A COMPARATIVE STUDY: SIMULATION METHOD AND LECTURE/READING METHOD EFFECTS ON ECONOMIC KNOWLEDGE AND ATTITUDE IN TEACHER ECONOMIC EDUCATION

By

David Anthony Dieterle

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ABSTRACT

A COMPARATIVE STUDY: SIMULATION METHOD AND LECTURE/READING METHOD ON ECONOMIC KNOWLEDGE AND ATTITUDE IN TEACHER ECONOMIC EDUCATION

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This experimental research studied the effectiveness of using simulations in a professional development course for teaching economic principles to K-12 school teachers. Using control and experimental groups, the study investigated the typical characteristics of participating teachers, any effect teaching methodology may have had on teachers' perception of the course, the course effects on teachers' economic knowledge and attitude, any effect of teaching methodology or teachers' knowledge and attitude, and personal and professional characteristics which affect a teacher's economic knowledge, attitude, and attitude sophistication. The major hypothesis was that the simulation teaching methodology, Treatment Variable (X1), was positive and significantly influenced economic knowledge and attitude. Several minor hypotheses were stated on personal and professional characteristics.

The hypotheses of the study were tested using the Statistical Package for the Social Sciences (SPSS-X) to obtain multiple regression models. T-test models were used to evaluate each independent variable and F-tests on the overall equations. T-test models were also used to evaluate the course evaluations. The statistical procedures used were the Fisher's F-test, pooled and separate variance t-test models, multiple regression models for the pre- and post-course, and a

multiple regression model to investigate the effects of the Treatment Variable and learning style interactive terms.

The course evaluations were positive for all sections, but the student course evaluations favored the use of simulations. All sections, regardless of teaching methodology, were successful in increasing economic knowledge, attitude, and attitude sophistication. The major hypothesis was rejected, reporting no significant difference between the studied teaching methods. Sex, general mental ability, and hours of economic coursework were significant on pre-course knowledge. Pre-course knowledge, previous economic coursework, structured learning preference (negatively), and kinesthetic learning preferences significantly influenced pre-course attitude sophistication.

Post-course knowledge was significantly influenced by pre-course knowledge, structured learning preference, and general mental ability. Pre-course attitude, hours of economic coursework, tactile learning preference, and course length (negatively) influenced post-course attitude. Pre-course attitude sophistication was the only influence on post-course sophistication. This study also found the interactive terms (Treatment Variable and learning style variables) insignficant.

To Mom and Dad,
you dedicated your life to me,
this small part of my life
is dedicated to you.

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CHAPTER I

THE PROBLEM

Introduction

This research investigated the effectiveness of using simulations in a professional development graduate course for teaching economic principles to K-12 school teachers. The experimental design of the study involved a control group which was taught by using the lecture/reading methodology. The experimental group was taught the identical course content through the use of simulations.

The two groups were enrolled in a graduate-level course for teachers in basic economic principles. The course was for four quarter hours, offered by the Greater Cincinnati Center for Economic Education at the University of Cincinnati. The first section was held during the Winter Quarter, 1984, where the main teaching methodology was the lecture/reading approach for the control group. The experimental sections were organized to use simulations as the major teaching methodology and were taught to two groups during the Spring and Summer Quarters, 1984.

Both control and experimental groups were pre- and post-tested for economic knowledge gain, attitude about economics, and attitude

sophistication about economics. The significance of any difference was determined by using a t-test. To measure outside influences, a variety of data on personal and professional characteristics was collected to determine any significance of these characteristics.

This chapter will describe the problem, purpose, importance of the study, research hypotheses, participants in the study, and definition of terms.

Purpose and Importance of Study

The purpose of this study was to assess and evaluate the use of simulations in an inservice teacher education course designed to teach basic economic principles. This study investigated the use of simulations to teach knowledge of economic principles with analysis of data completed using accepted statistical procedures and research design. Williams' model of a traditional discipline-centered model[1] was accepted by having the course taught as a graduate-level university course. An additional dimension of the research was the analysis of the impact on the economic attitudes of the participants and their attitude sophistication as a result of learning the economic principles. Economic literacy and attitude differences were also investigated.

The study focus included the use of simulations and economic knowledge gain via a professional development graduate course in economics. It was hypothesized that the participants would increase their

[1] Elmer D. Williams, "Teacher Education: The Continuous Process," Chapter 6, NCSS Bulletin No. 65, Economic Education: Links to the Social Studies, ed., Stowell Symmes, NCSS (Washington, D.C., 1981), p. 69.

personal economic knowledge, attitude, and attitude sophistication.

The importance of this research is demonstrated by the minimal work done in previous studies to highlight the relationships between the three areas studied in this research. In this study, simulations were used as the main teaching methodology during a graduate-level professional development course for teachers to teach economic principles. The relationship between economics and simulations was reported by Wilson and Schug as disappointing.[2] Lewis and Wentworth, commenting on simulation research in social studies, stated that, "Most of the research which has been accomplished in the field is suspect because of inadequate testing procedures and research design, use of unsophisticated statistics, and inability to determine important variables."[3]

The research provided:

1. empirical data on the effectiveness of simulations compared to the traditional lecture/reading method, and data about the influence of student characteristics on economic literacy, attitude toward economics, and attitude sophistication;
2. a professional course where the primary teaching methodology was the use of simulations.

[2] Cathy R. Wilson and Mark C. Schug, "The Evaluation of Instructional Games and Simulations," A Guide to Games and Simulations for Teaching Economics, 3rd ed., Joint Council on Economic Education, (New York, 1979), p. 22.

[3] Ibid, p. 22.

Background of the Study

The training of teachers in economic education has essentially been a role reserved for inservice teacher education. Williams stated, "... one will find little or no economic preparation of most prospective teachers. Considerably more activity in economic education takes place in graduate or inservice teacher education programs."[4] Walstad and Watts reported that many teachers who had previous economic training felt it was deficient.[5]

Many activities in economic education are designed to assist teachers during the inservice phase of teacher education. As Williams noted, "Traditionally, the model of economic education for teachers has been the discipline-centered 'Principles' courses."[6] Yet, much of the economic education research has been concerned with teaching economic principles courses at the college level.

Two types of simulations are widely used in economic education: 1) vocational/consumer, and 2) conceptual. The vocational/consumer type refers to such activities as Mini-Society, Kinder-Economy, the Stock Market Game, or other business-related simulations. These are simulations where economic concepts are taught and learned as an independent function of the activity. The amount of economics taught by using the vocational/consumer type is much more dependent upon the teaching objectives and training of the teacher. These simulations

[4] Williams, op. cit., p. 69.

[5] William Walstad and Michael Watts, "Teaching Economics in the Schools: Analysis of Survey Findings," delivered at Midwest Economic Association, 1983.

[6] Williams, op. cit., p. 69.

can be worthwhile learning experiences for other subjects such as math or social skills without any economics being introduced.

The conceptual type of simulation, however, has as the main goal the learning of an economic concept(s). Included in this group would be the Baseball Game (supply and demand), Cut the Budget (taxes), or Landosa (inflation). Unless the economic concept is introduced, the conceptual type simulation will not be an effective learning tool. The economic concept must be the focus of the activity.

Research Questions

This study has investigated the following questions:

1. What are the typical characteristics of participating teachers?
2. Do participants evaluate the value of a graduate-level course differently when simulations are the primary teaching methodology?
3. What is the effect of a graduate-level course in economics on the participants' economic knowledge, attitudes, and attitude sophistication?
4. What is the effect of the use of simulations as the methodology to teach economic knowledge?
5. Are there personal and/or professional characteristics which affect the economic knowledge, attitudes, and attitude sophistication?

Hypothesis

The major hypothesis of this study was that the coefficient on the Treatment Variable (X1) in the regression, representing the use of simulations, would be positive and significantly larger than zero in

equations measuring economic literacy and attitude change. The null hypothesis that the Treatment Variable was not significant was tested using the t-test and customary significance levels (.05 and .01).

For each independent variable there was a subhypothesis. The null hypothesis that the effect of each independent variable is not significant on the dependent variables was tested using the t-test. Significance was determined at the customary significance levels (.05 and .01).

Table I-A summarizes the hypotheses as they pertain to the study.

TABLE I-A[7]

Study Variables and Hypotheses

Regressions	Dependent Variables & Equations TEL - EQ1	ATE - EQ2	EAS - EQ3
Y1 - Post TEL	0	+	+
Y2 - Post ATE	0	0	0
Y3 - Post EAS	0	0	0
X1 - Treatment Variable	+	+	+
X2 - Pre TEL	+	0	0
X3 - Pre ATE	0	+	0
X4 - Pre EAS	0	0	+
X5 - Age	+	?	?
X6 - Sex	-	?	?
X7 - General Mental Ability	+	+	+
X8 - Hours Economic Coursework	+	+	+
X9 - Highest Degree	+	+	?
X10 - Teaching Experience	?	?	?
X11 - Auditory Learning Preference	?	?	?
X12 - Visual Learning Preference	?	?	?
X13 - Tactile Learning Preference	?	?	?
X14 - Kinesthetic Learning Preference	?	?	?
X15 - Structured Learning Preference	?	?	?
X16 - Course Length	-	-	-
X17 - Years Since Last Course	-	-	-

Notes:
0 = Variable omitted
+ = Positive and significant at .05
? = Unsure of sign and significance
- = Negative and significant at .05

[7] Based on a table of similar format used by William Walstad and John Soper, "A Model of Economic Learning in the High School," The Journal of Economic Education, vol. 13, no. 1, (Winter, 1982), p. 45.

Study Population and Sample

The population of this study were certified teachers in K-12 schools from the eligible population in the greater Cincinnati area. The exact number for the population was not relevant to the research design because the study accepted as a sample all eligible teachers who chose to enroll in an advertised university course.

The sample for the study was determined by the registration system for published graduate courses by the Greater Cincinnati Center for Economic Education and the University of Cincinnati. Forty-two teachers successfully completed the control section of the course. The experimental group consisted of two separate sections. Twenty-six teachers successfully completed the first experimental section using simulations, and nineteen teachers completed the second section for a combined total of forty-five in the experimental group.

Limitations

This research is intended as a policy statement relative to the usefulness of simulations and the effect of student characteristics on adult learners in developing economic literacy and supporting attitude change towards economics. As such, the research does not investigate relationships between the independent variables of post-course knowledge gain, attitudes, and attitude sophistication. Based on assumptions of earlier research, the conclusions drawn from this study are important only as they relate to the dependent variables.

It was not feasible to randomize the composition of the control and experimental groups. Thus, the two groups' composition was

described by collecting personal and professional data about the participants and assessing these data using a multiple regression model.

To control the instructor variable, a conscious effort was made to utilize the same instructor for both the control and experimental sections. The instructor had an extensive background in teaching economic education workshops, courses, and principles courses at the college level since 1980. However, caution must be taken with regards to possible bias by the instructor on a preferred teaching methodology.

Definition of Terms

Participants: these are adults who were teachers with a minimum B.A. degree, and who were taking coursework for graduate credit.

Simulation: Livingston and Stoll's (1973) definition of an instructional social simulation game is accepted for this research: any interaction game that represents a situation for the purpose of teaching a subject or skill.[8]

Economics: Hansen's, et al. (1983), definition has been accepted. They said, "Economics is the study of how our scarce productive resources are used to satisfy human wants ..., thus, we must 'economize' our resources, or use them as efficiently as possible."[9]

Economic Attitudes: these are measures of the participants' feelings toward economics as a science and field of study.

[8] Samuel A. Livingston and Clairice Stacz Stoll, Simulation Games: An Introduction for the Social Studies Teacher, Free Press, (New York, 1973), p. 1.

[9] Lee W. Hansen, et al., Part I: A Framework for Teaching Economic Basic Concepts, Joint Council on Economic Education, (New York, 1977), p. 3.

Economic Attitude Sophistication: these are measures of the participants' congruent attitudes with most professional members of the economic education discipline on knowledge of current economic policy issues.

Inservice Education: these are professional development programs designed to increase the professional capabilities of teachers. For this research, the term included teachers of all experience and grade level.

Learning Style: the definition given by Rita Dunn was accepted. She stated that learning style, "is the way an individual responds to environmental, sociological, and physical stimuli to achieve and learn to their fullest potential."[10]

Auditory Learning Preference: according to Dunn, Dunn, and Price, this is a learning preference where listening skills are preferred. This includes the use of tapes, videotapes, records, radio, television, and oral directions.[11]

Visual Learning Preferences: according to Dunn, Dunn, and Price, this is a learning preference where eye contact skills are preferred. This includes the use of pictures, filmstrips, films, graphs, books, drawings, etc.[12]

Tactile Learning Preference: according to Dunn, Dunn, and Price, this is a learning preference where hands-on activities are preferred. These would include resources that are touchable, movable,

[10] Rita Dunn, "Teaching in a Purple Fog: What We Don't Know About Learning Style," NASSP Bulletin, vol. 65, (March, 1981), p. 33.

[11] Gary Price, Rita Dunn, Kenneth Dunn, Productivity Environmental Preference Survey: PEPS Manual, (Lawrence, KS: Price Systems, 1982), p. 12.

[12] Ibid, p. 12.

readable, and can be manipulated.[13]

Kinesthetic Learning Preference: according to Dunn, Dunn, and Price, this is a learning preference where active experiences are preferred. These include site visits, action projects, and being physically involved.[14]

Structured Learning Preference: according to Dunn, Dunn, and Price, this is a learning preference where all phases of an assignment are detailed. This would include clearly stated objectives, time requirements, and required tasks.[15]

Overview

Chapter I described the problem, purpose, importance of the study, research hypotheses, participants in the study, limitations, and definition of terms.

In Chapter II, the related literature is reviewed. The literature is reviewed in five categories: economic education, simulations, inservice education, learning style, and adult learning.

In Chapter III, the design and procedure of the study is presented. This chapter includes a description of the reliability and validity data for the collection instruments.

In Chapter IV, the data are described.

In Chapter V, the hypotheses are tested and the study is summarized. The conclusions and recommendations from the research are presented and possibilities for future research are identified.

[13] Ibid, p. 13.

[14] Ibid, p. 13.

[15] Ibid, p. 9.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The focus of this study is on the impact of a teaching methodology, simulations, and personal and professional characteristics on the knowledge, attitude, and sophistication gain of teachers toward economics as the result of a graduate inservice economic education course. The research questions focused on simulations, inservice education, and those personal and professional characteristics that contributed to learning and attitude change. This chapter presents a review of the educational literature for each of these topics.

In each section, several of the closely related educational literature are reviewed followed by the significant economic education literature on the topic. The literature on adult learning, economic knowledge and attitude, and learning style are also reviewed.

Economic Education

The National Survey of Economic Education - 1981, conducted by Yankelovich, Skelly, and White, noted that 8 out of 10 teachers of economics have had a college or graduate-level course in economics.

However, of those who were not economics teachers, 81 percent felt they needed more materials, and a significant number also wanted better training to teach economics.[1] Williams supported this idea stating, "... economics has been a largely neglected content area in teacher preparation programs." He also noted the model for such training has normally been the disciplined-centered "principles" course.[2]

Much of the research in economic education has focused on the college "principles" courses. In 1979, Siegfield and Fels published a very comprehensive survey of research on economic education at the college level.[3] However, little attention was given to the simulation method of teaching. The following review specifically focuses the economic education literature in four areas: Teaching Methods, Student Characteristics and Simulation Teaching, Inservice Education, and Economic Knowledge and Attitude.

Teaching Methods

As economic education focused on the "principles" courses for its research population, the evaluation of teaching methods in the economic education literature also appears narrowly focused. Becker, along with Siegfield and Fels, has stated that most economic education

[1] Yankelovich, et al., National Survey of Economic Education, 1981, (New York: Phillips Petroleum Co., 1981), p. 26.

[2] Elmer D. Williams, "Teacher Education: The Continuous Process," Chapter 6, NCSS Bulletin No. 65, Economic Education: Links to the Social Studies, ed., Stowell Symmes. NCSS, (Washington, D.C., 1981), p. 67.

[3] John J. Siegfield and Rendigs Fels, "Research on Teaching College Economics: A Survey," Journal of Economic Literature, vol. 17, (September, 1979), p. 925.

literature and research evaluated teaching methods using production function models. Davisson and Bonello identified three categories of inputs for the popular models. The categories and examples are: 1) human capital (SAT, GPA, and Pretest), 2) utilization rate (study and class time), and 3) technology (lecture, simulations, and workbooks).[4] Recent articles in the Journal of Economic Education focused on "... finding the effects of alternative student and instructor inputs on student learning in a college-level introductory economics course."[5]

The method of presentation and content of inservice training has also been investigated. Lowell and Harter recommend an inservice training organized where an economics instructor teaches approximately two-thirds of the classroom time and classroom teachers handle the other one-third in smaller group sessions.[6] The instructional techniques recommended included lecturing, transparencies, films, and quizzes. Karstensson emphasized the lecture/reading and teaching material demonstrations methodology and content in teaching economics to teachers.[7] Dale Davis suggested inservice workshops "will be more helpful to teachers if they include practical as well as

[4] William E. Becker, "Economic Education Research: Part I, Issues and Questions," Journal of Economic Education, vol. 14, (Winter, 1983), p. 10.

[5] Ibid, p. 10.

[6] Hugh Lowell and Charlotte Harter, An Economic Course for Elementary School Teachers, 2nd ed., (New York: Joint Council on Economic Education,1975), p. 2.

[7] Lewis Karstensson, An Analysis of Short-Term Learning in Economics: The Case of Participant Performance in a Free Enterprise System Seminar, (Denton, TX: North Texas State Center for Economic Education, 1979), p. 3.

theoretical economic content."[8] In a 1966 NDEA Advanced Study Institute in Economics, Reese and Darcy related the uses of a combination of lectures, guest speakers, and study groups "to present a theoretical framework for the analysis of economic problems."[9]

The uniqueness of Economic Education, Simulation/Gaming, and Inservice Teacher Education in combination with each other was supported when an ERIC literature research matrixing these areas revealed zero citations. When Inservice Teacher Education was replaced with Teacher Education, only two citations appeared. The first was a Rafeld and Fraas study on the relationship of cognitive learning styles with teaching style (simulation/gaming versus lecture/discussion and the student effectiveness in a college-level introductory economics course. They proposed that a relationship should exist between learning and teaching style.[10] The second study by Zelmer and Zelmer reviewed eleven lectures at a Western Canada symposium on simulation and gaming.[11] When the descriptor Student Characteristics was substituted for Teacher Education in the ERIC search, seven citations were revealed, with one by John Fraas

[8] Dale Davis, Economic Education in the Curriculum, (ERIC:

[9] Jim E. Reese and Robert L. Darcy, Report on the 1966 NDEA Advanced Study Institute in Economics, (Consortium of Professional Associations for the Study of Special Teacher Improvement Programs, 1966), p. 13.

[10] John Fraas and Frederick Rafeld, Simulation Activities and Student Learning Characteristics in a College Economics Survey Course, (Paper presented at Annual Meeting of the Eastern Educational Research Association: Norfolk, VA, 1980), p. 15.

[11] A. C. Lynn Zelmer and Amy M. Zelmer, "Proceedings of the Western Regional Symposium on Instructional Simulations," ed. 054608, 1971.

emphasizing the relationships between student characteristics and simulation teaching.[12]

Student Characteristics and Simulation Teaching

John Fraas authored or co-authored all seven of the citations relating to "student characteristics." The population and setting for each of Fraas' articles was an undergraduate college-level "survey," "principles," or "introductory" course. The closest related of these studies investigated any superiority of simulations over lecture-discussion.[13] Using a college-level introductory course as his sample, the two primary questions investigated were:

> "Is the simulation/gaming technique superior to the lecture discussion technique in increasing the economic knowledge, interests in economics, and retention of economic knowledge of the college students enrolled in an introductory economics course?"

Also,

> "Do the instructors' and the students' pre-course economic knowledge, scholastic abilities, pre-course interests in economics, and previous economic training influence the relative effectiveness of the two methods of instruction to increase the students' economic knowledge, retention of economic knowledge, and interests in economics?"[14]

Fraas designed multiple linear regressional models to analyze the methods of instruction on students' post-course scores for economic knowledge, retention, and interests in economics. He concluded neither method "... could be declared superior."[15] This agreed with

[12] John W. Fraas, "The Use of Seven Simulation Games in a College Economics Course," Journal of Experimental Education, vol. 48, (Summer, 1980).

[13] Ibid, p. 264.

[14] Ibid, pp. 264 - 265.

[15] Ibid, p. 279.

Wilson and Schug who summed up the research on the simulation teaching method in economics as disappointing. They stated that, "Any answers we have are quite tentative and lack sufficient empirical support."[16]

The Fraas study did show a relation between certain student characteristics that were investigated. While using simulations, higher post-course scores were achieved by students who had a low pre-course knowledge, no previous training, and low SAT scores. Higher post-course scores were achieved with the lecture method by those students who had high pre-course knowledge, previous economic training, and high SAT scores.[17]

Inservice Education

An effort to further link economic education, simulations, and inservice education research was attempted with a final ERIC search. This last search linked the descriptor Economic Education and Inservice Education since 1966. A preview of the first 5 of 61 citations showed Home Economics as the major area of study. Removing Home Economics reduced the number of citations to 36. The focus of the references to Inservice Education and Economic Education was quite diverse. They ranged from promotional articles for the Joint Council on Economic Education to testing students.

Several studies investigated the effects of inservice training on increasing the economic knowledge of teachers. An early study by Girgis and MacDowell (1972) reported on the success of an inservice

[16] Cathy R. Wilson and Mark C. Schug, "Chapter 3 - The Evaluation of Instructional Games and Simulations," A Guide to Games and Simulations for Teaching Economics, 3rd ed., Joint Council on Economic Education, (New York, 1979), p. 22.

[17] John W. Fraas, op. cit., p. 279.

institute and the factors of those teachers who had the most gain. They reported that those teachers with the most knowledge increase "... were recently graduated from college, had a high grade point average, had taught for a few years, had taken a moderate number of courses in social science, and had more than two courses in economics."[18] In response to a 1973 Texas law mandating "Free Enterprise" education, David Armstrong studied the understanding of teachers in a one-month summer inservice teacher training institute held at Texas A & M in 1977. The average mean score of the 38 participants on a 105-item test increased from 67.8 on the pre-test to 84.8 on the post-test. They also showed significant gain in all the concept areas except "alternative economic systems."[19]

Three published studies in 1979 reported the success of teacher inservice training in economics.

Lewis Karstensson investigated elementary and secondary teachers during a 10-day seminar using primarily the lecture/reading teaching method. Using the Test of Understanding College Economics (TUCE), Part II A, as a pre- and post-test, Karstensson concluded, "... greater economic understanding was increased in the areas of the operation of competitive markets, the theory of the firm together with

[18] Maurice A. Girgis and Michael A. MacDowell, "A Quantitative Analysis of the Effectiveness of an Inservice Institute on Teaching Economics," Indiana Social Studies Quarterly, vol. 25, (Winter, 1972-73), p. 72.

[19] David G. Armstrong, Development of Behaviorial Objectives Test Items or "Free Enterprise" and Assessment of "Free Enterprise" Training's Impact on Understanding of (1) Teachers Taking the Training and (2) Secondary Students in Those Classes: Phase II, (College Statren, Texas: College of Education, Texas A & M, 1977), pp. 20 - 21.

the operation of non-competitive markets, and governmental activity in the economy."[20] The mean scores rose to 15.95 from 13.17 with a decrease in the standard deviation from 4.22 to 3.79, the mean increase significant at the .05 level.

In another 1979 study, William Walstad reported substantial benefits were achieved by the program participants of an economics inservice providing economics instruction as part of the Unified Sciences and Mathematics for Elementary School Program (USMES). With a sample of 17, the inservice variable in a regression model was significant at the .05 level.[21] The post-test scores had an average 7.03 gain over pre-test scores. Also in 1979, Dennis Murphy reported that a two-week economics inservice at Emory University for high school teachers had positive effects on economic understanding. His results were significant at the .01 level with a sample of 28 and 29 participants for the pre-test and post-test, respectively.[22]

Reese and Darcy, and Karstensson also reported on other factors and outcomes of inservice training in economics. They note the skill and personality of the instructor is a factor in the success or failure of an institute as well as a clear definition of objectives, a homogeneous composition of the participants, and attention given to

[20] Karstensson, op. cit., p. 12.

[21] William Walstad, "Effectiveness of A USMES Inservice Economic Education Program for Elementary School Teachers," Journal of Economic Education, 3rd ed., no. 1, (Fall, 1979), p. 9.

[22] Dennis Murphy, "Learning and Intensive Instruction," Journal of Economic Education, (Fall, 1979), p. 35.

classroom use of their economic understanding.[23] Karstensson reported the participants moved away "from unsophisticated agreement with popular opinion concerning the economy to sophisticated disagreement."[24] He also noted their interest in the subject increased.

Economic Knowledge and Attitude

In a 1983 essay, George Stigler asked why people need to be economically literate and not musically, historically, or chemically literate?[25] His criteria for answering the question relied on two questions: 1) Is the knowledge needed as a means of communication?, and 2) Is it a type of knowledge frequently needed? He answered "yes" to both questions, thus concluding that, "... every American must be his own economist ..."[26] The forementioned research literature points quite definitely to the positive effects of increasing a teacher's economic knowledge through professional development.

Harry Greenfield suggested that problems still exist in economic education at the inservice level. He contended that teacher training institutions do not emphasize economic education enough at the preservice level, economists are too specialized, and resources go to specialized fields.[27] He further suggested that three tasks need to

[23] Reese and Darcy, op. cit., p. 14.

[24] Karstensson, op. cit., p. 18.

[25] George Stigler, "The Case, If Any, for Economic Literacy," Journal of Economic Education, vol. 14, (Summer, 1983), p. 60.

[26] Ibid., p. 64

[27] Harry Greenfield, "Economics in Secondary Schools: Some Problems of Inservice Teaching," The Social Studies, vol. 73, (Sept./Oct., 1982), no. 3, p. 217.

be completed to remedy the perceived problems: 1) teacher training institutions need to strengthen their economics curricula, 2) the economics profession "as a whole" needs to aid in increasing the economic literacy of elementary and secondary teachers, and 3) the economics profession needs to allocate more time and resources to economic education. Greenfield's first assertions are supported by Weidenaar in a study of social studies methods educators.[28] In general, Greenfield was addressing the need for a more positive attitude towards economics and economic education.

Mark Schug studied the economic attitude of 171 public school teachers because attitudes influence their teaching patterns and content.[29] He used Riddles Survey of Opinions on Economic Issues to distinguish attitude differences between elementary, secondary, and preservice teachers. He concluded differences did exist between these teacher classifications.

Measuring economic attitude and development using an instrument with documented reliability and validity has become an important issue. Wetzel, Potter, and O'Toole used a self-made Likert scale questionnaire in 1978 to study the influence of learning and teaching style on economic attitude and achievement.[30] The questionnaire

[28] Dennis J. Weidenaar, "Economics: A Little Known Discipline Among Social Studies Methods Teachers," Peabody Journal of Education, vol. 57, (April, 1980), pp. 197 - 203.

[29] Mark C. Schug, "Elementary Teachers' Views on Economic Issues," Theory and Research in Social Education, vol. XI, (Spring, 1983), p. 55.

[30] James N. Wetzel, W. James Potter, Dennis M. O'Toole, "The Influence of Learning and Teaching Styles on Student Attitudes and Achievement in the Introductory Economic Course: Case Study," Journal of Economic Education, vol. 13, (Winter, 1982), p. 35.

reliability and validity were not documented, however, thus making it suspect.

Jerry Monahan statistically analyzed attitude by using a learning model with 168 students. The model used attitude as the dependent variable and was a function of achievement, ability, effort, socioeconomic variables, and quality of instruction. He concluded attitude changed little during a college principles course.[31]

The latest attitude measurement instrument with documented reliability and validity was presented by Walstad and Soper in 1983. They surmised the neglect of studying attitude except in a few instances was partially the result of instruments not available or poorly developed without any reliability or validity.[32] The Survey of Economic Attitude was developed to fill the void. Walstad and Soper present documented reliability and validity findings for both parts of their instrument: Attitude Toward Economics (ATE) and Economic Attitude Sophistication (EAS).[33] These instruments were used in this study because of their established reliability and validity.

Simulations

Most of the literature on simulations appeared to be definitional and somewhat generic. Livingston and Stoll's definition of

[31] Jerry Monahan, "An Educational Production Function for Principles of Economics," Journal of Economic Education, vol. 14, (Spring, 1983), p. 16.

[32] William C. Walstad and John C. Soper, "Measuring Economic Attitudes in High School," Theory and Research in Social Education, vol. XI, (Spring, 1983), p. 41.

[33] Ibid., pp. 53 - 54.

simulations was selected as the appropriate definition for this research. They defined a simulation as, "A situation involving human interaction intended to represent some other situation intended to teach a subject or skill."[34] Livingston and Stoll also stated that simulations have two instructional purposes: 1) to raise the student's ability to perform, and 2) to raise the student's knowledge and understanding of the situation."[35] This perception of simulations was also stated by McKilbin, Weil, and Joyce in their 1977 Association of Teacher Education article. They asserted that the "principle of simulation is that people learn from the dynamic consequences of their own actions."[36]

A purpose for the action is one of the two classifications of simulations given by Maidment and Bronstein, with mode of operation as the second.[37] Mode of operation is also known as "man simulations" where there is an interaction of players with rules and structure as opposed to computer simulations.[38] This research emphasized mode of operation simulations.

Some literature on simulations is more descriptive than definitional. Mark Heyman described simulation games as, "... instructional

[34] Samuel A. Livingston and Clairice Stacz Stoll, Simulation Games: An Introduction for the Social Studies Teacher, Free Press, (New York, 1973), p. 1.

[35] Ibid., p. 6.

[36] Michael McKilbin, Marsha Weil, Bruce Joyce, Teaching and Learning: Demonstrations of Alternatives, (Washington, D.C.: ATE, 1977), p. 45.

[37] Robert Maidment and Russell H. Bronstein, Simulation Games: Designand Implementation, (Columbus, OH: Charles E. Merrill Pub., 1973), pp. 13 - 14.

[38] Ibid., p. 15.

techniques which create a social environment in which participants become involved with whatever resources they have."[39] Robert Birnbaum differentiated "some" experience with "right" experiences when describing games and simulations in a 1980-81 study on their use in higher education. He identified "right" experiences as job training, internships, and simulations.[40] John Pager focused on the feedback of simulations when he identified them as a learning experience while providing feedback to the participants.[41]

The literature dealing with the effectiveness of simulations is not overly enthusiastic. For a pre-college level population, Cherryholmes concluded that learning and attitudinal changes due to simulations may not be as great as claimed.[42] However, the Fraas study concluded that higher post-course scores were achieved by students who had low pre-course knowledge, no previous training, and low SAT scores when taught economics using simulations.[43] As previously noted, Wilson and Schug summed up the research on simulations in relation to economics as disappointing. They concluded, "Any answers we have are quite tentative and lack sufficient empirical support."[44]

[39] Mark Heyman, "What are Simulation Games?" Environmental Education Report, vol. 10, (August/Sept., 1982), p. 2.

[40] Robert Birnbaum, "Games and Simulations in Higher Education," Simulations and Games, vol. 13, (March, 1982), p. 4.

[41] John M. Pager, Jr., "Simulations - A Valuable Learning Technique," Environmental Education Report, vol. 10, (Aug./Sept.,1982), p. 1.

[42] Cleo H. Cherryholmes, "Some Current Research in Effectiveness of Educational Simulations: Implications for Alternative Strategies," The American Behavioral Scientist, vol. 6, (Oct., 1966), p. 4.

[43] Fraas, op. cit., p. 279.

[44] Wilson and Schug, op. cit., p. 22.

Inservice Education

In his preface for a review of some of the research relating to inservice education, Donald Orlich wrote that 9,200 documents are listed on the subject in ERIC alone.[45] The focus in this section on inservice will center on the strengths and weaknesses of structure, emphasis on inservice models, and how some of the previously presented research studies in economic education used inservice education.

Robert Byrne, in a 1983 essay, concluded that what has been missing in inservice education is a "consistent, uniform approach to staff inservice."[46] Orlich agreed with Byrne, while also stressing the importance of inadequate funding, domination by school administrators, lack of direction, and lack of relevance to the needs of teachers.[47]

Both Byrne and Orlich presented generalized actions to improve inservice education. They included: teacher-orientation, flexibility, sequential, and specific. Byrne also emphasized personal and professional growth in place of improvement.[48] Orlich added feedback to Byrne's proposals. Sally Mertens summarized the comprehensive Rand Study which concluded inservices needed voluntary participation and opportunities for interaction.[49]

[45] Donald C. Orlich, "Inservice Education: A Problem or a Solution?" Science and Children, vol. 21, (Feb., 1984), p. 33.

[46] Robert Byrne, "Inservice Programs - What are the Essentials for Making Them Effective?" NASSP Bulletin, vol. 67, (March, 1983), p. 1.

[47] Orlich, op. cit., p. 34.

[48] Byrne, op. cit., pp. 2 - 3.

[49] Sally Mertens, "Basics in Inservice Education: Findings from Rand and Teacher Center Studies," Action in Teacher Education: Role of Research in Education, vol. 4, (Spring/Summer, 1982), p. 64.

Two models in the literature with specific components were very similar. Wilsey and Killian identified three components for successful programs: 1) new knowledge acquisition, 2) knowledge of new instruction methods, and 3) knowledge of clinical supervision.[50] Hall, Benninga, and Clark identified almost exactly the same three components with special emphasis for the importance of one and three.

Regarding new knowledge acquisition, they said, "Most educators would agree that a knowledge base is important for a teacher to create a learning environment that is appropriate for exceptional children in the regular class."[51]

For knowledge of clinical supervision, they concluded that, "Change in attitude will occur only after the teacher receives the necessary information and skills to interact successfully with all students in the classroom."[52]

Most inservice programs in economic education are developed to accomplish the acquisition of new knowledge. The Girgis-MacDowell, Armstrong, Karstensson, Walstad, and Murphy studies previously mention were implemented to study the improvement of teachers during the first stage of inservice. Walstad's study emphasized skill in using the new knowledge with a new program.[53] The skill and knowledge of how to

[50] Cathy Wilsey and Joellen Killian, "Making Staff Development Programs Work," Educational Leadership, vol. 40, (Oct., 1982), p. 36.

[51] John Hall, Jacques Benninga, Charlotte Clark, "A 3 Part Model: A Comprehensive Approach to the Inservice Training of Teachers," NASSP Bulletin, vol. 67, (March, 1983), p. 18.

[52] Ibid., p. 19.

[53] Walstad, op. cit., pp. 1 - 12.

use the new knowledge acquired is stressed in the Reese, Darcy, and Karstensson studies.

Learning Style

One purpose of this study was to investigate the significance of the learning style of teachers as related to the use of simulations and the lecture/reading approach. The authors are not in agreement about the definition and components of what identifies learning style. Rita Dunn made a distinction between learning style and cognitive style in one of her 1981 essays. She identified learning style as the way an individual responds to environmental, social, and physical stimuli. Cognitive style referred to how the brain processed information.[54] She considered the difference extremely important since the two terms are often used interchangeably when, in her opinion, they should not. David Hunt supported Rita Dunn by defining learning style in terms of educational conditions under which they are most likely to learn.[55] The definition of learning style must be carefully considered when reviewing learning style studies.

A study by Robert Stensrud and Kay Stensrud investigated the learning style of 95 public school teachers. Using the Barbe-Swassing Checklist of Observable Modality, they had the teachers complete the form twice, once as a learner and once as the teacher. The most

[54] Rita Dunn, "Teaching in a Purple Fog: What We Don't Know About Learning Style," NASSP Bulletin, vol. 65, (March, 1981), pp. 33 - 36.

[55] David Hunt, "Learning Style and the Interdependence of Practice and Theory," Phi Delta Kappan, vol. 62, (May, 1982), p. 647.

preferred modality was visual.[56] The Wetzel, Potter, O'Toole study examined the learning style preference of students and its possible affect on economic attitude and achievement. They concluded that the learning style variables were not significant in either model.[57] The previously cited economic education study by Rafeld and Fraas suggested that the relationship between learning and teaching style should be considered when matching students and teachers.[58]

Adult Learning

The education of teachers at the inservice level differs from educating prospective teachers at the preservice level. Inservice teachers are mature adults and "... educators need to be acutely aware that the adult learner is not just a grown-up child student."[59] Willey and Howey identified four inservice needs of adult professionals: 1) keep up with new knowledge, 2) master new concepts, 3) study basic disciplines, and 4) to grow as persons.[60] The first need coincides with new knowledge acquisition of the inservice models described earlier (see page 22).

[56] Robert Stensrud and Kay Stensrud, "Teaching Styles and Learning Styles of Public School Teachers," Perceptual and Motor Skills, vol. 56, (April, 1983), p. 414.

[57] Wetzel, Potter, O'Toole, op. cit., p. 38.

[58] Rafeld and Fraas, op. cit., p. 26.

[59] Lynn B. Burnham, "Adults: Not Grown Up Children," Community and Junior College Journal, vol. 53, (Nov., 1982), p. 26.

[60] Reynold Willey and Kenneth R. Howey, "Chapter 3 - Reflections on Adult Development: Implications for Inservice Teacher Education," Staff Development and Educational Change, ed. W. Robert Houston and Rober Panteratz, (Reston, VA: ATE, 1980), p. 25.

A research study by Andrews, Houston, and Bryant supports Burnham's quote in the previous paragraph by quoting Malcolm Knowles: "Adults as learners are different from children as learners in self-concept, in their experience, in orientation to learning, and in readiness to learn."[61] Seider suggested adults retain better with action-oriented environments.[62] In discussing adult achievement, Houston stated that, "... what is known about adult learning and instruction is meager."[63] He accepted Seider's view and teaching methodology became an important element of investigation in inservice education research for him. His "action-oriented environments" suggests that simulations would be more acceptable and effective to adult learners. A statement by Lawrence Dolan in a study on the affective characteristics of adult learners probably best summarizes present thinking on adult learning: "the laizze faire approach to instructional concerns (of the adult learner) is no longer valid."[64]

Summary

The National Survey of Economics Education - 1981 noted that 8 out of 10 teachers of economics have had a college or graduate-level

[61] Theodor E. Andrews, W. Robert Houston, Brenda L. Bryant, Adult Learners (A Research Study), (Washington, D.C.: ATE, 1981),p. 56.

[62] C. J. Seider, "Teaching with Simulations and Games," In N. L. Gage (ed.), The Psychology of Teaching Methods - The Seventy-Fifth Yearbook of the National Society of Education, Part I, The National Society for the Study of Education, (Chicago, 1976).

[63] Andrews, Houston, Bryant, op. cit., p. 69.

[64] Lawrence Dolan, "Affective Characteristics of the Adult Learner: A Study of Mastery Based Instruction," Community/Junior College Quarterly of Research and Practice, vol. 7, (July - Sept., 1983), p. 368.

course in economics. Yet, 81 percent wanted better training to teach economics.[65] Much of the research in economic education has focused on undergraduate college principles courses and evaluating teaching methods using production function models.

An ERIC search matrixing Economic Education, Simulation/Gaming, and Inservice Education produced two citations, and substituting Student Characteristics for Inservice Teacher Education produced 7, all authored or co-authored by John Fraas. In one study he concluded, "... neither (lecture or simulation) to be declared superior,"[66] yet a relation with student characteristics was shown.

The literature was quite definite that inservice teacher training in economics improved their economic understanding. Studies of the teaching methodology and content, however, were minimal.

The need for instructors of adult learners to use simulations is supported by Seider and the need for adults to "learn in action-oriented environments." The literature on simulations in economic education is generally limited but that which is available is not overly enthusiastic about the use of simulations. If simulations should be the mode for adult learners, the literature is not enthusiastic about their effectiveness in accomplishing new knowledge acquisition and knowledge of new instruction methods.

[65] Yankelovich, et al., op. cit., p. 9.

[66] John W. Fraas, op. cit., p. 279.

CHAPTER III

RESEARCH DESIGN AND PROCEDURES

Introduction

This chapter presents the research plan. The course sections used for the control and experimental groups are presented. The process of identifying the simulations for the experimental group is explained. The reliability and validity for the data collection instruments are given. A review of the hypotheses and the statistical analyses applied to the data is presented.

Research Procedures

The research procedure involved three sections of a graduate basic economics course for teachers entitled, Basic Economics for Everyday Life (see syllabus, Appendix A). The four graduate credit hours course was offered by the Greater Cincinnati Center for Economic Education at the University of Cincinnati. The first section (Winter Quarter, 1984) was the control group where the major teaching methodology was the lecture/reading approach. The experimental sections used simulations as the major teaching methodology and were offered in the Spring and Summer Quarters, 1984.

The textbook used in the course was, Teaching Economics: Contents and Strategies, written by Ronald A. Banaszak and Dennis C. Brennan (Addison/Wesley, 1983).[1] The textbook format was the basis of the schedules for the three sections. In the control section, the textbook was also the primary source of material used. In the experimental sections, the textbook was reduced to a supplementary role. Simulations were implemented to correlate with the Joint Council on Economic Education's Master Curriculum Guide - Part I: A Framework for Teaching Economics: Basic Concepts.[2] They replaced the textbook as the major source of teaching material in the experimental sections.

Sample

The sample consisted of those teachers in the greater Cincinnati area who registered for the 3 sections. In the Winter Quarter control section, 42 teachers registered and completed the course. In the Spring Quarter experimental section 26 teachers registered and completed the section; 19 teachers registered and completed the second experimental section, bringing the experimental sample total to 45 with a total sample for the 2 formats of 87.

[1] Ronald A. Banaszak and Dennis C. Brennan, Teaching Economics - Content and Strategies, (Menlo Park, CA: Addison-Wesley, 1983).

[2] W. Lee Hansen, Chairman, et al., Part I - A Framework for Teaching Economic Basic Concepts, Joint Council on Economic Education, (New York, 1977), p. 9.

Instrumentation

The following data on each participant were collected: age, sex, education, previous economic coursework, latest date of economics coursework, teaching experience, economic teaching materials used, learning style, pre- and post-test economic literacy, I.Q. (approximate), and attitude and sophistication toward economics. (See Appendix B).

These data were important because randomization was not feasible in selecting the control and experimental groups. They were used to help identify specific student characteristics that might have significance on the dependent variables (post-test economic literacy score, post-test economic attitude and sophistication scores), and on the use of simulations as a teaching method.

The following tests, or measurement instruments, were used to collect the data:

Test of Economic Literacy - Form B (TEL)

The test is published by the Joint Council on Economic Education. The content categories for the TEL are identical to those used to accumulate conceptual simulations (see Appendix B). The reliability of the TEL, Form B, as measured with a Cronbach Alpha correlation has a coefficient of .872.[3]

The validity of the test has not been completely determined. A review by the National Advisory Committee concluded that the test had

[3] John C. Soper, Test of Economic Literacy: Discussion Guide and Rationale, (New York: Joint Council on Economic Education, 1979), p. 11.

"face validity." There also was some evidence of "concurrent validity," or the test's correlation with other measures. "Content validity" was termed acceptable in relation to the "Basic Concepts," yet a potential problem may be the "weighting of content-cognitive level matrix."[4]

Survey on Economic Attitudes (SEA)

The Survey on Economic Attitudes has two parts: Attitudes Toward Economics (ATE) and Economic Attitude Sophistication (EAS) (see Appendix B). It was developed by a working committee under commission of the Joint Council on Economic Education.[5] The committee measured attitudes as individual responses to economics as a field of study. Attitude Sophistication was defined as, "the consistency of agreement with a current body of economic knowledge (policy issues) with which most members of the discipline agree."[6]

A reliability coefficient was established for each part of the SEA. The internal consistency of the ATE was considered good with a Cronbach Alpha coefficient of .88[7] and the EAS coefficient at .66.[8]

According to Soper and Walstad, the EAS is the more critical

[4] William Walstad and Stephen Buckles, "The New Economic Tests for the College and Pre-College Levels: A Comment," Journal of Economic Eduation, vol. 14, (Spring, 1983), pp. 17 - 22.

[5] William Walstad and John Soper, "On Measuring Economic Attitudes," The Journal of Economic Education, vol. 14, no. 4, (Fall, 1983), p. 5.

[6] Ibid., p. 6.

[7] Ibid., p. 7.

[8] Ibid., p. 7.

component of the SEA, consequently the added importance to the content validity process.[9] All of the Joint Council network Council and Center Directors (n = 231) were sent a twenty-item questionnaire (fourteen normal EAS items and six distractors). The fourteen items accepted received seventy percent agreement or disagreement, while the six distractors could not get a concensus. It was also determined the SEA was relatively independent of cognitive economic knowledge. "Neither (ATE or EAS) of these is particularly sensitive to student I.Q. measures" and "... that the ATE and EAS are measuring essentially different things."[10]

Personal Data Questionnaire (PD)

Reliability testing for the questionnaire was completed by asking five teachers to complete the form on two different occasions, several weeks apart. A comparison of the responses by the five teachers showed they responded the same both times with a reliability of .78. Content validity was established by the approval of the questionnaire by the members of the doctoral guidance committee.

Quick Word Test, Level 2, Form Am (QWT)

The Quick Word Test can assess general mental abilities in a time-saving instrument. Level 2 (QWT) is appropriate for college-level and professional groups. The reliability of the Level 2 (QWT) test based

[9] Ibid., p. 7.

[10] Ibid., p. 11.

on a Kuder-Richardson was .89.[11] Concurrent validity for the Level 2 (QWT) was measured at .80. This was determined through a comparison with the ACE Linguistic Test.[12]

Productivity Environmental Preference Survey (PEPS)

The PEPS is a learning style assessment instrument developed by Dunn, Dunn, and Price. They stated that, "The Productivity Environment Preference Survey (PEPS) is the first comprehensive approach to the diagnosis of an adult's individual productivity and learning style."[13] PEPS is designed to analyze individual adults' personal preference for 21 different elements through content and factor analysis. The areas of most interest for this research were "Structure," "Auditory Preference," "Visual Preference," "Tactile Preference," and "Kinesthetic Preference." Except for Kinesthetic, the use of Hoyt reliability coefficients show that some discrimination exists for the instrument. While the Kinesthetic coefficient was .38, Structure, Auditory, Visual, and Tactile had Hoyt reliability coefficients of .47, .87, .56, and .63, respectively.[14]

The authors of the test were not definitive on the survey's validity. However, using the subsets, they noted in earlier True/False forms of the instrument that the survey validity was weak

[11] Edgar F. Borgatta and Raymond J. Corsini, Quick Word Test Manual, (U.S.A.: Harcourt, Brace, & World, 1964), p. 14.

[12] Ibid., p. 14.

[13] Gary E. Price, et al., Productivity Environmental Preference Survey: PEPS Manual, (Lawrence, KS: Price Systems, 1982), p. 1.

[14] Ibid., p. 39.

in the subsets of Structure and Kinesthetic Preferences.[15] To improve the discriminating power of the weakest subsets, they have changed the format to the 5-point Likert Scale. The discriminatory ability "of the new survey should improve validity."[16]

Statistical Hypotheses

The major hypothesis of the study was that the coefficient on the Treatment Variable (X1) in the regression representing use of simulations, is positive and significantly larger than zero in equations measuring literacy and attitude change. The null hypothesis that the treatment variable will not be significant was tested using the t-test and customary significance levels of .05 and .01.

For each independent variable there is a subhypothesis. The null hypothesis that the effect of each independent variable is not significant on the dependent variables was tested using the t-test. Significance was determined at the customary significance levels (.05 and .01) (see Table I-A on page 6, Chapter I). Table III-A describes the variables investigated in the study.

[15] Ibid., p. 21.

[16] Ibid., p. 21.

TABLE III-A

Description of the Variables Studied

Y1	Post-Test for Economic Literacy	(Post-TEL score, 0-46)
Y2	Post-course Attitude Toward Economics	(Post-ATE score, 0-70)
Y3	Post-course Attitude Sophistication	(Post-EAS score, 0-70)
X1	Treatment Variable	(Yes = 1, No = 0)
X2	Pre-Test for Economic Literacy	(Pre-TEL score, 0-46)
X3	Pre-course Attitude Toward Economics	(Pre-ATE score, 0-70)
X4	Pre-course Economic Attitude Sophistication	(Pre-AES score, 0-70)
X5	Age	
X6	Sex	(Female = 1, Male = 0)
X7	General Mental Ability	(QWT proxy, 0 - 100)
X8	Hours of Economic Coursework	(Undergrad and grad hrs)
X9	Highest Degree	(BA=0, MA=1)
X10	Teaching Experience	(Years completed)
X11	Auditory Learning Preference	(PEPS scale 0-70)
X12	Visual Learning Preference	(PEPS scale 0-70)
X13	Tactile Learning Preference	(PEPS scale 0-70)
X14	Kinesthetic Learning Preference	(PEPS scale 0-70)
X15	Structured Learning Preference	(PEPS scale 0-70)
X16	Course Length	(8 days = 0, 10 wks = 1)
X17	Years Since Last Economics Course	

Statistical Procedures

Homogeneity of Variances

The statistical significance of the data involved two processes: determining the homogeneity of the variances and the t-test. For the homogeneity of the variances, it was assumed that they were not equal, so the Fisher's F-test was used to determine the variances.[17] The Fisher's F-test placed the larger s^2_a over the smaller s^2_b, creating the ratio, $F = \frac{s^2_a}{s^2_b}$, so the F value is always greater than one. If the calculated F is larger than the F value in the tables (df is n -1, n -1), the variances are considered homogeneous. Once the homogeneity of the variances is determined, the proper t-test model can be selected.[18]

T-Test Models

Two t-models are available, the pooled variance formula when the variances are homogeneous (equal), or the separate variance formula when the variances are not homogeneous. The formula for pooled variance, assuming homogeneous variances, is:[19]

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(n_1 - 1)\, s^2_1 + (n_2 - 1)\, s^2_2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

[17] Joseph E. Hill and August Kerber, "Chapter 27 - Parametric Statistical Tests - I," Models, Methods, and Analytical Procedures in Educational Research, (Detroit: Wayne State University Press, 1967), p. 344.

[18] Ibid., p. 344.

[19] W. James Popham and Kenneth A. Sirotnik, "Chapter 10 - The T-Test - Comuputation Procedures," Educational Statistics: Use and Interpretation, 2nd ed., (New York: Harper & Row, 1973), p. 141.

The formula for the separate variance is:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s^2_1}{n_1} + \frac{s^2_2}{n_2}}}$$

Since n_1 and n_2 are not equal in this study, the t-model applied is determined by the homogeneity of the variances as determined by the Fisher's F-test, with $s^2_1 = s^2_2$ using the pooled variance formula and $s^2_1 \neq s^2_2$ the separate variance formula.[20]

Estimation Model Development

Davisson and Bonello propose a taxonomy model of inputs for empirical production function research.[21] The models developed for this study had three categories of inputs: personal, which includes age, sex, general mental ability, learning preference, and pre-test scores on the TEL, ATE, and EAS; education, which includes degrees held, hours of economic coursework, and time from last economic course; and professional, which includes years of teaching experience.

The outputs in both the cognitive (knowledge) and affective (attitude and sophistication) domains were measured. The dependent variables were tested using ordinary least squares regression to estimate the influence of personal, education, and professional data

[20] Ibid., p. 139.

[21] William I. Davisson and Frank J. Bonello, Computer-Assisted Instruction in Economics: A Case Study, (South Bend: University of Notre Dame Press, 1976).

along with teaching methodology on each of the dependent variables. This follows a previous model developed by Walstad and Soper.[22] The significance of the independent variables in the regression models were tested using the t-test.

Pre-Course Models. The pre-test model for knowledge gain is:

$$X_2 = \{ \beta_1 X_1 + \epsilon_1 \quad [23]$$

where X_2 was students' pre-course TEL score, X_1 was the vector of exogeneous variables selected to define pre-economic knowledge, and ϵ_1 the error term.

Using the Davisson-Bonello taxonomy, the general pre-course models would be:

Student Pre-TEL (Test of Economic Literacy) or
Pre-ATE (Attitude Toward Economics) or
Pre-EAS (Economic Attitude Sophistication) =

f(Personal , Educational , Professional , U)

age	degrees held	years of teaching
sex	hours in economics	experience
mental ability	time from last	
learning preference	economics course	

The pre-test equation for economic attitude and attitude sophistication take the same form as knowledge gain, except for the substitution of X_3 and X_4, respectively, as the dependent variables. Also, X_2 becomes an exogenous variable on both X_3 and X_4.

A one-way relationship between the three pre-test dependent variables was noted by Brickell and Scott:

> General education research indicates that attitudes tend to change as knowledge increases. For example, attitudes towards

[23] Ibid., p. 42.

> a field of study usually change as students learn more about it. Or, to take another example, students develop more sophisticated insights into their problems as their knowledge increases with the result that their opinions about solutions shift. Thus, high school students who learn economics will tend to develop views about economic policies even if no policies are advocated in their courses.[24]

Walstad found that economic knowledge influenced attitude, but not the reverse.[25] Walstad and Soper concluded that there has been less empirical relationship research on economic knowledge and sophistication, but that the available evidence supports the positive hypothesis that economic knowledge does positively influence attitude sophistication. They stated, "The relationship between attitude and attitude sophistication is difficult to find."[26] Walstad and Soper intuitively expected a stronger effect of attitude sophistication than the reverse.

Their research employed a recursive set of equations and provided support for hypothesis that knowledge gain will influence attitude and sophistication, but not the reverse. The pre- and post-course models used in this research reflect that conclusion.

Post-Test Models. The post-test models mirror the pre-test models with two noted exceptions. First, the pre-course scores were added as exogenous variables for each of their related dependent variables. Second, Course Length (X17) and the Treatment Variable (X1)

[24] H. M. Brickell and M. C. W. Scott, The Effectiveness of Economic Education in Senior High Schools, (New York, Policy Studies in Education, 1976), ERIC, No. 143571.

[25] William Walstad, "Effectiveness of USMES Inservice Economic Education Programs for Elementary School Teachers," The Journal on Economic Education, 3rd ed., no. 1, (Fall, 1979), p. 9.

[26] Walstad and Soper, op. cit., p. 47.

were included so the models had the following forms:

$$Y_1 = \sum \beta_i X_i + \epsilon_i$$

$$Y_2 = \gamma_1 Y_1 + \sum \beta_i X_i + \epsilon_2$$

$$Y_3 = \gamma_i Y_i + \sum \beta_i X_i + \epsilon_3 \quad [27]$$

One research question this study attempted to answer was the effect of a graduate-level course in economics on a teacher's economic knowledge, attitude, and attitude sophistication. The pre-course equations show a stock picture of how the characteristics influence the dependent variables. The post-course equations show a flow picture because they are taking into account the effects of the course over time, and control for pre-tested knowledge or attitude. Two variables added to the post-course model, Course Length (X17) and Treatment Variable (X1), allowed investigation of this question using this model.

Interactive Model. In an effort to study the combined effect of the treatment variable and learning preferences on economic knowledge, attitude, and sophistication, the post-test regression models were tested again including interaction terms. In an interaction term, (X_{i1}, X_{i2}), the "effect of X_1 on Y_i depends on the level of X_2, and similarly for X_2."[28] "Hence, the effects are no longer additive," and take the following form:

$$Y_i = \beta_o + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i1} X_{i2} + \epsilon_i \quad [29]$$

To test the total contribution of variables which were also expected to have an interactive effect on the dependent variables, a

[27] Ibid., p. 49.

[28] John Neter, et al., "Chapter 20 - Multiple Regression," Applied Statistics, (Boston: Allyn & Bacon, 1978), p. 506.

[29] Ibid., p. 506.

hierarchical or joint-F test was employed.[30] The joint F's were calculated using the following formula:

$$\text{Joint } F = \frac{\frac{\Delta R^2}{m}}{\frac{1 - R^2}{N - k - 1}}$$

where m is the number of independent variables in the subset, and k is the total number of independent variables. The degrees of freedom for the F ratio are m and (N - k - 1).[31]

Multicollinearity

A major objective of this research was to measure the separate effects of independent variables on the dependent variables. These effects cannot usually be accurately measured when the independent variables themselves are highly correlated. According to Neter, Wasserman, and Whitmore, "Multicollinearity is present in a regression analysis when the sample observations of the independent variables, or linear combinations of them, are highly correlated."[32]

To study the correlations of the variables, a Pearson Product Moment Correlation Coefficients matrix was created. Kennedy stated that the "... off-diagonal elements contain the simple correlation coefficients for the given data set; the diagonal elements are all unity since each variable is perfectly correlated to itself. A high value (about 0.8 or 0.9 in absolute value) of one of these correlation coefficients indicates high correlation between the two independent variables to which it refers."[33]

[33] Peter Kennedy, "Chapter 9 - Assumption Five: Multicollinearity," A Guide to Econometrics, (Cambridge: MIT Press, 1979), p. 132.

Statistical Analysis

The Statistical Package for the Social Sciences X (SPSS-X) was used to obtain the multiple regression model of independent variables for the three dependent variables. The dependent variables were the Post-course TEL score, Post-course ATE, and Post-course EAS scores. The independent variables measured personal, educational, and professional characteristics and one variable was added to show participation in the simulation teaching methodology.

Summary

This study examined the use of simulations as a methodology to teach basic economic principles in two sections of Basic Economics in Everyday Life with 45 participants. A control group of 42 participants was taught by the lecture/reading method with the text, Teaching Economics: Content and Strategies, as a basis of reading.

Instrumentation to obtain data for analysis included:

1. Test for Economic Literacy - Form B (TEL)
2. Attitude Toward Economics (ATE) - (from Survey on Economic Attitude)
3. Economic Attitude Sophistication (EAS) - (from SEA)
4. Quick Word Test of Mental Ability (QWT)
5. Productivity Environmental Preference Survey (PEPS)
6. Personal Data Questionnaire (PD)

The following statistical procedures were outlined:

1. Fisher's F-test for homogeneity of variances

2. Pooled variance and separate variance t-test model formulas
3. Multiple regression pre- and post-course models
4. Multiple regression model for investigating the effects of interactive terms
5. Multicollinearity measurement of the independent variables

The hypotheses of the study were tested using a Statistical Package for the Social Sciences (SPSS-XY) to obtain a multiple regression model. Significant levels of .05 and .01 were used to test the independent variables on the dependent variables of simulations, post-test Attitude of Teaching Economics, and Economic Attitude Sophistication scores. The hypotheses were tested using the t-test on each independent variable and F-test on the overall equations.

CHAPTER IV

ANALYSIS OF DATA

Introduction

The data comparing the effectiveness of using simulations as a teaching method versus using instructor lecture/reading for a graduate-level economic course for teachers are reported in this chapter. The effects resulting from the method of teaching and the personal and professional characteristics of teachers are examined as related to the acquisition of knowledge of economics and the teacher's attitude toward economics as a field of study.

Review of Research Questions

The following research questions were asked:

1. What are the typical characteristics of participating teachers?
2. Do participants evaluate the value of a graduate-level course differently when simulations are the primary teaching methodology?
3. What is the effect of a graduate-level course in economics on the participants' economic knowledge, attitudes, and attitude sophistication?
4. What is the effect of the use of simulations as the methodology

to teach economic knowledge?

5. Are there personal and/or professional characteristics which affect the economic knowledge, attitudes, and attitude sophistication and changes in these variables during the course of a graduate credit inservice course on economic education?

Data Collected

Data were collected for 17 variables. Table IV-A reports the means, standard deviations, and ranges which were calculated to insure the reasonableness of the data.

TABLE IV-A

Variable Means, Standard Deviations, Ranges, Min/Max Scores

Variable	$\bar{x}$	s	R	Min/Max
Post TEL (Y1)	36.721	5.798	0-46	20-45
Post ATE (Y2)	52.267	7.435	0-70	29-67
Post EAS (Y3)	54.360	6.770	0-70	40-70
Treatment (X1) 0 = Lec./Dis. 1 = Simulation	.517	.503	0-1	N/A
Pre TEL (X2)	31.471	6.548	0-46	14-45
Pre ATE (X3)	47.943	6.757	0-70	33-68
Pre EAS (X4)	52.690	6.641	0-70	40-69
Age (X5)	40.345	8.430	N/A	23-60
Sex (X6) 0=M, 1=F	.621	.488	0-1	N/A
General Mental Ability (X7)	55.153	15.205	0-100	24-86
Hrs. Econ. Coursework (X8)	5.713	6.232	N/A	0-30
Highest Degree (X9) 0 = B.A. 1 = M.A. or higher	.488	.503	0-1	N/A
Teaching Experience (X10)	12.644	6.258	N/A	1-32
Auditory Lrn. Pref. (X11)	50.437*	10.298	20-80	31-77
Visual Lrn. Pref. (X12)	51.103*	8.801	20-80	23-69
Tactile Lrn. Pref. (X13)	51.552*	9.493	20-80	26-69
Kinesthetic Lrn. Pref. (X14)	51.943*	6.433	20-80	20-64
Structured Lrn. Pref. (X15)	51.241*	8.525	20-80	25-67
Course Length (X16) 0 = 8 days (Sum.) 1 = 10 weeks (Quarter)	.782	.416	0-1	N/A
Yrs. Since Last Course (X17)	9.082	9.993		0-36

* Standard scores ($\bar{X}$ = 50, s = 10)

In response to Research Question 1, the typical participant was approximately 40 years of age with 12-1/2 years teaching experience. This teacher had almost 6 credit hours in economics, with the last course taken 9 years ago. The teacher had a slight preference toward the kinesthetic learning style. The pre-course attitude was slightly positive and exibited a slight agreement in economic attitude sophistication.

Group Characteristics

The characteristics of the two groups were calculated to investigate their mix. The means and standard deviations of each characteristic for each group were tested using the t-test. Table IV-B reports the variable differences by groups. Except for X8 (Hours of Economic Coursework), the pooled variance t-test model was used signifying homogeneity of the variances.

TABLE IV-B

Variable Differences by Groups

Variable	n	Group	$\bar{x}$	s	t
Pre TEL (X2)	42	1=L/D	31.0952	6.917	
	45	2=SIM.	31.8222	6.242	-.52
Post TEL (Y1)	41	1	36.1707	6.332	
	45	2	37.2222	5.287	-.84
Pre ATE (X3)	42	1	49.2381	6.655	
	45	2	46.7333	6.699	1.75*
Post ATE (Y2)	41	1	52.9756	7.705	
	45	2	51.6222	7.206	.84
Pre EAS (X4)	42	1	53.4048	6.750	
	45	2	52.0222	6.542	.97
Post EAS (Y3)	41	1	54.7317	6.265	
	45	2	54.0222	7.253	.48
Age (X5)	42	1	39.4762	9.505	
	45	2	41.1556	7.302	-.93
Sex (X6)	42	1	.6667	.477	
	45	2	.5778	.499	.85
General Mental Ability (X7)	42	1	52.8571	13.598	
	43	2	57.3953	16.475	-1.38
Hours Econ. Coursework (X8)	42	1	7.5000	7.062	
	45	2	4.0444	4.852	2.64x*
Highest Degree (X9)	42	1	.5238	.505	
	44	2	.4545	.504	.64
Teaching Experience (X10)	42	1	12.9048	6.566	
	45	2	12.4000	6.020	.37
Auditory Lrn. Pref. (X11)	42	1	50.5476	10.650	
	45	2	50.3333	10.077	.10
Visual Lrn. Pref. (X12)	42	1	51.5238	9.696	
	45	2	50.7111	7.968	.43
Tactile Lrn. Pref. (X13)	42	1	51.1667	8.154	
	45	2	50.9778	10.653	.58
Kinesthetic Lrn. Pref. (X14)	42	1	53.2619	5.964	
	45	2	50.7111	6.673	1.88*
Structured Lrn. Pref. (X15)	42	1	51.6429	8.213	
	45	2	50.8667	8.882	.42
Course Length (X16)	42	1	1.0000	.000	
	45	2	.5778	.499	5.48**
Years Since Last Course (X17)	42	1	5.8571	8.020	
	43	2	12.2326	10.788	-3.09**

Notes:
x = Separate variance model t-test
* = Significant at .05
** = Significant at .01

Course Length (X16) was the only variable where the result was highly predictable. The significance of the others, Pre-ATE (X5), Hours of Economic Coursework (X8), Kinesthetic Learning Preference (X14), and Years Since Last Course (X17), demonstrated the differences that existed between the two groups. Tests revealed several significant differences which were present between the two samples.

The Pre-ATE (X3) and Hours of Economic Coursework (X8) significance revealed that the control group's attitude and background was greater than the experimental group's. The control group also significantly preferred the Kinesthetic Learning Preference (X14).

The Years Since Last Course (X17) difference signals that the experimental group is probably more aware of economics. Yet the Pre-TEL (X2) and Pre-EAS (X4) were not significant, and Pre-ATE (X3) was significant only for the control group.

To account for these differences, the use of a parametric statistical analysis was necessary. The parametric test used was the ordinary least squares multiple regression analysis calculating t-scores on coefficients to note those responsible for any significant change of economic knowledge gain, attitude, or attitude sophistication.

Course Evaluations

Each of the sections was evaluated at its conclusion for effectiveness and worthiness for possible future offering. Every course offered by the Greater Cincinnati Center for Economic Education must be evaluated as a matter of policy. These evaluations allowed for examination of differences among the courses as perceived by the participants. The evaluation form (see Appendix C) stressed three

major areas: the course format, the instructor, and the materials used. The data from these surveys addressed Research Question Two: Do participants evaluate the value of a graduate-level course differently when simulations are the primary teaching methodology?

Determining the statistical significance of these data involved two processes. The variances were not assumed equal, so the Fisher's F-test was used to determine homogeneity.[1] The Fisher's F-test placed the larger s^2_a over the smaller s^2_b, creating the ratio $F = \frac{s^2_a}{s^2_b}$, so the F value is always greater than 1. If the calculated F is larger than the F value in the tables (df is n -1, n -1), the variances are considered homogeneous. Once the homogeneity of the variances is determined, the proper t-test model can be selected.[2]

Two t-models are available, the pooled variance formula when the variances are homogeneous (equal), or the separate variance formula when the variances are not homogeneous. Since n_1 and n_2 are not equal in this study, the t-model applied is determined by the homogeneity of the variances as determined by Fisher's F-test, with $s^2_1 = s^2_2$ using the pooled variance formula $s^2_1 \neq s^2_2$ the separate variance formula.[3]

Table IV-C reports the results of the evaluations from the control and experimental sections.

[1] Joseph E. Hill and August Kerber, Chapter 27 - Parametric Statistical Tests - I," Models, Methods, and Analytical Procedures in Educational Research, (Detroit: Wayne State University Press, 1967), p. 344.

[2] W. James Popham and Kenneth A. Sirotnik, "Chapter 10 - The T-Test - Computation Procedures," Educational Statistics: Use and Interpretation, 2nd ed., (New York: Harper & Row, 1973), p. 141.

[3] Ibid., p. 141.

TABLE IV-C

Course Evaluations Summary

	Control		Experimental		(F)	
	$\bar{x}$	s	x	s	t-model	t-value
1. Course content	4.44	.77	4.73	.45	s (2.926)	2.44[x]
2. Course organization	4.32	.85	4.77	.42	s (4.107)	3.102*
3. Instructor's presentation	4.44	.60	4.84	.43	p (1.945)	.574
4. General attitude and rapport among participants	4.12	.81	4.75	.70	p (1.342)	3.829**
5. Instructor's general attitude & willingness to help	4.56	.63	4.95	.30	s (4.418)	3.606**
6. Textbook	4.34	.76	4.64	.61	p (1.545)	.336
7. Handouts & supplemental materials	4.19	.95	4.61	.62	s (2.382)	2.381[x]

$\bar{x}$'s derived from Likert scale -- 5 (high), 1 (low) $F_{40,44}$ (2.06)

Notes:
s -- separate variance t-test model
p -- pooled variance t-test model
x -- significance at .05 (two-tailed)
* -- significance at .01 (two-tailed)
** -- significance at .001 (two-tailed)

The course content and organization were evaluated significantly higher by the experimental group, though both groups rated content and organization very high. The standard deviations of the experimental group were almost half of those for the control group. This provided much more consistency of scores around the mean for the experimental group. As previously stated, the homogeneity of the variances was not assumed equal and the Fisher's F-test was utilized.[4] The Fisher's F scores (2.926 and 4.107) had significant differences in the variances and led to using the separate variance t-test model to determine t-values.[5] The statistically significant higher mean and low standard deviations suggested the course content and organization were better received by the teachers when simulations were used.

Items 3, 4, and 5 on the evaluation form referred to the course instructor, attitude, and rapport of the participants. The experimental group definitely felt a better rapport among the teachers and a willingness to help on the part of the instructor. The use of simulations could explain these significant differences. Simulations required active participation by the entire group, including a helping relationship by the instructor. Thus, a social stimulus that generated interaction was a part of the experimental group which did not occur in the control group. The increased social interaction created a class for the experimental group with fewer inhibitions and the participants felt better about the usefulness of the class as a whole.

The increased perception of the instructor's willingness to help

[4] Hill and Kerber, op. cit., p. 344.

[5] Popham and Sirotnik, op. cit., p. 141.

could very well be a follow-up response to the increased social interaction in the experimental group. The instructor presented the simulations, which created the social interaction and good feelings toward the group. Thus, the instructor's role was perceived as extremely important by the experimental group as noted by the high mean (4.95) and low standard deviation (.3). The merit of this role model notion increased when the "instructor's presentation" evaluations were assessed. Both groups gave relatively high marks (4.44 and 4.83), and there was no statistical significance between them.

The final items, 6 and 7, evaluated the textbook and handout materials used in the courses. Several observations need attention. First, even though the textbook had entirely different roles, it was evaluated by both groups. With the control group, the text was the focus of the course content. In the experimental group, it was relegated to strictly a resource.

Secondly, many of the handouts given the experimental groups were copies of the simulations for use in their own teaching. These were not made available, obviously, to the control group. News articles and other subject items used as handouts to the control group were also made available to the experimental group. Consequently, the significant difference in the evaluation means must be attributed to the simulation handouts.

Course Results

Table IV-D reports the results of the analysis of the impact of the sections, regardless of teaching methodology, on the teacher's

economic knowledge (TEL), attitude (ATE), and sophistication of the attitude (EAS).

TABLE IV-D

Results on Economic Knowledge Gain, Attitude, and Economic Sophistication for All Participants

Pre-	TEL n = 85	Post-	Difference
$\bar{x}$ 31.471		$\bar{x}$ 36.721	5.250
s 6.548		s 5.798	(5.432)**

Pre-	ATE n = 86	Post-	Difference
$\bar{x}$ 47.943		$\bar{x}$ 52.267	4.324
s 6.757		s 7.435	(3.927)**

Pre-	EAS n = 86	Post-	Difference
$\bar{x}$ 52.690		$\bar{x}$ 54.360	1.670
s 6.641		s 6.770	(1.607)x

Notes:
x significance at .1 (one-tailed)
** significance at .01 (one-tailed)

The analysis demonstrated the success of the control and experimental sections in increasing the teacher's knowledge, as well as improving his/her attitude toward economics as a subject (both were significant at .01). Attitude sophistication gain (significant at .1) was not as large as the preceding two variables. These data answer Research Question Three: What is the effect of a graduate-level course in economics on the participants' economic knowledge, attitudes, and attitude sophistication?

The standard deviations remained relatively constant throughout, which signified total group improvement. However, the TEL was the

only one where dispersion was reduced on the post-test. This suggests that the economic knowledge level became more consistent among the teachers who participated in all the sections. The course seemed to result in a somewhat wider dispersion of attitude and sophistication.

Course Results by Experimental and Control Groups

Table IV-E has the pre- and post-course comparisons of both groups for economic literacy (TEL), attitude (ATE), and sophistication of the attitude (EAS).

TABLE IV-E

Course Results by Groups

TEL

$n_c = 42$, $n_e = 45$

	Pre-course			Post-course		
	C	E	Difference	C	E	Difference
$\bar{x}$	31.0952	31.8222	-0.727	36.1707	37.2222	-1.0515
s	6.917	6.242		6.332	5.287	
		(-.52)			(-.84)	

ATE

$n_c = 42$, $n_e = 45$

	Pre-course			Post-course		
	C	E	Difference	C	E	Difference
$\bar{x}$	49.2381	46.7333	2.505	52.9756	51.6222	1.3534
s	6.655	6.699		7.705	7.206	
		(1.75)*			(.84)	

EAS

$n_c = 42$, $n_e = 45$

	Pre-course			Post-course		
	C	E	Difference	C	E	Difference
$\bar{x}$	53.4048	52.0222	1.3826	54.7317	54.0222	.7095
s	6.750	6.542		6.265	7.253	
		(.97)			(.48)	

Notes:

* significant at .05 (one-tailed)

The only significant pre-test difference involved the groups pre-course attitude toward economics. The standard deviation data for the pre-tests revealed very similar dispersion around the mean for both groups. The pre-test significant difference of attitude showed the control group having a better attitude toward economics coming into the course.

The lack of significance of the post-test t-values on the three dependent variables does not support greater positive effects for simulations as compared to the lecture/reading teaching methodology. The use of simulations seemed to have more effect on the teachers' attitude toward economics. The significant difference between the groups on the pre-test was not evident on the post-test. This was the result of a greater gain by the experimental group. The greater attitude gain of the experimental group seemed to be related to teachers having a different attitude about the course and the instructor's role when simulations are used (See Table IV-C and discussion). It appeared this also was applicable for teachers' attitude.

Regression Model Data Estimates

The models developed for this study had three categories of inputs:

A) Personal, which included age, sex, general mental ability, learning preference, and pre-test scores on the TEL, ATE, and EAS;

B) Educational, which included degrees held, hours of economic coursework, last economic course; and

C) Professional, which included teaching level and years of teaching experience.

The outputs in both the cognitive (knowledge) and affective (attitude and sophistication) were measured and tested. The dependent variables were tested using ordinary least squares regression to estimate the influence of personal, educational, and professional data along with teaching methodology on each of the dependent variables. This follows a previous model developed by Walstad and Soper.[6] The significance of the independent variables in the regression models was tested using the t-test.

Multicollinearity

A major objective of this research was to measure the separate effects of independent variables on the dependent variables. These effects cannot be measured accurately when the independent variables themselves are highly correlated. "Multicollinearity is presented in a regression analysis when the sample observations of the independent variables, or linear combinations of them, are highly correlated."[7]

To study the correlations of the variables, a Pearson Product Moment Correlation Coefficients matrix was created. This is reported in Appendix D.

The variables and correlations for Age (X5) and Highest Degree (X9) were both highly correlated to Teaching Experience (X10). To avoid the risk of multicollinearity, Teaching Experience (X10) was used in the models, while Age and Highest Degree were deleted from the models.

[6] William Walstad and John Soper, "A Model of Economic Learning in the High School," The Journal of Economic Education, vol. 13, no. 1, (Winter, 1982), p. 42.

[7] John Neter et al., "Chapter 20 - Multiple Regression," Applied Statistics, (Boston: Allyne and Bacon, 1978), p. 512.

Pre-course Data

Table IV-F reports the pre-course equations using ordinary least squares, the obtained estimator, and t-value (parenthesis).

TABLE IV-F

Pre-Course Regressions Coefficients

(t-statistics are given in parentheses)

Regressors	Dependent Variables and Equations TEL - EQ1	 ATE - EQ2	 EAS - EQ3
X2 - Pre-TEL	----	.13774 (.989)	.37387 (2.778)**
X6 - Sex	-3.80844 (-2.711)**	-.82635 (-.487)	2.24191 (1.366)
X7 - General Mental Ability	.19531 (3.888)**	-.03044 (-.477)	.02883 (.468)
X8 - Hours Economic Coursework	.25299 (1.997)*	.49210 (3.288)**	.35597 (2.461)*
X10 - Teaching Experience	.13620 (1.234)	.03753 (.293)	.21193 (1.711)x
X11 - Auditory Learning Pref.	.05049 (.806)	.00692 (.096)	-.04789 (-.686)
X12 - Visual Learning Pref.	.04738 (.624)	.00181 (.021)	-.11947 (-1.414)
X13 - Tactile Learning Pref.	.11632 (1.535)	.06037 (.682)	-.06818 (-.797)
X14 - Kinesthetic Learning Pref.	-.02676 (-.241)	.01413 (.111)	.23640 (1.919)x
X15 - Structured Learning Pref.	-.02645 (-.328)	-.14440 (-1.560)	-.20952 (-2.342)*
Adjusted R^2	.36207	.16252	.26037
Total Equation F	5.85598**	2.49421*	3.71054**
N	87	87	87

Notes:
** = Significant at .01 (two-tailed)
* = Significant at .05 (two-tailed)
x = Significant at .1 (two-tailed)

The F statistics for all three equations were significant at .01. These equations identified the variables that significantly affected the long-term stock of the three dependent variables. The equations helped answer Research Question 5: Are there personal and/or professional characteristics which affect the economic knowledge, attitudes, and attitude sophistication?

Equation One (see Table IV-F) with TEL as the dependent variable related to the teacher's pre-course economic literacy. Sex (X6), General Mental Ability (X7), and Hours of Economic Coursework (X8) were significant variables to the teacher's pre-course knowledge. Teaching Experience (X10) and the Learning Preference variables, X11 to X15, were not significant, suggesting their influence on economic knowledge was negligible.

Equation Two (See Table IV-F) with ATE as the dependent variable relates to the teacher's attitude toward economics. The only significant predictor for EQ 2 was Hours of Economic Coursework (X8). Sex (X6) and General Mental Ability (X7), which were highly significant predictors of TEL, were not significant and were both negative. Pre-Economic Literacy (X2) was positive but not significant.

Attitude Sophistication was the dependent variable for Equation Three (see Table IV-F). The most significant positive predictor on EAS was Pre-course Economic Literacy (X2) at .01. Other significant predictors for EAS were Hours of Economic Coursework (X8) and Structured Learning Preference (X15) at .05, and Teaching Experience (X10) and Kinesthetic Learning Preference (X14) at .1. General Mental Ability (X7) has very little influence on EAS.62

Post-Course Data

Table IV-G reports the post-course equations using ordinary least squares, estimate of the coefficient, and t-values (in parentheses).

TABLE IV-G

Post-Course Regressions

Regressors	Dependent Variables and Equations TEL - EQ1	ATE - EQ2	EAS - EQ3
Y1 - Post-TEL	----	.07387 (.433)	.16385 (1.133)
X1 - Treatment Variable	.34928 (.337)	-1.18274 (-.630)	1.35529 (.841)
X2 - Pre-TEL	.57056 (6.775)**		
X3 - Pre-ATE		.38712 (2.994)**	
X4 - Pre-EAS			.49710 (4.397)**
X6 - Sex	-.44900 (-.448)	1.8229 (1.033)	.53694 (.353)
X7 - General Mental Ability	.08999 (2.319)*	.10616 (1.489)	.07285 (1.173)
X8 - Hours Economic Coursework	.01359 (.150)	.28469 (1.669)x	.03843 (.266)
X10 - Teaching Experience	.00741 (.099)	.07228 (.579)	-.04862 (-.411)
X11 - Auditory Learning Pref.	-.05795 (-1.365)	-.01766 (-.232)	.00966 (.147)
X12 - Visual Learning Pref.	-.00412 (-.081)	-.02899 (-.318)	-.02294 (.288)
X13 - Tactile Learning Pref.	-.00538 (-.100)	.18121 (1.904)x	.05270 (.647)
X14 - Kinesthetic Learning Pref.	.02114 (.281)	-.07290 (-.562)	-.06523 (-.550)
X15 - Structured Learning Pref.	.11600 (2.127)*	-.07722 (-.765)	-.05726 (-.642)
X16 - Course Length	-1.19714 (-.886)	-4.42339 (-1.819)x	2.54172 (1.194)
Adjusted R^2	.68932	.27548	.30867
Total Equation F	12.01824**	3.25211**	3.64453**
N	87	87	87

Notes:
** = Significant at .01 (two-tailed)
* = Significant at .05 (two-tailed)
x = Significant at .1 (two-tailed)

As with the pre-tests, all equation F statistics were significant at .01. The post-course estimators were used for two purposes. The primary reason was to test the Treatment Variable (X1). The second purpose was to compare the pre-course "stock" equations with the flow of learning and attitude change that occured on the exogenous variables as a result of the course. The pre-course equations were a "stock" model reporting on understanding at a point in time. The post-course equations are "learning flows" reporting on changes in knowledge and attitude over the treatment period.

Several major changes occurred to Equation One (see Table IV-G). The Treatment Variable (X1) relating to course structure or methodology was not significant, it was a positive estimator. Sex (X6) was no longer a significant predictor and the significance of General Mental Ability (X7) was reduced to .05 from .01. Structured Learning Preference (X15) was significant at .05, now as a positive predictor. The variable with the strongest predictive influence was Pre-course Economic Knowledge (X2).

A teacher's Pre-course Economic Knowledge, General Mental Ability, and Preference for a Structured Learning style are significant, positive predictors of post-course literacy. Sex (X6) continues to be a negative predictor. Auditory, Visual, and Tactile Learning Preferences were non-influential, negative estimators. Course Length (X16) was not significant.

In Equation Two (see Table IV-G), Pre-course Attitude (X3) was the most significant predictor (.01) of Post-course Attitude (Y2). Hours of Economic Coursework (X8) was significant as in the pre-course regression, but only at .05.

Tactile Learning Preference (X13) was also significant (.5), although it was not significant in the pre-course regression. This supported the notion that the course had a positive effect on teacher's attitude and especially on those teachers who prefer to learn by tactile methods. The other learning preference estimators were negative.

Course Length (X16) was significant and negative on Post-course Attitude at .05. Since Course Length (X16) was a dummy variable, 0 = 1 evening/week for 10 weeks and 1 = 8 consecutive weekdays (hours of instruction were equal), the negative sign suggested that more intense courses may have a negative effect on teacher's attitude.

Post-course Literacy (Y1), Sex (X6), General Mental Ability (X7), and Teaching Experience (X10) were positive predictors, but were not at a significant level. The Treatment Variable (X1) was a negative coefficient and not significant, suggesting the simulations were less effective in contributing to teacher attitude when holding other variables in the equation constant.

In Equation Three (see Table IV-G), Pre-course EAS (X4) had the most significant influence on Post-course EAS (Y3). This was consistent with Post Equation Two where Pre-course ATE was the most significant variable of Post-course ATE. The exogenous variables that significantly influenced pre-course EAS were not significant in the post-course model. Course Length (X16) and Treatment Variable (X1) were not significant. The nature of this endogenous variable makes it a conceptually difficult concept to predict.

Interactive Equations

In an effort to study the combined effect of the treatment variable and learning preferences on economic knowledge, attitude, and sophistication, the post-course regression models were tested again including interaction terms. Table IV-H reports the post-course results with the interaction terms.

TABLE IV-H

Post-Course Regressions With Interactive Variables

Regressors	Dependent Variables & Equations TEL - EQ1	ATE - EQ2	EAS - EQ3
Y1 - Post-TEL		.15373 (.870)	.21663 (1.401)
X1 - Treatment Variable	-7.60481 (-.753)	10.59730 (.560)	-19.52112 (-1.222)
X2 - Pre-TEL	.57621 (6.700)**		
X3 - Pre-ATE		.37505 (2.692)**	
X4 - Pre-EAS			.48450 (4.333)**
X6 - Sex	-.26900 (-.273)	2.61808 (1.472)	.61469 (.404)
X7 - General Mental Ability	.05813 (1.558)	.08559 (1.256)	.06598 (1.130)
X8 - Hours Economic Coursework	.01516 (.190)	.29153 (1.777)x	.03364 (.255)
X10 - Teaching Experience	.01754 (.247)	.02738 (.210)	-.08416 (-.743)
X11 - Auditory Learning Pref.	-.14156 (-2.480)*	.03004 (.274)	-.02395 (-.255)
X12 - Visual Learning Pref.	-.01418 (-.231)	.02004 (.175)	-.09351 (-.954)
X13 - Tactile Learning Pref.	.02516 (.334)	.14312 (1.021)	.01280 (.107)
X14 - Kinesthetic Learning Pref.	-.05791 (-.539)	.03492 (.171)	-.09521 (.107)
X15 - Structured Learning Pref.	.16163 (2.243)*	-.07330 (-.521)	-.09173 (-.782)
X16 - Course Length	-.26009 (-.195)	-4.05878 (-1.668)x	1.31589 (.626)
X19 - Interaction Term (X1 * X12)	.21244 (2.468)*	-.02632 (-.159)	.04924 (.346)
X20 - Interaction Term (X1 * X13)	.04861 (.457)	-.03901 (-.199)	.27455 (1.625)
X21 - Interaction Term (X1 * X14)	-.04504 (-.455)	.09088 (.495)	.04759 (.303)
X22 - Interaction Term (X1 * X15)	.05795 (.385)	-.22299 (-.763)	-.08709 (-.364)
X23 - Interaction Term (X1 * X16)	-.11354 (-1.079)	-.03277 (-.167)	.10191 (.617)
Adjusted R^2	.63952	.25626	.30185
Total Equation F	9.66169**	2.58880**	2.99360**
N	87	87	87

Notes:
** = Significant at .01 (two-tailed)
* = Significant at .05 (two-tailed)
x = Significant at .1 (two-tailed)

The regression model, including the interactive terms, resulted in numerous positive/negative direction changes among the learning preference variables. These direction changes suggested multicollinearity among these variables. The possibility of multicollinearity created a need to refer to the correlation matrix which confirmed the multicollinearity of the interactions (.9617, .9759, .9829, .9705) (see Appendix D) and the learning preference variables. Multicollinearity was the result of a data problem quite possibly related to the size of this set. Even so, it is possible to judge the overall impact of the treatment and learning [reference variables on the various independent variables by use of a hierarchical or "Joint-F" test. It is not appropriate, however, to rely on the coefficients or t-tests for the individual independent variables which are affected by multicollinearity in these equations.

Joint F Tests

In an effort to discern any significant differences the interaction terms and their component variables had on the overall model, the Joint F was calculated. The calculated F's are reported in Table IV-I.

TABLE IV-I

Joint F Test for Interactive Variables

X19 = X1 * X 12
X20 = X1 * X 13
X21 = X1 * X 14
X22 = X1 * X 15
X23 = X1 * X 16

Dependent Variable	R^2	R^2 CHG	Joint F
Y1 - Post TEL Test	.71335	.03098	1.2434
Y2 - Post ATE Test	.41755	.01310	.2545
Y3 - Post EAS Test	.45325	.03266	.6766

None of the Joint F's were significant, suggesting that the treatment and learning preference variables do not jointly affect the economic learning or attitudinal variables measured here at customary significance levels.

Summary

This chapter presented the data from the control and experimental group and analyzed the effectiveness of simulations as a teaching methodology. Teacher personal and professional characteristics were also tested for their significance in estimating economic knowledge, attitudes, and attitude sophistication.

The test results suggested the following:

1. Sample differences identified by testing the two groups separately provided evidence for the use of parametric testing.
2. The course evaluations were positive for all sections.
3. Course evaluations favored the use of simulations as a teaching method.

4. All sections, regardless of teaching methodology, were successful in increasing the economic knowledge, attitude, and attitude sophistication of the teachers.
5. Experimental and control group effects were not significantly different on the three variables (TEL, ATE, EAS) tested with regression analysis. This suggested that, after controlling for other key variables, no difference exists on the effects gained by using simulations rather than lecture/reading.
6. Using OLS model on Pre-course Knowledge, Sex, General Mental Ability, and Hours of Economic Coursework were significant.
7. Only Pre-course Knowledge significantly influenced Pre-course Attitude.
8. Pre-course knowledge, previous economic coursework, structured learning preference (negatively), and kinesthetic learning preference were significant compared to pre-course attitude sophistication.
9. Pre-course knowledge, structured learning preference, and general mental ability significantly influenced pre-course knowledge.
10. Pre-course attitude, hours of economic coursework, tactile learning preference, and course length, influenced post-course attitude toward economics.
11. Pre-course attitude sophistication significantly influenced post-course sophistication.
12. Multicollinearity restricted study of the effects of interactive terms on the dependent variables.
13. The addition of interactive terms did not show a combined impact

of the simulation treatment and learning styles on the overall post-course models. This was determined by the Joint-F values, which were not significant.

CHAPTER V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS, REFLECTIONS

Summary

This research investigated the effectiveness of using simulations in a professional development graduate course for teaching economic principles to K-12 school teachers. The experimental design of the study involved a control group which was taught by using the lecture/reading methodology. The experimental group was taught the identical course content through the use of simulations.

The two groups were enrolled in a graduate-level course for teachers in basic economic principles. The course was for four quarter hours, offered by the Greater Cincinnati Center for Economic Education at the University of Cincinnati. The first section met during the Winter Quarter, 1984, where the main teaching methodology was the lecture/reading approach for the control group. The experimental sections were organized to use simulations as the major teaching methodology and were taught to two groups during the Spring and Summer Quarters, 1984.

The following questions were investigated:

1. What are the typical characteristics of participating teachers?
2. Do participants evaluate the value of a graduate-level course differently when simulations are the primary teaching methodology?
3. What is the effect of a graduate-level course in economics on the participants' economic knowledge, attitudes, and attitude sophistication?
4. What is the effect of the use of simulations as the methodology to teach economic knowledge?
5. Are there personal and/or professional characteristics which affect the economic knowledge, attitudes, and attitude sophistication?

The major hypothesis of this study was that the coefficient on the Treatment Variable (X1) in the regression, representing the use of simulations, was positive and significantly larger than zero in regression equations measuring economic knowledge and attitude change. The null hypothesis that the Treatment Variable (X1) was not significant was tested using t-tests and customary significance levels (.05 and .01).

For each independent variable other than the treatment variable, there was a subhypothesis. The null hypothesis that the effect of each independent variable was not significant on the dependent variables was tested using the t-test. Significance was determined at the customary significance levels (.05 and .01).

The sample for the study was determined by the registration system for published graduate courses by the Greater Cincinnati Center

for Economic Education at the University of Cincinnati. Forty-two teachers registered and successfully completed the control section. The experimental group consisted of two separate sections. Twenty-six teachers successfully completed the first experimental course using simulations, and nineteen teachers completed the second section for a total of forty-five in the experimental group.

This research was intended as an attempt to provide a policy statement relative to the usefulness of simulations and the effect of student characteristics on economic literacy and attitude change towards economics. As such, the research did not investigate relationships between the independent variables of post-course knowledge gain, attitudes, and attitude sophistication. The conclusions drawn from this study were as they related to the dependent variables of post-test and attitude scores.

The National Survey of Economic Education - 1981 noted that eight out of ten teachers of economics have had a college or graduate-level course in economics. Yet, 81 percent wanted better training to teach economics. Much of the research in economic education has focused on undergraduate college principles courses using production function models.

The literature was quite definitive that inservice teacher training in economics improved the economic understanding of the teachers. Studies of the teaching methodology and content, however, were minimal. The need for adult learners to use simulations was supported by Seider and the need for adults to "... learn in action-oriented environments." The literature on simulations in economic education was not overly positive.

The following instruments were used to obtain data for analysis:

1. Test for Economic Literacy - Form B (TEL)
2. Attitude Toward Economics (ATE) - (from Survey on Economic Attitude)
3. Economic Attitude Sophistication (EAS) - (from SEA)
4. Quick Word Test of Mental Ability (QWT)
5. Productivity Environmental Preference Survey (PEPS)
6. Personal Data Questionnaire (PD)

The following statistical procedures were used to analyze the data:

1. Fisher's F-test for homogeneity of variances.
2. Pooled variance and separate variance t-test model formulas.
3. Multiple regression pre- and post-course models.
4. Multiple regression model for investigating the effects of interactive terms.
5. Multicollinearity measurement of the independent variables.

The hypotheses of the study were tested using the Statistical Package for the Social Sciences (SPSS-X) to obtain multiple regression models. The significance levels of .05 and .01 were used to test the independent variables on the dependent variables of Post-course Test for Economic Literacy, Attitude Toward Economics, and Economic Attitude Sophistication scores. The hypotheses were tested using the t-test on each independent variable and F-test on the overall equations.

As a result of the data analysis, the researcher found that:

1. Sample differences identified by testing the two groups separately provided evidence for the use of parametric testing.
2. The course evaluations were positive for all sections.
3. Student course evaluations favored the use of simulations as a teaching style.
4. All sections, regardless of teaching methodology, were successful in increasing the economic knowledge, attitude, and attitude sophistication of the teachers.
5. Experimental and control group results were not significantly different on the three variables (TEL, ATE, EAS) tested with regression analysis. This suggested that no difference exists on the effects gained by using simulations rather than lecture/reading.
6. Using OLS model on Pre-course Knowledge, Sex, General Mental Ability, and Hours of Economic Coursework were significant.
7. Only Pre-course Knowledge significantly influenced Pre-course Attitude.
8. Pre-course Knowledge, Previous Economic Coursework, Structured Learning Preference (negatively), and Kinesthetic Learning Preference were significant compared to Pre-course Attitude Sophistication.
9. Pre-course Knowledge, Structured Learning Preference, and General Mental Ability significantly influenced Post-course Knowledge.
10. Pre-course Attitude, Hours of Economic Coursework, Tactile Learning Preference, and Course Length (negatively), influenced Post-course Attitude Toward Economics.
11. Pre-course Attitude Sophistication significantly influenced

Post-course Sophistication.

12. Multicollinearity restricted study of the effects of interactive terms on the dependent variables.
13. The interactive terms did not have a significant effect on the overall post-course models. This was determined when the Joint-F values were not significant.

Conclusions

The first research question was, "What are the typical characteristics of participating teachers?" The conclusions supported from the data are summarized as follows.

The typical participant identified had some previous economics experience, even though it was some time ago. The participant had approximately twelve and one-half years teaching experience, yet may or may not have had an advanced degree. This teacher had almost six credit hours in economics, with the last course taken nine years ago. The teacher had a slight preference for Kinesthetic Learning which may have had a bearing toward the Course Evaluation preferences toward simulations that were revealed. The Pre-course Attitude was slightly positive and slight agreement in Economic Attitude Sophistication.

Items 3, 4, and 5 on the Course Evaluation Form referred to the course instructor, attitude, and rapport of the participants. The experimental group definitely felt a better rapport among the teachers and a willingness to help on the part of the instructor. These data support an affirmative answer for Research Question Two, "Do participants evaluate the value of a graduate-level course differently when simulations are the primary teaching methodology?" The use of

simulations could explain these significant differences. Simulations required active participation by the entire group. This social stimulus generated interaction of the experimental group which did not occur in the control group. The increased social interaction created a class for the experimental group with fewer inhibitions, and the participants felt better about the usefulness of the class as a whole.

The increased perception of the instructor's willingness to help could very well be a follow-up response to the increased social interaction in the experimental group. The instructor presented the simulations, which created the social interaction and good feelings toward the group. Thus, the instructor's role was perceived as extremely important by the experimental group.

The analysis of the teachers' post-course knowledge, attitude, and attitude sophistication gain demonstrated the success of the control and experimental sections. These data confirmed a positive effect for participants relative to Research Question Three, "What is the effect of a graduate-level course in economics on the participants' economic knowledge, attitudes, and attitude sophistication?"

The major hypothesis of the study predicted that the use of simulations would result in a statistically significant difference between the control and experimental groups. The course evaluations for both groups were favorable with the experimental group's (simulations) evaluations in a more positive direction than the control group. However, the regression analyses did not show any significance between the two groups on the three dependent variables. The major hypothesis was therefore rejected.

Though not significant, the evidence from the course evaluation does support that the use of simulations had a positive effect in teaching economic knowledge. These data are significant for conclusions regarding Research Question Four, "What is the effect of the use of simulations as the methodology to teach economic knowledge?" The positive direction of the data from the experimental group as compared to the control group does support a qualified conclusion that simulations were more effective with inservice teachers as a means to teach economic knowledge.

The following subhypotheses were accepted:

1. Equation One (Post-course knowledge) - Pre-course Knowledge, Structured Learning Preference, General Mental Ability;
2. Equation Two (Post-course attitude) - Pre-course Attitude, Hours of Economic Coursework, Tactile Learning Preference, Course Length (negatively);
3. Equation Three (Post-course attitude sophistication) - Pre-course Attitude Sophistication.

Accepting these subhypotheses answered Research Question Five, "Are there presonal and/or professional characteristics which affect the economic knowledge, attitudes, and attitude sophistication?"

Recommendations

Based on the study findings, the researcher recommends that further research be conducted in the following areas:

1. Although the major hypothesis was rejected, there was limited

evidence that simulations were more effective in doing some things. Therefore, more research is urged on the effectiveness of simulations as a teaching methodology in teacher education.

2. In Chapter I, this researcher made a distinction between different types of simulations. Research should be completed to investigate the effectiveness of different types of simulations or if the distinction itself is valid.
3. Simulations are often used as a teaching methodology to relate to the real world. Future research that finds simulations effective should pursue student perceptions as to why they might be more effective.
4. Although simulations were not identified as statistically significant as a methodology, the role of the instructor seemed to be perceived as different when simulations were used. Further research should explore the students' perceptions of an instructor's role as a function of the teaching methodology employed.
5. Research should be completed on identifying any instructor difference that may have affected outcomes. Since the experimental sections were taught after the control, this research could be replicated with the sections reversed so as to investigate whether any Hawthorne effect occurred related to the instructor, regardless of the teaching methodology used. Instructor differences could also be studied by replicating this research using different instructors.
6. Further research is needed to investigate possible relationships between economic knowledge gain and economic attitude with

learning styles. This would also include studying interactive terms using larger sample sizes.

7. Further research should investigate any relationships between learning styles and the methodology of simulations. Is a particular learning style a factor on the effectiveness of simulations?
8. If the simulations are used as course handouts, any course evaluations conducted at the conclusion should differentiate between topical handouts (newspaper articles) and professional handouts (simulations). This would assist evaluations of the handouts as to quality and/or quantity.
9. A follow-up study of the participants several years from now to investigate any possible long-range differences that may exist as a result of their participation and exposure to an economic education course using a specific teaching methodology.
10. One of the costs involved in using simulations is the extra course preparation time required. The cost is incurred in researching for simulations that are applicable to specific concepts to be taught, and familiarizing oneself with the substance and procedure. In an effort to reduce these costs for other instructors who wish to use simulations, it is recommended that a syllabus or manual be developed for inservice use categorizing simulations with the concepts.

Reflections

As this study draws to its conclusion, there are several observations and feelings that need to be addressed. One is the

instructor's perception of using the different teaching methodologies. A second is an observation of the costs and benefits of using simulations. Finally, an overall reflection of the research in it's entirety.

This researcher, being the instructor for all the sections, had some strong feelings on which particular teaching methodology was best suited for his teaching strengths and personality. The instructor felt a pre-research preference for the lecture/discussion method. Consequently, if a bias was present, it was probably toward that methodology. At one point during a simulation section, this instructor had felt a loss of control of the class and inwardly expressed some concerns regarding the effectiveness of any kind in these sections. The results of this research, however, showed the concerns were without merit.

The second observation was the noticeable costs and benefits associated with using simulations. The primary benefit was the interaction experienced by the participation. The participants in both experimental sections were noticeably more at ease and willing to verbally participate. The forced interactions created by using the simulations seemed at least partially responsible for this difference. Two costs were evident. The first was the extra time needed by the instructor preparing for class. This involved finding the proper simulation, studying its method and implementation, and understanding the full educational scope of the exercise. The recommendation for a manual of simulations would be an effort to reduce this cost for other teachers who wish to use simulations. The second cost involved the deleting of certain topics because a

simulation was not appropriate. The most obvious case was the lecture/discussion section on the history of money. Although general information, it is interesting enough to be included in a course discussion. Yet the lack of a simulation made this impossible for the experimental sections.

While it will contribute to the existing body of knowledge in teacher education, this research study also proved to be a valuable learning experience. The knowledge gained and received will be effectively used in the future by this researcher, and hopefully, the profession.

APPENDIX A

APPENDIX A

S Y L L A B U S

Basic Economics in Everyday Life

Objectives

1. To assist teachers in gaining an understanding and appreciation for the science of economics.

2. To expose the teachers to the diversified approaches of economics in the classroom.

3. To provide the teachers a pool of resources for incorporating economics into the classroom as "the business of everyday life."

4. To create an atmosphere of continued cooperation between the course participants and the Greater Cincinnati Center for Economic Education.

Materials

Textbook: Teaching Economics: Contents & Strategies
Films: Give & Take, Trade-Offs

Setting

1. Follow textbook "Contents" (see schedule)
2. Simulations/discussion/question
3. Relate textbook material to current events and teaching
4. Use A-V and speakers when appropriate

Grade Criteria

1. Attendance - maximum of two absences
2. Review Tests (2)
3. Outside readings
4. Class Participation

APPENDIX B

APPENDIX B

TEST OF ECONOMIC LITERACY
Form B

1. Every economic system must make choices. Which of the following choices do all economic systems face?

   A. To balance the government's budget by reducing spending.
   B. To save money and thus reduce the national debt.
   C. To dispense with the production of luxuries.
   D. To make the best use of scarce resources.

2. When a nation's human and material resources are being fully and efficiently used, more of any one product

   A. cannot be produced.
   B. can be produced only if there is a general decrease in prices.
   C. can be produced only if there is less production in some other products.
   D. cannot be produced unless private enterprise rather than government does so.

3. Newspaper headline: "SCHOOL REFERENDUM DEFEATED." In many recent votes on school budgets, citizens have defeated school tax proposals and forced schools to eliminate extracurricular activities because of a lack of funds. What, if any, are the opportunity costs of such decisions?

   A. Whatever benefits there might have been from the extra-curricular activities.
   B. Since less money will be spent there are no opportunity costs.
   C. The costs of what taxpayers will now buy with what they saved.
   D. The opportunity to use school facilities fully.

4. Of the following, the principle of diminishing returns is best illustrated by

   A. any decline in the average rate of profit.
   B. the decline in personal income as workers age.
   C. small firms being driven out of business by large firms.
   D. a slowing rate of increase in output as farmers add increasing amounts of fertilizer to their land.

5. The best definition of profit is

   A. total assets minus total liabilities.
   B. total revenues minus total costs.
   C. total sales minus all taxes.
   D. total sales minus wages.

6. Most of the money that American businesses receive by selling their products or services is paid as

   A. profits to the owners of the businesses.
   B. wages and salaries to employees.
   C. rent to property owners.
   D. interest on debts.

7. Specialization and division of labor by nations followed by increasing international trade probably would

   A. increase total world production of wanted goods and services.
   B. eliminate differences in standards of living among nations.
   C. increase the likelihood of worldwide unemployment.
   D. lower living standards in the wealthy nations.

8. The specialization of labor results in

   A. increased price inflation.
   B. less output per hour worked.
   C. more economic interdependence.
   D. more equal distribution of income.

9. Within a market economy a northern state produces a great quantity of cheese; a southern state grows many oranges. If exchanges of cheese and oranges take place between these states

   A. both states lose.
   B. both states gain.
   C. one state gains at the expense of the other.
   D. one cannot determine gains or losses from the given information.

10. Which tax is likely to alter most the pattern of consumer choice among various products?

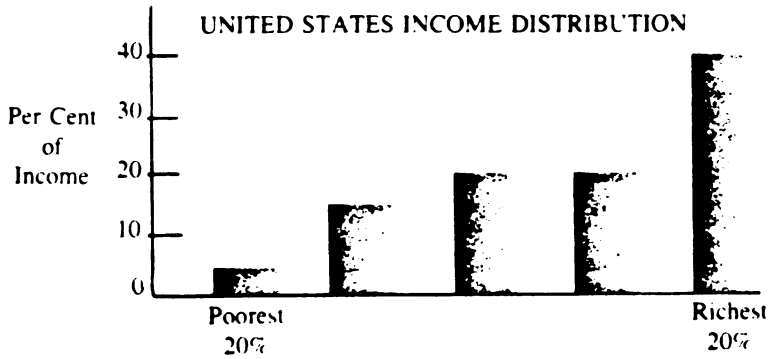
   A. A general sales tax.
   B. A personal income tax.
   C. A specific excise tax.
   D. A business profits tax.

11. "Economic demand" for a product refers to how much of the product

   A. the poeple are willing and able to buy at each price.
   B. the people want, whether they can buy it or not.
   C. the government orders to be made.
   D. is available for sale.

12. Initially, the price system in a market economy reacts to a shortage of a product by

   A. raising the price and producer profits.
   B. lowering the price and producer profits.
   C. raising the price, but lowering producer profits.
   D. lowering the price, but increasing producer profits.



13. Using the chart above, the poorest 20% of the U.S. population received about what percentage of the nations income?

A. 40%
B. 20%
C. 15%
D. 5%

14. You read the following headline: "ORANGE GROWERS FORM MONOPOLY." How will the new orange monopoly most likely differ from a highly competitive orange growing industry?

A. Profits in the orange industry will now be certain.
B. The orange growers will increase their use of capital goods.
C. The orange monopoly will hire more workers and increase output.
D. There will be less incentive for the orange monopoly to be efficient.

15. A rise in the price of which product would be likely to increase the demand for butter?

A. Margarine.
B. Butter.
C. Cheese.
D. Bread.

16. If U.S. farm output remains the same how will several years of bad weather in Europe and the Soviet Union affect American food prices?

A. Raise them.
B. Decrease them.
C. Make no change.
D. Cannot be determined.

17. As more sewage processing plants are built and put into operation, more fer-tilizer may be produced as a by-product. If this happens, fertilizer will be

A. increasingly scarce.
B. more expensive.
C. less expensive.
D. wanted less.

18. If the government were to levy a tax of one dollar on every pair of pants sold, which of the following would most likely result?

A. Suppliers would sell more and charge a higher price.
B. Consumers would pay a higher price for pants and probably buy a smaller quantity.
C. Consumers would pay a higher price and as a result suppliers would make larger profits.
D. Suppliers would increase the quantity sold in order to make up for the taxes paid to the government.

19. Business firms wish to sell their products at high prices. Households wish to buy products a low prices. In a market economy this conflict of interests

A. is resolved by competitive markets.
B. is resolved by government intervention.
C. is resolved in favor of business since all household heads are members of firms.
D. does not exist; there is really no conflict of interest between households and firms.

20. Assuming the supply of a product remains constant as the demand for it increases, its price will normally

A. fall.
B. rise.
C. stay the same.
D. either rise or fall.

21. "Americans are a mixed up people. Everyone knows that baseball is far less necessary than food and steel. Yet they pay ball players a lot more than farmers and steelworkers." Why?

A. The employers of the ball players are monopolists.
B. Ball players are really entertainers rather than producers.
C. There are fewer professional ball players than farmers or steelworkers.
D. Good ball players are scarce compared to the demand for their services.

Questions 23 and 23 are based on the following news story:

"ANOTHER SHIP WRECKED -- For the fourth time in six years. Rocky point claims more victims. Millions of dollars in ships and cargo lost. Ships heading into the nearby port must come dangerously close to this well known hazard. Citizens are concerned that no lighthouse protects shipping into our ports."

22. Private businesses are <u>not</u> likely to build a lighthouse because

A. the cost of building the lighthouse is too high.
B. the risk of loss to shipowners is eliminated by insurance.
C. a private business would have great difficulty collecting fees from shipowners.
D. it would cost more for a private firm to build the lighthouse than for the government to do so.

23. Suppose that the state decides to build and operate a lighthouse to prevent shipwrecks. What would be the fairest way to pay for the project?

A. An income tax on all shipowners.
B. A docking tax on all ships using the seaport.
C. A general sales tax on all goods sold in the state.
D. A general sales tax on all goods sold in the seaport.

24. Unexpected inflation is most likely to benefit

A. persons living on fixed pensions.
B. life insurance policy holders.
C. savings bank depositors.
D. people who owe money.

25. Gross National Product is a measure of

A. the price level of goods and services sold.
B. that part of production which is used by the government.
C. the market value of a nation's output of final goods and services.
D. the quantity of goods and services produced by private businesses.

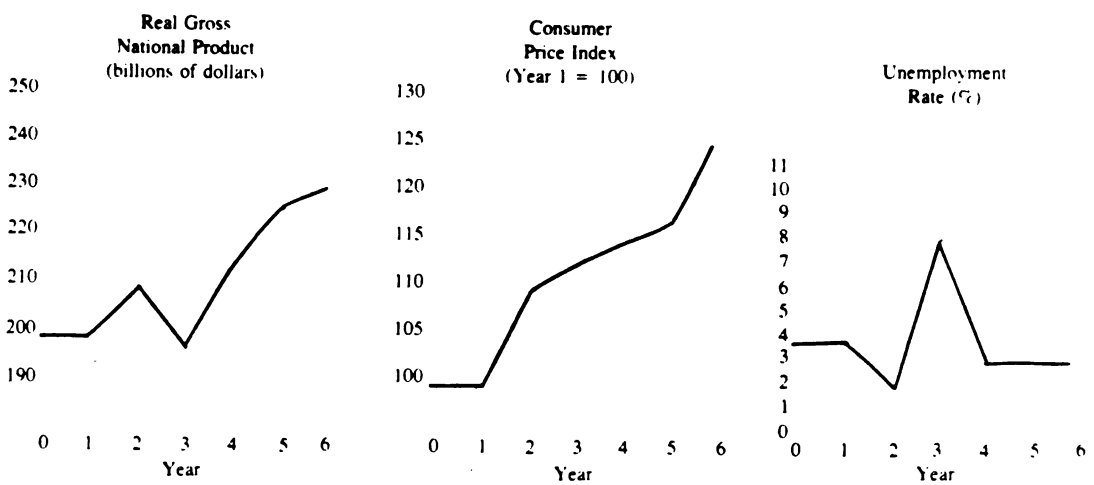
26. When comparing Gross National Product over several years, it is necessary to adjust for

A. changes in technology.
B. changes in the price level.
C. product quality improvement.
D. new products that enhance our wealth.

27. The commercial banking system creates money when

A. business firms extend credit to customers.
B. individuals deposit currency in banks.
C. the nation's gold holdings increase.
D. banks make loans and investments.

Questions 28, 29, and 30 are based on the following graphs.



28. The rate of inflation was greatest during which period.

A. Years 1-2.
B. Years 2-3.
C. Years 3-4.
D. Years 4-5.

29. During what period was Econoland in a recession.

A. Years 1-2.
B. Years 2-3.
C. Years 3-4.
D. Years 4-5.

30. What is the economic situation and the most appropriate monetary and fiscal policy during years 5 - 6?

A. It is a period of inflation; a budget surplus and/or tight money policy is needed.
B. It is a period of recession; a budget surplus and/or easy money policy is needed.
C. It is a period of recession; a budget deficit and/or easy money policy is needed.
D. It is a period of inflation; a budget deficit and/or easy money policy is needed.

31. Which of the following makes up the major portion of the money supply in the United States.

A. Federal Reserve notes.
B. National Bank notes.
C. Currency and coins.
D. Checking accounts.

32. A government budget deficit exists

A. whenever taxes are reduced.
B. whenever the national debt is decreasing.
C. whenever government expenditures are increased.
D. when total government spending exceeds revenues.

33. The maximum gross national product a nation can produce in any one year is set by

A. its natural resources.
B. its productive resources.
C. the amount of money people have to spend.
D. demand for goods and services by families.

34. Which one of the following would usually reduce consumer spending?

A. A decline in consumer incomes.
B. A reduction in personal income tax rates.
C. An expectation that prices will soon rise.
D. Increased government payments to individuals.

35. When commercial banks increase their loans to businesses and consumers, the result is

A. a decrease in the spending power of consumers and businesses.
B. an increase in government control over the economy.
C. an increase in the banks' excess reserves.
D. an increase in the nation's money supply.

36. In a market economy high wages depend largely upon

A. minimum wage laws.
B. actions of government.
C. high output per worker.
D. socially responsible business leaders.

37. If your annual money income rises 50% while prices of the things you buy rise by 100%, then your

A. real income is unaffected.
B. money income has fallen.
C. real income has fallen.
D. real income has risen.

38. One of the reasons a government might reduce taxes is to

A. slow down the rate of inflation.
B. slow down the rapid rise in interest rates.
C. increase consumer spending and stimulate the economy.
D. help finance space exploration and trips to the moon.

39. When the economy begins a rapid downturn, the part of total spending that changes by the largest percent is

A. business spending on factories, machinery, and inventories.
B. state and local government spending on all activities.
C. spending by families on consumer goods and services.
D. business spending on wages and salaries.

40. If from time to time total spending falls short of productive capacity, the rate of growth of the economy over a long period will be

A. higher because production will be concentrated on necessary goods rather than luxuries.
B. lower because of a heavier reliance on the raw materials of foreign countries.
C. higher because inefficient plants, equipment, and labor no longer need be employed.
D. lower because some productive resources will not be fully employed.

41. Rapidly growing economies always have

A. a slow rate of inflation.
B. a high rate of investment.
C. a low rate of population growth.
D. a rapid rate of population growth.

42. Which of the following statements about tariffs is true?

A. Tariffs decrease employment in domestic industries whose products they protect.

B. Tariffs benefit some groups at the expense of the national level of living.
C. Tariffs increase the market for our exports by reducing our imports.
D. Tariffs encourage the growth of our most efficient industries.

43. The right to join a union and elect representatives to negotiate with the employer is referred to as

A. a closed shop.
B. a seniority system.
C. collective bargaining.
D. right to work legislation.

44. Common stocks, limited liability, and unlimited life are characteristics of

A. proprietarships.
B. corportions.
C. partnerships.
D. cartels.

45. Those who believe that people should be taxed according to their ability to pay would be most likely to favor

A. an excise tax.
B. a general sales tax.
C. a progressive income tax.
D. a residential property tax.

46. A national program of free housing for the aged poor is established. The program is paid for by an increase in the income tax. These actions promote one economic goal, but work against another. Specifically, these actions are likely to

A. reduce freedom but promote equity.
B. reduce equity but promote efficiency.
C. reduce stability but promote growth.
D. reduce security but promote efficiency.

Source: Test of Economic Literacy - Form B. Joint Council on Economic Education, 1978.

SURVEY OF ECONOMIC ATTITUDES

ATTITUDES TOWARD ECONOMICS

Circle the most appropriate response.

1=strongly agree 2=agree 3=undecided 4=disagree 5=strongly disagree

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

Source: Soper, John C. and William B. Walstad. "On Measuring Economic Attitudes"

SURVEY OF ECONOMIC ATTITUDES

ECONOMIC ATTITUDE SOPHISTICATION

Circle the most appropriate response.

1=strongly agree 2=agree 3=undecided 4=disagree
5=strongly disagree

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

Source: Soper, John C. and William B. Walstad. "On Measuring Economic Attitudes"

S/E

Name _____

Age _____ Sex (1=Female, 0=Male) _____

EDUCATION

Highest Degree earned (B.A.=0, M.A.=1, Ed.S.=2, Other=3) _____

Total course hours of Economics _____
undergraduate _____
graduate _____

Describe Economic courses taken (course title, institution, year; use back of page if necessary) _____

_____

_____

Date of last Economics course (date of completion; mo./yr.) _____
(check one) course _____ workshop _____

TEACHING EXPERIENCE

Teaching experience in years _____

Previous teaching experience (assignments and number of years taught)

_____

_____

Economic teaching experience, if any (years and grade) _____

Amount of time presently used teaching economics, if any (hours/week)

_____

Economic teaching materials used, if any _____

_____

Teaching Level (grades K-3=0, 4-6=1, 7-9=2, 10-12=3, Other=4) _____

How would you describe your prominent teaching style? (check ONLY ONE)
Auditory (lecture) _____ Visual (films, etc.) _____
Tactile (hands-on) _____ Kinesthetic (experiential) _____

How would you describe your preferred learning style? (check ONLY ONE)

Auditory (listening) _____ Visual (films, etc.) _____
Tactile (touch) _____ Kinesthetic (whole body) _____

SCHOOL DISTRICT

(check one) Urban _____ Suburban _____ Rural _____

Approximate enrollment _____

IBM 805
Test Sheet

QUICK WORD TEST: Level 2 – Form Am

Edgar F. Borgatta
Raymond J. Corsini

Published by F. E. Peacock Publishers, Inc. Test Division

	Raw Score	%ile Rank	Stanine
Norms Group			

Name _____ Age _____

Place _____ Group _____ Sex _____

Date _____ 1 _____ 2 _____

DIRECTIONS: Fill in the answer space for the word that means the same as the first word. If you do not know, GUESS. Work quickly—**ANSWER ALL THE QUESTIONS.**
SAMPLE: happy dull seem glad fast

1	edict	flat	talk	root	oust	26	queue	what	mane	line	abop	51	omega	dose	last	salt	bone	76	opine	tree	deem	pick	drag
2	genre	peer	waft	sort	norm	27	stead	foal	rely	lieu	bear	52	barge	vast	bark	pull	abet	77	reign	stem	fall	sway	ride
3	travl	boat	flak	cape	sing	28	whine	pole	coil	boer	weir	53	wheel	coil	boil	spin	ribe	78	rough	rude	wave	hard	deep
4	heart	boat	draw	core	vein	29	crawl	riot	knee	skin	inch	54	grove	cave	vase	wood	hole	79	vogue	good	nice	bury	mode
5	taint	dusy	spot	fill	fall	30	swirl	tide	eddy	ribe	swim	55	snare	bark	trap	leer	walk	80	chuck	wood	tone	bade	trim
6	topic	bent	wide	term	book	31	natty	bold	blue	flay	trim	56	trick	left	send	joke	ruse	81	taunt	lean	send	twit	scat
7	alter	mode	late	bomb	show	32	shape	neat	chap	cote	tool	57	quirt	emit	bend	whip	hole	82	cheap	hand	sort	game	heap
8	habit	rise	hail	evil	serf	33	hutch	nest	coop	hold	snag	58	debar	wood	mine	tabu	help	83	heady	vast	rush	shed	firm
9	girth	wide	hand	awry	glue	34	crisp	dare	firm	snap	code	59	feign	away	abam	rule	glad	84	valid	dead	cold	just	weak
10	bedrum	died	lent	bunk	doze	35	elide	dash	trod	emit	skim	60	chest	hope	case	hang	dump	85	flout	hurt	fool	drop	jest
11	levee	raze	lift	flat	dike	36	flair	hair	dare	bent	game	61	skein	only	lift	flaw	heck	86	canon	shot	rule	hall	soon
12	force	cope	grit	dint	wade	37	eagle	fish	rage	ring	line	62	sward	dirt	turf	feed	hive	87	smoke	fire	heat	blow	rock
13	stern	rear	glum	rage	shop	38	small	mean	pint	meek	safe	63	irate	rust	lift	tire	like	88	brace	pair	rush	clap	hard
14	bathe	goat	good	soft	hill	39	glaze	lens	look	pane	coat	64	trunk	neck	body	bunk	rank	89	chump	mate	drag	debt	bump
15	suave	leak	prig	oily	lean	40	sober	wash	side	weep	cool	65	order	send	boat	cash	rank	90	adorn	gilt	gold	gild	herb
16	sully	soil	deny	brag	cart	41	crook	jail	lout	deal	bend	66	chafe	fret	cook	hilt	dish	91	avast	heap	huge	hole	stop
17	thick	dull	lily	ruse	rube	42	ember	heat	glow	coal	seem	67	argot	gold	drug	peak	cant	92	craft	wile	rank	sail	tool
18	abyss	rule	dent	urge	gulf	43	facet	pain	side	turn	easy	68	lease	loco	pert	void	vine	93	think	whit	nick	know	muse
19	crock	high	chap	file	cake	44	usurp	grab	slop	ghet	ante	69	alter	self	mind	vary	weed	94	cheer	good	bode	lift	send
20	eject	coat	emit	cart	rush	45	covet	envy	rill	coat	vest	70	valve	salt	ease	seek	work	95	caper	romp	wrap	game	roll
21	taper	bear	wick	worm	bind	46	shaft	pole	deep	high	move	71	alter	lend	mete	wear	much	96	harry	raid	male	join	wait
22	shoot	bang	push	twig	jump	47	algid	damp	wood	cold	moss	72	belly	hard	haul	fine	evil	97	trust	oral	pool	bold	file
23	storm	wild	wash	read	rave	48	parry	wear	hunt	bear	feud	73	arbor	zeal	iron	gilt	vine	98	curdle	coat	lead	rule	coax
24	fatal	dire	evil	omen	wish	49	dowry	acid	gift	wife	grin	74	crown	hair	brag	hail	pate	99	hovel	shed	tool	rare	wrap
25	feisty	food	wood	take	raid	50	aerial	dire	load	fear	vast	75	flock	tame	game	coat	bury	100	staff	cram	junk	hard	knot

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PRODUCTIVITY ENVIRONMENTAL PREFERENCE SURVEY

Dunn, Dunn and Price

FORM •5

PRINT INSIDE BOXED IN AREA ONLY

Major or Occupation

NAME — LAST / FIRST / MIDDLE INITIAL

GRADE

USE A NO. 2 PENCIL. DO NOT FOLD OR STAPLE

DO NOT MARK HERE

SEX — FEMALE / MALE

BIRTHDAY — MONTH / YEAR

SPECIAL CODES

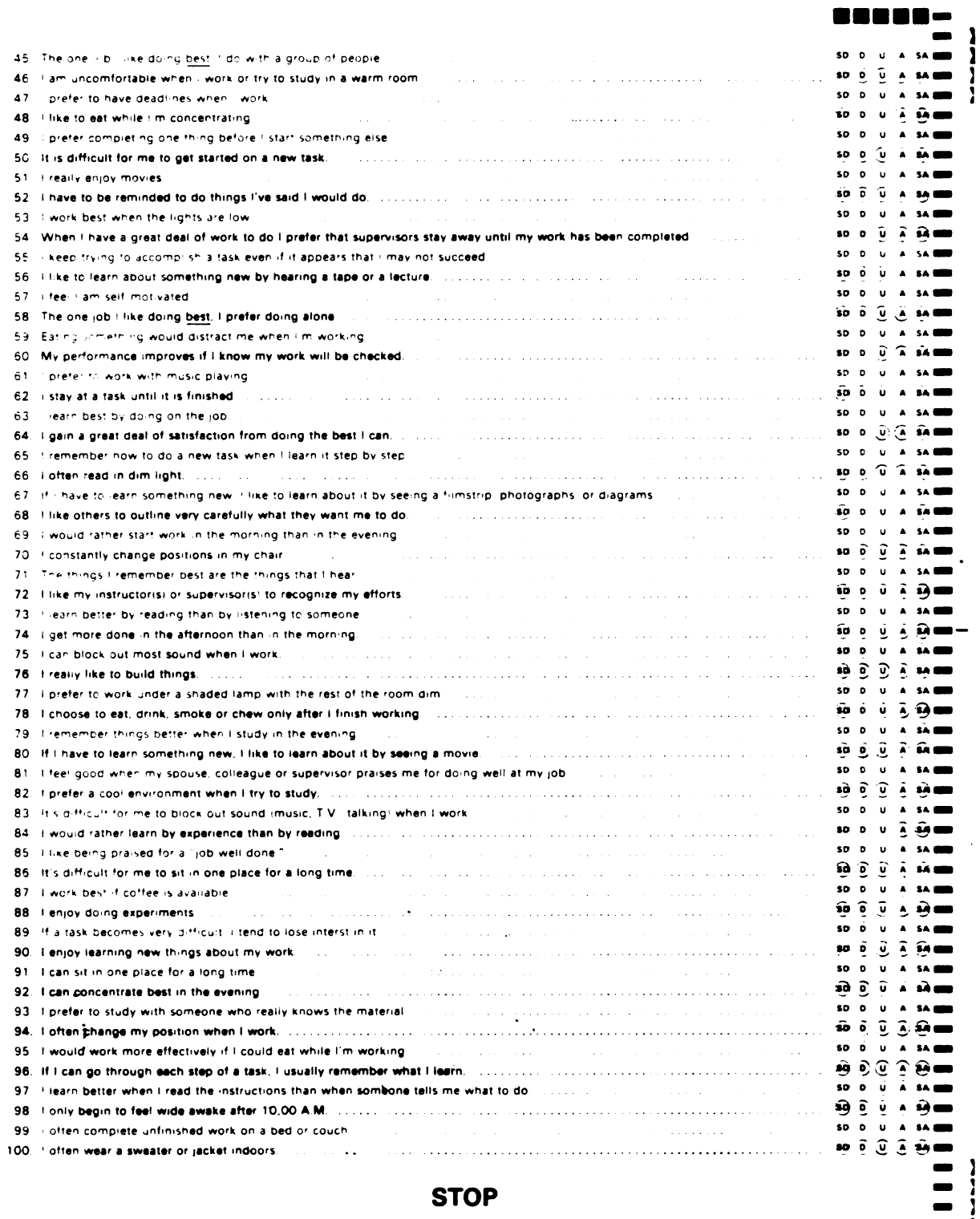
IDENTIFICATION NUMBER

Write your name, sex, and birthdate in the space provided.
Blacken the bubbles below each of the boxes you filled out.

NCS Trans Optic M800 19821 321

Read each statement and decide to what extent you would agree or disagree with that statement if you had something new or difficult to learn. Mark (SD), if you strongly disagree, or (D), disagree, or (U), uncertain, or (A), agree or (SA), strongly agree, as the response that best describes how you feel most of the time. Give your immediate or first reaction to each question. Please answer all the questions.

1	I prefer working in bright light	SD	D	U	A	SA
2	I like to work alone	SD	D	U	A	SA
3	It is easy for me to concentrate late at night	SD	D	U	A	SA
4	I like to draw or use diagrams when I work	SD	D	U	A	SA
5	I often have to be reminded to complete certain tasks or assignments	SD	D	U	A	SA
6	The one job I like doing best, I do with an expert in the field	SD	D	U	A	SA
7	I can think better lying down than sitting	SD	D	U	A	SA
8	I prefer cool temperatures when I need to concentrate	SD	D	U	A	SA
9	I can block out noise or sound when I work	SD	D	U	A	SA
10	People keep reminding me to do things	SD	D	U	A	SA
11	It is difficult for me to concentrate when I am warm	SD	D	U	A	SA
12	The one job I like doing best, I do with two or more people	SD	D	U	A	SA
13	I often work in an area where the lights are low	SD	D	U	A	SA
14	When I concentrate I like to sit on a soft chair or couch	SD	D	U	A	SA
15	I usually finish what I start	SD	D	U	A	SA
16	The things I remember best are the things that I hear	SD	D	U	A	SA
17	I enjoy tasks that allow me to take breaks	SD	D	U	A	SA
18	I can work more effectively in the afternoon than in the morning	SD	D	U	A	SA
19	I like to "snack" when I am concentrating	SD	D	U	A	SA
20	When I really have a lot of work to do I like to get it done with several colleagues	SD	D	U	A	SA
21	Noise or extraneous sound usually keeps me from concentrating	SD	D	U	A	SA
22	I often forget to do the things I've said I would do	SD	D	U	A	SA
23	I enjoy working with my hands	SD	D	U	A	SA
24	I like to work or analyze an assignment with another individual	SD	D	U	A	SA
25	I prefer cool temperatures when I'm working	SD	D	U	A	SA
26	The one job I like doing best, I do with several people	SD	D	U	A	SA
27	I concentrate best in the late afternoon	SD	D	U	A	SA
28	The things I remember best are the things that I see or read	SD	D	U	A	SA
29	I usually complete tasks that I start	SD	D	U	A	SA
30	I think best sitting up	SD	D	U	A	SA
31	I like to learn or work with an expert	SD	D	U	A	SA
32	I work best early in the morning	SD	D	U	A	SA
33	I get a lot done when I work on my own	SD	D	U	A	SA
34	When I work I turn all the lights on	SD	D	U	A	SA
35	I prefer that others share responsibility for a task we're doing	SD	D	U	A	SA
36	I really enjoy television	SD	D	U	A	SA
37	I like having access to supervisors when I have an important task to complete	SD	D	U	A	SA
38	I like to sit on a straight back chair when I concentrate	SD	D	U	A	SA
39	I work or study best by myself	SD	D	U	A	SA
40	I can remember things best when I study them in the evening	SD	D	U	A	SA
41	The things I remember best are the things that I see in a movie, book, magazine, photo or diagram	SD	D	U	A	SA
42	I always finish tasks that I start	SD	D	U	A	SA
43	If I have to learn something new, I prefer to learn about it by hearing a record, a tape, or a lecture	SD	D	U	A	SA
44	I am most alert in the evening	SD	D	U	A	SA



45	The one job I like doing best I do with a group of people	SD D U A SA
46	I am uncomfortable when I work or try to study in a warm room	SD D U A SA
47	I prefer to have deadlines when I work	SD D U A SA
48	I like to eat while I'm concentrating	SD D U A SA
49	I prefer completing one thing before I start something else	SD D U A SA
50	It is difficult for me to get started on a new task.	SD D U A SA
51	I really enjoy movies	SD D U A SA
52	I have to be reminded to do things I've said I would do.	SD D U A SA
53	I work best when the lights are low	SD D U A SA
54	When I have a great deal of work to do I prefer that supervisors stay away until my work has been completed	SD D U A SA
55	I keep trying to accomplish a task even if it appears that I may not succeed	SD D U A SA
56	I like to learn about something new by hearing a tape or a lecture	SD D U A SA
57	I feel I am self motivated	SD D U A SA
58	The one job I like doing best, I prefer doing alone	SD D U A SA
59	Eating something would distract me when I'm working	SD D U A SA
60	My performance improves if I know my work will be checked.	SD D U A SA
61	I prefer to work with music playing	SD D U A SA
62	I stay at a task until it is finished	SD D U A SA
63	I learn best by doing on the job	SD D U A SA
64	I gain a great deal of satisfaction from doing the best I can.	SD D U A SA
65	I remember how to do a new task when I learn it step by step	SD D U A SA
66	I often read in dim light.	SD D U A SA
67	If I have to learn something new, I like to learn about it by seeing a filmstrip, photographs, or diagrams	SD D U A SA
68	I like others to outline very carefully what they want me to do.	SD D U A SA
69	I would rather start work in the morning than in the evening	SD D U A SA
70	I constantly change positions in my chair	SD D U A SA
71	The things I remember best are the things that I hear	SD D U A SA
72	I like my instructor(s) or supervisor(s) to recognize my efforts	SD D U A SA
73	I learn better by reading than by listening to someone	SD D U A SA
74	I get more done in the afternoon than in the morning	SD D U A SA
75	I can block out most sound when I work.	SD D U A SA
76	I really like to build things.	SD D U A SA
77	I prefer to work under a shaded lamp with the rest of the room dim	SD D U A SA
78	I choose to eat, drink, smoke or chew only after I finish working	SD D U A SA
79	I remember things better when I study in the evening	SD D U A SA
80	If I have to learn something new, I like to learn about it by seeing a movie	SD D U A SA
81	I feel good when my spouse, colleague or supervisor praises me for doing well at my job	SD D U A SA
82	I prefer a cool environment when I try to study.	SD D U A SA
83	It's difficult for me to block out sound (music, TV, talking) when I work	SD D U A SA
84	I would rather learn by experience than by reading	SD D U A SA
85	I like being praised for a "job well done"	SD D U A SA
86	It's difficult for me to sit in one place for a long time.	SD D U A SA
87	I work best if coffee is available	SD D U A SA
88	I enjoy doing experiments	SD D U A SA
89	If a task becomes very difficult, I tend to lose interst in it	SD D U A SA
90.	I enjoy learning new things about my work	SD D U A SA
91	I can sit in one place for a long time	SD D U A SA
92.	I can concentrate best in the evening	SD D U A SA
93	I prefer to study with someone who really knows the material	SD D U A SA
94.	I often change my position when I work.	SD D U A SA
95	I would work more effectively if I could eat while I'm working	SD D U A SA
96.	If I can go through each step of a task, I usually remember what I learn.	SD D U A SA
97	I learn better when I read the instructions than when someone tells me what to do	SD D U A SA
98	I only begin to feel wide awake after 10:00 A.M.	SD D U A SA
99	I often complete unfinished work on a bed or couch	SD D U A SA
100.	I often wear a sweater or jacket indoors.	SD D U A SA

STOP

APPENDIX C

APPENDIX C

ECONOMIC EDUCATION COURSE FOR TEACHERS

Evaluation Form

	High 5	4	3	2	Low 1
1. Course Content					
2. Course Organization					
3. Instructor's Presentations					
4. General attitude and rapport among participants					
5. The instructor's general attitude and willingness to assist					
6. Textbook					
7. Handouts and supplemental materials					
8. Lesson plans and teaching assignments					

1. What was the strongest element of the course? Why?

2. What was the weakest element of the course? Why?

3. How much has your interest in the subject area been stimulated by this course?
   ____ a great deal ____ some ____ little ____ very little
   ____ nothing

4. Would you recommend this course to a friend? Yes No

5. Other comments:

APPENDIX D

APPENDIX D

PEARSON CORRELATION COEFFICIENTS

	Y1	Y2	Y3	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X1	X19	X20	X21	X22	X23
Y1	1.0000																								
Y2	.3181	1.000																							
Y3	.3967	.3538	1.000																						
X2	.7829	.3668	.3938	1.000																					
X3	.1780	.4993	.1837	.2710	1.000																				
X4	.3024	.4046	.5426	.3863	.4075	1.000																			
X5	.2243	.1728	.3710	.1636	.0691	.2711	1.000																		
X6	-.1708	-.0535	.0341	-.2782	-.2606	-.0260	.1396	1.000																	
X7	.5007	.1690	.3348	.4712	-.083	.1105	.3028	.0723	1.000																
X8	.1904	.3899	.1745	.2686	.5118	.3282	-.021	-.292	-.222	1.000															
X9	.3017	.1684	.3161	.3356	.1805	.2788	.3436	-.018	.2222	.1211	1.000														
X10	.2951	.1839	.2053	.3120	.0859	.3012	.4848	.0542	.3340	.1929	.4368	1.000													
X11	-.081	.0036	-.031	.0211	.0139	-.042	-.063	.0287	-.122	.0779	-.144	-.025	1.000												
X12	.1614	.0505	.0584	.1196	-.011	-.023	.0227	.2610	.2254	-.010	.1219	.1417	-.234	1.000											
X13	.2451	.2402	.1295	.2754	.1385	.0269	-.034	-.105	.1888	.1696	-.001	-.061	-.034	.1357	1.000										
X14	-.046	-.033	-.041	-.084	-.001	.0537	-.163	.1300	-.184	.1214	-.029	-.090	-.024	.2324	.3576	1.000									
X15	.2380	.0094	-.039	.1113	-.065	-.110	-.068	.0446	.0564	.1902	.0439	.0707	.1718	.1364	.3524	.3365	1.000								
X16	-.036	-.072	.0660	-.060	-.000	-.097	-.108	.0455	.1538	.0473	-.040	.0055	-.111	.143	.3227	.1388	.1332	1.000							
X17	.1278	-.081	.1163	.0012	-.239	.0221	.4137	.1539	.3075	-.450	.1437	.1068	-.062	.0724	-.210	-.249	-.018	-.212	1.000						
X1	.0911	-.091	-.053	.0558	-.186	-.105	.1001	-.092	.1501	-.279	-.069	-.041	-.011	-.046	-.063	-.199	-.046	-.511	.3209	1.000					
X19	.1391	-.057	-.036	.0997	-.154	-.097	.0808	-.0732	.1335	-.216	-.066	-.029	.1817	-.078	-.050	-.170	.0322	-.537	.2845	.9617	1.000				
X20	.1001	-.102	-.013	.0570	-.212	-.093	.1042	-.023	.1848	-.284	-.036	-.016	-.039	.0960	-.022	-.111	-.019	-.458	.3086	.9759	.9272	1.000			
X21	.1397	-.050	-.030	.1186	-.164	-.124	.055	-.132	.1734	-.218	-.093	-.061	-.001	-.003	.1685	-.111	.0555	-.386	.2342	.9585	.9254	.9493	1.000		
X22	.0946	-.103	-.055	.0641	-.208	-.105	.0629	-.068	.1237	-.2508	-.087	-.054	.0036	.0158	-.006	-.059	.0036	-.493	.2762	.9829	.9507	.9799	.9621	1.000	
X23	.1420	-.077	-.038	.1070	-.173	-.119	.0687	-.079	.1637	-.225	-.048	-.024	.0529	-.021	.0295	-.130	.1353	-.460	.2939	.9705	.9580	.9553	.9624	.9696	1.000

APPENDIX E

APPENDIX E

LIST OF CONCEPTS

Basic Economic Concepts

The Basic Economic Problem
1. Economic Wants
2. Productive Resources
3. Scarcity and Choices
4. Opportunity Costs and Trade-Offs
5. Marginallism and Equilibrium

Economic Systems
6. Nature and Types of Economic Systems
7. Economic Incentives
8. Specialization, Comparative Advantage, and Division of Labor
9. Voluntary Exchange
10. Interdependence
11. Government Intervention and Regulations

Microeconomics: Resource Allocation and Income Distribution
12. Markets, Supply and Demand
13. The Price Mechanism
14. Competition and Market Structure
15. "Market Failures": Information Costs, Resource Immobility, Externalties, etc.
16. Income Distribution and Government Redistribution

Macroeconomics: Economic Stability and Growth
17. Aggregate Supply and Productive Growth
18. Aggregate Demand: Unemployment and Inflation
19. Price Level Changes
20. Money and Monetary Policy
21. Fiscal Policy: Taxes, Expenditures, and Transfer Payments
22. Economic Growth
23. Savings, Investment, and Productivity

The World Economy
24. International Economics (uses the concepts above)

Broad Social Goals
Freedom, Economic Efficiency, Equity, Full Employment, Price Stability, Security, Growth, Other Goals

Source: Hansen, Lee W., et al. Part I: A Framework for Teaching Economics: Basic Concepts. Joint Council on Economic Education, New York: 1977.

APPENDIX F

APPENDIX F

SIMULATION SUMMARY

Concept	Simulation	Source
Basic Economic Problem		
Economic wants	All in the Family Money	
Productive Resources	Growth and Production	Choice, p. 92
Scarcity and Choices	Sevier Prom	
Opportunity Costs and Trade-offs	Choices	American Enterprise Teaching Notes (9/10, '77)
	Basic Economic Problem	Gaming and Simulations in Economics, Dale, p. 49
Marginalism and Equilibrium	To Sell or Not to Sell	Choice, p. 81
Economic Systems		
Nature and Types of Economic Systems	Barter Activity	
Economic Incentives		
Specialization, Comparative Advantage, and Division of Labor	Specialized Trade	Choice, p. 48
Voluntary Exchange	Galactica	Activities That Teach Economics AT:TN (Spring '78)
Government Intervention and Regulation	Returnable or Non-Returnable	Analyzing Government Regulation (JCEE, '78)
Microeconomics: Resource Allocation and Income Distribution		
Markets, Supply and Demand	Crawfish Game	
	How Much?	Economics: Intro to World Around You ('76)
The Price Mechanism	Dollar Voting	Gaming and Simulations, (Dale, p. 100)

Competition and Market Structure	Competing Soft-Drink Stands	Pt. III Strategies at Intermediate Level (JCEE, '78)
"Market Failures" - Externalties, Informal Costs	Gold Rush	Strategies, JCEE, p. 97

Macroeconomics: Economic Stability and Growth

Aggregate Supply and Productive Capacity	Widget Game	State of Ohio
Aggregate Demand: Unemployment and Inflation	Landosa	Activities That Teach Economics ('75)
Price Level Changes		
Money and Monetary Policy	Out of Thin Air	Strategies, (JCEE, p. 54)
Fiscal Policy: Taxes, Expenditures, and Transfers	Cut the Budget? Tax Simulation	Give and Take (JCEE)
Economic Growth	Manufacturing (rev)	Choice, p. 89
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