve?
D - Did the subjects feel that the behaviorally written objectives were either helpful or useful?
na - not available
none - no subjects or length involved in the study.
-- - question not investigated.

improvements and three did not. Six reports used attitudinal questionnaires. Three noted an improved attitude toward subject matter and three noted no improvement. Only when the students were asked to rate the usefulness of behavioral objectives was there a discernible trend. Researchers in five of the seven studies found their students feeling that behavioral objectives were both helpful and useful.

Within this overall picture it is important to look at factors which could account for discrepancies and inconsistencies in the results. The first of these is the topic or subject matter used in the learning materials. In the first part of this review of the literature topics ranged from health and safety to bowling and accounting. In the economic education review the subject matter was normally principles of economics, but even that covers a wide range of topics, laws, theories and issues. And the dissertations reviewed revealed topics from sex education and mathematics to English and biology. The wide range of topics may have led to an inconsistency of results.

A second factor was the level of schooling. Here again studies were conducted at the primary, secondary, junior college, college and graduate levels. Furthermore,

the length of studies did not seem to bring any clarity to the results. Studies ranged from two days to one academic year. Finally, the type of learning was rarely specified. It was seldom explained whether students were to grasp knowledge, concepts, analysis, or some other level of cognitive learning. And, as indicated in the summary following the review of studies in economic education, numerous investigators did not reference the behavioral objectives to examination questions, making one or the other inappropriate.

Implications for the Present Study

Do behaviorally written instructional objectives make a difference? The state of the art, both in and outside of economic education reveals an inconsistency of results. A study appeared warranted in which instructional objectives would be formulated and tested for effect on gains in economic understanding. The purpose of this investigation is to reduce the deficiency of literature on instructional objectives in economic education and to design a study which does not repeat earlier errors.

Thus, this study attempts to overcome many earlier research flaws with design controls on some important variables:

Ceiling Effect: The Ceiling effect problem (Serena) will be prevented by adjusting the degree of difficulty on the localized instruments.

Teacher Effect: The present study design controls for the teacher effect by combining four sections of students into two groups. Both groups are equally influenced by both the instructors in the investigation. Earlier studies (Dalis, Casper and Farrah) experienced the problem of having the teacher unduly influence the results.

Group Homogeniety: Every effort will be made to work with homogeneous groups. Subjects are randomly assigned class sections and the difficulty of an earlier study (Davidson) is avoided.

Group Size: The present investigation includes adequate and comparable size groups. This avoids numerical problems reviewed in two studies (Chang and Hass).

Subject Understanding of Objectives: The problem of one study (Boardman) is eliminated by introducing instructional objectives to the subjects before and during the investigation. It is felt that students need to understand the reasoning behind the use of objectives before they can be employed effectively.

Correlation of Objectives to Test Items: The most notable research flaw of earlier studies (Tiemann, Phillips, Nelson and Casper) is that instructional objectives were not referenced to the measurement device. Earlier studies asked questions which did not correspond to communicated objectives. The present study references all test items to the instructional objectives to clarify what level of learning the test items attempt to measure.

Careful Preparation and Design of Objectives: One investigator (Phillips) admitted failing to arrange the instructional objectives in a hierarchial format according to an accepted learning theory. And most other investigators completely ignored this problem. The present study develops behaviorally written instructional objectives according to the cognitive levels of Bloom's taxonomy. Thus, test items, corresponding to instructional objectives, attempt to measure specific levels of learning, e.g. knowledge, comprehension or application.

Instructional Objectives as a Pretest: Several studies (Tiemann and Nelson) stated the objectives in such a specific way as to make the communicated objectives a pretest. One study even informed the subjects as to the specific text pages from which the test items

would be selected. Care is taken so that the present study measures the effect of behaviorally written objectives and not simple recall.

Forced Results: Because one investigation (Nelson) attached so much importance to the communicated objectives in the teaching delivery system and so much importance to the students' grades significant differences between experimental and control groups were likely to result. This study is designed to test the effectiveness of instructional objectives under normal teaching conditions without pressuring the subjects. The researcher feels that a different design could indeed dictate significant differences in the achievement level of students. But forcing results to fit the design is not the intent.

In summary this study attempts to overcome earlier design errors examined in a review of the literature. In addition the impact of communicating instructional objectives on economic understanding is assessed.

III. BEHAVIORAL OBJECTIVES

Instructional objectives are educational goals stated in general terms. Behaviorally written objectives are a form of instructional objectives. They are stated in behavioral terms and specify what students are to learn and how such learning is to be demonstrated. An understanding of this form of instructional objectives is necessary since objectives are an integral part of the study. Numerous references are made in other studies concerning the effectiveness of instructional objectives without defining what they are or without explaining the type of objective used. Since this study uses a particular type of instructional objective, a description is appropriate.

The purpose of this chapter is to define and describe in detail the form of instructional objectives used in the present study. The instructional objectives were referenced to an educational attainment system known as a taxonomy. In the taxonomy, cognitive categories of learning are arranged in hierarchial form. These categories, described behaviorally, are used in preparing the instructional objectives. Finally, the chapter describes an eight-step process which was

followed in preparing learning sheets for the economic instructional material of the study.

Instructional Objectives as Learning Outcomes

Instructional objectives can be stated in numerous ways. The focus can be on either teaching activity or learning activity. A fruitful way to state instructional objectives is to specify the types of outcomes expected from teaching activity in terms of student performance. That is, behavioral objectives direct the teacher's attention to the student and to his behavior. Instructional objectives as used in this study focus on outcomes or products of instruction and not the process. Product and process are frequently confused in statements of instructional objectives. Gronlund warns that "stating objectives in terms of the learning process is misleading because one learning experience may contribute to many different learning outcomes, and one learning outcome (e.g. a scientific attitude) may be the result of many different learning experiences."[41] Thus, instructional objectives are defined and identified in terms of learning outcomes.

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[41]Norman Gronlund, Stating Behavioral Objectives for Classroom Instruction, (New York: MacMillian Publishing Co., Inc., 1970), p.3.

Stating instructional objectives as learning outcomes contributes to the instructional process. This technique provides direction for the instructor, a basis for selecting teaching materials, methods and subject matter, and a guide for constructing tests.

Stating the Instructional Objectives

Gronlund suggests that instructional objectives must focus attention on the student and on the types of performance he is expected to demonstrate at the end of the instruction. He suggests that they be "...brief, clear statements that describe instructional intent in terms of desired learning outcomes."[42] Gronlund-style instructional objectives are a two part set of outcomes. The first part of each objective consists of defining, in general terms, what is expected as a learning outcome. For example:

Understands law of demand.

This is an instructional outcome stated in general terms. The outcome focuses on the student behavior, not the teacher's performance or the learning process. The general objective usually begins with a verb such as knows, uses, or applies.

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[42] Ibid., p. 10.

Once a general instructional objective has been stated at the proper level of generality, in terms of the student performance, and as a learning product (and not a process), then specific examples of general student behavior may be indicated. The second step is to state specific sample outcomes in behavioral terms. Unless the general objectives are further defined they will convey to the student only a nebulous notion of what is expected of him. The following statement of a general objective and list of specific sample outcomes illustrates what is meant by defining instructional objectives in behavioral terms:

Understands basic law of demand
States the law in his own words
Relates two examples of the law of demand
Distinguishes between a change in demand and a change in quantity demanded.

The above is a modified Gronlund-style objective. Each specific learning outcome starts with a verb indicating observable behavior. The behavior can be seen by an outside observer. In the example above the behavior of the student is characterized by "stating", "relating," and "distinguishing". "Terms such as these make clear precisely what the pupils will do to demonstrate their understanding. Such nonbehavioral terms as

'realizes,' 'sees,' and 'believes' are less useful in defining objectives because they describe internal states that can be expressed by many different types of overt behavior."[43]

In summary, Gronlund's procedure for defining instructional objectives in behavioral terms includes the following steps:

1. State the general instructional objectives as expected learning outcomes.
2. Place under each general instructional objective a list of specific learning outcomes that describes the terminal behavior students are to demonstrate when they have achieved the objective.
    a. Begin each specific learning outcome with a verb that specifies definite, observable behavior.
    b. List a sufficient number of specific learning outcomes under each objective to describe adequately the behavior of students who have achieved the objective.
    c. Be certain that the behavior in each specific learning outcome is relevant to the objective it describes.
3. When defining the general instructional objectives in terms of specific learning outcomes, revise and refine the original list of objectives as needed.
4. Be careful not to omit complex objectives (e.g. critical thinking, appreciation) simply because they are difficult to define in specific behavioral terms.
5. Consult reference materials for help in identifying the specific types of behavior that are most appropriate for defining the complex objectives.[44]

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[43]Norman Gronlund, Measurement and Evaluation in Teaching, 3rd ed., (New York: MacMillan Publishing Co., Inc., 1976), p. 41.

[44]Op. cit., Gronlund, p. 17.

Although other styles for writing behavioral objectives can be used, Gronlund-style objectives were prepared for this study.

Using the Taxonomy Model

There are a number of sources that might be consulted to obtain suggestions for objectives in particular instructional areas or levels of education.[45] Two were used. The first, a programmed book designed to improve skill in stating instructional objectives for teaching of minimum essentials is Preparing Instructional Objectives by Robert Mager.[46] It is especially helpful for programmed instruction and for learning outcomes at the training level.

The most useful guide in preparing instructional objectives is Taxonomy of Educational Objectives by Benjamin Bloom, et. al.[47] Bloom describes the cognitive domain in detail and presents illustrative objectives and test items for each level of the taxonomy. The

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[45]For example, two books published by the Russell Sage Foundation illustrate the wide variety of instructional objectives that can be considered: Behavioral Goals of General Education in High School by W. F. French and Associates, 1957, and Elementary School Objectives by N. C. Keraney, 1953.

[46]Op. cit., Mager, p. 3.

[47]Op. cit., Bloom.

cognitive domain consists of a set of general and specific categories that encompass all possible learning outcomes which might be expected from instruction. The classification system was developed by psychologists, teachers and test experts for use in curriculum development, teaching and testing. In spite of the overwhelming acceptance of Bloom's taxonomy as a description of educational attainment levels, few studies designed to test the effectiveness of behavioral objectives purposefully utilize the taxonomy. Bloom arranged the major categories of the cognitive domain in a hierarchical order, from simplest to most complex behavior: knowledge, comprehension, application, analysis, synthesis, and evaluation. Specific learning outcomes, stated in behavioral terms, can be expressed for each of these categories.

The taxonomy served as a guide in preparing behavioral objectives for this study. Once the instructional objectives were described for a particular week they were then used in test preparation. The achievement test was designed to measure a sample of student behavior as described in the objectives.

Learning Sheet Preparation

Following an eight-step process the researcher prepared a learning sheet for three sets of economic instructional material:

1) Delimiting the area to be tested.
2) Writing the objectives in specific terms.
3) Making a content outline for students.
4) Preparing a table of specifications.
5) Setting standards of performance and projections of achievement levels.
6) Selecting item types to be used.
7) Writing the test items.
8) Setting up answer key and answer distribution.

Copies of all learning sheet preparation materials are in appendices A, B, and C.

Delimiting the Area to be Tested

The area to be tested by the experiment was divided into relatively small units. All instructors of the Principles of Economics course at Mount Saint Mary's College used Economics: Principles, Problems and Policies, 6th edition by Campbell R. McConnell, as the basic text. The text is straightforward and used by many of the nation's colleges and universities. A recent sample of two and four year colleges indicated that in 40% of the responding schools texts by McConnell

or Paul Samuelson are used in the principles course.[48] The instructors and the researcher decided to use textual material as the content to be tested. Demand and supply, the mechanics of individual prices, was the first delimited area (McConnell, Chapter 4, pp. 59-80). Similar procedures were used in delimiting material for the second and third packages. All instructors agreed to teach the text material at the pace of the experiment. This assured consistency of economic subject matter throughout the study.

Writing the Objectives

Using Bloom's Taxonomy the instructional objectives were devised in a hierarchical scale. Bloom's taxonomy lists knowledge, comprehension, and application, as the first three levels of the cognitive domain. The principles of economics course is geared to beginning students, usually freshmen. Initial economics courses usually concentrate on knowledge, understanding, and application, and pay less attention to higher order

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[48] J.A. Dopp and B.R. Dalgaard, "A Survey of the Content and the Methodology of the Economics Principles Course," A paper presented at the National Association of Affiliated Economic Education Directors, New Orleans, October, 1977.

taxonomy levels of analysis, synthesis, and evaluation. This is particularly true of the basic principles course. Several outstanding economic educators are in agreement on this point.[49] The general instructional objectives were usually written in terms of "knows basic terms," "understands price concepts," "applies supply and demand principles." A fourth general instructional objective was attached to the list. It dealt with using and interpreting economic data expressed graphically. This was done to aid in test preparation because graphic interpretation is considered to be an essential aspect of the principles course. It is important enough to be included as a separate instructional objective. Graphic interpretation involves skills which can be described by one of the taxonomy levels, generally application. Thus, all four instructional objectives were designed to measure student learning within one of three levels of the cognitive domain.

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[49]This is in reference to G.L. Bach, "What Should a Principles Course in Economics Be?" and Robert H. Leftwich, "Objectives of the College-Level Principles of Economics Course," presented in Goals and Objectives of the Introductory College-level Course in Economics, edited by Allen F. Larsen and Andrew T. Happi, Federal Reserve Bank of Minneapolis, 1976.

Each general instructional objective was further defined by listing a representative sample of specific types of behavior students were to demonstrate at the end of the unit. This procedure is described earlier in this chapter.

The following list of general instructional objectives and specific learning outcomes was developed for the unit in "supply and demand".

1. Knows Basic Terms

   1.1 Relates terms that have different meaning (e.g. "supply" and "quantity supplied").
   1.2 Selects the term that best fits a particular definition (e.g. "substitute goods").
   1.3 Identifies terms used in reference to a particular price mechanism problem.
   1.4 Uses terms correctly in describing the mechanics of individual prices.

2. Understands Individual Price Concepts and Principles

   2.1 Identifies examples of substitute and complementary goods.
   2.2 Identifies difference between changes in "demand" and "quantity demanded" and changes in "supply" and "quantity supplied".
   2.3 Points out the relationship of supply and demand on surpluses and shortages.
   2.4. Indicates the major determinants of supply and demand.
   2.5 Recognizes an equilibrium market situation.

3. Applies "Supply and Demand" Principles to New Situations

   3.1 Describes how to solve a practical economic problem in terms of "supply and demand" principles.

3.2 Predicts the outcome of a market change on equilibrium price/quantity.
3.3 Utilizes market analysis (interaction of demand and supply) to suggest market solutions to economic problems.

4. Interprets and Graphically Portrays Market Data

4.1 Explains how a change in price is depicted on a graph of demand and/or supply.
4.2 Indicates equilibrium price and quantity graphically and in tabular form.
4.3 Distinguishes between surpluses and shortages
4.4 Describes probable results from market data.

The research used knowledge, comprehension, application, and graphic interpretation as general instructional objectives for each of the three learning packages. The last category embodied knowledge, comprehension, and application behavior. Therefore, in preparing a norm-referenced instrument objectives were limited to the first three categories of the taxonomy. Each of the specific learning outcomes was coded for future use.

Making a Content Outline

A content outline was prepared indicating the subject matter topics to be studied by students. The outlines were used for test planning. The following was the first of three content outlines.

Content Outline:

The Mechanics of Individual Prices: Demand and Supply

A. Demand
   1. Law of Demand and Illustration
   2. Individual and Market Demand
   3. Determinants of Demand
   4. Changes in Demand and Quantity Demanded

B. Supply
   1. Law of Supply and Illustration
   2. Determinants of Supply
   3. Changes in Supply and Quantity Supplied

C. Market Equilibrium
   1. The Rationing Function of Prices
   2. Changes in Supply and Demand
   3. The Resource Market

Preparing a Table of Specifications

"A table of specifications is a twofold table that relates the instructional objectives to the course content. The table makes it possible to classify each test item in terms of both objectives and content."[50] It assures that a representative sample of instructional objectives and the content are included in the tests. The instructional objectives are listed across the top of the table and the content areas listed down the left side. The numbers in the cells indicate the number of test items allotted for each objective and each content

[50] Op. cit., Gronlund, p. 41.

area. For example, according to Table 5, three test items on unit one should measure understanding of demand. The purpose of such a table is to guide an instructor in test preparation and to assure that a test measures all the objectives.

Because of time constraints each test included twenty items. The test items were arranged so that three questions addressed knowledge of basic terms, eight questions addressed understanding of concepts, three questions addressed application of principles, and the final six dealt with interpretations of graphic information. They were attached at the end of each test for time saving and practical purposes even though they too were measuring knowledge, understanding and application of economic principles.

The initial table of specifications appears below:

Table 5

Table of Specifications (#1) for Unit on Supply and Demand

Content Area	Instructional Areas				
	Knows basic terms	Understands Concepts	Applies principles	Interprets graphs	Total
1. Demand	1	3	1	3	5+3*
2. Supply	1	2	1	3	4+3*
3. Mkt. Equilibrium	1	3	1	3	8
Total # test items	3	8	3	6	20

legend: * - overlap, three questions deal with both supply and demand.

Assuming that Bloom's concept is correct, that knowledge, understanding and application are increasingly complex layers of learning in the cognitive domain, then student achievement on the simplest section, knowledge, would be greater than the more difficult understanding items, which, in turn, would be greater than the application questions. The fourth instructional objective does not neatly fit into Bloom's taxonomy. But, since the first three do, it was felt that content and construct validity were enhanced.

Setting Standards of Performance

Standards of mastery were not set but predictions of class performance were made during the summer of 1977. It was felt that, with objectives, students would score in the 60% to 80% range (12 to 16 correct answers). But qualitative judgments about what each percentage-correct score represented were not arbitrarily made.

Selecting the Item Types to be Used

Observed behavior was to be tested using short-answer items. The behavioral objectives required students to select, identify, and distinguish something. The multiple-choice item was selected because of its

many desireable characteristics: "(1) It can be designed to measure a variety of learning outcomes, ranging from simple to complex; (2) the use of four or five alternatives reduces the students' chances of guessing the correct answer."[51] "The main advantage of the multiple-choice item is its wide applicability in the measurement of various phases of achievement."[52]

Writing Test Items

Accepted guidelines were followed for writing the objective test items. Since student achievement (i.e. understanding, application) was being measured, the questions asked students to identify examples. The examples were not the ones included in instruction. If subjects were asked to identify examples and make applications identical to those encountered in the instruction, their responses would likely reflect only recall of past learning. None of the instructors was aware of the test items before they were administered.

All test items were pretested in a group of twenty-two students who had taken the principles of

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[51]Norman E. Gronlund, Preparing Criterion-Referenced Tests for Classroom Instruction, (New York: McMillan Co., 1973), p. 30.

[52]Op. cit., Gronlund, Measurement, p. 208.

economics course. Items were corrected for confusing phrasing and grammatical errors. Chapter four summarizes technical characteristics of the instruments.

Answer Key and Answer Distribution

To facilitate grading of the tests an answer key was devised. The researcher also set up an answer distribution table. Each response (A, B, C, D) appeared no more than any other (5 each) so that scores would not be influenced by students perceiving an answer pattern.

A description of the study design and results are presented in the following chapters. Copies of all learning sheets and learning preparation material are in appendices A-F.

Summary

This chapter defined and described the form of instructional objectives used in the present study. They were developed from the guidelines of Norman Gronlund by using Benjamin Bloom's learning model taxonomy. An eight-step process used in preparing the instructional objectives and test items was presented. The reliability and validity of the instruments are assessed in the following chapter which outlines the design of the study.

IV. DESIGN OF THE STUDY

The primary purpose of the study is to investigate the impact of behaviorally written instructional objectives on economic understanding. The procedure for achieving this purpose is presented in this chapter including the subjects and setting of the investigation, an assessment of the reliability and validity of the instruments and the procedure for the data collection.

Subjects and Setting

Mount St. Mary's is a liberal arts college, founded in 1808, with many of its students enrolling in business and economics courses. Approximately 45% of the undergraduates major in economics, accounting or business and finance. The principles of economics course (Econ 101) is required of all majors in The Department of Business and Economics. Normally sixty-five percent of each year's freshman class enroll in the course. Class size ranges from thirty to fifty.

In May 1977 two professors in the Department of Business and Economics consented to support the experiment and agreed to the basic research design of the study. Scheduling arrangements were made for four

sections of Principles of Economics to be offered at the following times for the Fall (1977) semester:

Section	Days	Time	Instructor
Econ 101A	M-W-F	10:00-10:50 AM	X
Econ 101B	M-W-F	11:00-11:50 AM	X
Econ 101C	M-W-F	1:15-2:05 PM	Y
Econ 101D	M-W-F	2:15-3:05 PM	Y

Each instructor taught two sections of the course which met three times per week for fifty minute periods. The author did not teach any of the sections. Instructor X had taught principles of economics for nine years. He held the academic rank of associate professor. Instructor Y held an academic rank of assistant professor and had taught the principles course at various colleges. The college registrar arranged for comparable physical settings for all classes.

Each class contained a mixture of upperclassmen and freshmen. The registration procedure for each group differed. Upperclassmen registered for various sections of principles of economics during a spring advance registration in April, 1977. There was no such advance registration for freshmen and they were assigned to each of the four sections in a random manner through the Admissions and Registrar's offices during the

summer of 1977, six to ten weeks prior to the start of classes. The experiment was designed to include only non-transfer freshmen students in their first semester. Freshmen at Mount St. Mary's usually enroll in a broad range of courses such as English, mathematics, and social sciences. Many do not officially declare a major immediately and it was therefore not possible to identify each student by major area of concentration.

Only freshmen were considered to be part of the study. The remaining students in each class, although participating in the objectives and testing procedure, were not considered. Also, those students who did not participate in the entire study (due to absences) were not considered. Every attempt was made to work with homogeneous groups. The study calls for an aggregation of class sections into research groups. The subject characteristics of the aggregated groups are summarized in Tables six and seven which follow.

Even though there was no reason to assume lack of homogeniety of groups the researcher examined student characteristics as evidence that the groups were homogeneous. Thus no pretest was administered. The subjects were arranged in groups A-D and B-C. The

Table 6

Characteristics of Those Students Considered to be Part of the Experiment

Section	N	M	F	Mean Age	Mean SAT	Mean H.S. Rank	Percentage with previous economics
101A	33	25	8	17.91	896.6	.568	45.4%
101B	26	17	9	18.07	848.1	.572	30.7%
101C	18	8	10	18.00	837.2	.547	44.4%
101D	9	5	4	18.22	915.5	.340	55.5%

legend: N - number of subjects in each class considered part of the study.
M - male
F - female
SAT - Scholastic Aptitude Test used nationally as a criterion for college entrance.
H.S. Rank - percentage of the subject's high school class finishing behind the individual.
Percentage with previous economics - percentage of N who had taken a high school course in economics.

Table 7

Characteristics of the Experiment's Groups

Group	N	M	F	Mean Age	Mean SAT	Mean H.S. Rank	Percentage with previous economics
A-D	42	30	12	17.97	900.65	.519	47.6%
B-C	44	25	19	18.04	843.62	.503	36.4%

legend: N - number of subjects in each class considered part of the study
M - male F - female
SAT - Scholastic Aptitude Test used nationally as a criterion for college entrance.
H.S. Rank - percentage of the subject's high school class finishing behind the individual.
Percentage with previous economics - percentage of N who had taken a high school course in economics.

letter designation of the groups refers to the class sections. The subjects were grouped in this pattern to assure similar group size and to control the teacher influence variable. Indeed, the groups' sizes were strikingly similar (forty-two subjects in A-D and forty-four in B-C). And achievement in each group was equally influenced by each instructor.

Instruments

Assessments of the validity and reliability of the study's four test instruments were made at the completion of the investigation. This was done to verify that the instruments were adequately measuring economic achievement. The investigator assumed that Bloom's concept of taxonomy in the cognitive domain is correct. That is, knowledge, understanding, and application are increasingly complex layers of learning in the cognitive domain. Instrument construct validity would be enhanced if it could be shown that student achievement on the knowledge questions was greater than on those questions measuring understanding which, in turn, was greater than those questions which measured application. This was found to be so. For each of the four instruments the student achievement declined as the questions moved

up the taxonomy scale. The results, summarized in Table eight, support the contention of the construct validity of the tests.

Content validity was verified, as described earlier, by the use of tables of specifications illustrated in the previous chapter. Construct validity is verified by the results of Table 8.

Reliability assessments were run on all four tests for a random sample of twenty-five subjects. A table of random numbers was used to select the sample. A coefficient of internal consistency (Split-Half) was derived for each test and adjusted by the Spearman-Brown Prophecy formula. The reliability coefficients were favorable in all cases but test #3. A Kuder-Richardson Formula 20 reliability coefficient was also derived for all four instruments. Again, all but test two was found to be reliable for a teacher-made, non-normed test.[53] A summary of the various reliability coefficients for the four localized instruments is found in Table 9.

Because of the aforementioned validity tests and the good levels of reliability as evidenced from Table 9,

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[53]Generally in educational research coefficients of internal consistency above .5 or .6 are deemed adequate for teacher-made instruments.

Table 8

Student Achievement on Question Subgroups

Test	Performance by Category (percentage correct) "Knowledge"	"Understanding"	"Application"
Test #1	.788	.534	.453
Test #2	.488	.447	.368
Test #3	.608	.510	.382
Test #4	.523	.517	.363
All Tests	.602	.502	.392

Table 9

Summary of Reliability Tests for the Four Localized Instruments

Type of Reliability Test:	Instrument: #1	#2	#3	#4
Split-Half	.274	.169	.423	.486
Spearman-Brown	.403	.289	.595	.654
Kuder-Richardson 20	.524	.340	.532	.616

it was felt that the instruments adequately measured economic achievement. The other instrument in the study, a questionnaire, was administered to assess the student's attitude toward the use of instructional

objectives for economics material. The questionnaire was brief and designed to determine whether the students felt the learning sheets provided an overview of the course content, whether they were an effective study guide for economic material and whether they were beneficial enough to be incorporated into a future collegiate principles of economics course. A copy of this instrument is in Appendix M.

Procedure and Data Collection

During the first several weeks students drop and add courses to their schedule. It is a confusing time. As a result, the experiment began during the third week of the semester. During this week material on production possibility functions was presented by both instructors. Traditional lecture and discussion methods were employed. At the end of the week all subjects completed a twenty item, objective test on the introductory production possibility function material. This provided all subjects familiarity with the short objective tests that would be used at the end of each week.

During the experiment's second week all subjects were provided with a learning sheet, #1, on supply and demand. It included a summary of the course material

and Gronlund-style instructional objectives. The researcher instructed the subjects on the use of the learning sheet and encouraged them to use it without the help of classmates or peers. A short objective test (Test #1) consisting of items dealing with learning sheet #1 was administered at the completion of the second week. The test items were closely related to the instructional objectives in the learning sheet. The purpose of the procedure during week two was to instruct the subjects in the use of behaviorally written instructional objectives and to prepare the subjects for a test at the end of each week.

At the beginning of the experiment's third week the classes were divided. Section A (Instructor X) and D (Instructor Y) received learning sheet #2 on the next set of textual material. Subjects in A-D were instructed to use the learning sheets on their own and not to share them with subjects in other sections. Subjects in group B-C did not receive learning sheets with behaviorally written instructional objectives. They were instructed to attend class and study material from the text in the normal fashion. Both instructors conducted their classes in their usual manner. The

subject material dealt with principles in a market economy. The same twenty-item instrument (Test #2) was administered to all sections at the end of the week during the normal class period.

For the fourth week of the study the assignments were reversed. Sections B (Instructor X) and C (Instructor Y) received learning sheet #3. At the end of the week all subjects completed the same test (Test #3).

At the end of the fall semester, eleven weeks after the experiment began, similar tests on learning sheets #2 and #3 were administered to all subjects. The purpose of this instrument (Test #4) was to determine whether provision of instructional objectives enhanced retention of economics material.

The time schedule for the experiment is summarized in Table 10.

At the conclusion of the fall semester, before students were administered their final exam, a questionnaire was administered to assess the student's attitude toward the use of instructional objectives for economics material.

Table 10

Schedule, Content and Treatment Used in the Study

Week	Economic material	Treatment (Classes)
1	Production Possibility	Practice test (A,B,C,D)
2	Supply and Demand	Learning sheet #1 (A,B,C,D) Test #1 (A,B,C,D)
3	Market Economy	Learning sheet #2 (A,D) Test #2 (A,B,C,D)
4	Economic Functions of Government	Learning sheet #3 (B,C) Test #3 (A,B,C,D)
11	Market Economy and Functions of Govt.	Test #4 (A,B,C,D)
legend:	A,B,C,D refer to sections of Principles of Economics course.	

During the experiment the two instructors were told to do nothing out of the ordinary in their delivery system. They were unable to "teach" the instructional objectives since the objectives were distributed only to the students.

Summary

This chapter described the subjects and setting of the investigation. Every attempt was made to work with homogeneous groups of students who were exposed to a similar setting and teaching conditions. The four

localized instruments were reviewed for validity and reliability and were found to be adequate for measuring economic understanding. The data collection procedure has been outlined in this chapter and the experimental results are reviewed in the following chapter.

V. EXPERIMENTAL RESULTS

The results of the investigation described in the previous chapter are reported here. The scores of the prepared instruments were used to determine if any differences existed between groups of students provided with behaviorally written instructional objectives and students who were not. Reliability and validity assessments of the instruments were provided in the previous chapter. A performance summary and an analysis of variance is presented for each test. Finally the chapter describes the results of a student questionnaire administered at the completion of the experiment.

Summary of Test #1

During the second week of the experiment all subjects were provided with learning sheet #1. Test #1, consisting of objective items referenced to the learning sheet, was administered at the completion of the week's work. The test items were closely related to the objectives

of the learning sheet. No treatment difference occurred between groups A-D and B-C since the purpose of the procedure was to instruct all subjects in the use of behaviorally written objectives and to prepare them for end-of-the-week tests. A summary of student achievement on Test #1 is presented in Table 11 and an analysis of variance is presented in Table 12. No significant difference in mean achievement was expected. None resulted.

Table 11

Achievement on Test #1

Group	n	mean	standard deviation
A-D	42	12.095	2.776
B-C	44	11.477	2.536

Table 12

Analysis of Variance of Performance on Test #1

Source of Variation	Sum of Squared Deviations	Degrees of Freedom	Variance
Between Groups	8.207	1	8.207
Within Groups	606.600	84	7.221
Total	614.807	85	

Analysis of variance of Test #1 scores yielded an F value of 1.136, not statistically significant at the .05 level.

Summary of Test #2

At the beginning of the experiment's third week sections A and D received instructional objectives. Subjects in sections B and C did not. The same twenty item test was administered to all sections at the end of the week. It was expected that the subjects in A-D would have significantly higher scores on Test #2. Tables 13 and 14 summarize the achievement results and present an analysis of variance.

Table 13

Achievement of Test #2

Group	n	mean	standard deviation
A-D	42	8.143	2.522
B-C	44	8.273	2.425

Table 14

Analysis of Variance of Performance on Test #2

Source of Variation	Sum of Squared Deviations	Degrees of Freedom	Variance
Between Groups	.363	1	.363
Within Groups	525.870	84	6.260
Total	526.233	85	

The achievement of the subjects in group B-C was actually greater without learning objectives, but not significantly so. An F test yielded a value of .058.

Summary of Test #3

For the fourth week of the semester assignments were reversed. Sections B and C received instructional objectives and sections A and D did not. At the end of the week all subjects completed the same twenty item test. Again the investigator expected an enhancement of achievement from the group supplied with instructional objectives. Summaries of achievement and analysis of variance are presented.

Table 15

Achievement on Test #3

Group	n	mean	standard deviation
A-D	42	10.429	3.133
B-C	44	9.114	2.948

Table 16

Analysis of Variance of Performance on Test #3

Source of Variation	Sum of Squared Deviations	Degrees of Freedom	Variance
Between Groups	37.157	1	37.157
Within Groups	794.720	84	9.460
Total	831.877	85	

The difference between achievement of the two groups is not significant at the .05 level ($F = 3.92$).

The results of the analysis of variance, examined in the light of the hypotheses tested, lead to the following findings:

Hypothesis 1 - "No significant difference in achievement exists between groups A-D and B-C on Test #1, when both groups were provided with instructional objectives," is not rejected. No difference was expected since both groups received the same treatment. An F value of 1.136 was not significant at the .05 level.

Hypothesis 2 - "No significant difference in achievement on Test 2 exists when group A-D is provided with instructional objectives and group B-C is not," is not rejected. The F value of .058 was not significant at the .05 level.

Hypothesis 3 - "No significant difference in achievement on Test #3 exists when group B-C is provided with instructional objectives and group A-D is not," is not rejected. An F value of 3.92 is not significant at the .05 level.

Retention Test

As an addition to the study, retention tests were administered to all subjects. Eleven weeks after the experiment began, similar retention tests, referenced to learning sheets #2 and #3 were administered to groups A-D and B-C. The purpose of the retention tests was to

investigate whether provision of instructional objectives improved long-term achievement. Inconsistent findings resulted. In the case of Group A-D the improvement was significant at the .05 level ($F = 4.39$). For Group B-C the improvement in mean scores was insignificant at the .05 level ($F = 1.25$).

Results of Student Questionnaire

A simple one page questionnaire was prepared to assess student attitudes toward the use of instructional objectives. The questionnaire was administered at the completion of the semester since the researcher considered it unwise to contaminate the study by drawing student attention to the use of objectives during the research. All subjects were requested to respond to the questionnaire. Most did so, but not all students responded to every item in the questionnaire.

The results of the questionnaire reported here are provided for general information purposes, and, at best, only general observations can be drawn. Ample space and time were provided for students to make comments about either the objectives or the tests themselves. The comments provide valuable insight into the experimental design and the subjects' assessments of instructional objectives.

The first four items on the questionnaire indicate student attitude toward the behaviorally written instructional objectives. 71.4% of the students thought the instructional objectives provided an immediate overview of the course content. 86.3% felt the learning sheets could be utilized as an effective study guide. Of the subjects 56.0% indicated that learning objectives were beneficial in preparing for tests while 84.7% thought the learning objectives would have been more beneficial if they had been provided for all course material throughout the semester.

An important piece of information provided by the questionnaire related to the use of specifically written behavioral objectives. Of the students 69.2% used the instructional objectives, but of those using objectives only 3.7% used them a great deal; 50.0% used them somewhat and 46.3% used them only sparingly. In other words, 30.8% of the subjects did not use the objectives when provided. This is not a surprising fact since the subjects were not forced to comply with the experiment. They were told it would be helpful to their study for "real" exams. Since the experimental test scores did not count in compiling the

student's semester grade, numerous subjects lacked motivation to use the objectives. Comments by students at the end of the questionnaire verified this fact.

Of the respondents 87.6% felt that a combination of classroom lecture and learning objectives sheet would result in higher individual achievement. More than two-thirds were doubtful whether independent study when combined with instructional objectives was better than the lecture method. 76.2% of the students indicated they spent about the same amount of time studying without objectives.

In general the responses indicated a high, positive attitude toward the use of specifically written objectives even though most subjects used them only somewhat or sparingly. A sample questionnaire is found in the appendix. Table 17 summarizes the results.

Summary

The students' scores on the teacher-prepared instruments were subjected to analysis of variance in this chapter. Additionally, the mean achievement scores for groups when provided and when not provided with instructional objectives are reported here. Using .05 level the findings show that no significant difference resulted on immediate tests when one group was

Table 17

Summary of Student Questionnaire

Question	Response Yes	No
1. Do you feel that the learning objective sheet provided an immediate overview of the course material?	71.4%	29.6%
2. Do you feel that the learning objective sheet could be an effective study guide?	86.3%	13.7%
3. When the learning objective sheet was provided did it prove beneficial in preparing for the tests?	56.0%	44.0%
4. Would the learning objectives have been more beneficial if they were provided for all the course material throughout the semester?	84.7%	15.3%
5. Did you use the learning objective sheet when provided?	69.2%	30.8%
If yes: I used them a great deal: 3.7%		
I used them somewhat: 50.0%		
I used them sparingly: 46.3%		

provided instructional objectives and the other group was not. The delayed retention instruments provided inconsistent results.

Finally, student questionnaire responses provided the researcher with valuable insight into the subjects' use and attitude toward instructional objectives. In the next chapter the findings of the study are summarized and its conclusions, limitations and recommendations are reported.

VI. SUMMARY

This investigation developed from a recognized need to study ways of improving the teaching of economics at the college level. The ultimate goal was to verify whether a treatment consisting of behaviorally written instructional objectives would enhance student achievement in economics. Impetus for the study originated from the researcher's own interest in his teaching field of economics and the apparent lack of reported research on instructional objectives in the economic education literature. Few studies have tested the effectiveness of instructional objectives. The usefulness of instructional objectives has simply been assumed. In this chapter the conclusions are drawn, the limitations are noted, and recommendations made.

Conclusions

This experiment attempted to ascertain whether the provision of instructional objectives, stated in behavioral terms, enhanced student achievement. The researcher finds the following conclusion tenable on the basis of the statistical results of the experiment. The treatment used had no significant differential effect on the achievement of students studying principles

of economics. The null hypothesis was not rejected. The conclusion does not go so far as to state that instructional objectives have no value. It is possible that such treatment can have valuable effects on both teachers and students other than an improvement of achievement scores. The conclusion is restricted in that it applies to a particular type of instructional objective, and to students of economics. It must also be remembered that the experiment's instructors did not write the objectives.

The conclusion supports a growing list of evidence that instructional objectives, when behaviorally written and provided to students, do not enhance economic understanding. An additional major contribution of this study is the design which has corrected numerous shortcomings of earlier studies.

The statistical analysis indicates no significant difference between teacher groups, which illustrates that the design successfully controlled the teacher variable. Based on the student's questionnaire responses and care taken in the study design it is concluded that the Hawthorne effect, if any, was minimal. The results were not biased since the students acted

in a normal fashion during the experiment. And, since the test items were discriminating, the "ceiling effect" was not introduced in this investigation. Item analysis indicates very few subjects doing extremely well (i.e. eighteen, nineteen or twenty of twenty items correctly answered).

While the intended contribution, evaluation of the use of instructional objectives, may not have been entirely accomplished, the research design and null hypothesis selected for this study were judged to be valid in generating the test findings. The researcher makes some broad generalizations about why no enhancement in achievement resulted. A number of these generalizations, noted in the following section, are based on post-treatment student questionnaire responses.

Limitations

Some limitations of the study and caution regarding the applicability of the conclusions must be noted. First, only eight-six students were involved in the experiment, forty-two in group A-D and forty-four in group B-C. The group sizes were similar but small. Furthermore, the experiment involved students taking a principles of economics course at only one school.

Any conclusions made are applicable only to a population similar to that involved with this investigation. Second, although the subjects reviewed the specifically written instructional objectives in a very positive way, many of the students attached less than major importance to them. The instruments did not contribute to the students' course grades. The possibility that some subjects did not take the instruments seriously could have hampered results. The researcher had neither the authority nor the desire to tell the instructors how to conduct classes or grade students. Interference with the classroom process or learning environment was not desired. Subjects were instructed to use the instruments as a "warm up" for the regular examinations. The subjects were informed that the test scores would not count in the final grade but their compliance was encouraged. This was the experiment's most important limitation.

A basic implication and lesson was that for maximum achievement with the use of instructional objectives and any other instructional methodology innovations, there must be some identifiable grade impact. And the researcher must attempt to obtain some agreeable testing

procedure without interference in the instructional process. Pressure to enhance the grade point average is too real and relevant to our students, in any field, to ignore its effects on research results.

Third, the issue of using a nationally-standardized test or a localized instrument is an important one. The researcher used a localized instrument since it was referenced to the specific objectives constructed. This aspect of the design corrected earlier study flaws and provided validity and reliability to the tests. It was felt that a careful design would lead to more valid findings. But, although the instruments were referenced to a taxonomy of learning levels in the cognitive domain, the degree of difficulty of questions was not necessarily similar in all cases. Thus, even though the instruments possessed a degree of construct and content validity, no guarantee can be made about the degree of difficulty of individual items. Some instruments were more difficult than others even though they were measuring the same levels of cognitive functioning. This can be alleviated in future studies by lengthening the number of test items in each instrument.

Fourth, it is possible that treatment of the course material differed between teachers. One may have taught the course at a higher (or lower) cognitive level than the other during different phases of the experiment. Or, one instructor may have taught the material at a faster (or slower) pace. But since both experimental groups included subjects taught by each instructor, the effect on student achievement levels is hidden. The study design maintained good but not complete control over the teacher variable.

These study limitations may explain why the behaviorally written instructional objectives did not appear to enhance student achievement. Future investigations will have to correct for these impurities. This and other recommendations are included in the following section.

Recommendations

The empirical evidence gathered to date has not demonstrated the usefulness of behaviorally written instructional objectives. Perhaps the most serious question for further study of these instructional objectives (or any other learning objectives) is exactly what degree of enhancement in achievement is

desired. Do the benefits of implementing instructional objectives justify the costs? The major cost is the time necessary to develop expertise with behaviorally written objectives (training costs) and the time involved in developing the objectives themselves for each set of economic material. Economists must apply a cost-benefit analysis to economic education. Stated another way, improved economic understanding should be significant if it is to match the time involved in preparing instructional objectives, referencing them to a taxonomy and then preparing reliable and valid tests which measure specified levels of learning. It is possible that other pedagogical methods (programmed tests, televised lectures, etc.) are more economical in enhancing student achievement in economics.

At this point the investigator has serious doubts whether the benefits of using behaviorally written objectives in a formal learning sheet are worth the effort required to develop them. Many of the same goals of behavioral objectives are achieved when instructors realize what the instructional objectives are and convey them to the students in a less formal manner than prepared learning sheets. The researcher

recognizes that the instructor may emphasize what is important to master and what is not. This may be done in a number of informal ways. A formally prepared learning sheet may be unnecessary. The college students in the principles of economics course normally do not need to be "spoon fed" learning goals. It is felt that instructional objectives may be more beneficial at other educational levels. This is not to say that just because instructional objectives do not lead to a perceived improvement in achievement there are no spillover benefits to the teacher who develops them. These spillover benefits, in the form of better organization of material and clarification of goals in the mind of the instructor, better examinations, and better appreciation of the learning process, may, in the end, outweigh the costs of development.

Statistically significant differences between group achievement were not found with this study. This does not suggest that innovation in economic education should be halted nor does it suggest that additional experiments using instructional objectives as the primary variable should be discontinued. The null hypotheses of this study were not rejected. But that does not mean that the null hypotheses were accepted.

Additional work with instructional objectives in studies with different controls could produce different results. Despite the results future research with behaviorally written instructional objectives should continue because it can have beneficial effects on economic education in general and on the principles course in particular. Principles of economics instructors are encouraged to think longer and harder about their teaching goals and develop more adequate ways of determining their success.

Therefore, the researcher encourages additional research and recommends that the limitations of the present study be controlled. Specifically: larger groups of subjects should be tested; the instruments should have a direct impact on student grades; the degree of difficulty of each test should be similar; and all instructors should present economic material at the same pace and conduct their classes on the same cognitive level. It is further recommended that earlier design flaws be controlled. The nine variables noted under "Implications for the Present Study" (Chapter II) are design controls which should be given serious consideration in any additional research. Earlier design errors should not be repeated.

Summary

The empirical evidence gathered to date has not conclusively proved or disproved the usefulness of behavioral objectives. Critics argue that instructional objectives impose rigidity on the instructional situation. It is suggested that the use of such objectives makes teaching a technical process.

If behaviorally written instructional objectives can have a beneficial and meaningful impact on the achievement of students in economics courses, then their use is encouraged. It is recommended that, to be relevant, instructional objectives must be written for a specific course with stated goals related to a given institution and for a single instructor's class. Given the present state of research, individuals in economic education must decide whether to use instructional objectives or not. They must develop and design objectives and instruments which suit their own needs. This study described a systematic method for writing instructional objectives, indexing the objectives to various levels of cognitive learning and testing the resulting economic achievement. The study concluded that one type of instructional objective did

not enhance economic achievement at the principles level. This investigation has taken a small step towards enhancing economic understanding. At times, learning what does not improve student economic understanding is as important as learning what does.

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APPENDIX A

LEARNING SHEET PREPARATION #1

Package to be distributed Monday, September 26, 1977 and test to be given Friday, September 30, 1977.

STEP ONE.....DELIMIT THE AREA TO BE TESTED
McConnell, pp 59-80, Chapter 4
The Mechanics of Individual Prices: Demand and Supply

STEP TWO.....WRITE OBJECTIVES

1. Knows Basic Terms
   1.1 Relates terms that have a different meaning (e.g. "supply" and "quantity supplied")
   1.2 Selects the term that best fits a particular definition (e.g. "substitute goods")
   1.3 Identifies terms used in reference to a particular price mechanism problem
   1.4 Uses terms correctly in describing the mechanics of individual prices
2. Understands Individual Price Concepts and Principles
   2.1 Identifies examples of substitute and complimentary goods
   2.2 Identifies difference between changes in "demand" and "quantity demanded" and changes in "supply" and "quantity supplied"
   2.3 Points out the relationship of supply and demand on surpluses and shortages
   2.4 Indicates the major determinants of supply and demand
   2.5 Recognizes an equilibrium market situation
3. Applies "Supply and Demand" Principles to New Situations
   3.1 Describes how to solve a practical economic problem in terms of "supply and demand" principles
   3.2 Predicts the outcome of a market change on equilibrium price/quantity
   3.3 Utilize market analysis (interaction of demand and supply) to suggest market solutions to economic problems

4. Interprets and Graphically Portrays Market Data
   4.1 Explains how a change in price is depicted on a graph of demand and/or supply
   4.2 Indicates equilibrium price and quantity graphically and in tabular form
   4.3 Distinguishes between surplus and shortages
   4.4 Describes probable results from market data

STEP THREE.....MAKE A CONTENT OUTLINE

The Mechanics of Individual Prices: Demand and Supply

A. Demand
   1. Law of Demand and Illustration
   2. Individual and Market Demand
   3. Determinants of Demand
   4. Changes in Demand and Quantity Supplied

B. Supply
   1. Law of Supply and Illustration
   2. Determinants of Supply
   3. Changes in Supply and Quantity Supplied

C. Market Equilibrium
   1. The Rationing Function of Prices
   2. Changes in Supply and Demand
   3. The Resource Market

STEP FOUR.....PREPARE A TABLE OF SPECIFICATIONS

	Instructional Objectives				
Content Areas	Knows Basic Terms	Understands Concepts	Applies Principles	Interprets & Graphs Data	Total
A. Demand	1	3	1	3	5+3
B. Supply	1	2	1	3	4+3
C. Market Equilibrium	1	3	1	3	8
Total Number of Test Items	3	8	3	6	20

STEP FIVE.....SET THE STANDARDS OF PERFORMANCE

I assume homogeneous groups and my hypotheses is that the learning objectives will make a difference in student achievement. These are my predictions of how the classes will do:

A. - students with learning objectives

Objective	Levels of Achievement
1. Knows basic terms	85%
2. Understands Concepts and Principles	75%
3. Applies Principles	65%
4. Interprets and graphs data	85%

STEP SIX.....SELECT THE ITEM TYPES TO USE

Multiple Choice - because of the versatility of multiple choice items and sample availability from McConnell Instructor's Manual.

STEP SEVEN.....WRITE THE TEST ITEMS

See appendix H.

STEP EIGHT.....ANSWER KEY AND ANSWER DISTRIBUTION

ANSWER KEY

legend: q-question, lo-learning objective, a-answer

q	lo	a	q	lo	a	q	lo	a	q	lo	a
1.	1.1	A	4.	2.4	C	12.	3.1	D	15.	4.2	B
2.	1.3	C	5.	2.1	B	13.	3.1	A	16.	4.3	B
3.	1.2	D	6.	2.1	A	14.	3.4	A	17.	4.4	D
			7.	2.2	C				18.	4.2	D
			8.	2.4	C				19.	4.3	A
			9.	2.3	B				20.	4.3	B
			10.	2.5	C						
			11.	2.5	D						

ANSWER DISTRIBUTION

A	-	1,6,13,14,19	= 5
B	-	5,9,15,16,20	= 5
C	-	2,4,7,8,10	= 5
D	-	3,11,12,17,18	= 5

APPENDIX B

LEARNING SHEET PREPARATION #2

Package to be distributed Monday, October 3, 1977 and test to be administered Friday, October 7, 1977.

STEP ONE.....DELIMIT THE AREA TO BE TESTED

The five fundamental questions and the Price System. This material is covered in Chapter 5, pp 81-100 in Economics, Campbell McConnell, 6th edition, McGraw-Hill, N.Y. This is the text used in the course, Econ 101, Principles of Economics.

STEP TWO.....WRITE OBJECTIVES

1. Knows Basic Terms
   - 1.1 Relates terms which have same meaning
   - 1.2 Selects a term which best fits a particular definition
   - 1.3 Identifies terms used in reference to the five fundamental questions
   - 1.4 Uses terms correctly in describing price system situations
2. Understands Price System Concepts and Principles
   - 2.1 Identifies examples of price system concepts and principles
   - 2.2 Identifies principles of price system leading to economic efficiency
   - 2.3 Points out the interrelationships of profits to price system principles
   - 2.4 Indicates the positive and negative aspects of the price system
3. Applies Price System Principles to New Situations
   - 3.1 Identifies the economic principles needed to solve a practical problem
   - 3.2 Predicts the probable outcome of an action involving economic principles
   - 3.3 Utilizes price system analysis to suggest market solutions to economic problems
4. Interprets Economic Data
   - 4.1 Determines the most efficient production techniques given data on technology and costs
   - 4.2 Indicates economic profits or losses with production data

4.3 Distinguishes between efficient and inefficient production techniques
4.4 Describes probable results from market data

STEP THREE.....MAKE A CONTENT OUTLINE

The Five Fundamental Questions and The Price System

A. Framework of the Price System
   1. Demand and Supply in the Product Market
   2. Demand and Supply in the Resource Market

B. Economic Choices
   1. Scarcity
   2. Substitutability
   3. Choice

C. Operation of the Price System
   1. Determining what is to be produced
   2. Organizing production
   3. Distribution of total output
   4. Providing for flexibility and change
   5. Competition, control and the "invisible hand"

D. Evaluation of the Price System
   1. Case for the Price System
   2. Case against the Price System
   3. Size and government influence

STEP FOUR.....PREPARE A TABLE OF SPECIFICATIONS

Instructional Objectives					
Content areas	Knows Basic Terms	Understands Concepts	Applies Principles	Interprets Data	Total
Framework of Price System	--	1	1	--	2
Economic Choices	1	1	1	1	3
Operation of Price System	2	4	1	6	13
Evaluation	--	2	--	--	2
Total no. of Test Items	3	8	3	6	20

STEP FIVE.....SET STANDARDS OF PERFORMANCE

I assume homogeneous groups and my hypotheses is that the learning objectives will make a difference in student achievement. These are my predictions of how the classes will do:

A-students with learning objectives
B-students without learning objectives

Objective	Level of achievement A	B
1. Knows basic terms	95%	90%
2. Understands concepts and principles	85	80
3. Applies principles	80	75
4. Interprets data	80	70

predictions made September 2, 1977

STEP SIX.....SELECT THE ITEM TYPES TO BE USED

Multiple choice, all with four alternative answers

STEP SEVEN.....WRITE THE TEST ITEMS

See appendix I

STEP EIGHT.....SET UP ANSWER KEY AND ANSWER DISTRIBUTION

legend: lo = learning objective
q = question number
a = answer

q	lo	a	q	lo	a	q	lo	a	q	lo	a
1.	1.4	b	4.	2.1	a	12.	3.2	b	15.	4.1	d
2.	1.2	d	5.	2.2	c	13.	3.4	b	16.	4.2	d
3.	1.3	b	6.	2.2	d	14.	3.2	a	17.	4.1	c
			7.	2.1	c				18.	4.1	a
			8.	2.3	c				19.	4.2	a
			9.	2.2	b				20.	4.4	d
			10.	2.4	a						
			11.	2.4	c						

Answer Distribution

Answer	Questions	Total
a	4,10,14,18,19	= 5
b	1,3,9,12,13	= 5
c	5,7,8,11,17	= 5
d	2,6,15,16,20	= 5
Total		20

APPENDIX C

LEARNING SHEET PREPARATION #3

Package to be distributed, Monday October 10, 1977 and test to be given Friday, October 14, 1977

STEP ONE.....DELIMIT THE AREA TO BE TESTED
McConnell pp 101-116, Chapter 6
Mixed Capitalism and the Economic Functions of Government

STEP TWO.....WRITE OBJECTIVES

1. Knows Basic Terms
   - 1.1 Relates terms that have the same meaning
   - 1.2 Selects the terms that best fits a particular definition
   - 1.3 Identifies terms used in reference to a particular economic function of government
   - 1.4 Uses terms correctly in descriptions of mixed capitalism and economic role of government
2. Understands Economic Concepts and Principles
   - 2.1 Identifies examples of social goods
   - 2.2 Identifies spillover costs and spillover benefits
   - 2.3 Points out the relationship between social balance and benefit-cost analysis
   - 2.4 Recognizes the "social balance" controversy
   - 2.5 Identifies functions assigned to government in a mixed economy
3. Applies Economic Principles to New Situations
   - 3.1 Identifies economic solutions for increased government economic activity in the United States
   - 3.2 Identifies economic solutions for reduced government economic activity in the United States
   - 3.3 Predicts the probable outcome of a change in economic activity in the United States
   - 3.4 Utilizes the concept of benefit-cost analysis to choose the optional variant of a proposed government economic activity

4. Interprets Economic Data
   4.1 Recognizes efficient allocation of resources if spillover benefits occur
   4.2 Indicates government activity if spillover costs occur
   4.3 Distinguishes among alternative economic plans using benefit-cost analysis
   4.4 Indicates government activity with use of benefit-cost information

STEP THREE.....MAKE A CONTENT OUTLINE

Mixed Capitalism and the Economic Functions of Government

A. Economic Functions of Government
   1. Legal and Social Framework of the Price System
   2. Maintaining Competition
   3. Redistribution of Income
   4. Reallocation of Resources
   5. Stabilization

B. Evaluating Governments' Role
   1. Desirability of functions
   2. Efficiency in Government - benefit-cost

C. The Social Balance Question
   1. Wagner's Law
   2. Obstacles to social goods supply

STEP FOUR.....PREPARE A TABLE OF SPECIFICATIONS

Instructional Objectives					
Content Areas	Knows Basic Terms	Understands Concepts & Principles	Applies Principles	Interprets Data	Total
A Functions of Government	2	5	2	2	11
B Evaluation of Government		1	1	4	6
C Social Balance	1	2			3
Total Number of Test Items	3	8	3	6	20

STEP FIVE.....SET STANDARD OF PERFORMANCE

My projection-assuming homogeneous groupings-hypothesis-objectives do make a difference

Objective	Levels of Mastery	
	A	B
1. Knows basic terms	95%	85%
2. Understands Concepts and Principles	85%	75%
3. Applies Principles	80%	70%
4. Interprets and graphs data	80%	65%

A - with learning objectives
B - without learning objectives

STEP SIX.....SELECT THE ITEM TYPES TO USE

Multiple Choice, all with four alternative answers

STEP SEVEN.....WRITE THE TEST ITEMS

See appendix J

STEP EIGHT.....ANSWER KEY

Answer Key

learning objectives	question	answer	learning objective	question	answer
1	1	C	2	11	A
1	2	C	3	12	C
1	3	D	3	13	A
2	4	A	3	14	D
2	5	D	4	15	B
2	6	B	4	16	B
2	7	D	4	17	C
2	8	A	4	18	B
2	9	B	4	19	C
2	10	D	4	20	A

ANSWER DISTRIBUTION

A	4,8,11,13,20	= 5
B	6,9,15,16,18	= 5
C	1,2,12,17,19	= 5
D	3,5,7,10,14	= 5

APPENDIX D

LEARNING SHEET #1

Material: Chapter 4 of McConnell (use the chapter outline as a guide). The Mechanics of Individual Prices: Demand and Supply

Comments and Suggestions:

This material develops the concepts of supply and demand. It is common sense and straightforward. Emphasize the fact that demand and supply are schedules, the slopes of the curves make common-sense, and know the determinants of both supply and demand. It is important that the student grasp the meaning of increases and decreases in demand and supply and the impact of these shifts upon equilibrium price and quantity.

LEARNING OBJECTIVES

1. Knows Basic Terms
   - 1.1 Relates terms that have a different meaning (e.g. "supply" and "quantity supplied")
   - 1.2 Selects the term that best fits a particular definition (e.g. "substitute goods")
   - 1.3 Identifies terms used in reference to a particular price mechanism problem
   - 1.4 Uses terms correctly in describing the mechanics of individual prices
2. Understands Individual Price Concepts and Principles
   - 2.1 Identifies examples of substitute and complimentary goods
   - 2.2 Identifies difference between changes in "demand" and "quantity demanded" and changes in "supply" and "quantity supplied"
   - 2.3 Points out the relationship of supply and demand on surpluses and shortages
   - 2.4 Indicates the major determinants of supply and demand
   - 2.5 Recognizes an equilibrium market situation
3. Applies "Supply and Demand" Principles to New Situations
   - 3.1 Describes how to solve a practical economic problem in terms of "supply and demand" principles

3.2 Predicts the outcome of a market change on equilibrium price/quantity
3.3 Utilize market analysis (interaction of demand and supply) to suggest market solutions to economic problems

4. Interprets and Graphically Portrays Market Data
4.1 Explains how a change in price is depicted on a graph of demand and/or supply
4.2 Indicates equilibrium price and quantity graphically and in tabular form
4.3 Distinguishes between surplus and shortages
4.4 Describes probable results from market data

APPENDIX E

LEARNING SHEET #2

Material: Chapter 5 of McConnell (use the chapter outline as a guide). The 5 Fundamental Questions and the Price System

Comments and Suggestions:

This chapter is a bit abstract and draws upon earlier chapters. The central point is that the price system is a coordinating mechanism which gives order to the decentralized decisions which buyers and sellers make in both the product and resource markets. Pay attention to the rationing and guiding function of prices.

A warning: don't get mired in a maze of details. It is essential to have a working knowledge of how a market economy can provide answers to the Fundamental Questions.

LEARNING OBJECTIVES

1. Knows Basic Terms
   - 1.1 Relates terms which have same meaning
   - 1.2 Selects a term which best fits a particular definition
   - 1.3 Identifies terms used in reference to the five fundamental questions
   - 1.4 Uses terms correctly in describing price system situations
2. Understands Price System Concepts and Principles
   - 2.1 Identifies examples of price system concepts and principles
   - 2.2 Identifies principles of price system leading to economic efficiency
   - 2.3 Points out the interrelationships of profits to price system principles
   - 2.4 Indicates the positive and negative aspects of the price system
3. Applies Price System Principles to New Situations
   - 3.1 Identifies the economic principles needed to solve a practical problem

3.2 Predicts the probable outcome of an action involving economic principles
3.3 Utilizes price system analysis to suggest market solutions to economic problems

4. Interprets Economic Data
4.1 Determines the most efficient production techniques given data on technology and costs
4.2 Indicates economic profits or losses with production data
4.3 Distinguishes between efficient and inefficient production techniques
4.4 Describes probable results from market data

APPENDIX F

LEARNING SHEET #3

Material: Chapter 6 of McConnell (use the chapter outline as a guide). Mixed Capitalism and the Economic Functions of Government

Comments and Suggestions:

The material is designed to add realism to the market economy model by indicating ways in which government affects the operation of American Capitalism. The first part of the chapter explains the 5 basic functions of government. An understanding of spillovers is essential.

Evaluating the economic role of government is important. Benefit-cost analysis should be studied, along with its examples. Wagner's Law and the problem of social imbalance should be understood.

LEARNING OBJECTIVES

1. Knows Basic Terms
   - 1.1 Relates terms that have the same meaning
   - 1.2 Selects the terms that best fits a particular definition
   - 1.3 Identifies terms used in reference to a particular economic function of government
   - 1.4 Uses terms correctly in descriptions of mixed capitalism and economic role of government
2. Understands Economic Concepts and Principles
   - 2.1 Identifies examples of social goods
   - 2.2 Identifies spillover costs and spillover benefits
   - 2.3 Points out the relationship between social balance and benefit-cost analysis
   - 2.4 Recognizes the "social balance" controversy
   - 2.5 Identifies functions assigned to government in a mixed economy
3. Applies Economic Principles to New Situations
   - 3.1 Identifies economic solutions for increased government economic activity in the United States
   - 3.2 Identifies economic solutions for reduced government economic activity in the United States

3.3 Predicts the probable outcome of a change in economic activity in the United States
3.4 Utilizes the concept of benefit-cost analysis to choose the optional variant of a proposed government economic activity

4. Interprets Economic Data
4.1 Recognizes efficient allocation of resources if spillover benefits occur
4.2 Indicates government activity if spillover costs occur
4.3 Distinguishes among alternative economic plans using benefit-cost analysis
4.4 Indicates government activity with use of benefit-cost information

APPENDIX G

TEST OF PRINCIPLES OF ECONOMICS, (Pre-Test)

NAME_____No._____Date_____

Multiple choice test...Read each item carefully and select the answer that best completes the statement or answers the question. Mark your choice by writing the letter response to the left of the question in the space provided. Try to answer every item. Your score will be the number of items answered correctly.

____1. Which of the following is <u>not</u> an assumption of the Production Possibility Curve:
   a) a constant supply of factors of production
   b) unemployment rate of 6%
   c) constant technological knowledge
   d) full employment

Answer questions 2 through 6 on the basis of the data given in the following production possibility table:

	Production possibilities (alternatives)				
	A	B	C	D	E
Capital Goods	4	3	2	1	0
Consumer Goods	0	4	7	9	10

____2. If the economy is producing at production alternative C, the real cost of the eighth unit of consumer goods will be:
   a) 1 unit of capital goods
   b) $\frac{1}{2}$ of a unit of capital goods
   c) 3 units of capital goods
   d) 2 units of capital goods

____3. As compared to production alternative D, the choice of alternative C would
   a) tend to foster a slower growth rate
   b) entail either unemployment or underemployment
   c) be unattainable
   d) tend to foster a more rapid growth rate

____4. A total output of 3 units of capital goods and 3 units of consumer goods
   a) would involve an inefficient use of the economy's scarce resources
   b) is unobtainable in this economy
   c) will result in the maximum rate of growth available to this economy
   d) is irrelevant because the economy is capable of producing a larger total output

____5. In order for this economy to produce total output of 3 units of capital goods and seven units of consumer goods it must
   a) achieve the full employment of available resources
   b) allocate its available resources most efficiently among alternative uses
   c) use its resources more efficiently than the data in the table now indicates
   d) achieve economic growth

____6. In this illustration the law of increasing costs is reflected in the fact that
   a) the economy's resources are presumed to be scarce
   b) the production possibilities data would graph as a straight downsloping line
   c) larger and larger amounts of capital goods must be sacrificed to get additional units of consumer goods
   d) the amount of consumer goods which must be sacrificed to get more capital goods diminishes beyond a point.

____7. The economizing problem is essentially one of deciding how to make the best use of
   a) limited resources to satisfy virtually unlimited wants
   b) virtually unlimited resources to satisfy virtually unlimited wants
   c) unlimited resources to satisfy limited wants
   d) limited resources to satisfy limited wants

____8. The production possibility (or transformation) curve illustrates the basic principle that:
a) an economy's capacity to produce increases in proportion to its population size
b) if all the resources of an economy are in use, more of one good can be produced only if less of another good is produced
c) an economy will automatically seek that level of output at which all of its resources are employed
d) the production of more of any one good will in time require greater and greater sacrifices of other goods

____9. The law of increasing costs states that:
a) if the prices of all the resources devoted to the production of goods increase, the cost of producing any particular good will increase at the same rate
b) if the sum of the costs of producing a particular good rises by a specified percent, the price of that good must rise by a greater relative amount
c) the sum of the costs of producing a particular good cannot rise above the current market price of that good
d) if society wants to produce more of a particular good, it must sacrifice larger and larger amounts of other goods to do so

___10. If the production possibility curve was a straight line, this would imply that:
a) equal quantities of the two products will be produced at each possible point on the curve
b) the two products are equally important to consumers
c) economic resources are perfectly shiftable between the production of the two products
d) the two products will sell at the same market prices

___11. Which of the following would be most likely to shift the production possibilities curve to the right?
  a) shifting resources from butter to gun production
  b) a decline in the size of the population and labor force
  c) an improvement in the literacy level and general level of education
  d) a sudden and substantial expansion in consumer wants

___12. When the economist says that material wants are insatiable, he means that:
  a) the structure of consumer wants is highly unpredictable
  b) the structure of consumer demand varies from time to time and from country to country
  c) these wants are virtually unlimited and therefore incapable of complete satisfaction
  d) economic resources--land, labor, capital and entrepreneurial ability--are scarce

___13. When an economy is operating with maximum efficiency, the production of more of commodity A will entail the production of less of commodity B because:
  a) resources are limited
  b) resources are specialized and only imperfectly shiftable
  c) the structure of demand is fixed at any point in time
  d) material wants are insatiable

___14. The fundamental problem of economics is:
  a) to achieve a more equitable distribution of money income in order to mitigate poverty
  b) the scarcity of productive resources relative to material wants
  c) the establishment of prices which accurately reflect the relative scarcities of products and resources
  d) to establish a democratic political framework for the provision of social goods and services

___15. Unemployment and underemployment:
  a) can both be illustrated by a point inside the production possibilities curve
  b) can both be illustrated by a point outside the production possibilities curve
  c) can both exist at any point on a production possibilities curve
  d) cause the production possibilities curve to shift inward

___16. Other things being equal, which of the following would tend to shift the economy's production possibilities curve to the left?
  a) an increase in the proportion of total output which consists of investment goods
  b) a law requiring mandatory retirement from the labor force at 55
  c) the entrance of more women into the labor force
  d) the discovery of a low-cost means using solar energy

___17. Which of the following is <u>not</u> considered an economic resource?
  a) land
  b) labor
  c) money
  d) entrepreneurial ability

___18. Which of the following is a money payment to the owners of land?
  a) wages
  b) profits
  c) interest
  d) rent

___19. Which of the following is <u>not</u> an example of a capital good?
  a) a dump truck
  b) a tool kit
  c) a crane
  d) a record album

___20. Which of the following would result in additional economic growth?
  a) an improvement in society's technological knowledge
  b) an increase in the money supply
  c) a reduction in the quality of collegiate education
  d) a reduction in the size of the labor force

APPENDIX H

TEST, PRINCIPLES OF ECONOMICS (#1)

Name_____No._____Date_____

Multiple choice test...Read each item carefully and select the answer that best completes the statement or answers the question. Mark your choice by writing the letter response to the left of the question in the space provided. Try to answer every item. Your score will be the number of items answered correctly.

Knows Basic Terms

____1. An increase in the number of consumers in the market will result in:
a) a change in demand
b) a change in quantity demanded
c) a change in supply
d) a change in quantity supplied

____2. The law of supply indicates that:
a) the product curve in downsloping
b) producers will offer more of a product at low prices than they will at high prices
c) producers will offer more of a product at high prices than they will at low prices
d) consumers respond to a change in prices

____3. A market situation in which all goods which are supplied to the market are purchased is called:
a) the law of demand
b) a change in quantity demanded
c) the law of supply
d) equilibrium

Understands Price Concepts and Principles

____4. All of the following will cause the demand for product Z to change except?
a) a change in the price of close substitute product X
b) a decline in consumer incomes
c) a change in the price of product Z
d) an alteration of consumer preferences

____5. Gin and Tonic are:
a) inferior goods
b) complementary goods
c) independent goods
d) substitute goods

____6. Which of the following statements is correct?
a) an increase in the price of L will decrease the demand for complimentary product K
b) a decrease in income will decrease the demand for inferior good M
c) an increase in income will reduce the demand for normal good N
d) a decline in the price of R will increase the demand for substitute product Y

____7. A movement of the demand schedule to the left is:
a) a change in quantity demanded
b) a change in quantity supplied
c) a change in demand
d) a change in supply

____8. A shift to the right in the supply curve for product G can most reasonably be explained by saying that:
a) consumer incomes have declined and they want to buy less G
b) the price of G has increased and, as a result, consumers desire to purchase more of it
c) additional firms producing G have entered the market
d) production cost of G have increased

____9. If a product is in surplus supply, we can conclude that its price:
a) is below the equilibrium level
b) is above the equilibrium level
c) is in equilibrium
d) will fall in the near future

___10. A market is in equilibrium:
a) provided there is no shortage of the product
b) at all prices below that shown by the intersection of supply and demand curves
c) if the amount which consumers want to buy equals the amount which producers are willing to make available for sale
d) whenever the demand curve is downsloping and the supply curve is upsloping

___11. If the supply and demand curves for product Y both decrease, we note that:
  a) equilibrium price and equilibrium quantity both decrease
  b) equilibrium price and equilibrium quantity both increase
  c) equilibrium price must fall, but equilibrium quantity may rise, fall or remain the same
  d) equilibrium price may either rise, fall or remain unchanged, but equilibrium quantity must decline

Applies Supply and Demand Principles to New Situations

___12. Assume that the demand schedule for product T is downsloping. If the price of T rises from $2.50 to $3.00:
  a) the demand for T will fall
  b) the demand for T will rise
  c) a larger quantity of T will be demanded
  d) a smaller quantity of T will be demanded

___13. "In 1975 VW sold 900,000 "bugs" at an average of $2,500 per car; in 1976 750,000 "bugs" were sold at an average price of $2,800 per car." This suggests that:
  a) the supply of VW "bugs" has decreased from 1975-1976
  b) the supply curve for VW "bugs" is downsloping
  c) that VW "bugs" are inferior cars
  d) that the demand for VW "bugs" increased

___14. If the price of energy fossils and fuels have risen in recent years with no change in annual supply what would be the most reasonable long range method of reducing the price:
  a) increase the supply via exploration
  b) decrease the supply via neglect
  c) increase the demand via improved income
  d) increase demand via government controls

Answer questions 15 through 17 on the basis of the given supply and demand data for cases of carrots:

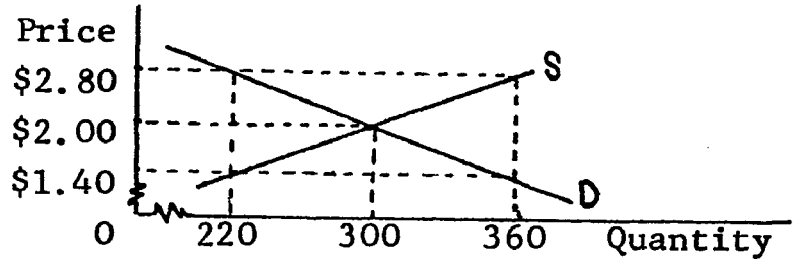
Cases Demanded per Month	Price per Case	Cases Supplied per Month
65	$3.50	94
70	3.00	90
76	2.50	87
83	2.00	83
97	1.50	80

___15. Equilibrium price will be:
a) $1.50
b) $2.00
c) $2.50
d) $3.00

___16. If the government supported a price of $3.00 in this market:
a) there would be a shortage of carrots
b) farmers would not be able to sell all their carrots
c) farmers would reduce the amount of land allocated to growing carrots
d) consumers would be willing to purchase more carrots than is currently being supplied.

___17. Now assume that the government abandons the $3.00 price support. The effect will be for:
a) the price of carrots to rise
b) the quantity demanded of carrots to fall
c) quantity supplied would continue to exceed quantity demanded
d) the quantity of carrots supplied would decline as a result of the price change

Answer questions 18 through 20 on the basis of the following diagram:



___18. The equilibrium price and quantity in this market will be:
a) $2.80 and 360
b) $1.40 and 320
c) $2.00 and 320
d) $2.00 and 300

___19. A surplus of 140 units would be encountered if the price was:

a) $2.80
b) $1.40
c) $2.00
d) .60 that is $2.00 minus $1.40

___20. A shortage of 140 units would be encountered if the price was:

a) $2.80
b) $1.40
c) $2.00
d) .80, that is $2.80 minus $2.00

APPENDIX I

TEST, PRINCIPLES OF ECONOMICS (#2)

Name_____No._____Date_____

Multiple choice test...Read each item carefully and select the answer that best completes the statement or answers the question. Mark your choice by writing the letter response to the left of the question in the space provided. Try to answer every item. Your score will be the number of items answered correctly.

Knows Basic Terms

____1. If the demand for waterbeds increases and the resulting market system responds by producing more waterbeds, then this illustrates:
  a) the concept of derived demand
  b) the concept of the directing function of of prices
  c) the scarcity function of prices
  d) consumer sovereignity

____2. Normal Profits:
  a) are not a cost of production because they need not be realized for the firm to stay in business
  b) are not a cost because a firm never experiences them
  c) are a cost because excess receipts accrue to the businessman
  d) are a cost because they represent payments for the resource which the businessman supplies

____3. When economists say that the demand for a resource is a "derived demand", they mean that:
  a) resource supply curves are downsloping
  b) the demand for resources depnds upon the demand for the products which those resources produce
  c) producers tend to substitute high-priced for low-priced resources
  d) the private sector determines its demand from the public sector

Understands Price System Concepts and Principles

____4. The product demand curve is downsloping because:
  a) consumers tend to substitute other goods for any good whose price happens to rise
  b) resource suppliers shift their human and property resources from low-paying to high-paying employments
  c) producers will tend to substitute alternative resources for any resource whose price rises
  d) consumers will purchase more goods at high prices than at low prices

____5. The most efficient combination of resources in producing any output is that combination which:
  a) comes closest in using the same quantities of land, labor and capital
  b) uses the smallest total quantity of all resources
  c) can be obtained for the lowest money outlay
  d) conserves most of the use of land

____6. Economic profits:
  a) are a cost because they are really a part of wage costs
  b) are a cost because they accrue to the entreprenuer
  c) are not a cost because they are incapable of calculation
  d) are not an economic cost because they need not be realized to obtain and retain the entrepreneur

____7. Which of the following best describes the "invisible hand" concept?
  a) mixed capitalism is the best system for reducing scarce resources
  b) central direction by the government will improve the efficiency of an economy
  c) self interest will automatically further the public interest
  d) the need for government intervention is apparent in big business situations

____8. When an industry is in equilibrium:
a) normal profits will not be realized
b) economic profits will be positive
c) economic profits will be zero
d) product demand and derived demand are equal

____9. The price system corrects a shortage by:
a) raising product price and lowering product profits
b) raising product price and producer profits
c) lowering product price, and increasing producer profits
d) setting a price ceiling on the product

___10. Which of the following is <u>not</u> a basic criticism of the price system?
a) the price system limits individual freedom
b) the price system does not account for social costs
c) the price system reallocates resources slowly during times of emergency
d) income inequality causes the price system to result in the production of luxury goods amid poverty

___11. All of the following are criticisms of the price system EXCEPT:
a) the system has resource immobilities
b) the system results in market failures
c) the system results in full employment
d) the system leads to an unequal distribution of income

<u>Applies Economic Principles</u>

___12. An increase in the demand for antique furniture is most likely to:
a) reduce the supply of antique furniture
b) increase the demand for antique furniture outlets
c) increase the demand for modern furniture
d) reduce the demand for antique furniture outlets

___13. Producers of skateboards realize that resources used to produce skateboards have become particularly scarce. You suggest to them to:
a) lower the price of skateboards
b) raise the price of skateboards
c) close down operations
d) substitute other forms of recreation/ transportation

___14. If competitive industry R is realizing substantial economic profits, we can expect that:
a) output will expand, product price will fall, and economic profits will tend to disappear
b) output will expand, product price will fall, and economic prices tend to rise
c) output will fall, product price will rise, and economic profits will tend to disappear
d) outputs will fall, product price will fall, and economic profits will tend to disappear

Interprets Data

Answer questions 15-16-17 on the basis of the following data which show all available techniques by which 10 units of a given commodity can be produced:

Resource	Resource Price	Possible Production Techniques #1	#2	#3	#4	#5
Land	3	4	2	4	4	1
Labor	2	2	4	1	3	1
Capital	2	2	3	1	2	8
Entrepreneurial Ability	1	1	1	4	1	3

___15. Given the indicated resource prices, the economically most efficient production technique(s) will be:
a) technique #4
b) techniques #1 and 2
c) techniques #2 and 5
d) technique #3

___16. Assuming that the firm is motivated by self interest and that the 10 units which can be produced with each technique can be sold for $2 per unit the firm will:
a) close down rather than incur a loss
b) realize an economic profit of $10
c) incur a loss of $1
d) just manage to cover all its costs

___17. If the resource price of capital was cut to $1, the firm would switch to:
a) techniques 1 or 2
b) technique 3
c) technique 5
d) technique 4

Answer questions 18-19-20 on the basis of the following information:

Assume that company G can produce 200 units of product X by combining land, labor, capital and entrepreneurial ability in each of the four ways shown in the table below. Assume that the firm can hire labor at $2 per unit, land at $3 per unit, capital at $5 per unit and entrepreneurship at $15 per unit.

	Techniques			
	I	II	III	IV
Labor	12	10	6	8
Land	3	4	3	5
Capital	2	3	7	5
Entrepreneurship	1	1	1	1

___18. Which technique is the economically most efficient way of producing product X?
a) I
b) II
c) III
d) IV

___19. What economic profit or loss will the firm realize if product X sells for $.30 per unit?
a) a profit of $2
b) a profit of $22
c) a loss of $2
d) a loss of $21

___20. If the price of labor increased to $4, it would now pay the firm to use technique:
a) IV
b) III
c) II
d) I

APPENDIX J

TEST, PRINCIPLES OF ECONOMICS, (#3)

Name_____No._____Date_____

Multiple choice test...Read each item carefully and select the answer that best completes the statement or answers the question. Mark your choice by writing the letter response to the left of the question in the space provided. Try to answer every item. Your score will be the number of items answered correctly.

Knows basic terms

____1. The American economy is called mixed Capitalism because:
  a) many business enterprises are owned by both government and private business
  b) the products of many businesses are used by both government and consumers
  c) solving economic problems are to some extent determined by government and to some extent by private individuals and businesses
  d) the Federal Government provides most of the capital for American business

____2. Which of the following statements is correct?
  a) social goods are bought voluntarily, out of private incomes
  b) private goods yield no significant spillover benefits
  c) social goods are purchased by government with tax revenues
  d) private goods are financed by the government

____3. Wagner's Law states that the role of the public sector:
  a) declines both absolutely and relatively as an economy grows
  b) declines absolutely, but increases relatively as an economy grows
  c) declines relatively, but increases absolutely as the economy grows
  d) increases both absolutely and relatively as an economy grows

Understands Concepts and Principles

____4. Which of the following is a social good?
a) a highway
b) butter
c) a wristwatch
d) a threatre ticket

____5. For which of the following goods or services would a government subsidy most likely improve the allocation of resources?
a) corn
b) steel
c) magazine publishing
d) heart disease research

____6. If there are important spillover benefits associated with the consumption of a product, it can be said that:
a) the supply curve for the product lies too far to the right to provide an efficient allocation of resources
b) the demand curve understates the relative importance of the product and therefore, resources are underallocated
c) special taxes should be levied on the producers of the product
d) government should prohibit the production of the commodity

____7. Total government spending--local, state and Federal combined--acount for what percentage of national output?
a) 4%
b) 12%
c) 15%
d) 23%

____8. The public decision to finance the construction of state colleges and universities is an example of:
a) the allocation function of government
b) governmental action designed to enhance competition
c) the stabilization function of government
d) the legal framework of the price system

____9. A useful tool in providing guidance in formulating a judgment on the proper balance between the private and public sector is:
a) stabilization policy
b) benefit-cost analysis
c) Wagner's Law
d) regression analysis

___10. Which of the following statements best describes the problem of social imbalance?
  a) Modern monetary policy is inflationary
  b) fiscal policy provides for economic stability while contributing to the shortage of social goods and services
  c) in affluent societies there is an over-allocation of resources to social goods
  d) in growing economies resources tend to be overallocated to private goods and under-allocated to social goods

___11. Social goods are allegedly at a "psychological disadvantage" as compared to private goods because:
  a) the benefits of social goods are less immediate and less certain
  b) the production of social goods is faster and more efficient
  c) social goods are inherently less capable of satisfying consumer desires
  d) the prices of social goods are inherently higher than those of private goods

Applies Principles

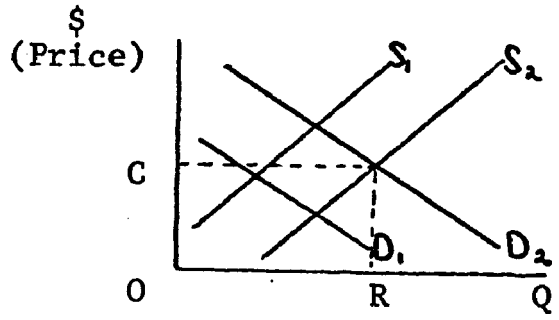
___12. As an economist, if the economy is at full-employment, suggest a formula to reallocate resources from private to public employment:
  a) reduce taxes and increase government spending
  b) reduce taxes and reduce government spending
  c) increase taxes and increase government spending
  d) increase taxes and reduce government spending

___13. As an economist, if the economy is experiencing unemployment, suggest a remedy for the problem:
  a) increase government spending and reduce taxes
  b) increase both taxes and government spending
  c) decrease government spending and increase taxes
  d) wait for an inflationary spiral and increase taxes

___14. Which of the following outcomes would probably occur if the Federal government drastically cut its spending in the next year?
a) inflation
b) full-employment
c) growth in money supply
d) increase in unemployment

Interprets Data

Answer questions 15 and 16 on the basis of the following competitive market diagram for soybeans



___15. Assume that the current market demand and supply for soybeans are D_2 and S_2. If there are substantial spillover benefits associated with the production of soybeans, it can be argued that:
a) government should levy a tax on soybeans shifting the supply curve to S_1
b) a greater output than OR would result in a more efficient allocation of resources
c) an output smaller than OR would result in a more efficient allocation of resources
d) government should levy a tax on soybeans to shift the demand curve to the left

___16. If S_2 and D_2 apply to soybean production it can be argued that if there are substantial spillover costs associated with the production of soybeans:
a) government should subsidize the production of soybeans
b) government should levy a tax on soybeans to shift the supply curve toward S_1
c) a price lower than OC would improve resource allocation
d) government should take no action to affect either price or production of soybeans

Answer questions 17 through 20 on the basis of the following data which are for a series of increasingly extensive flood control projects

	(millions of $) Total cost per year	Total benefit per yr.
Plan A--levees	$ .5	$ .7
Plan B--small reservior	1.0	1.9
Plan C--medium resevior	3.0	4.0
Plan D--dam	7.0	6.0

___17. For Plan B marginal costs and marginal benefits are:
a) $ .5 and $ .7 respectively
b) $1.5 and $2.6 respectively
c) $ .5 and $1.2 respectively
d) $1.0 and $1.9 respectively

___18. For Plan D marginal costs and marginal benefits are:
a) $7.0 and $6.0 respectively
b) $4.0 and $2.0 respectively
c) $11.5 and $12.6 respectively
d) $3.0 and $4.0 respectively

___19. On the basis of benefit-cost analysis the government should undertake:
a) Plan A
b) Plan B
c) Plan C
d) Plan D

___20. Plan D entails:
a) an overallocation of resources to flood control
b) an underallocation of resources to flood control
c) marginal benefits in excess of marginal costs
d) fewer spillovers than Plans A, B or C

APPENDIX K

TEST, PRINCIPLES OF ECONOMICS (2X) (Retention Test)

Name_____Section_____Date_____

Multiple choice test...read each item carefully and select the answer that best completes the statement or answers the question. Mark your choice by writing the letter response to the left of the question in the space provided. Try to answer every item. Your score will be the number of items answered correctly.

____1. If the demand for fur coats decreases and the resulting market system responds by producing fewer fur coats, then this illustrates:
  a) government sovereignity
  b) the concept of derived demand
  c) the concept of the directing function of prices
  d) the scarcity function of prices

____2. Economic or "Pure" Profits:
  a) are a cost of business because they represent payments for a resource
  b) are not a cost of doing business
  c) are a cost of business because excess receipts accrue to the businessman
  d) are not a cost of production because they never occur

____3. When an economist notes that "demand for a resource depends upon the demand for the products which those resources produce" he is illustrating:
  a) the concept of derived demand
  b) the concept of consumer prices
  c) supply and demand
  d) the scarcity function of prices

____4. When consumers purchase more goods at lower prices than high prices:
  a) the supply curve is upsloping
  b) the supply curve is downsloping
  c) the demand curve is upsloping
  d) the demand curve is downsloping

____5. The most efficient combination of resources in producing any product is the combination which:
   a) conserves most of the use of natural gas
   b) can be obtained at the lowest price
   c) uses identical amounts of capital, land and labor
   d) uses the most labor

____6. Which of the following best describes the "invisible hand" concept?
   a) government intervention in business situations is necessary on occasion
   b) socialism is the most appropriate system for satisfying unlimited wants
   c) "planned" economies improve economic efficiency
   d) self interest automatically advances the interest of the public

____7. Economic profits will be zero when:
   a) normal profits are also zero
   b) the industry is in disequilibrium
   c) the industry is in equilibrium
   d) industry supply and market supply are equal

____8. All of the following are criticisms of the price system EXCEPT:
   a) the system results in full utilization of resources
   b) the system has immobile resources
   c) the system is an impersonal mechanism
   d) the system results in market failures

____9. Which of the following is a basic criticism of Capitalism?
   a) Capitalism reallocates resources quickly during times of emergency
   b) income inequality results in a production of luxury goods amid poverty
   c) Capitalism results in full-employment
   d) Capitalism does not limit individual freedom of choice

___10. The price system corrects a surplus by:
a) lowering the product price
b) raising the product price
c) setting a price ceiling on the product
d) setting a price floor on the product

___11. Economic profits exist when:
a) they become part of the wage package
b) they are an economic cost and need to be realized to obtain and retain the entrepreneur
c) only when they are capable of being calculated
d) normal profits are greater than zero

___12. An increase in the demand for aspirin is most likely to:
a) reduce the demand for aspirin outlets (drugstores)
b) increase the supply of aspirin
c) increase the demand for aspirin outlets (drugstores)
d) reduce the supply of aspirin substitutes

___13. If competitive industry M is realizing substantial economic losses, we can expect that:
a) output will expand, product price will fall and economic losses will tend to disappear
b) output will expand, product price will increase and economic losses will continue
c) output will fall, product price will fall and economic losses will fall
d) output will fall, product price will rise, and economic losses will tend to disappear

___14. The manufacturers of shoelaces realize that cotton used to produce shoelaces has become particularly scarce. You suggest to them to:
a) raise the price of shoelaces
b) close down operations
c) substitute other forms of footwear
d) lower the price of shoelaces

Answer questions 15-16-17 on the basis of the following data which show all available techniques by which 10 units of a given commodity can be produced:

Resource	Resource Price	Possible Production Techniques #1	#2	#3	#4	#5
Land	$ 3	4	2	4	4	1
Labor	4	2	4	1	3	1
Capital	4	2	3	1	2	8
Entrepreneurial Ability	6	1	1	4	1	3

___15. Given the indicated resource prices, the economically most efficient production technique(s) will be:
a) technique #4
b) technique #1
c) techniques #2 and #5
d) technique #3

___16. Assuming that the firm is motivated by self interest and that the ten units which can be produced with each technique can be sold for $4 per unit the firm will:
a) just manage to cover all its costs
b) realize an economic profit of $6
c) close down rather than incur a loss
d) incur a loss of $4

___17. If the resource price of capital was cut to $1, the firm would switch to:
a) techniques 2 or 3
b) technique 1
c) technique 5
d) technique 4

Answer questions 18-19-20 on the basis of the following information:

Assume that Company M can produce 100 units of product E by combining land, labor, capital and entrepreneurial ability in each of the four ways shown in the table below. Assume that the firm can hire labor at $10 per unit, land at $6 per unit, capital at $4 per unit, and entrepreneurship at $20 per unit.

	Techniques			
	I	II	III	IV
Labor	12	10	6	8
Land	3	4	3	5
Capital	2	3	7	5
Entrepreneurship	1	1	1	1

___18. Which technique is the most economically efficient way of producing product E?
a) I
b) II
c) III
d) IV

___19. What economic profit or loss will the firm realize if product E sells for $1.30 per unit?
a) a profit of $4
b) a loss of $20
c) a loss of $4
d) a profit of $12

___20. If the price of labor increased to $12 per unit, it would pay the firm to use technique:
a) III
b) II
c) IV
d) I

APPENDIX L

TEST, PRINCIPLES OF ECONOMICS, (3X) (Retention Test)

Name_____Section_____Date_____

Multiple choice test...Read each item carefully and select the answer that best completes the statement or answers the question. Mark your choice by writing the letter response to the left of the question in the space provided. Try to answer every item. Your score will be the number of items answered correctly.

____1. Wagner's Law states that the role of government:
a) increases during periods of inflation
b) increases both absolutely and relatively as the economy grows
c) declines both absolutely and relatively as the economy grows
d) declines during periods of full-employment

____2. Which of the following statements is correct?
a) private goods yield no spillover benefits
b) social goods are purchased by the government
c) social goods are purchased with private incomes
d) private goods are financed by the government

____3. The American economy is called "mixed capitalism" because:
a) the Federal government provides most of the investment for American business
b) many business enterprises are owned by government
c) solving economics problems are to some extent determined by government and to some extent by private individuals and businesses
d) products are used both by Americans and foreigners

____4. Private goods are allegedly at a "psychological advantage" as compared to social goods because:
a) the benefits of private goods are immediate and certain
b) the production of social goods is slower and less efficient
c) the prices of private goods are almost always lower than those of social goods
d) social goods are less capable of satisfying the consumer than private goods

____5. Which of the following statements best describes the problem of social imbalance?
   a) Modern fiscal policy is inflationary
   b) monetary policy leads to a shortage of private goods
   c) the distribution of wealth allows more social goods
   d) economic growth tends to overallocate resources to private goods and underallocate resources to social goods

____6. Benefit-cost analysis is a useful tool in providing guidance in formulating judgment about:
   a) the balance between the public and private sector
   b) stabilization policy
   c) monetary vs. fiscal policy
   d) balance of payments equilibrium

____7. The public decision to sponsor chest X-Rays is an example of:
   a) the legal framework of the price system
   b) governmental action designed to enhance competition
   c) the allocation function of government
   d) stabilization policy

____8. Total non-government spending (all spending but that of state, local and Federal governments) accounts for what percentage of national output?
   a) 96%
   b) 90%
   c) 77%
   d) 40%

____9. If there are important spillover benefits associated with the consumption of a product, it can be said that:
   a) government should raise sales taxes on that item
   b) special taxes should be levied on the suppliers of the products
   c) the supply curve for the product lies too far to the right to provide an efficient allocation of resources
   d) the demand curve understates the relative importance of the product and therefore resources are underallocated

___10. For which of the following goods or services would a government subsidy most likely improve the allocation of resources?
a) automobiles
b) jewerly
c) wheat
d) cancer research

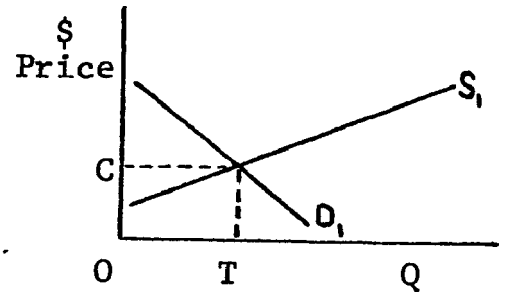
___11. Which of the following is a social good?
a) a submarine
b) a newspaper
c) Wheaties, "Breakfast of Champions"
d) a pair of gloves

___12. An increase in unemployment would likely occur if the Federal Government:
a) increases the money supply in the next year
b) drastically cut its spending in the next year
c) encouraged additional economic growth for the next year
d) reduced income taxes for the next year

___13. As an economist, if the economy is experiencing inflation, suggest a remedy for the problem:
a) increase government spending and reduce taxes
b) wait for unemployment and decrease taxes
c) increase income taxes and reduce defense expenditures
d) reduce taxes and reduce government spending

___14. As an economist, if the economy is at or very close to full employment, suggest a formula to reallocate resources from private to public employment:
a) increase taxes and reduce government spending
b) reduce taxes and reduce government spending
c) increase taxes and reduce government spending
d) reduce taxes and increase government spending

Answer questions 15 and 16 on the basis of the following competitive market diagram for wheat



___15. Assume that the current market demand and supply for wheat are D_1 and S_1. If there are substantial spillover benefits associated with the production of wheat, it can be argued that:
  a) an output smaller than OT would result in a more efficient allocation of resources
  b) a greater output than OT would result in a more efficient allocation of resources
  c) government should levy a tax on wheat shifting the supply curve to the left
  d) government should levy a tax on wheat to shift the demand curve to the left

___16. If S_1 and D_1 apply to wheat production it can be argued that if there are substantial spillover costs associated with the production of wheat:
  a) a price lower than OC would improve resource allocation
  b) government should take no action to affect either the price or production of wheat
  c) government should subsidize the production of wheat
  d) government should levy a tax on wheat to shift the supply curve to the left

Answer 17 through 20 on the basis of the following data which are for a series of increasingly extensive flood control projects.

	(millions of $)	
	Total cost per year	Total benefit per year
Plan A--levees	$ 1	2
Plan B--small reservior	4	6
Plan C--medium reservior	8	7
Plan D--dam	12	9

___17. For Plan B marginal costs and marginal benefits are:
  a) $3 and $4 respectively
  b) $4 and $3 respectively
  c) $4 and $2 respectively
  d) $4 and $6 respectively

___18. For Plan D marginal costs and marginal benefits are:
  a) $4 and $3 respectively
  b) $12 and $9 respectively
  c) $12 and $7 respectively
  d) $4 and $2 respectively

___19. On the basis of benefit-cost analysis the government should undertake:
  a) Plan A
  b) Plan B
  c) Plan C
  d) Plan D

___20. Plan A entails:
  a) marginal costs in excess of marginal benefits
  b) fewer spillovers than Plans B, C or D
  c) an underallocation of resources to flood control
  d) an overallocation of resources to flood control

APPENDIX M

QUESTIONNAIRE

Name_____section_____date_____

Early in the semester you were administered several tests dealing with content in your Pinciples of Economics course. At times you were also provided a sheet with a chapter overview and specifically written learning objectives.

Please answer the following questions as openly as possible:

YES NO 1. Do you feel that the learning objective sheet provided an immediate overview of the course material?

YES NO 2. Do you feel that the learning objective sheet could be an effective study guide?

YES NO 3. When the learning objective sheet was provided did it prove beneficial in preparing for the tests?

YES NO 4. Would the learning objectives have been more beneficial to you if they were provided for all the course material throughout the semester?

YES NO 5. Did you use the learning objective sheets when provided?

If Yes ... circle one:

I used them a great deal

I used them somewhat

I used them sparingly

YES NO 6. For this course would a learning objective sheet each week, when combined with classroom lectures result in higher achievement for you?

YES NO 7. Would independent study and the learning objective sheet be more beneficial to you than the classroom lecture?

8. When you were provided with the learning objective sheet, did you spend (circle one)

a) More

b) Same

c) Less

time studying for the tests?

COMMENTS.....Please feel free to make any observations you like about the learning objective sheets or the tests themselves. Thanks.

VITA

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In 1971 he was awarded a General Electric Foundation Grant to study at the University of Chicago and in 1975-76 served as a Carnegie Fellow at Lehigh University.

He has an interest in track and field and has published five books on the decathlon.