

**A MEASURE OF ATTITUDINAL CHANGE
TOWARD STUDENT LEARNING AND
ECONOMICS INSTRUCTION**

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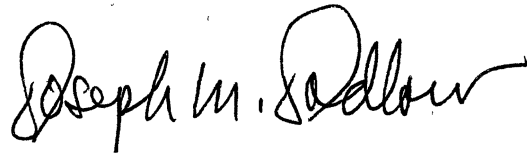
**Master of Science
North Texas State University
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1976**

**Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in Partial Fulfillment of
the Requirements for
the Degree of
DOCTOR OF EDUCATION
December, 1990**

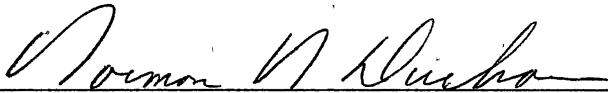
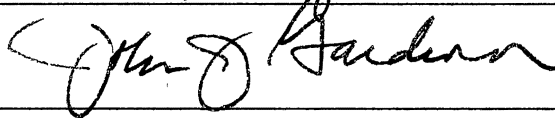
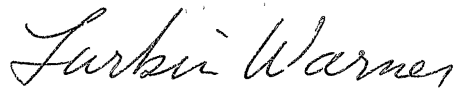
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PREFACE

This paper analyzes the impact of instruction on students' learning as a result of studying economics at the high school level. Data have been collected from 6570 students pretested in the spring of 1986 who were enrolled in high school economics, consumer economics, or in a social science course. The same group was post-tested at the end of the school year. The empirical question to be addressed is whether a difference in attitudinal change occurs as a result of students' exposure to economics instruction. The study is unique in that it provides a statistically significant relationship between economic instruction and students' change in attitudes to economic issues. This relationship is important because it helps to explain a student's ability to analyze and examine judgment questions related to economic concepts. It is for this purpose this research is intended.

I wish to express my sincere gratitude to the individuals who assisted me in this project and during my course work at Oklahoma State University. In particular, I wish to thank my major advisor, Dr. Joseph Jadow for his guidance and invaluable aid. I am also thankful to the other committee members, Dr. Donald Bumpass, Dr. Larkin Warner, and Dr. John Gardiner, for their advisement during the course of this work.

I would also like to express my special thanks to my wife, Cynthia Cadwallader Scott for her support and encouragement.

TABLE OF CONTENTS

Chapter		Page
I.	INTRODUCTION	1
	Statement of the Problem	2
	Purpose of the Study	3
II.	REVIEW OF LITERATURE	4
	Economic Education: The Beginnings	4
	Attitudinal Change and Critical Thinking	5
	Current Research	16
III.	METHODOLOGY AND ANALYTICAL FRAMEWORK	19
	Research Model	19
	Affective Domain	22
	Teaching for Affective Learning	23
	Hypothesis Testing and Summary	24
IV.	ANALYSIS OF THE DATA	26
	Research Procedure	26
	Analysis of Covariance	28
	Experimental Research	29
	Multiple Regression Estimation	30
	Simultaneity	31
	Multicollinearity	32
	Analysis of Posttest Data	33
	The t-test	33
	Measures of Relationships:	
	Correlation	33
	Correlation and t-test for ATE and EAS	34
	Results of the Data on Student and Teacher Characteristics	36

V.	SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	51
	Summary	51
	Conclusion	53
	Recommendations	53
	Limitations of Study and Need for Future Research	54
	LITERATURE CITED	56
	APPENDICES	63
	APPENDIX A – SHORT-FORM DOGMATISM SCALE	64
	APPENDIX B – THE OPINATIONION SCALE	66
	APPENDIX C – ATTITUDE TOWARD ECONOMICS INSTRUMENT	69
	APPENDIX D – ECONOMIC ATTITUDE SOPHISTICATED INSTRUMENT	70

LIST OF TABLES

Table		Page
1	Mean Scores on the Nine-Term Opinionation Test	12
2	The Relationship Between Actions Concerning a Null Hypothesis and the Truth or Falseness of the Hypothesis	25
3	Description and Means of Variables	27
4	Hypothesis Test Summary t-test for Two Dependent Variables: ATE and EAS	35
5	Variance Estimates Dependent Variable: ATE2 – Course	37
6	Variance Estimates Dependent Variable: ATE2 – Race	38
7	Variance Estimates Dependent Variable: ATE2 – Econ	39
8	Variance Estimates Dependent Variable: ATE2 – Focus	40
9	Variance Estimates Dependent Variable: EAS2 – Course	42
10	Variance Estimates Dependent Variable: EAS2 – Race	43
11	Variance Estimates Dependent Variable: EAS2 – Econ	44
12	Variance Estimates Dependent Variable: EAS2 – Focus	45

13	Multiple Regression Dependent Variable: ATE2	48
14	Multiple Regression Dependent Variable: EAS2	49
15	Regression Coefficients	50

CHAPTER I

INTRODUCTION

The main purpose of this research is to look at changes in attitudes of students who have completed a high school course in economics, consumer economics, or social studies where economics was a part of the course instruction. The hypothesis to be tested is whether or not attitudinal differences are independent of the content or structure of courses taught. This research also focuses on the implications of other variables that may explain possible differences in attitudinal changes of students enrolled in a particular course. Specifically, this study will test if a greater attitudinal change will result from subject-matter oriented students taught by student oriented teachers.

This study is unique for two reasons. First, it provides statistically significant results of the effects of economics instruction on attitudinal change in students. Baumol & Highsmith (1988) have concluded that in general students who have studied economics believe economics helps them in focusing in on major, long term issues, which is related to beliefs, attitudes and values. This can be important when public policy is at issue. William Mann and Daniel Fusfeld (1970) have argued that "the attainment of a high level of attitude sophistication should be as much a goal as the proper manipulation of supply and demand schedules" (p. 125). Secondly, the affective domain which describes changes

in interest, attitudes, and values of economic understanding may be as important as knowing the basic language of economics. In the last analysis, educational purposes lie within the learners themselves, because education is a process of transforming the behavioral patterns of people.

Statement of the Problem

The research will examine teaching economics at the high school level and its impact on attitudinal changes. The first empirical question to be addressed is whether a difference in attitudinal change exists among the three types of high school courses focused on in the study. The measured difference may be found to be the result of course content. The study will describe the development, validation, and national norming of the revised Test of Economic Literacy (TEL). In 1977, the TEL was developed to be used as a prime teaching and research test instrument at the senior high school level. In 1985 the TEL was revised by a national committee of economists, high school economics teachers, and test experts. Data have been collected under the direction of the Joint Council on Economic Education (JCEE) from 6570 students pretested in the spring of 1986 in high school economics, consumer economics, and in a social science course (e.g., U.S. history or government). The data represented a regional distribution of secondary students in the United States, where 23 percent of the sample resided in the Northeast, 28 percent in the North Central region, 32 in the South and 18 percent in the West (U.S. Department of Commerce, 1984). The same group was post-tested at the end of the school year to measure the degree of attitudinal change.

Purpose Of The Study

The purpose of this study in developing a model of attitudinal change is to determine:

- (1) The relationship between changes in students' attitudes toward and increased learning through economic instruction.
- (2) If the type of economic class chosen by students is related to significant changes in attitudes.

CHAPTER II

REVIEW OF LITERATURE

Economic Education: The Beginnings

In the late 1950s there were two institutional developments which provided the basis for scientific inquiry into the instruction of economics. The first was the growth and maturity of the Joint Council on Economic Education. Secondly, the foundational elements initiated by the American Economic Association's Committee on Economic Education. This cooperative effort produced the foundation for scientific investigation in economic education (Luker, 1972).

Two foundational directions were initiated:

- (1) The formation of the National Task Force on Economic Education whose efforts produced a task force report, Economic Education in the Schools. The report defined economic education as a discipline, without reference to social values or persuasion (National Task Force, 1961).
- (2) The development of tests which measure economic understanding. Tests measuring economic understanding at the elementary (JCEE, 1971), secondary (JCEE, 1971), and college level (JCEE, 1971). The development of these tests were important because it provided a basis for evaluation of teaching and student learning (Luker, 1972).

These developments were significant because they have several implications for economic education. First, the cognitive tests enabled the researcher to measure economic knowledge reliably and objectively. It is apparent economics instruction impacts the cognitive domain. According to Bloom's Taxonomy, (the most widely accepted and documented of the cognitive-level classification schemas, Gronlund, 1970) the system specifies behaviors in six categories:

Highest Level Evaluation – the ability to value, judge, and conclude

Synthesis – the ability to create

Analysis – the ability to distinguish and illustrate

Applications – the ability to demonstrate

Comprehension – the ability to interpret

Lowest Level Knowledge – the ability to recall

The Test of Economic Literacy (TEL) included economic content and the cognitive levels of Bloom's Taxonomy (Bloom 1956). Walstad and Soper (1988) found that a quality instrument for assessing student knowledge does exist in learning economics at the high school level. Secondly, a widespread disciplinary agreement evolved for a test and measurement construct which could be used without concern of ideological recrimination. Within this favorable research climate, educational research designs in the pedagogy of economics began to emerge (Luker, 1972).

Attitudinal Change and Critical Thinking

There have been studies that suggest that there is a correlation between economic knowledge and critical thinking. Saunders (1970) suggested a correlation between economic knowledge and critical thinking. A study by Walstad and Soper (1988) concluded that students who have completed a high school economics class, from teachers who have taken many economics classes are factors which have significantly influenced the level of economic knowledge and the ability to think critically. Another study by Baumol and Highsmith (1988) stated that the central objectives of economic education should be to equip students to make reasoned judgments on economic issues. Specifically, educators are interested in what effect instruction in the classroom has on students' attitudes and possible behavior.

The assumption of instructors in the social sciences is that "Most students are rational, open, and capable of modifying behavior if they have facts or adequate (scientifically verified) data" (Luker, 1972, p. 14). Consequently, educators in the discipline of economics have used "methods of the real sciences" (Heilbroner, 1972, p. 6). Also, it is argued that language usage, formulae, and modeling point to the fact that "the paradigm of elucidation that economics follows is patterned as closely as possible on that of the physical sciences" (Heilbroner, 1972, p. 6).

Certain questions significantly related to understanding policy issues have arisen, which concern the relationship between knowledge and attitudes. As individuals gain in economic understanding, for example, they should be

able to apply that knowledge to their own attitudes and decisions about policy issues. Perhaps a step toward realizing this possibility is the attainment of logical, clear, well-conceived attitudes.

Further, it has been argued that the instruction an economist receives makes for increased conservatism. Stigler (1959) stated that "the main reason for the conservatism surely lies in the effort of the scientific training the economist receives. He is drilled in the problems of all economic systems and in the method by which a price system solves these problems" (p. 532). This statement provides a broad opportunity for inquiry for educators and social scientists.

Educators are increasingly interested in what effect formal exposure to economic education has had on changes in attitudes. This research is directed toward measuring changes in attitudes of students exposed to economic instruction.

Mann and Fusfeld (1970) went beyond the issue of critical thinking to study the affective domain which is the area of knowledge that defines a person's values. The two researchers measured the relationship between attitudes and instruction in economics, and found that, while knowledge tends to disappear quickly unless it is reinforced by further study, attitudinal changes tend to remain. Mann and Fusfeld further explained attitude sophistication in this way:

When a subject with a high degree of attitude sophistication is asked his opinions about a group of statements, he will be able to differentiate between accepted "laws" and unfounded platitudes, between rational and nonrational arguments, between defensible and naive positions and between justifiable and unwarranted conclusions (Mann & Fusfeld, 1970, p. 111).

These two educators also concluded that becoming "worldly wise" with respect to public policy judgments is a separate and distinct dimension of the educational process from that area which focuses on increases in knowledge or cognitive forms of learning. This conclusion suggests a link between the knowledge of economics and an increase in attitudinal sophistication. Attitude measures are not conclusive, but should provide an index or measure for researchers to make judgments about economic education. This may be useful to teachers and researchers who study methods of instruction to enhance teacher effectiveness. It has been shown for example that teacher quality, as measured by academic credits, can have a positive impact on student performance (Rhine, 1989).

Another study which measured the relationship between attitudes and knowledge of economics is one conducted by William Hemmer (1969). Hemmer compared the affective and cognitive change in twelfth-grade students in economics courses. Affective and cognitive instruments were used as pretest and post-test with students from 46 New York State public schools. Hemmer's research showed that, as affective and cognitive learning took place, the positive correlation between the scores on the affective and cognitive instruments increased. The scale showed that the students' attitudes toward economic problem-solving did converge toward a consensus of attitudes held by economists who served as advisors for the curriculum of the National Task Force on Economic Education (1961).

Thompson (1973) sought to determine whether an increase in students' cognition in international trade is correlated with a change toward policy issues.

Results from the tests showed that knowledge increases and changes in attitude had a strong correlation, that basic understanding of facts about free trade was sufficient to elicit a change in terms of a "pro-free trade" attitude. Luker (1972) examined the relationship between economic knowledge and conservatism and concluded that there was a positive correlation.

William Luker's (1972) project was designed to study three areas that related to behavior. First, he examined the relationship between economic knowledge and dogmatism. To measure economic knowledge he used the Test of Understanding College Economics (TUCE), while to measure dogmatism, he used the Rokeach dogmatism scale (For the short form see Appendix A). Dogmatism refers to being closed in a way of an individual's manner of thought and belief. Milton Rokeach's value scales were based on the nature of human values and attitudes. Rokeach's theory is based on the assumption that the antecedents of human values can be traced to culture, society, and personality (Rokeach, 1960). Second, he sought to measure the degree to which a relationship between economic knowledge and opinionation existed (See Appendix B). He used the Rokeach opinionation scale to measure this relationship. The operational definition of opinionation is related to implicit value judgments such as belief-disbelief systems. The Opinionation Scale serves as a measure of general intolerance. Third, he attempted to determine if any relationship existed between economic knowledge and conservatism. Conservatism is an ideological construct which is defined by moderatism or temperance. This relationship was measured by the Conservatism Scale, used originally in the Berkeley investigations (Adorno, 1950) which contains

statements testing attitudes toward concepts related to government control of industry and others focusing on labor and capitalism. This relationship was also measured by the Rokeach Opinionation scale. His analysis of the test results showed that there was no relationship between economic knowledge and dogmatism, nor was there any relationship between economic knowledge and opinionation. The study did indicate, however, a positive relationship between economic knowledge and conservatism.

A study which replicated Luker's study (1972) was one conducted by Scott (1976). The population of the study includes the students taking two classes of introductory economics, one class of consumer economics, two classes of sociology, and one class each in psychology, philosophy, and logic. The research took place in the spring of 1976 at Texas Woman's University in Denton, Texas. The classes were divided into experimental (all economics) classes and control (noneconomics) classes.

The first instrument was designed to test attitudes. The device used a semantic differential which identifies a range of values where students rank their values or beliefs toward a concept. At the top of the separate pages were nine terms.

Democrat
 Republican
 Labor Unions
 Free Enterprise
 Capitalism
 Socialism
 Welfare Recipients
 Liberalism
 Conservatism

Below each term was a set of scales constructed in the following manner:

Wise	_____	_____	_____	_____	_____	Foolish
Good	_____	_____	_____	_____	_____	Bad
Fair	_____	_____	_____	_____	_____	Unfair
Safe	_____	_____	_____	_____	_____	Dangerous
Positive	_____	_____	_____	_____	_____	Negative

The students were given detailed instructions concerning how to respond effectively to the term. The score of the term was calculated by assigning a value of one through five, reading left to right, to each scale. The total of all scales was then computed, and a mean value was determined.

The second instrument used was the Hollingshead Two-Factor Index of Social Position. Students were asked to indicate their parent's occupation. They were also asked to give educational level of this wage earner. A class scoring was determined, based on the Hollingshead Scale. A third instrument, a researcher-designed questionnaire, developed data as to class tested, previous economics courses taken, major and age.

Instructors at Texas Woman's University administered the tests to eight classes. The instructors were asked not to tell their students what type of test was being given, but only to ask them to cooperate in an educational experiment. Before the test materials were passed out, the students were asked to give their response to certain concepts, in the interest of research.

In the analysis Table 1 shows the mean raw score, pretest and post-test, for each of the nine terms. The table also indicated the standard deviation for each term (pre and post) and the absolute change.

The analysis of the relationship between the classes showed no significant relationship. The results of the data may have indicated explanatory variables related to instructional methods should have been included. A survey of the instructors showed that they used the lecture method. Bligh (1971) suggested that lectures (one-way communication) are often less effective than other instructional methods, such as independent study, in developing critical thinking skills in students, and fostering attitudinal change toward learning.

TABLE 1
 MEAN SCORES ON THE NINE-TERM
 OPINIONATION TEST

Term	N Classes	Mean Raw Score Pretest	S.D.	Mean Raw Score Posttest	S.D.	Change
Democrat	8	3.52500	0.11650	3.57500	0.19086	+0.05000
Republican	8	3.00000	0.20000	3.15000	0.14142	+0.15000
Labor Unions	8	3.41250	0.27484	3.36250	0.15059	-0.05000
Free Enterprise	8	3.97500	0.13887	3.92500	0.21213	-0.05000
Capitalism	8	3.33750	0.26693	3.28750	0.32705	-0.05000
Socialism	8	2.80000	0.15119	2.76250	0.13025	-0.03750
Welfare Recipients	8	2.80000	0.09258	2.72500	0.14880	-0.07500
Liberalism	8	3.38750	0.14577	3.33750	0.20659	-0.05000
Conservatism	8	3.38750	0.12464	3.31250	0.16421	-0.07500

(Scott, 1976)

In an analysis of the relationship between Theoretical Economics versus Consumer Economics and the dependent variable, which is the post-test mean of the term, Scott (1976) found a significant relationship that showed the presence of a value for the independent variable pushed the raw coefficient lower or more negative for labor unions. The study also found that the Theoretical Economics class was significantly related to a lower or more negative score on the nine terms.

In summary Scott (1976) concluded:

- (1) There is no relationship between the Post-test mean of the terms and the critical independent variable Experimental/Control.
- (2) Theoretical Economics makes students more negative toward Labor Unions relative to students in Consumer Economics and students in sociology, psychology, philosophy, and logic, other things being equal.

The only relationship that emerged was the second finding. While not conclusive, this lends weight to Stigler's and Lekachman's argument that teaching market theory produces increased conservatism in students.

Rothman and Scott (1972) conducted another research project with forty-nine students enrolled in two sections of a beginning economics course at Carnegie-Mellon University. The purpose of the study was to determine what effect an introductory economics course would have on student political attitudes. The sections were pre and post-tested with 1) the Test of Understanding in College Economics (TUCE) and 2) forty-one item Social Opinion Questionnaire. This testing produced six scales to discriminate between economic liberals and conservatives.

These opinion scales were regressed against the TUCE scores with the result of a movement toward the conservative direction. An alternative implication could be that students coming into the course with conservative leanings are more proficient on the test. However, when the effect the economics course had on attitudes is questioned, then no significant relationship (post) is indicated between opinion scores and TUCE scores.

One other study conducted by Mitchell P. Rothman and James H. Scott, Jr. (1975), tends to be supportive of Luker's hypothesis concerning conservatism. When Rothman and Scott (1975) compared the effects of an introductory economics course on student political attitudes, they found that a course in economics tended to make students more conservative.

An additional study related to conservative attitudes, entitled "Effect of Class Work in Economics on Attitudes and Understanding of a Select Group of Secondary School Pupils," was conducted by Edward G. Sewell (1967). An instrument was developed to measure the liberal and conservative attitudes held by high school students. The instrument validity was determined by the fact that there was a significant difference between the mean score of groups with and without economic instruction. Of the total 922 students tested, the group who had experienced instruction in economics demonstrated more conservative attitudes than did the students who had received no economics instruction.

Current Research

In recent years, studies on economic attitudes have received considerable attention by both economists and professional educators. Soper and Walstad (1983) indicated, however, a limitation to the study of "economic attitudes" was the lack of appropriate measurement instruments to quantify the affective construct. In 1979, the Joint Council on Economic Education (JCEE) took steps to develop a two part affective-domain instrument to measure student attitudes. The result of this effort was a 28-item Survey on Economic Attitudes (SEA) which focused on two separate dimensions. The first dimension centers on students' attitudes towards economics as a discipline (ATE), and the second dimension attempts to quantify economic attitudinal sophistication (EAS) of students exposed to courses in economics (See Appendices C and D).

Results of students' affective responses to SEA were originally reported in Soper and Walstad (1983), and then from data collected in 1986, reported in Soper and Walstad (1988). The two authors reported that the two parts of the SEA are reliable measures of attitudes, and are stable over time. Soper and Walstad (1988) indicated that when combined, the SEA and the revised TEL did show that students with economics instruction showed a "more positive attitude toward the subject and possessed a higher degree of economic sophistication than did those students without economics instruction" (p. 43).

While Walstad and Watts (1985) indicated that teachers of economics in the schools tend not to teach concepts they feel they do not understand,

students do react positively to the economic concepts taught. In other words, students have an open mind with respect to exposure to economic concepts. When the National Survey of Economic Education was conducted in 1981, it showed that most teachers know little economics due to the lack of academic preparation, and thereby influence the concepts that are taught. Walstad and Watts (1985) also report that problems arise with the course content and structure. In the national survey, 49 percent of the teachers teach economics as part of another subject, usually in the social studies area. How this "infused" approach impacts learning is not yet clear.

Findings by Armento (1983) who studied curriculum guides in Developmental Economic Education Program (DEEP) schools, suggested that there were problems with the "infused" economic studies approach. The problems cited were related to weak presentation of economic concepts in the textbooks, insufficient instructional time for economics, and low level of attitudinal sophistication with regard to the student supplementary materials.

The research in economic education is voluminous. What then has been learned with respect to attitudinal change and student learning attributed to economic instruction? First, students learn economics in different ways. The best teaching strategy is to personalize education because different students need different things (Siegfried and Fels, 1979). Secondly, if students like economics, they tend to learn more and learning more indicates their attitude toward the subject will improve (Ramsett, Johnson and Adams, 1973; Karstensson and Vedder, 1974). However, even if students like the subject more, that does not mean they will learn more economics (Walstad, 1987). The

implication is that instructors need to be most concerned about finding ways to teach economics. Siegfried and Walstad (1990) suggest that "attitudes towards economics may be a product of what students learn rather than a determinant of what they learn" (p. 276).

The disturbing research findings came from Walstad and Watts (1985) where it was found that most teachers are inadequately prepared to teach economics. The researchers further state that even among the smaller percentages of teachers with substantial course work, little is known how long ago the credits were earned or the quality of the course work taken. Earlier, Bach and Saunders (1965) found that based on the number of courses taken, most teachers were inadequately prepared to teach economics.

These conclusions suggest that strengthening the teaching of economics in the schools is necessary if students are to be more adequately prepared for college work. This research will add to the knowledge of economic education, and provide a foundation for research in the area of attitudinal change and student learning.

CHAPTER III

METHODOLOGY AND ANALYTICAL FRAMEWORK

Research Model

The research model used in this study is a generalization of two categories where estimation of the variance from different sources are derived. The first category focuses on student characteristics and the second category focuses on teacher characteristics. This model may be described in a generalized functional form as follows:

$$\text{ATE} = F(\text{Economics, Course, Focus, Race})$$

$$\text{EAS} = F(\text{Economics, Course, Focus, Race}),$$

where the dependent variables in the model are Attitudes Toward Economics (ATE) and Economic Attitude Sophistication (EAS). These attitudinal surveys were administered along with the revised Test of Economic Literacy to 6570 high school students representing census regions of the country to include the Northeast, South, North Central, and West. Additionally both urban and rural school districts were included in the sample. The two-part affective domain instrument measured attitudes with respect to students' exposure to economic instruction.

The independent variables included are (ECON) denoting whether the students have had a prior economics course, (COURSE) indicating type of

course (Economics, Consumer Economics, or Social Studies), (FOCUS) relating to teaching pedagogy with respect to whether the teaching style is theoretical, practical, a combination of both approaches or neither, and (RACE), defined as White, Black, Hispanic, and other.

The 28-item Survey on Economic Attitudes (SEA) has two separate dimensions. The first dimension of the SEA attempts to quantify students' attitudes toward economics (ATE) as a subject of school study. The second dimension of the SEA attempts to characterize students' attitudinal sophistication (EAS). The students were to respond to an instrument designed to test attitudes, and the device used was a semantic differential type scale (Osgood, Succi, Tannebaum, 1957).

Each of the two parts of the two instruments (ATE and EAS) consists of fourteen statements where students responded to a five point scale. The response code used was:

1 = strongly agree

2 = agree

3 = undecided

4 = disagree

5 = strongly disagree.

These survey instruments were commissioned in 1979 by the Joint Council on Economic Education (JCEE) and initial steps named a project director and Working Committee to carry out the design of the instruments. Copies of the ATE and EAS are presented in Appendix C and D respectively.

With the adoption of this attitude–sophistication, four selection criteria were used to develop the statements:

1. The economics profession should have a consensus of opinion with respect to their agreement or disagreement of the statement.
2. The statement should be relevant to current economic issues which are controversial and not resolved by public opinion.
3. The statement must use language of limited economic jargon, appropriate to a level of high school juniors and seniors.
4. The statements should meet school district and teacher approval for use with students. (Soper and Walstad, 1983)

The two part SEA was nationally normed in May 1979, and it was found the item–to scale correlations are significant (0.01 level), and the reliability estimate is good in relation to other affective measures (Soper & Walstad, 1983). Validity assessment of the EAS instrument was determined by a few select economists (N=13), and by a 100 per cent sample of Joint Council affiliated Council and Center Directors. A clear consensus resulted where agreement or disagreement was greater than 70 per cent on the four items (Soper and Walstad, 1983).

In general, Soper and Walstad (1983) concluded that the means for both ATE and EAS move upward from the high school sample to the college level sample. Additionally, there is evidence that the SEA probably measures a separate dimension of learning by students and that the affective domain is much more difficult to change than student cognition.

Affective Domain

Affective objectives embrace a range of human responses. These include active emotions, solving problems, and creating an interest in some kind of human experience. These objectives also include having an attitude toward an experience, expressing one's feelings and views on a variety of subjects. Behavioral objectives specify in operational terms the actions, feelings, and thoughts of students that are expected to develop as a result of the instructional process.

Objectives of education, according to Bloom (1956) describe the types of educational experiences that produce educational development. The question centered to the theory of behavioral objectives is--what types of educational experiences produce what types of educational development?

This study focuses on the affective domain. Affect objectives vary from simple attention to selected phenomena to complex objectives expressed as interests, attitudes, values and emotional sets or biases. In the last analysis the question posed by behavioral science research is whether a person actively thinks without feeling, or acts without thinking.

The research on the relationship between cognitive achievement and attitudes and values shows them to be statistically independent (Mayhew, 1958). What is implied is that the relationship between the cognitive domain and the affective domain is too low to predict one type of response, effectively, from the other (Bloom, 1956).

Teaching for Affective Learning

Instruction for learning has long assumed that if a student learned the information of a course, a direct consequence of this learning would be sophistication in problem solving. The teacher's responsibility, then, was reduced to that of providing learning experiences designed to appraise the students' progress. However, as a result of the research of Tyler (1934, 1951) and others this belief in an automatic development of higher mental processes is not widely held. The evidence suggests that affective behaviors develop when effective teaching and appropriate learning experiences are provided for students (Bloom, 1956).

As the learner internalizes values by attaching worth to an activity or behavior, the affective domain is initiated with respect to several categories. The lowest category is receiving, developing some consciousness of the current situation. At the next level the learner responds to a situation, complying with expectations. Valuing, the next category, describes a person who has internalized a conviction. Then the learner encounters a complex value system, that requires organization. Lastly, when the learner accepts a particular view of the world, a characteristic "lifestyle" is developed. This, then describes the categories of character development, a person who acts for principles, who is neither a passive conformist nor an intolerant reformer (Bloom, 1956).

The analytical framework attempts to distinguish between students exposed to economics as a subject and attitudinal change. A limitation to the study is the systematic effort to collect evidence in the area of the affective domain parallel to the volume of research in the cognitive domain.

Hypothesis Testing and Summary

When hypothesis testing is seen as a problem, two alternative actions can be taken: accept the null hypothesis or reject the null hypothesis. The first problem is to know whether a population parameter has changed from or differs from a particular value. The null hypothesis, H_0 supplies the single value about which the hypothesized sampling distribution is centered. The second type of problem is to test whether the sample came from a population that has a parameter less or greater in value than a hypothesized value.

The basic hypothesis, H_0 , tested for possible rejection is referred to as the null hypothesis. Hypothesis H_1 is generally called the alternative hypothesis. To reject the null hypothesis when in fact it is true is referred to as a "Type I error." To accept the null hypothesis when it is false is described as a "Type II error" (Hamburg, 1974, p. 167).

Table 2 summarizes alternative situations to be tested with the associated problems just discussed.

TABLE 2
 THE RELATIONSHIP BETWEEN ACTIONS
 CONCERNING A NULL HYPOTHESIS
 AND THE TRUTH OR FALSENESS
 OF THE HYPOTHESIS

Action Concerning Hypothesis H_0	State of Nature	
	H_0 is True	H_0 is False
Accept H_0 Error	Correct	Type II Decision
Reject H_0 Decision	Type I	Correct Error

(Hamburg, 1974)

In symbols, Table 2 can be shown to read:

$$H_0: u_1 = 0$$

$$H_0: u_1 \neq 0$$

This study then attempts to test the condition which rejects the null hypothesis, and conclude that economics instruction is statistically significant. In other words, exposure to formal instruction in economics at the high school level may have an impact on students' attitudes toward economics, and attitudinal sophistication, thereby showing a measurable influence on opinions toward economic issues.

CHAPTER IV

ANALYSIS OF THE DATA

Research Procedure

The experimental design and procedure provided a four-dimensional matrix which might impact student learning and the educational experience.

Two of the four dimensions represent outputs:

1. Students' attitudes toward economics (ATE) as a discipline measured by the differences in the pre and posttest.
2. Economic attitudinal sophistication of students' (EAS) measured by the differences in the pre and posttest.

The other dimensions are inputs:

3. Student characteristics, measured by previous exposure to courses in economics, type of course, and race.
4. Teacher characteristics, measured by instructional focus.

Table 3 reports the variables, their description and means, and standard deviations. The original sample was based on a population of students who elected to take a course in economics. This nonrandom sampling results in a selective bias, where students were mandated into courses that contained economics instruction.

TABLE 3
DESCRIPTION AND MEANS OF VARIABLES

		N = 6570	
Dummy Variables		ATE2	EAS2
COURSE	1 = economics	43.40	46.92
	2 = consumer economics	(9.20)	(6.85)
	3 = social studies		
RACE	1 = White 2 = Black	43.40	46.91
	3 = Hispanic 4 = other	(9.22)	(6.90)
ECON	Prior economics course	43.64	46.98
	1 = yes 2 = no	(9.22)	(6.95)
FOCUS	Way economics is taught	43.98	47.13
	1 = theoretical	(9.22)	(6.94)
	2 = how to		
	3 = both		
	4 = neither		

* Standard deviations in parenthesis

The two directions of focus were on student characteristics and teacher characteristics. The course content was to provide students with a clearer understanding of economic principles to enable them to apply that knowledge to current policy issues. The criterion for teacher effectiveness was to measure the change in the level of attitude sophistication of students, and to determine if students' attitude toward economics has a measured change.

The analysis of the data indicate that students exposed to economics instruction at the high school level showed little measurable differences in attitudinal changes. However, the results of the study indicate there are statistically significant differences among the group means, with respect to type of course the students were enrolled in. Additionally, the method of instruction does positively impact the level of sophistication of students when policy issues are addressed.

Analysis of Covariance

The research used the analysis of covariance (ANCOVA) as a technique for the study. Covariance is a form of analysis of variance (ANOVA), and is a statistical rather than experimental method of equating groups on one or more variables.

When groups are pretested, then administered a treatment and then posttested, many would assume the procedure would be to (1) subtract each student's pretest score from their posttest score, (2) compute the gain, and then (3) calculate a t value for the difference between the two average mean differences. However, the problem arises when a subject with a pretest low score is compared to a subject who scores very high on the pretest. The

question then becomes who has gained more? If there is a difference of performance of the groups on the pretest, the preferred posttest analysis is the analysis of covariance (ANCOVA), because it adjusts the posttest scores for initial differences on the variables being tested. In this study the analysis of covariance is a superior method for controlling for pretest differences (Roscoe, 1975).

Essentially, ANCOVA adjusts posttest scores for initial differences, and then compares the adjusted scores. Therefore, any variable that is correlated with the dependent variable can be controlled by applying ANCOVA. By using covariance the study attempts to reduce variation in posttest scores which is attributable to another variable. An important conclusion would be for all posttest variance to be attributable to treatment conditions.

Experimental Research

Analysis of covariance is a control technique used in experimental research. In experimental research, the researcher manipulates the independent variables, and observes the effect on one or more dependent variables. The results of experimental research are predictive in nature. The actual experiment is conducted in order to confirm or reject the experimental hypothesis. In other words, the researcher attempts to determine whether the treatment made a difference.

A problem associated with this type of research is that if the treatment (those students exposed to economics instruction) received by the groups are not sufficiently different to make a difference. This is the problem of selectivity

bias. If participation in an economics course is based upon self-selection, it is possible that those who choose the full semester course in economics did so because they were biased toward the course. Results based on these nonrandom samples are, therefore, likely to be selectively biased when applied to the national database used in this research.

The economic education literature indicates (Fels, 1990) that there is no best teaching methodology, and no consensus supporting a learning theory which explains the educational experience. In one study Hansen, Kelly, and Weisbrod (1970) stated that "It seems intuitively clear that different types of students, as defined by previous academic performance, desire for theoretical rigor, degree of social concern, family background and the like, will benefit differentially, depending upon course content and instructional content" (p. 365).

Multiple Regression Estimation

Regression analysis was used for assessing the influence of the pre-TEL Score (Test of Economic Literacy), (SEX), (COURSE), (RACE), (ECON), ATE1, EAS1, (pretest attitudinal surveys), and (FOCUS). The dependent variables were the posttest ATE and EAS. In its simplest form, the regression model is a single, linear equation with specific assumptions about the source of error and interrelationships among variables.

The model focuses on student performance and economic instruction and the impact on attitudes. The regression is analyzed through a descriptive model of learning defined as:

$$(1) Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_k X_{ki} + \epsilon_i$$

where Y is attitudinal change, the X_i are the learning and instructional inputs.

X_{ki} is the k^{th} covariate, where $k = 1, 2, \dots, K$, for the i^{th} subject which is the regressor. X_{ki} may represent an (0–1) accurately measured explanatory variable that independently affects Y , but has not been controlled in the research design.

β_k is a parameter to be estimated and reflects the impact of X_{ki} on Y , holding all other variables constant.

ϵ_i is an error that results from the omission of variables.

According to the model, student attitudinal change is dependent on various student characteristics and variables related to instruction. The dependent variable is the two–part affective domain instrument to measure student attitudes as a result of exposure to economics instruction.

Economists and other social scientists rely upon the use of regression analysis when studying behavioral relationships. However, there are statistical problems that affect either the estimated coefficients or tests of the hypotheses.

Simultaneity

Problems caused by errors in the measurement of regression are sometimes referred to as simultaneous equation biases that result from ignoring the relationship within a system of equations. Walstad (1979) built a two–equation production system where a posttest economic understanding and a posttest attitudinal measure are endogenous variables. This type of regression

analysis was based on a two-stage least squares method to estimate the parameters in the model.

Recently, however, Chizmar and Zak (1982) criticized the use of the two-stage least squares method as representations of educational experiences. This criticism was based upon the view that learning in the cognitive (knowledge level) and affective domains as being joint products which cannot be represented by interrelated but separate production equations. The argument is, according to Chizmar and Zak (1982), that if cognitive and affect learning are produced by the same process, then neither can be appropriately identified. Because of this simultaneous interaction, it may be incorrect to assume that all the independent variables in an equation are not correlated. The consequence then is that simultaneous equation techniques break down.

Multicollinearity

Multicollinearity, encountered in multiple regression analysis, implies that at least two of the independent variables are "highly" correlated. This results in biased least-squares estimators to be imprecise and inefficient. Since poor design cannot be completely eliminated, when multicollinearity is suspected, a common technique is to eliminate one of the highly correlated variables from the regression.

In this analysis, two performance models are studied. The dominate model is the analysis of covariance (ANCOVA), and the second estimation uses regression analysis to support the findings of the overall study.

Analysis of Posttest Data

The t-Test

The t-test is used to determine whether two means are statistically different at a given probability level. The strategy of the t-test is to compare the actual mean difference observed with the difference expected by chance. In other words, the numerator for a t-test is the difference between the sample means X_1 and X_2 , and the denominator is the standard error of the difference between the means. The denominator, also described as the chance difference which would be expected if the null hypothesis were true, is functionally related to both the sample size and group variance. The t ratio determines whether the observed difference is significantly larger than the difference which would be expected by chance. After the coefficient (numerator) is divided by the standard error (denominator), the t ratio value is then compared to the appropriate t table value, depending on the level of probability and the degrees of freedom. If after comparing the values, the calculated t value is equal to or greater than the table value, the null hypothesis then is rejected.

Measures of Relationships: Correlation

Additionally, it should be pointed out when two variables are correlated, the result is a correlation coefficient. A correlation coefficient is a decimal number between .00 and +1.00, or .00 and -1.00. If the coefficient is near +1.00, the variables are positively correlated. However, if the coefficient is near

.00, the variables are not related. If the coefficient approximates -1.00 , the variables are inversely related (Gay, 1987).

Located within a scale from -1.00 to $+1.00$, the value of r (the Pearson correlation coefficient) gives information about the direction of a linear relationship. An r relationship in excess of approximately $.50$ in either a positive or negative direction would qualify as a strong correlation. Interpretation of correlation depends in part on how it is to be used. For example in research designed to explore or test hypotheses, a correlation coefficient can be interpreted in terms of statistical significance. When interpreting a correlation, it must be concluded that the research concerns a relationship only, and not a cause-effect relationship (Gay, 1987).

Correlation and t-test for ATE and EAS

Table 4 represents a t-test for the dependent variables ATE and EAS. For the dependent variable, attitude toward economics (ATE), the t-test is -2.578 which indicates that the null hypothesis is probably false. If the null hypothesis is rejected, then the alternative hypothesis is probably true, even though the pre/post means, (ATE1, ATE2, respectively), are clearly very close in value. The economic attitude sophistication (EAS) also is statistically significant at -2.445 . The p values represent the degree of rarity of the t-test result. In this hypothesis test summary there is evidence that on average, ATE1/ATE2 indicate small decreases in attitudes toward economics:

$$[t (2896) = -2.578, p < .001]$$

This is to indicate that the difference in attitudes toward economics is statistically significant with a greater than 99% probability the result was not attributable to chance.

Similarly, there is evidence that on average, EAS1/EAS2 indicate decreases in economic attitude sophistication:

$$[t (2280) = -2.445, p < .001]$$

This illustrates that the difference in economic attitude sophistication is statistically significant with a 99% probability the result was not attributable to chance.

TABLE 4
HYPOTHESIS TEST SUMMARY
t-TEST FOR TWO DEPENDENT VARIABLES:
ATE AND EAS

Variables	N	Means	S.D.s	T-test	Correlation
ATE2	2898	43.403	9.197	T -2.578	R 0.648
ATE1		43.764	8.711	P 0.0100	DF 2896 P 0.0000
EAS2	2282	46.862	6.891	T -2.445	R 0.511
EAS1		47.202	6.567	P 0.0145	DF 2280 P 0.0000

Results of the Data on Student and Teacher Characteristics

The independent variables (Course, Race, Economics, and Focus) were measured separately when analyzing the relationship each variable had on ATE and EAS, the dependent variables. Table 5 through Table 8 show the results of the fourteen-item Attitude Toward Economics (ATE) scale. Tables 9 through 12 repeated the process with a different dependent variable using the fourteen-item Economic Attitude Sophistication (EAS) scale.

The research analyzed the separate contribution of each of the independent variables to explain the variation of the dependent variables. Additionally, a regression model, using the same independent variables was run to measure the correlation of the explanatory variables on the two dependent variables. The hypotheses to be tested were whether the variation among the sample means, and variation within the sample means with respect to student and teacher characteristics reflect chance errors of the sampling process. Under the null hypotheses, that the population means are equal, the between-column variation and between-row variation would essentially be expected not to differ significantly, since they reflect the same type of chance sampling errors. Alternatively, if the null hypotheses are false, then the between-column variation should significantly exceed the between-row variation.

In Table 5 the posttest data on ATE2 (the 2 refers to the posttest survey results) shows the mean and standard deviation of the three factors which represent course types – economics = 1, consumer economics = 2, and social

studies – 3. As discussed previously, the three course types are the same for EAS2. With respect to ATE2 – Course, the Critical F value which tests the homogeneity of between–subject variances (homogeneity refers to testing the null hypothesis that $n = 0$) is equal to 1.18. The observed F value for C (Course) is 21.127. Therefore, if the observed F (21.137) \geq Table value of F (1.18) then the decision is to reject H_0 , the null hypothesis. The interpretation is that type of course does affect the students' mean and is statistically significant.

TABLE 5
VARIANCE ESTIMATES
DEPENDENT VARIABLE: ATE2 – COURSE

N's, means and standard deviations based on dependent variable: ATE2

* Indicates statistics are collapsed over this factor

Factors:	C	N	Mean	S.D.
	*	2898	43.4030	9.1973
	1	1397	45.3629	9.1574
	2	515	42.1592	8.4237
	3	986	41.2759	9.0623

Fmax for testing homogeneity of between subjects variances: 1.18

Number of variances = 3 df per variance = 816.

Analysis of Variance		Dependent variable: ATE2			
Source	df	SS (H)	MSS	F	P
Between Subjects	2987	245057.2500			
ATEP1	1	102782.5230	102782.5230	2121.232	0.0000
C (COURSE)	2	2048.3970	1024.1985	21.127	0.0000
Subj w Groups	2894	140226.3280	48.4542		

Table 6 indicates the Table F value for Race is 1.58 and the calculated value is 0.777. If the observed or calculated F value $0.777 < \text{the critical value } 1.58$, that the observed differences between group means is not statistically significant, then this outcome assumes that the null hypothesis cannot be rejected. This indicates Race is probably not a factor in changing students' attitudes toward economics.

TABLE 6
VARIANCE ESTIMATES
DEPENDENT VARIABLE: ATE2 - RACE

N's, means and standard deviations based on dependent variable: ATE2

* Indicates statistics are collapsed over this factor

Factors:	R.	N	Mean	S.D.
*		2826	43.4016	9.2203
1		2363	43.2907	9.4442
2		340	43.8647	7.8232
3		42	44.8810	9.6378
4		81	43.9259	7.6792

A total of 601 observations had missing data on a dependent variable or covariate or inappropriate factor level codes.

Fmax for testing homogeneity of between subjects variances: 1.58

Number of variances = 4 df per variance = 100.

Analysis of Variance		Dependent variable: ATE2			
Source	df	SS (H)	MSS	F	P
Between Subjects	2825	240165.0000			
ATEP1	1	101578.0390	101578.0390	2069.376	0.0000
R (RACE)	3	114.4798	38.1599	0.777	0.5109
Subj w Groups	2821	138472.4840	49.0863		

Table 7 shows that the independent variable, ECON (prior economics course) is not significant with respect to a change in attitudes of students toward economics as an academic course of study. The calculated value of F (0.040) < the table value of F (1.11). The decision is to accept H₀.

TABLE 7
VARIANCE ESTIMATES
DEPENDENT VARIABLE: ATE2 – ECON

N's, means and standard deviations based on dependent variable: ATE2

* Indicates statistics are collapsed over this factor

Factors:	E	N	Mean	S.D.
	*	2645	43.6416	9.2169
	1	1576	43.3407	9.0178
	2	1069	44.0851	9.4897

A total of 782 observations had missing data on a dependent variable or covariate or inappropriate factor level codes.

Fmax for testing homogeneity of between subjects variances: 1.11

Number of variances = 2 df per variance = 1273.

Analysis of Variance		Dependent variable: ATE2			
Source	df	SS (H)	MSS	F	P
Between Subjects	2644	224610.4220			
ATEP1	1	93800.5780	93800.5780	1894.543	0.0000
E (ECON)	1	1.9821	1.9821	0.040	0.8415
Subj w Groups	2642	130807.8590	49.5109		

Table 8 asserts that the independent variable, FOCUS, has an observed value of F (2.311) > a critical value of F (1.84). Therefore we reject H₀, and conclude that the way economics is taught does affect students' attitudes toward economics.

TABLE 8
VARIANCE ESTIMATES
DEPENDENT VARIABLE: ATE2 – FOCUS

N's, means and standard deviations based on dependent variable: ATE2

* Indicates statistics are collapsed over this factor

Factors:	F	N	Mean	S.D.
*		2375	43.9815	9.2168
1		834	44.2722	9.2513
2		454	42.3921	8.6190
3		1063	44.4525	9.4154
4		24	43.0833	6.9340

A total of 1052 observations had missing data on a dependent variable or covariate or inappropriate factor level codes.

Fmax for testing homogeneity of between subjects variances: 1.84

Number of variances = 4 df per variance = 86.

Analysis of Variance		Dependent variable: ATE2			
Source	df	SS (H)	MSS	F	P
Between Subjects	2374	201669.1090			
ATEP1	1	81379.3670	81379.3670	1608.062	0.0000
F (FOCUS)	3	350.8557	226.9519	2.311	0.0737
Subj w Groups	2370	119938.8830	50.6071		

Table 9 through Table 12 analyzed the fourteen-item Economic Attitude Sophistication (EAS) scale. The independent variables were the same as those analyzed in the ATE survey. The objective was the same for both surveys, that all of the estimates will reflect random error, but the estimate of variability between groups also will reflect the treatment effect.

The variance estimates for EAS2 – Course, where EAS2 is the posttest survey result shows the calculated F value of C (Course) 9.134 > the table F value 1.11. Refer to Table 9 where the decision is to reject H_0 . This can be interpreted type of course does affect the students' sophistication with respect to economic policy.

TABLE 9
 VARIANCE ESTIMATES
 DEPENDENT VARIABLE: EAS2 - COURSE

N's, means and standard deviations based on dependent variable: EAS2

* Indicates statistics are collapsed over this factor

Factors:	C	N	Mean	S.D.
*		2178	46.9188	6.8534
1		1099	47.6615	6.9499
2		374	45.4198	6.7608
3		705	46.5348	6.5950

A total of 720 observations had missing data on a dependent variable or covariate or inappropriate factor level codes.

Fmax for testing homogeneity of between subjects variances: 1.11

Number of variances = 3 df per variance = 599.

Analysis of Variance		Dependent variable: EAS2			
Source	df	SS (H)	MSS	F	P
Between Subjects	2177	102253.0000			
EAS1	1	27056.4043	27056.4043	788.797	0.0000
C (COURSE)	2	626.5872	313.2936	9.134	0.0001
Subj w Groups	2174	73470.0080	34.3008		

In Table 10 RACE, the independent variable show the calculated F value 1.671 > the table value 1.13. Thus the experimental outcome would be to reject H_0 , in that RACE appears to be statistically significant with respect to attitudinal sophistication of students.

TABLE 10
VARIANCE ESTIMATES
DEPENDENT VARIABLE: EAS2 - RACE

N's, means and standard deviations based on dependent variable: EAS2

* Indicates statistics are collapsed over this factor

Factors:	R	N	Mean	S.D.
*		2225	46.9110	6.9011
1		1895	47.1441	6.8880
2		229	45.1703	6.9182
3		36	45.0278	6.5574
4		65	47.2923	6.5041

A total of 1202 observations had missing data on a dependent variable or covariate or inappropriate factor level codes.

Fmax for testing homogeneity of between subjects variances: 1.13

Number of variances = 4 df per variance = 82.

Analysis of Variance		Dependent variable: EAS2			
Source	df	SS (H)	MSS	F	P
Between Subjects	2224	105918.4610			
EAS1	1	27581.6289	27581.6289	783.405	0.0000
R (RACE)	3	176.4424	58.8141	1.671	0.1698
Subj w Groups	2220	78160.3910	35.2074		

In Table 11 whether students had received prior economics instruction seems not to have any measurable difference. The calculated F value 0.695 < the table value 1.03. Therefore the experiment does not reject H_0 .

TABLE 11
VARIANCE ESTIMATES
DEPENDENT VARIABLE: EAS2 - ECON

N's, means and standard deviations based on dependent variable: EAS2

* Indicates statistics are collapsed over this factor

Factors:	E	N	Mean	S.D.
	*	2083	46.9765	6.9149
	1	1294	46.7009	6.9470
	2	789	47.4284	6.8422

A total of 1344 observations had missing data on a dependent variable or covariate or inappropriate factor level codes.

Fmax for testing homogeneity of between subjects variances: 1.03

Number of variances = 2 df per variance = 979.

Analysis of Variance		Dependent variable: EAS2			
Source	df	SS (H)	MSS	F	P
Between Subjects	2082	99551.8750			
EAS1	1	26618.7676	26618.7676	759.402	0.0000
E (ECON)	1	24.3753	24.3753	0.695	0.4044
Subj w Groups	2080	72908.7340	35.0523		

Table 12 shows that the independent variable FOCUS had a calculated F value 5.018 > the table or critical value 3.48. Therefore the experiment rejects H_0 , and indicates that FOCUS (the way economics is taught) does affect the students' attitudinal sophistication as they are exposed to the method of instruction by teachers in high school economics courses.

TABLE 12
VARIANCE ESTIMATES
DEPENDENT VARIABLE: EAS2 - FOCUS

N's, means and standard deviations based on dependent variable: EAS2

* Indicates statistics are collapsed over this factor

Factors:	F	N	Mean	S.D.
*		1888	47.1282	6.9385
1		667	47.4438	6.9771
2		362	45.2376	6.4871
3		843	47.7367	6.9996
4		16	44.6875	3.7544

A total of 1539 observations had missing data on a dependent variable or covariate or inappropriate factor level codes.

Fmax for testing homogeneity of between subjects variances: 3.48

Number of variances = 4 df per variance = 58.

Analysis of Variance		Dependent variable: EAS2			
Source	df	SS (H)	MSS	F	P
Between Subjects	1887	90844.8200			
EAS1	1	24510.8652	24510.8652	701.344	0.0000
F (FOCUS)	3	526.1047	175.3682	5.018	0.0018
Subj w Groups	1883	65807.8520	34.9484		

A summary of the findings indicate that the variables RACE and ECON are not statistically significant, but that COURSE and FOCUS are factors which affect students' attitudes toward economics. When the survey on attitude sophistication was analyzed COURSE, RACE, and FOCUS were significant. Prior economics instruction, however, showed not to be statistically significant.

A multiple regression estimation is shown in Table 13 and 14. The independent variables are FOCUS, COURSE, RACE, ECON, SCORE 1 (Pre TEL Score), SEX, and ATE1, (EAS1 in the second model). The dependent variables are ATE2 and EAS2.

The predictive equations are specified as:

$$\begin{aligned} \text{ATE2} = & \beta_0 + \beta_1 \text{ FOCUS} + \beta_2 \text{ COURSE} + \beta_3 \text{ RACE} + \beta_4 \text{ ECON} \\ & + \beta_5 \text{ SCORE 1} + \beta_6 \text{ SEX} + \beta_7 \text{ ATE1} \end{aligned}$$

where

$$\begin{aligned} \text{EAS2} = & \beta_0 + \beta_1 \text{ FOCUS} + \beta_2 \text{ COURSE} + \beta_3 \text{ RACE} + \beta_4 \text{ ECON} \\ & + \beta_5 \text{ SCORE 1} + \beta_6 \text{ SEX} + \beta_7 \text{ EAS1} \end{aligned}$$

The results from estimating the ATE2 equation indicate FOCUS, ECON, and RACE do not measurably explain the posttest score ATE2. SEX, COURSE, Pre TEL Score (ATE) and ATE1 do, however, show a statistically significant impact. The estimated regression for EAS 2 indicates Pre TEL Score (EAS), and EAS1 have a statistically significant effect. The independent variables FOCUS, COURSE, RACE, ECON and SEX did not measurably explain EAS2. These results are shown in Tables 13 and 14.

Still another interpretation is related to R^2 . The coefficient of multiple correlation, often denoted R, indicates the degree to which variation in the

variations in the independent variables. The value of R^2 for the first equation is .44 which indicates that 44 percent of the total variability in ATE2 can be explained by the independent variables ATEP1, SCORE 1, SEX, and COURSE. The second equation has a R^2 value of .14 with the explanatory variables including EAS1, and SCORE 1.

Table 15 summarizes the results from both regression equations. Columns 1 and 2 present the results as measured by ATE2 and EAS2. Student characteristics as measured by the Pre-TEL score, and the pre ATE and EAS scores showed a positive impact on attitudinal change. Further, a relationship does exist between students' attitudes toward economics as a subject, and the type of course students choose. When measuring the impact of being male or female, the regression results indicate that males are more likely to elect an economics course than females.

A teacher characteristic, FOCUS, which is directed toward instructional methods, showed no statistically significant results on either attitudinal sophistication or how well students liked economics as a subject. A student's race or prior instruction in economics was not statistically significant in the regression analysis.

TABLE 13

MULTIPLE REGRESSION
DEPENDENT VARIABLE: ATE2

Variables Entered: FOCUS
 COURSE
 RACE
 ECON
 SCORE 1
 SEX
 ATE1

Multiple R 0.66663
R-Square 0.44440
Adjusted R-Square 0.44208
Standard Error 6.86902

Analysis of variance

Source	DF	SS	MSS	F	P
Regression	12	108727.308	9060.609	192.029	0.0000
Residual	2881	135935.486	47.183		

Variables in the Model

Variable	Beta	Std. Error	t Statistic	p-value
FOCUS				
F1	-.011768	.445774	-.026	.9789
F2	-.118272	.521025	-.227	.8204
F3	-.418641	.448327	-.934	.3505
COURSE				
C1	1.642015	.401823	4.086	.0000
C2	.144930	.469355	.309	.7575
RACE				
R1	-.602036	.573796	-1.049	.2942
R2	.223084	.676829	.330	.7417
R3	1.472786	1.200408	1.227	.2200
ECON	-.262230	.328748	-.798	.4251
SCORE 1	.123679	.019612	6.306	.0000
SEX	-1.369086	.258166	-5.303	.0000
ATE1	.627157	.015868	39.523	.0000

TABLE 14
 MULTIPLE REGRESSION
 DEPENDENT VARIABLE: EAS2

Variables Entered: FOCUS
 COURSE
 RACE
 ECON
 SCORE 1
 SEX
 EAS 1

Multiple R 0.37876
 R-Square 0.14346
 Adjusted R-Square 0.13962
 Standard Error 6.38992

Analysis of variance					
Source	DF	SS	MSS	F	P
Regression	11	16775.687	1525.062	37.350	0.0000
Residual	2453	100158.774	40.831		

Variables in the Model

Variable	Beta	Std. Error	t Statistic	p-value
FOCUS				
F1	.259789	.465730	.558	.5770
F2	.136263	.527408	.258	.7961
F3	.631891	.457395	1.382	.1673
COURSE				
C1	.823391	.424357	1.940	.0525
C2	-.568761	.486522	-1.169	.2425
RACE				
R1	.781200	.561315	1.392	.1641
R2	.234792	.677886	.346	.7291
R3	.687722	1.160965	.592	.5537
ECON	.044877	.345091	.130	.8965
SCORE 1	.320653	.018349	17.475	.0000
SEX	.481928	.260074	1.853	.0640
EAS 1	.44984	.022450	24.109	.0000

TABLE 15
REGRESSION COEFFICIENTS

Dependent Variables:	ATE2 (1)	EAS2 (2)
Independent Variable		
ATE 1	0.62715 (39.523)*	--
EAS 1	--	0.4498 (24.109)*
COURSE	1.64201 (4.086)*	--
SCORE 1	.12367 (6.306)*	.32065 (17.475)*
SEX	-1.36908 (-5.303)*	--

* Significance at the .01 level

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

One of the purposes of the research described in this study was to see if a link could be found between instructional methods and attitudinal changes of students. Attitude changes were studied by including both variables related to student and teacher characteristics. If students do react to different teaching strategies, it would seem reasonable to explore classroom research directed toward enhancing teacher effectiveness. This research has shown that a small statistically significant relationship does exist between attitude change and sophistication in economic education.

Students whose beliefs have moved toward a more logical, clear, and defined understanding of policy issues show greater sophistication in reasoning. For example, a student's self-selection of type of course was shown to have had a positive impact on how well students liked economics. Additionally, students' economic sophistication showed a positive gain. This is clear when SCORE 1 (Pre-TEL score) was regressed against the post attitude surveys. SCORE 1 showed a high degree of significance toward changes in attitudes.

This establishes a link between knowledge of economics and the affective domain. This means that students with a higher stock of knowledge, the more likely that the course material will reinforce what students already know. The implication as shown through previous research is that increases in knowledge will lead to improved critical thinking, which can translate into attitudinal change.

Another result indicates that FOCUS (the way economics is taught), does have a marginal impact on whether students like economics as a discipline and increased attitude sophistication. However, when FOCUS was regressed against the attitudinal surveys in the multiple regression, it was not statistically significant. The problem with the difference of means tests was that there was no allowance for controlling for other variables that may have had an impact on survey scores. The regression equation forced all of the variables into the model and did allow for control of the variables. RACE showed no impact on attitudinal change. However, the regression results indicate a negative change in attitudes for females.

Finally, while selected variables are known to be statistically significant, the variation of means are so slight, no predictive conclusions can be drawn with certainty. However, the results do seem to confirm that the level of economic knowledge plays a role in determining the attitudes toward economics as a subject as well as students' values and beliefs concerning economic issues.

Conclusion

While there is evidence of increased gains in knowledge of economic concepts, there is far from enough evidence to indicate economics instruction impacts the affective domain of high school students' learning. The affective domain, which describes changes in interests, attitudes, and value judgments has been shown to impact a student's behavior. Affective learning is an important part of the research in economic education for several reasons. First, as students gain in knowledge of economics, they should then be more able to apply that understanding to economic policy issues. Secondly, as students gain in sophistication (the ability to apply understanding to the accepted values of an academic discipline), it can therefore become a meaningful dimension used in determining and comparing different methods of instruction for assessing teaching effectiveness.

The purpose of this study was to provide a linkage between attitudinal change toward economics among students and sophistication with respect to value judgments, and teacher characteristics focusing on instruction. While there is not substantial evidence to confirm this linkage, there is an implied positive direction between the way a teacher teaches and learning on the part of students in high school exposed to economics instruction.

Recommendations

What is needed is to research instructional methodology and to come to conclusions about how teaching styles translate into effective learning. The

dominant model for teaching economics is the "infusion" approach where economics instruction is integrated into a social studies or consumer economics course. At the secondary level, economics reaches few students as a separate course of study. This is shown in the empirical results where not having had a free standing course in economics results in students being less prepared with respect to economics as a subject. With this type of curriculum, it is debatable, given the weak background of most teachers, whether much economics is learned. Consequently, the limitations to this study are interrelated to the recommendations for future research.

Limitations of Study and Need for Future Research

What we do know is that there are test instruments available which measure both the cognitive and affective domains. These instruments have received rigorous analysis with respect to content validity, reliability and norming. However, more research remains to be done studying the problems economic education faces with respect to teacher training, curriculum structure, and instructional materials.

Earlier studies concerning economic education have several limitations. The first limitation was the failure to take into account students' exposure to economics over a period of time extending into a student's post-secondary education. This problem suggests the need for collection of periodic and

economics over a period of time extending into a student's post-secondary education. This problem suggests the need for collection of periodic and reliable data, and perhaps monitoring the academic progress of students who remain in school from the earliest exposure to economics instruction through the college level.

A second limitation focuses on the teachers' preferred teaching style. Future research need to be directed toward the impact of structured lectures compared to those focusing on independent study, where the course emphasizes writing intensive assignments. Previous studies suggest students' learning styles are tied to instructional methods. These limitations suggest that if students' learning styles are related to their ability, preassessment of students' learning styles should be linked to the appropriate instructional design.

Further research might not only replicate the present results, but also assess the needs of students during their academic life. Additionally, along with using cognitive and affect instruments, a teacher effectiveness evaluation should be used to measure the teacher's enthusiasm, organization of the course, presentation of materials, and overall appreciation of the subject. This might help in identifying both the learning process and how increased teacher training might lead to greater attitudinal sophistication for the student as well as the teacher.

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APPENDIXES

APPENDIX A

SHORT-FORM DOGMATISM SCALE

The Rokeach dogmatism scale uses a personal interview technique. Prior to administering the dogmatism scale, the interviewer reads a set of instructions explaining that some statements persons have made were recorded for evaluation by the person being interviewed. Respondents are given a 5x8 index card which contains the following description:

Agree	Disagree
1. Agree a little	1. Disagree a little
2. Agree on the whole	2. Disagree on the whole
3. Agree very much	3. Disagree very much

Should the respondent volunteer a "don't know" answer, his response is coded "0". Two separate responses were recorded, first an "agree" or "disagree," then the number 1, 2, or 3.

The interviewer then read the following statement and the respondent replied to the 40 items: We want your *personal* opinion on each statement. When I read each one, first tell me whether . . . in general . . . you agree or disagree with it . . . then tell me a number . . . one, two, or three . . . that indicates how strongly you agree or disagree with it.

ROKEACH'S DOGMATISM SCALE

In this complicated world of ours the only way we can know what's going on is to rely on leaders or experts who can be trusted.

My blood boils whenever a person stubbornly refuses to admit he's wrong.

There are two kinds of people in this world: those who are for the truth and those who are against the truth.

Most people just don't know what's good for them.

Of all the different philosophies which exist in this world there is probably only one which is correct.

The highest form of government is a democracy and the highest form of democracy is a government run by those who are most intelligent.

The main thing in life is for a person to want to do something important.

I'd like it if I could find someone who would tell me how to solve my personal problems.

Most of the ideas which get printed nowadays aren't worth the paper they are printed on.

Man on his own is a helpless and miserable creature.

It is only when a person devotes himself to an ideal or cause that life becomes meaningful.

Most people just don't give a "damn" for others.

To compromise with our political opponents is dangerous because it usually leads to the betrayal of our own side.

It is often desirable to reserve judgment about what's going on until one has had a chance to hear the opinions of those one respects.

The *present* is all too often full of unhappiness. It is only the *future* that counts.

The United States and Russia have just about nothing in common.

In a discussion I often find it necessary to repeat myself several times to make sure I am being understood.

While I don't like to admit this even to myself, my secret ambition is to become a great man, like Einstein, or Beethoven, or Shakespeare.

Even though freedom of speech for all groups is a worthwhile goal, it is unfortunately necessary to restrict the freedom of certain political groups.

It is better to be a dead hero than to be a live coward.

(Troidahl and Powell, 1965)

APPENDIX B

THE OPINATION SCALE

The purpose of the Opinionation Scale serves as a separate measure of general intolerance. Rokeach (1960) accepted the assumption that the more closed our belief systems, the more we will reject others who disagree with our beliefs, and, conversely, the more we will accept others because they agree with us. Rokeach concludes that opinionated language seems to be the best indicator of such intolerance.

In the Opinionation Scale there are two kinds of opinionation statements. Opinionated rejection refers "to a class of statements made by a speaker which imply that the speaker rejects a particular belief, and at the same time that he rejects people who accept it (Rokeach, 1960, p. 80). The opinionated acceptance statements imply the speaker believes something and accepts others who believe in the same way.

The design made it possible, according to Rokeach, to measure the following variables for persons filling out the Opinionation Scale:

1. Total opinion (left opinionation plus right opinionation)
2. Left opinionation
3. Right opinionation
4. Opinionation rejection

5. Opinionation acceptance
6. Conservatism–Liberalism (right opinionation minus left opinionation), low scores indicating liberalism, and high (positive) scores indicating conservatism.

The respondents employed the following quantitative scale:

1. I disagree with the statement.
2. I agree with the statement in part.
3. I agree with the statement.

THE OPINIONATION SCALE

Left Opinionation	Right Opinionation
Opinionated Rejection	
<ol style="list-style-type: none"> 1. It's just plain stupid to say that it was Franklin Roosevelt who got us into the war. 2. A person must be pretty stupid if he still believes in differences between the races. 3. There are two kinds of people who fought Truman's Fair Deal program: the selfish and the stupid. 4. A person must be pretty short-sighted if he believes that college professors should be forced to take special loyalty oaths. 5. It's the people who believes that college professors should be forced to take special loyalty oaths. 6. It's mainly those who believe the propaganda put out by the real estate interests who are against a federal slum clearance program. 	<ol style="list-style-type: none"> 21. It's simply incredible that anyone should believe that socialized medicine will actually help solve our health problems. 22. A person must be pretty ignorant if he thinks that Eisenhower is going to let the "big boys" run this country. 23. It's the fellow travellers or Reds who keep yelling all the time about Civil Rights. 24. It's the radicals and labor racketeers who yell the loudest about labor's right to strike. 25. It is foolish to think that the Democratic Party is really the party of the common man. 26. You just can't help but feel sorry for the person who believes that the world could exist without a Creator. 27. It's usually the trouble-makers who talk about government ownership of public utilities.

7. A person must be pretty gullible if he really believes that the Communists have actually infiltrated into government and education.
8. It's mostly those who are itching for a fight who want a universal military training law.
9. It is very foolish to advocate government support of religion.
10. Only a simply minded fool would think that Senator McCarthy is a defender of American democracy.
11. It's perfectly clear that the decision to execute the Rosenbergs has done us more harm than good.
12. Any person with even a brain in his head knows that it would be dangerous to let our country be run by men like General MacArthur.
13. The truth of the matter is this! It is big business which wants to continue the cold war.
14. Make no mistake about it! The best way to achieve security is for the government to guarantee jobs for all.
15. It's perfectly clear to all decent Americans that Congressional Committees which investigate communism do more harm than good.
16. Thoughtful persons know that the American Legion is not really interested in democracy.
17. It's perfectly clear to all thinking persons that the way to solve our financial problem is by a soak-the-rich tax program.
18. It's all too true that the rich are getting richer and the poor are getting poorer.
19. History clearly shows that it is the private enterprise system which is at the root of depressions and wars.
20. Anyone who's old enough to remember the Hoover days will tell you that it's a lucky thing Hoover was never re-elected.
28. Only a misguided idealist would believe that the United States is an imperialist warmonger.
29. It's mostly the noisy liberals who try to tell us that we will be better off under socialism.
30. It's the agitators and left-wingers who are trying to get Red China into the United Nations.
31. Any intelligent person can plainly see that the real reason America is rearming is to stop aggression.
32. Plain common sense tells you that prejudice can be removed by education, not legislation.
33. Anyone who is really for democracy knows very well that the only way for America to head off revolution and civil war in backward countries is to send military aid.
34. History will clearly show that Churchill's victory over the Labour Party in 1951 was a step forward for the British people.
35. The American rearmament program is clear and positive proof that we are willing to sacrifice to preserve our freedom.
36. This much is certain! The only way to defeat tyranny in China is to support Chiang Kai-Shek.
37. It's already crystal-clear that the United Nations is a failure.
38. A study of American history clearly shows that it is the American businessman who has contributed most to our society.
39. Even a person of average intelligence knows that to defend ourselves against aggression we should welcome all help—including Franco Spain.
40. Anyone who knows what's going on will tell you that Alger Hiss was a traitor who betrayed his country.

(Rokeach, 1960)

APPENDIX C

ATTITUDES TOWARD ECONOMICS INSTRUMENT

- | | |
|--|---|
| 1. I enjoy reading articles about economics topics. | + |
| 2. I hate economics. | - |
| 3. Economics is easy for me to understand. | + |
| 4. Economics is dull. | - |
| 5. I enjoy economics. | + |
| 6. Studying economics is a waste of time. | - |
| 7. Economics is one of my most dreaded subjects. | - |
| 8. On occasion I read an unassigned book in economics. | + |
| 9. I would be willing to attend a lecture by an economist. | + |
| 10. Economics is a very difficult subject for me. | - |
| 11. Economics is one of my favorite subjects. | + |
| 12. I use economic concepts to analyze situations. | + |
| 13. Economics is practical. | + |
| 14. Economic ideas are dumb. | - |

Response Code

+ Indicated the positive ATE response is to strongly agree.

- Indicates the positive ATE response is to strongly disagree.

APPENDIX D

ECONOMIC ATTITUDE SOPHISTICATION INSTRUMENT

1. Government should control the price of gasoline. -
2. Inflation is caused by greedy business union leaders. -
3. Business makes too much profit. -
4. People should not have to pay taxes. -
5. Free medical care should be provided for all Americans. -
6. Banks should not charge interest on loans to customers. -
7. Most people who do not have jobs are too lazy to work. -
8. When a business gets big, it should be controlled by government. -
9. New factories are not needed. -
10. People should not be told how to spend their money. -
11. If everybody had more money, we'd all be better off. -
12. Profits should not be regulated by government. +
13. Most unemployed people are lazy. -
14. When a strike occurs, government should step in and settle the dispute. -

Response Code

+ Indicated sophisticated EAS response is to strongly agree.

- Indicates sophisticated EAS response is to strongly disagree.

VITA

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Candidate for the degree of

Doctor of Education

**Thesis: A MEASURE OF ATTITUDINAL CHANGE TOWARD STUDENT
LEARNING AND ECONOMIC INSTRUCTION**

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